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REVIEW OF THE NUCLEAR EMERGENCY IN JAPAN AND IMPLICATIONS FOR THE UNITED STATES

JOINT HEARING

BEFORE THE

SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY

AND THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

APRIL 12, 2011

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ONE HUNDRED TWELFTH CONGRESS
FIRST SESSION

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REVIEW OF THE NUCLEAR EMERGENCY IN JAPAN AND IMPLICATIONS FOR THE UNITED STATES

TUESDAY, APRIL 12, 2011

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
JOINT WITH
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY,
Washington, DC.

The full committees met, pursuant to notice, at 2:45 p.m. in room 406, Dirksen Senate Office Building, Hon. Thomas R. Carper (chairman of the subcommittee) presiding.

Present: Senators Carper, Barrasso, Boxer, Inhofe, Lautenberg, Udall, Merkley, Gillibrand, Alexander and Boozman.

Also present: Representatives Capps and Bilbray.

STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. The committee will come to order.

When Senator Carper comes, I am going to ask him to take the gavel since he is the Chair of the appropriate Subcommittee. But I want us to get started because we have a number of witnesses today.

I want to say welcome to my distinguished Ranking Member.

Just over 1 month ago today, Japan was hit by a 9.0 magnitude earthquake and a tsunami that measured roughly 30 feet high. The devastation brought on by these catastrophic events is heart breaking and our deepest condolences go out to the victims and their families. Today we are hearing that this event now, in terms of radiation leaked, is equal to that of Chernobyl. So, the news is not good coming out of Japan.

The tragedy serves as an important wake up call for us. We cannot ignore it. I think one thing that we would all agree to is we must plan for the unexpected and when we know of threats we must act quickly to address them. So, what can we learn from the tragic situation in Japan?

The United States has 104 commercial nuclear power reactors operating at 65 sites in 31 States. Twenty-three reactors are boiling water reactors with Mark I containment systems like the ones at the Daiichi plant. It is true that the NRC has instituted an improvement program for this type of reactor. However, the lessons from the tragedy in Japan demonstrate the importance of reassessing the safety of these reactors.

The compromised reactors in Japan, like those in the United States, were built on a set of assumptions regarding the potential magnitude of natural disasters such as earthquakes and tsunamis. We know that some U.S. nuclear facilities are located in areas with high and moderate seismic activity. I can tell you, you are going to hear from our people, that we have a couple of those.

The situation in Japan has shown us we must take a hard look at the risk assumptions that were made when the reactors were designed. We know in the case of Japan, they designed it for a lower magnitude quake.

As a result of the catastrophic situation in Japan, Senator Tom Carper, who is going to chair this hearing as soon as I complete my remarks, Tom Carper and I have called on the NRC to conduct a comprehensive review of all nuclear facilities in the United States to assess their capacity to withstand and respond to natural or manmade disasters.

Senator Feinstein and I also requested special immediate attention be given to those U.S. nuclear reactors that are subjected to significant seismic activity or are located near coastlines such as San Onofre Nuclear Generating Station and Diablo Canyon Nuclear Power Plant.

The NRC has identified both of these plants in California as being located in high seismicity zones. The Commissioners found another nine plants, which are located in North Carolina, Illinois, Georgia, South Carolina, Virginia and Tennessee, but they are in moderate seismicity zones.

Both reactors in California are located in high density areas. Four hundred twenty-four thousand people live within 50 miles of Diablo and 7.4 million people live within 50 miles of San Onofre. Let me repeat that. Four hundred twenty-four thousand people live within 50 miles of Diablo and 7.4 million live within 50 miles of San Onofre.

Other nuclear facilities in the United States are also located in highly populated areas. If you look at the one in New York, it is about 17 million people live within that 50-mile radius.

Although evacuation plans are generally a State and local concern, there have been calls for more involvement from FEMA to assess those plans.

Today we will hear testimony from a number of our colleagues as well as the Chairman of the NRC, Greg Jaczko, who has been so helpful to us moving forward, and of course we will hear from the Administrator of the EPA, Lisa Jackson.

I am very interested to hear how the EPA is monitoring the radiation in the United States and we have, Lisa and I, have talked over the weeks. I am just making sure we have accurate up-to-date information on the radioactivity.

We know that low levels of radiation have been detected in the United States from the compromised reactors in Japan. We can only imagine what the potential impacts on health and environment would be if, God forbid, we ever experienced the same type of accidents that occurred in Japan.

Small but elevated levels of radiation have been detected in milk and other food. We are going to talk about that. Experts say that we are OK right now. I want to probe that. I want to make sure

of that. Whether it is the NRC's review process of our reactors or EPA's monitoring of our drinking water, complete transparency and prompt disclosure are vital to maintaining the Government's credibility, our credibility, frankly, at this Oversight Committee.

The Federal Government must heed the wake up call from the catastrophe in Japan. As Chairman of this committee, working with everybody on both sides of the aisle, and particularly my Subcommittee Chair, I will continue to provide vigorous oversight to ensure that we learn the tragic lessons from the Fukushima reactors and take reasonable steps to make our Nation's nuclear facilities as safe as they can be made.

I know that Chairman Jaczko and Administrator Jackson share my concern for the safety of the American people. Our common goal is to ensure we are prepared and obviously we take another hard look at what is going on in our country at a time when we need every bit of energy we can get. There is no question about that. But, as we know from looking at what is going on over there, it is the unthinkable and we have to avoid it.

So, with that I am going to turn the gavel over to Senator Carper and ask Senator Inhofe to make his opening statement.

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. Thank you, Madam Chairman.

First of all, Senator Johanns was going to be here today. He is very interested in this hearing but was unable to do so. He asked if I would put into the record a statement from the Omaha Public Power District, which I put into the record right now, Mr. Chairman.

Senator CARPER. [Presiding.] Without objection.

Senator INHOFE. Chairman Jaczko, I appreciate your efforts to assure the Nation that we are, that the nuclear plants here in the United States are safe and I appreciate very much, Administrator Jackson, your repeated assurances that traces of radioactive materials that have drifted here from Japan will not impact public health.

I am sure we all agree that we need to study the accident at the Fukushima Nuclear Plant and learn from it. As Chairman Jaczko frequently reminds us, we cannot be complacent with regard to nuclear safety. Even so, we cannot allow ourselves to be paralyzed by fear. Any, harnessing any energy source carries some level of risk, and we need to be, to make sure that we can safely manage that risk.

Ensuring the safe use of nuclear energy is a very serious job. In 1974, Congress established an independent Commission and charged five individuals with the responsibility to protect public health and safety. The public is best served by a Commission that functions collectively and collegially to pool their expertise. I am concerned that the public may currently be getting less than it deserves.

I was surprised to learn from my staff that Chairman Jaczko has invoked emergency authority and transferred Commission functions to himself in the wake of the earthquake in Japan, especially after speaking with me personally by phone and then appearing be-

fore this committee. Let us get our dates straight because I want the Commissioner to address this.

First of all, it took place on the 11th, our phone call took place on the 14th, the hearing took place on the 16th, and never was this mentioned that this was going to be invoked. The law confers emergency authority on the Chairman in the wake of an emergency at a particular facility or materials regulated by the NRC. At present, I am not aware of an emergency condition that exists in the United States, in any United States facility.

Chairman Jaczko, I want to work with you as the NRC tries to understand what happened in Japan, what the United States can learn from it, but our collaboration, and indeed, collaboration with all of us in Congress, can only proceed prudently if we have openness and fairness and transparency. That applies to your office.

So, as we move forward I hope you would provide us with full and complete information about your activities and that you will work with your fellow Commissioners in the same spirit. In that vein, I look forward to your testimony and to yours, Administrator Jackson, and to working with both of you on gaining full understanding of the impact of the Fukushima accident.

Before I yield to my colleague, I think it is significant that I get my request in here. I am anxious to see progress on the nominations of Commissioners Ostendorff and Svinicki which I hope President Obama sends us soon. Given the scope of the issues before the Commission, it is important we have our Commission full with all the members appointed and confirmed.

Thank you, Mr. Chairman.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Chairman Jaczko, I appreciate your efforts to assure the nation that our nuclear plants here in the U.S. are safe. Administrator Jackson, I also appreciate your repeated reassurances that traces of radioactive materials that have drifted here from Japan will not impact public health.

I'm sure we all agree that we need to study the accident at the Fukushima nuclear plant and learn from it. As Chairman Jaczko frequently reminds us, we can't be complacent with regard to nuclear safety. Even so, we can't allow ourselves to be paralyzed by fear. Harnessing any energy source carries some measure of risk that must be safely managed for our nation to prosper.

Ensuring the safe use of nuclear energy is a very serious job. In 1974, Congress established an independent commission and charged five individuals with the responsibility to protect public health and safety. The public is best served by a commission that functions collectively and collegially to pool their expertise. I'm concerned that the public may currently be getting less than it deserves.

I was surprised to learn from my staff that Chairman Jaczko has invoked emergency authority and transferred Commission functions to himself in the wake of the earthquake in Japan, especially after speaking with me personally by telephone and appearing before this committee in a public briefing—and failing to mention it either time. The law confers emergency authority on the Chairman in the wake of an emergency at a particular facility or materials regulated by the NRC. At present, I'm not aware that an emergency condition exists at any U.S. facility.

Chairman Jaczko, I want to work with you as the NRC tries to understand what happened in Japan, and what the United States can learn from it. But our collaboration—indeed, collaboration with all of us, Congress—can only proceed fruitfully if we have openness and transparency. That applies to your office. So as we move forward, I hope you will provide us with full and complete information about your activities, and that you will work with your fellow commissioners in the same spirit.

In that vein, I look forward to your testimony, and yours Administrator Jackson, and to working with both of you on gaining a full understanding of the impact of the Fukushima accident.

But, before I yield to my colleague, I'd be remiss if I didn't say I'm anxious to see progress on the renominations of Commissioners Ostendorff and Svinicki which I hope President Obama sends us soon. Given the scope of issues before the Commission, it is important that the agency continues to benefit from their valuable expertise.

STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Senator CARPER. You bet. Thank you very much, Senator Inhofe.

Let me begin by saying, first of all, Senator Inhofe and Madam Chair, thanks very much for holding this hearing and for giving me the opportunity to co-chair it with you.

Let me begin by saying that, again, I have said this before and I will certainly say it again here today, our thoughts and prayers go out to all of the citizens of Japan, especially those families of the thousands of disaster victims and those that are going through a very, very difficult time. As this tragedy unfolds, I encourage the Nuclear Regulatory Commission and other U.S. agencies to continue to coordinate with the Japanese government to provide any assistance that they need to recover.

The events that struck Japan are reminders that we are all vulnerable to unexpected disasters, whether it is an act of nature or a terrorist attack. While we cannot predict when or where the next major disaster will occur, we know that it will occur and we also know that adequate protection, adequate preparation in response planning are vital to minimize both the injury and death when it does happen.

Today's hearing is one of many I hope that this committee will have to make sure that our Nation has prepared for the worst in order to prevent any lives lost from nuclear power in this country. In the United States we have, as you know, 104 nuclear power plants in some 31 States which generate approximately one-fifth of our Nation's total electric consumption. Nuclear power has helped to curb our reliance on dirty fossil fuels and reduce air pollution that damages our health and causes global warming.

Over the years, the NRC has strived to create a culture of safety in the nuclear energy industry and as long as I have been on this Subcommittee, we have worked very hard to reinforce those efforts. As a result, we have seen, not seen, any direct deaths from nuclear power by radiation exposure in this country in over 50 years.

As part of its culture of safety, the NRC requires nuclear facilities to be designed to withstand natural disasters and terrorist attacks. After September 11th, the NRC took a closer look at the nuclear industry and put in place additional safety and security requirements.

Despite all of the protections that are in place, the crisis in Japan is a clear warning, a clear reminder, that we cannot become complacent when it comes to nuclear safety. I often say it, and my colleagues are tired of hearing me say it, if it is not perfect, make it better. That certainly applies to nuclear plants and the way that they are operated with respect to their safety.

That is why Chairman Boxer and I asked the NRC for a conference review of our nuclear fleet. We want to make sure that every precaution is being taken to safeguard the American people from a similar nuclear accident. The NRC is just getting started on this review and I anxiously await their results.

Today I look forward to hearing from our witnesses an update on the Fukushima Daiichi Nuclear Plant and an update on our response to that crisis. I also look forward to hearing what we can learn from the ongoing crisis in order to prevent similar events from occurring right here.

I am particularly interested in hearing about the State of Emergency Planning Process from the Delaware Department of Safety and Homeland Security. Secretary Schiliro, we welcome you especially.

As Chairman of the Subcommittee on Nuclear Safety, I take seriously my responsibilities, our responsibilities, to make certain that we are taking appropriate measures to make the nuclear industry as safe as it can possibly be. As I said before, while I am a proponent of clean energy, my top priority of our domestic power, our nuclear power industry, to me is public safety.

With that having been said, I look over to my right and I see Senator Lamar Alexander of Tennessee. We welcome you and await your comments.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Let me begin by saying my thoughts and prayers go out to all citizens of Japan, especially to the families of the thousands of disaster victims. As this tragedy unfolds, I encourage the Nuclear Regulatory Commission (NRC) and other U.S. agencies to continue to coordinate with the Japanese government to provide any assistance they need to recover.

The events that struck Japan are reminders that we are all vulnerable to unexpected disasters, whether an act of nature or a terrorist attack. While we cannot predict when or where the next major disaster will occur, we know adequate preparation and response planning are vital to minimize injury and death when it does happen. Today's hearing is one of many I hope this committee will have to make sure our nation has prepared for the worst—in order to prevent any lives lost from nuclear power in this country.

In the United States we have 104 nuclear power plants in 31 states, which generate approximately a fifth of our Nation's total electric consumption. Nuclear power has helped curb our reliance on dirty fossil fuels and reduce air pollution that damages our health and causes global warming.

Over the years, the NRC has strived to create a "culture of safety" in the U.S. nuclear energy industry. As a result, we have not seen any direct deaths from nuclear power plant radiation exposure in this country. As part of its "culture of safety," the NRC requires nuclear facilities to be designed to withstand natural disasters and terrorist attacks. After September 11th, the NRC took a closer look at the nuclear industry and put into place additional safety and security requirements.

Despite all the protections in place, the crisis in Japan is a clear warning that we must not become complacent when it comes to nuclear safety. As I often say, if it is not perfect, make it better. That is why Chairman Boxer and I asked the NRC for a comprehensive review of our nuclear fleet. We wanted to make sure every precaution is being taken to safeguard the American people from a similar nuclear incident. The NRC is just getting started on this review and I anxiously await their results.

Today, I look forward to hearing from our witnesses an update on the Fukushima Daiichi nuclear plant and update on our response to that crisis. I also look forward to hearing what we can learn from the ongoing crisis in order to prevent similar events from occurring here. I'm particularly interested in hearing about the State

emergency planning process from Delaware Department of Safety and Homeland Security Secretary Schiliro.

As Chairman of the Subcommittee on Nuclear Safety, I take seriously my responsibility to make certain we are taking the appropriate measures to make the nuclear industry safe. As I have said before, while I am a proponent of clean energy, my top priority for our domestic nuclear power industry remains public safety.

STATEMENT OF HON. LAMAR ALEXANDER, U.S. SENATOR FROM THE STATE OF TENNESSEE

Senator ALEXANDER. Thanks, Mr. Chairman. I want to thank you and Senator Boxer for——

Senator CARPER. Senator, Senator, I did not notice that Senator Barrasso had stepped in.

Senator Barrasso.

[Remarks off microphone.]

Senator CARPER. Are you sure? OK, thank you very much.

Senator ALEXANDER. Thanks, Senator Barrasso. Well, I want to thank everybody. I thank Senators Boxer and Carper for having the hearing.

I think nuclear power is, and I have said this before the Japan accident, something we ought to have more oversight of and that is because it is complex science, it is complex engineering, and it is vitally important to the future of our country.

I remember back when I was Governor of Tennessee in the 1980s. We had a question that was presented to me when we were building, TVA was building, one of its nuclear power plants. The issue was whether to distribute iodide tablets to people who were in the area of the new nuclear power plant.

Some people said, oh, do not do that because you will scare people to death. The other argument, of course, was, well, if it would, if people understand what they are for, and they are only to be used in the event of an emergency, then it is better to go ahead and talk about the process that we are using and let people know what we are dealing with. So, I made the decision then, let us go ahead and let people who live within the area of the nuclear power plant have access to iodide tablets in case there was a problem.

I feel the same way today about our nuclear power program in the United States and what happened in Japan. I cannot imagine a future for the United States that does not include nuclear power to create electricity. I mean, it is only 20 percent of our electricity, but it is 70 percent of our clean electricity. Senator Carper has been very consistent. He cares deeply about climate change. This is one way to deal with it. He and I have worked hard on clean air in the Smoky Mountains and the East Coast. This is one way to deal with it.

So, it is hard to imagine that. But on the other hand, I think those of us who, who find it especially important have maybe a special responsibility to see that there is clear oversight and public understanding of this complex system of science and engineering so that people are comfortable with whatever risks there are.

As we look at our own history, actually, we have done a fair job of that. I mean, Three Mile Island spawned several improvements such as the Institute for Nuclear Power Operations, which has improved safety. It is important for Americans to know that while Three Mile Island was a significant accident and a big problem,

that no one was hurt at Three Mile Island. That is important to know.

September 11th. That had nothing to do with nuclear power but it caused nuclear power operators around the country to take a look at what would happen if there were a terrorist attack. You can go on YouTube and see what happens when an F–4 Phantom Jet runs into a concrete wall at 500 miles an hour. The jet vaporizes but the plant is still there.

Hurricane Katrina had nothing to do with nuclear power but it caused operators at the 104 nuclear plants around the country and the Nuclear Regulatory Commission to think about well, what would happen if we had a horrific event like the size of Hurricane Katrina.

So, I think we still have a lot to learn from what happened in Japan. For example, spent fuel storage. There is a lot of talk about that. It helps us think about, is it possible, how long should it be in pools, how soon could it go to dry casks? It is important also to know, as the Chairman of the Nuclear Regulatory Commission says, as Dr. Chu has said, the President's Energy Chief and Nobel Prize Winning Physicist, that it is safe to store spent fuel onsite for 100 years.

It is important to know that all the fuel that we have produced that is used fuel from commercial reactors in the United States would fit on one football field to a depth of about 20 feet. That is the mass that we are talking about.

It is important to ask, what about Yucca Mountain? We do need to eventually dispose of it. We have collected $30 billion to pay for an eventual disposal. Why do we not do it?

We could ask about safety improvements. We should be thinking about new reactors. In Tennessee, TVA's got 3,200 people building a new reactor at Watts Bar. How can we know it is even safer than the other 104 reactors we have had at which, as Senator Carper said, we have not had one single fatality related to a reactor in the last, well, in the history of those facilities?

So, there are important questions to ask. There is a lot of information to learn from the Japan disaster. But it is important, at the same time, to recognize the safety record that we have for this form of energy production in the United States and keep it all in perspective.

Senator Carper and Senator Boxer, I welcome these hearings. The more of them, the better. I believe that the more we understand and talk about this complex system of energy production, the safer it is likely to be and the more useful it will be to help produce clean air in our country.

Thank you.

Senator CARPER. Thank you, Senator Alexander. If it is OK with Senator Barrasso, I am going to slip over to Senator Udall and then back to you. OK? Senator Udall.

STATEMENT OF HON. TOM UDALL, U.S. SENATOR FROM THE STATE OF NEW MEXICO

Senator UDALL. Thank you, Senator Carper, and thank you very much, you and Senator Boxer, for holding this hearing. I appreciate

very much and welcome my colleagues that I served with over in the House and look forward to hearing their testimony.

As Senator Carper and others have said, I think our thoughts and prayers really do go out to the Japanese people for this tragedy and what has happened to them. I know when I talked the other day with Japan's Ambassador to the United States he was very, very appreciative of the level of scientific support that we were giving Japan. I know many scientists have come from both California and New Mexico and from our national labs and so that is something that they appreciate and I think we are all very proud of.

This is a three-part disaster, an earthquake, a tsunami and a nuclear crisis and it is tragic. Americans should focus on assisting our close friends, the Japanese, in recovering from it. Nuclear energy has tremendous potential for good and also for harm. Nuclear accidents are rare, but their consequences can be severe. Nuclear energy safety must be the top priority for Government regulators and it should be the top priority for the industry as well.

The Japanese crisis underscores the need for information transparency. Nuclear energy will almost certainly continue to be part of America's energy mix. We have 100, 104 reactors today, and if it economic, more will be built. But it will be harder to build reactors if the public lives in fear of them.

Our role in Congress is to conduct the oversight to ensure that the NRC and the EPA do their job and ensure U.S. nuclear power plants are safe. Safety standards are of the utmost importance and we should be highly skeptical of proposals to "streamline" or cut corners on safety standards. It will be up to the banks and the investor community to decide whether to invest in nuclear power projects compared to the other investment options out there.

Nations like France, which rely heavily on nuclear power, also have taxpayers picking up most of the tab. That is not realistic for the United States' current budget situation.

So, I very much appreciate this list of witnesses today and I am going to yield back my time so we can get quickly to the witnesses.

Senator CARPER. Thank you, Senator Udall.

Senator Barrasso is the Ranking Republican Member of the Subcommittee on Clean Air and Nuclear Safety. Senator Barrasso, thank you for your patience.

STATEMENT OF HON. JOHN BARRASSO, U.S. SENATOR FROM THE STATE OF WYOMING

Senator BARRASSO. Thank you very much, Mr. Chairman.

I appreciate our guests for being here to testify and I want to associate myself with the opening remarks of Senator Udall regarding his concerns for the people of Japan. Absolutely. Incredible challenges, incredible loss and I think the hearts of all of us on this committee, and in this Body, have great, great concerns for the people in Japan.

The tsunami and the earthquake occurred in Japan, not in the United States. The emergency that preceded the tsunami and the earthquake occurred in Japan. The emergency response is occurring in Japan with the help of the United States.

Some people seem to want Americans to believe that the disaster occurred here and that is not the case. As Ranking Member Inhofe

has pointed out, the current Chairman of the Nuclear Regulatory Commission is operating under his emergency powers since the disaster first occurred. The reasons why these emergency powers continue to be in effect, and the implications that has for future chairmen, does not have implications for the United States nuclear safety, does have implications for the United States nuclear safety response. This is one of the reasons that I believe the hearing today is so important.

Some want to use this crisis in Japan as a tool to wipe out nuclear power in the United States. For example, there is an April 6th inside EPA story entitled "Activists Step Up Effort to Strengthen Oversight of Uranium Recovery." The article states that "environmentalists are stepping up their efforts to push EPA to strengthen its oversight of uranium mining and processing operations in the wake of the Japanese nuclear disaster, targeting the processed metal because its extraction marks the first step in the nuclear fuel cycle that its proponents tout as a low carbon alternative to fossil fuels."

Well, how uranium mining is tied to the Japanese nuclear emergency is beyond me. I would hope that the EPA Administrator, who is with us today, would ignore these types of attacks which would have occurred whether the Japanese disaster occurred or not.

Earlier today in this very committee we heard testimony from those who want to stop hydraulic fracturing. This is the process whereby we can tap America's vast domestic natural gas reserves. Apparently, these activists do not want natural gas either.

By attacking all of the affordable energy sources, including our nuclear and natural gas, activists are driving up the cost of energy. They are raising the costs of running a factory, or a mine, or a small business. They are raising the cost of heating and cooling homes across this country. This will cost thousand of jobs during our economic downturn.

We cannot reach a clean energy future without natural gas and without nuclear power. We need all the power, not just some. That means coal, natural gas, wind, solar, hydro, geothermal and nuclear power. As Senator Carper and I talk about and discuss and agree, the cheapest energy is energy that is not used. So, we need to be more efficient in how we use our energy.

But we need the kind of energy mix that keeps factories running and homes heated. Countries like Germany, which are phasing out domestic nuclear power, are discovering this fact. The Washington Post ran an Associated Press story on April 6th entitled Utilities: Germany Now Importing Energy After Taking Nuclear Power Plants Off the Grid. The article goes on and states that Chancellor Angela Merkel's decision to take some atomic power plants offline in the wake of Japan's disaster means Germany is now importing power from its nuclear-reliant neighbors. It goes on to say Germany now imports about 50 gigawatts, gigawatt hours, or the capacity equivalent to 1.5 reactors, from France and the Czech Republic every day. This is from the German Association of Energy and Water Industries.

So, this same pattern that we are seeing in Germany will occur in the United States. American States that declare themselves nuclear free, whether they are California or elsewhere, whatever

States declare themselves nuclear free and shut down their nuclear plants will have to have power shipped in from neighboring States. It is an energy shell game and it will not hide America's growing need for affordable domestic energy to power our economy.

Let us be careful not to jump to conclusions and try to shut down another domestic energy source. Let us work together to make America's energy as clean as we can as fast we can without raising energy prices and costing American jobs.

Thank you, Mr. Chairman. I look forward to the testimony.

Senator CARPER. Thank you, Senator Barrasso.

Senator Lautenberg.

STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. Thanks, Mr. Chairman.

As said, we all agree that our sympathies, our concern and our desire is to be of help to the people in Japan who are affected as a result of the earthquake, tsunami and nuclear emergency. But we want to learn from it and we want to make sure that we are doing what we can for the people in our country.

Since the latest disaster began unfolding, Americans have had one question on their minds. Could it happen here? I am not willing to wait to find out. We need to answer that question now.

Soon after the meltdown in Japan began, I asked the Nuclear Regulatory Commission to conduct a comprehensive review of New Jersey's four nuclear power reactors which provide our State with about half of its electricity. I also requested the chief executives of New Jersey's nuclear power companies to join me in my office where they agreed to a thorough safety review at each of the four reactors. The people of New Jersey need to know if our State's nuclear plants are safe and we are determined to make sure that they get the peace of mind that they deserve, but the reality of being protected.

But this is not the only issue in New Jersey. Nuclear energy provides 20 percent of America's electricity and so we have to make nuclear safety a national priority. The United States has a good track record of keeping our plants safe. There have been few accidents and few fatalities. But we have got to remain vigilant if we want to preserve this record.

Now Japan, a world leader in technology in its plants, were built to resist earthquakes. But as we know, it was not enough. So here in the United States we cannot take anything for granted.

To keep Americans safe also means making sure that we give citizens, our citizens, a clear guidance during emergencies. I was troubled when American citizens in Japan were told to stay at least 50 miles away from the site of this meltdown. In our country, the NRC Emergency Guidelines require people to stay only 10 miles away from plants during emergencies.

So, make no mistake, nuclear power generates emission-free energy and it should and will be part of our energy future. But we cannot ever trade people's safety for the sake of meeting our energy demands. We saw Chernobyl a quarter of a century ago, the effects of a single nuclear accident that will linger for generations.

So, I look forward to hearing from today's witnesses, and thank our colleagues from the House, about how we can learn from the past mistakes and make sure that nuclear power remains a safe, clean energy source.

I want to respond to something that we heard, talked about this morning and that is, well, costs. Costs. Nuclear power does so much for us but has risks. When we think of the contribution that nuclear power brings to our energy needs, we know that we are going to keep on having nuclear power created. But burning fossil fuel has an extra cost. It has a lasting effect on our environment and on the health and wellbeing of our citizens.

So, when we look at the costs for energy, we have to look at the costs of unfit air for those who have asthma or otherwise, and pollution generally. So, we have to look at the whole picture and I assure you that we would like to do just that.

Thank you very much.

Senator CARPER. Thank you, Senator Lautenberg.

Senator Merkley.

STATEMENT OF HON. JEFF MERKLEY, U.S. SENATOR FROM THE STATE OF OREGON

Senator MERKLEY. Thank you, Mr. Chair.

I express my deepest sympathies to the families in Japan, victims of the triple tragedy, the earthquake, the tsunami and certainly the nuclear disaster. I thank all of the heroes in Japan who raced to the scene to provide assistance to victims of the earthquake and tsunami and those who are working around the clock to cool the nuclear reactors and contain the radiation that is being released.

It is very much our worst nightmare that a natural disaster of some kind should cause us some more tragedy in the United States and that is why it is certainly appropriate and important that we do everything possible to take and look at the lessons in Japan and apply them to our own system. Just as we applied a stress test to the banks in the financial crisis, we need to apply a stress test to our nuclear plants and understand what the weaknesses are.

When the disaster happened in Japan, and certainly a lot of the discussion was around the cooling pools for rods, I was taken back to when I was traveling through Hanford many years ago, about 14 years ago, and was looking at the cooling pool at Hanford, and it had that kind of eerie blue glow at the bottom of the pool. I asked the question, if an earthquake occurs and it splits this pool, what happens when the water rushes out? Basically the response was a blank look with that would be bad. Certainly we have to be prepared in far better ways than simply saying that something would be bad.

In the last two decades, we have built only three new nuclear reactors because the cost is so high by the time we account for human error, by the time we account for natural disaster, and by the time we account for terrorist attack and design plans accordingly. We have to take a look at those things because the upside risk is so substantial. So that is certainly a factor.

We have strategies that have been put forward by groups like New Scale, a group in Oregon, other research that has been done

on pebble bed strategies that have failsafe mechanisms and/or passive protections that I think certainly should be, we should look into and understand that part of this conversation, whether fundamentally different designs would greatly mitigate the risks.

These disasters occur because we lose the heating transfer medium and plants overheat. But there are designs intended to make sure that there is no meltdown even when that happens, whether the medium be water or the medium be helium. That needs to be part of the national discussion.

So with that, thank you very much, Madam Chair, and I yield back the balance of my time.

Senator CARPER. I believe the next person we recognize is Senator Gillibrand.

Senator Gillibrand.

STATEMENT OF HON. KIRSTEN E. GILLIBRAND, U.S. SENATOR FROM THE STATE OF NEW YORK

Senator GILLIBRAND. Thank you so much, Mr. Chairman, for holding the hearing. Madam Chairwoman, I appreciate you holding this hearing as well. This is obviously an issue that we share a great passion for and in light of the disaster in Japan, I am really looking for answers. So, I just want to thank you both for drawing attention to such a serious issue.

I want to thank Chairman Jaczko for coming. Congresswoman Capps, thank you so much for spending time with us to answer our questions.

I may not have the opportunity to ask my questions, but I do want to highlight some of the areas of my concern and I will submit the questions directly for answers for the record, but I do hope you get to address this in part of this hearing.

One issue is the issue of licensing exemptions. Now, in the Indian Point Plant, which is the one that serves about 30 percent of New York's electricity right now, within a 50-mile radius it hits 16 million people. So, we have significant concern to focus on that, and all the plants in New York, to make sure they are safe.

Now, with Indian Point, there have been a number of waivers given. I would like an analysis and a review of in what instances are waivers given? Are you going to re-look at the issue in light of the Japan disaster to see if those waivers were legitimate, if they should be reconsidered and perhaps withdrawn? The issue of waivers is something I care a lot about.

The second issue is the issue of evacuations. In Japan, we have evacuated U.S. citizens within a 50-mile radius. The plan with regard to Indian Point is a 10-mile evacuation plan. I would like to know the reason why there are differences in evacuation plans.

To do a 10-mile evacuation for Indian Point takes 9 hours. I understand that there are different types of redundancies at Indian Point, one is a going to a diesel system and another diesel thereafter, but, then it is a battery system that only lasts for 3 hours. How do you reconcile evacuations with what your redundancies are and how capable they are in such a situation?

I also care a lot about security issues. Now, obviously, we are soon on the 10-year anniversary of 9/11 and one of the 9/11 Commission recommendations was to secure all nuclear facilities. I

would like to have an opportunity to talk to you about those security measures and where they stand and what kind of investigations are you doing with regard to employees, with regard to background controls and other potentially vulnerable infrastructure issues.

Then the last issue is the spent fuel pool and dry cask storage issue. Are these pools designed to be long-term storage? What do you intend to do to move them from fuel pool to dry cask storage facilities as a general matter for safety?

So, obviously that is a long list of concerns and issues. If you do get to address them, I will be very grateful. If not, I will submit them all for the record, Madam Chairwoman.

Thank you very much, again, for your testimony.

Senator CARPER. Thank you for your statement and introducing Congresswoman Capps and Congressman Bilbray. Let me just say to Congresswoman Capps, thank you so much for sharing with us a former member of your staff, Emily Spain. She is a gift to the people of Delaware. So, we are grateful for that.

With that, we would like to recognize Congresswoman Lois Capps, 23d District of California, and followed by Congressman Brian Bilbray, the 50th District of California. How many do you all have, 53? Fifty-three. We have one.

[Laughter.]

Senator CARPER. But as I like to say in Delaware, if you can only send one, send the best.

We are glad you are here, we recognize you and please proceed.

STATEMENT OF HON. LOIS CAPPS, U.S. REPRESENTATIVE FROM THE STATE OF CALIFORNIA

Ms. CAPPS. Thank you. Chairwoman Boxer, Ranking Member Inhofe, Chairman Carper and Members of the committee, thank you for holding this hearing and for the opportunity to testify.

I am here today because my congressional District includes Diablo Canyon Nuclear Power Plant, which has become a central focus in the weeks following the Japanese earthquake, tsunami and subsequent nuclear crisis.

Last month, I called upon the NRC to stay the license renewal process for Diablo Canyon until further studies demonstrate that the plant's design and operations can withstand an earthquake and other potential threats. Yesterday, Pacific Gas & Electric, which I will refer to as PG&E, asked the NRC to delay its license renewal application while it completes their studies.

Here today, in light of PG&E's action, I am renewing my request to the NRC to halt the re-licensing process. I do not make this request lightly. Last month, I again toured the Diablo Canyon Nuclear Power Plant. Following that visit, I was convinced of two things. First, that the employees are committed to getting it right. Second, that we are not there yet.

I am not alone in that assessment. I am grateful to be joined today by my constituent, California State Senator Sam Blakeslee, who also represents Diablo Canyon and its surrounding communities. State Senator Blakeslee will testify today both in his role as State elected official and also as a scientist with a Ph.D. in seismic studies. I am confident that our shared assessment of the situation

will offer the committee valuable, on the ground insight into the current and future landscape of nuclear power in California.

The bottom line is this. We do not have the answers we need to confidently move forward in extending the licensing agreement of Diablo Canyon. We should not move forward until we have those answers. Because the reactors do not need to be relicensed for more than a dozen years, we have plenty of time to find those answers.

Mr. Chairman, what happened so tragically in Japan offers us an opportunity to question and question again whether we are ready, whether we can handle the unthinkable. Now, the NRC is already, had already determined that it is non-credible that there could be multiple catastrophes such as an earthquake and a meltdown at Diablo Canyon Plant. The NRC has maintained, "The chance of such a bizarre concatenation of events occurring is extremely small. Not only is this conclusion well supported by the record evidence, it accords most eminently with common sense notions of statistical probability."

Yet, the unthinkable did happen in Japan. An earthquake, a tsunami, and a nuclear accident, all occurring in sequence. Clearly, a bizarre concatenation of events is not merely hypothetical.

Mr. Chairman, let us be clear. We know seismic uncertainty exists at the Diablo Canyon site. In the early 1970s, while the plant was originally under construction, scientists discovered the Hosgri Offshore Fault less than three miles away, forcing a major re-design and pushing the project billions of dollars over budget.

In 2008, scientists discovered yet another fault, the Shoreline Fault, which lies offshore less than one mile from the plant. The stakes were raised just last month when the NRC confirmed that Diablo Canyon was one of two nuclear power plants in the highest risk area for seismic activity in the entire country.

Clearly, we need answers to major questions. Can this plant, including the spent fuel pool, withstand an earthquake and a nuclear accident at the same time? How long would the plant be self-sustaining in the event of such damage? Is Diablo Canyon's evacuation plan during an incident workable?

Many of us on the central coast of California remain concerned that the NRC has not taken action to answer these questions or address these warnings, so much so that the California Energy Commission has recommended, and our State Public Utilities Commission has directed, that independent, peer reviewed, advanced seismic studies be performed prior to applying for re-licensing. I agree with this assessment. That is why it is so important to halt the re-licensing process. We need to take some time to get all the answers.

It is important to note that I am not calling for Diablo Canyon to be shut down. I am also not calling for PG&E to be denied an operating license. What I am doing today is asking that the re-licensing process be halted until updated, state-of-the-art seismic studies and 3D seismic mapping are completed, that they be considered as part of the re-licensing process, and that these studies be done by third party, independent scientists.

Failure to do so is unwise and irresponsible. It will feed public uncertainty about the oversight and safety of nuclear energy and it could cost taxpayers billions of dollars to once again belatedly ad-

dress issues that should have been dealt with beforehand. That is why I am hopeful the NRC will work with all stakeholders to get answers to the seismic questions which, at this point, remain unstudied and unresolved prior to the continuation of the re-licensing process.

Once again, I thank you for the opportunity to testify today.

Senator CARPER. Congresswoman Capps, thank you so much for coming. I very much appreciate it.

Congressman Bilbray, welcome.

STATEMENT OF HON. BRIAN P. BILBRAY, U.S. REPRESENTATIVE FROM THE STATE OF CALIFORNIA

Mr. BILBRAY. Thank you, Mr. Chairman. Madam Chair, Members of the committee, it is an honor to be here.

Let me say, first of all, as a lifelong resident of San Diego County, I have the same concerns that everyone who lives downwind of a nuclear power plant would have after seeing what happened in Japan. Every one of my children and grandchildren, except for those that have been exiled to Helena, MT, live within not only the downwind area from San Onofre but also within the tsunami zone of San Diego County.

I speak not just as a father and a grandfather, but as somebody who had the privilege of serving two terms as the Chairman of the Disaster Council for the 3 million people of San Diego County that designed the evacuation and response to not just the nuclear issue but also the tsunami issue, and also had the privilege of serving on the California Coastal Commission, an agency that has oversight and review of the nuclear power plants in California. This issue really did bring back memories of all the hearings and processes that we have had.

Frankly, there are still the facts to be taken, still research that needs to be done. But I think there are some indications that are very, very enlightening. One was the fact that even though the Japanese was not designed to those engineered at California plants, it did survive an earthquake that is well over what our plants ever perceived to be.

In fact, the 9.0 that we are talking about that has struck this plant, we are looking at 7.0 maximum, or 7.2 maximum in California. That frequency of 7.2, as pointed out by Secretary Chu, occurs every 7,000 to 10,000 years. So, it gives you an idea of the engineering.

The Japanese were hit with a ground motion of .52. Our California San Onofre is designed not for a .52 but for a .67. You have to remember that this is also in a region that geologists say will not get anything over a 7.2, and that 7.2 will be between 7,000 and 10,000 years. It gives us some perspective of the challenges we have to have.

The biggest concern was the fact that it was not the earthquake, as we know with the information now, but it was the tsunami. As a surfer, let me tell you something. This is not one thing that is joking in any matter, but it is one that is very, very disconcerting.

The fact is that Japan had a 10-foot surge wall. San Onofre is sitting on a 20-foot elevation with a 30-foot-plus surge wall. Diablo is around 85. Obviously, in an area where all the experts say that

the tidal waves would never reach that level, but if they did, the difference between the California facilities and the Japanese facilities is that the California facilities have gravity-feed cooling built into their system and they have their pump systems totally protected from inundation, which the Japanese did not have. They did not even have their fuel tanks protected, which was a major flaw. I think that is where good assessment can really be made on this issue.

Now remember as we talk about nuclear, ladies and gentlemen, as a former member, 6 years on the Air Resources Board, we are talking about 20 percent of our energy that avoids emissions equal to 96 percent of all the automobiles that are driving on American soil. I think that we have got to recognize that the challenges that we have to go forward, especially those of us who are addressing environmental issues, need to remember that even the U.N. Council on Climate Change has said that a robust commitment to nuclear is, has to be, part of any plan looking to address climate change.

But I think that one of the things we need to get out of this, Madam Chair and Mr. Chairman, is that where are we today, have we over engineered and was that over engineering prudent. I think the one thing that it looks like in California is we have and that should be reassuring.

My biggest concern is that we do not talk about the fact that, as Madam Chair knows, we are not just talking San Onofre in San Diego, we are talking many nuclear reactors that are within not just miles but within yards of residences in San Diego that the U.S. Government owns. Those are issues that we sort of ignore and I think this one we address.

I guess the biggest issue, and I would like to agree with you strongly on, Senator, is not just how do we address the technology that is 40 years old that we have on the ground operating today, but how do we move forward with technology that has been upgraded that not only avoids the threats of meltdowns, totally engineers out that problem, but also creates the opportunity to address that waste problem, that 100 yard by 20 foot, that now nuclear waste not only could be a fuel that could be burned in the new technology that is now safe and designed not to do this, but also a technology that could use up our weapons grade material as we talk about going to zero options.

So, I appreciate the chance to be able to address you today, Mr. Chairman.

Senator CARPER. Congressman Bilbray, Congresswoman Capps, great of you to come. Thank you so much for your contributions. We look forward to seeing you soon. Thank you.

With that we are going to invite our second panel, Chairman Jaczko, Administrator Jackson, to join us at the table please. Neither of our guests on the second panel are strangers to this committee. It is great to see both of you. We appreciate your stewardship and the hard work that you are doing in response to the disaster, the disasters, in Japan.

First we will hear from Lisa Jackson, who is the Administrator of the Environmental Protection Agency, and following her testi-

mony, we will hear from Greg Jaczko, who is the Chairman of the Nuclear Regulatory Commission.

I will ask you to use about 5 minutes for your statement, and then we will have some questions.

Thank you so much for coming. Your entire statement will be made part of the record.

Please proceed.

STATEMENT OF LISA JACKSON, ADMINISTRATOR, U.S. ENVIRONMENTAL PROTECTION AGENCY

Ms. JACKSON. Thank you, Chairman Carper. To you, Chairman Carper, Chairwoman Boxer, our Ranking Member Inhofe, and all the members of this committee, thank you for inviting me to testify on EPA's role in responding to the tragedy in Japan.

I do want to begin by expressing my sympathy for those who have lost loved ones from the earthquake and tsunami, and my support to those who are working tirelessly to control the radiation at the Fukushima Daiichi Plant in Japan. Their efforts are selfless and truly heroic.

As Japan works to address the challenges at their nuclear reactors, many Americans are concerned about what the radiological releases to the atmosphere may mean to them and what their Government is doing to make sure that they are safe here in the United States.

Let me begin by speaking directly to those who are concerned about radiation detection that monitoring and sampling from EPA and other Federal agencies are picking up throughout the United States. Let me be clear. EPA has not seen, and does not expect to see, radiation in our air or water reaching harmful levels in the United States.

All of the data which we have seen, which we continue to make public and available on our Web site, indicates that while radiation levels are slightly elevated in some places, they are significantly below problematic levels.

To put this in perspective, days after the tsunami struck, we detected radioactive isotopes consistent with a nuclear incident at several air monitors along the West Coast. These readings were so minuscule that they were 100,000 times lower than the daily exposure we all receive.

Keep in mind that all of us are exposed to radiation every day, both from natural sources such as minerals in the ground and manmade sources such as medical x-rays. That said, we will continue to monitor the environment for radiation. We will continue to make the data public. We will continue to explain what the data mean to the people and families we serve. As I have said to this committee many times before, transparency and communication with the public is a priority for our agency and will guide all of our actions.

EPA's main role in this response is simple but very important. Using a variety of techniques, we monitor and track radiation and radionuclide releases into the environment in the United States. These radioactive releases range from ones that dissipate from the environment within days, such as iodine, to those that have half-lives of thousands of years, such as plutonium.

Let me speak for just a moment about those monitoring efforts. EPA's nationwide radiation monitoring network, known as RadNet, continuously monitors the Nation's air, drinking water, rainwater and milk. The data provide the information scientists need to estimate long-term trends in environmental radiation levels and allows them to detect minuscule increases.

RadNet's air monitoring system is made up of more than 100 fixed stations that create a network of detection across the United States. Over the last 5 years, EPA has been enhancing the capabilities of the RadNet system by replacing existing monitoring equipment with new air monitors that send real time data to our laboratory.

In response to the Japanese nuclear incident, we added to this system by quickly deploying mobile air monitors to far westerly locations, including Alaska and islands in the Pacific, to detect radiation as it slowly moved from Japan.

In addition, several times a week, we collect filters from these air monitors and perform a detailed analysis that lets us find even minuscule amounts of radioactive material in the air.

EPA also samples rainwater for radioactive isotopes. Monitoring stations across the country submit precipitation samples to EPA laboratories as rainfall, snow or sleet occur. Under usual circumstances, these samples are analyzed by EPA scientists quarterly. But during this response, we are analyzing precipitation samples as they come in to the laboratory and quickly post the results on our public Web site.

Also, EPA routinely samples milk and drinking water from sites across the Nation. Like rainwater, these samples are normally collected and analyzed on a quarterly basis but, in response to the nuclear release in Japan, we have accelerated the normal sampling schedule.

As I mentioned, the levels detected have been far below levels of public health concern. The information is all available on EPA's Web site, *www.epa.gov/Japan2011*. This Web site was quickly expanded after the tsunami so that the general public, especially those without a Ph.D. in nuclear physics, could easily understand what the monitors in their communities were indicating. EPA's Web site has been featured extensively on CNN, Fox, and Facebook and it helps answer many of the questions that some of your constituents may be asking.

Madam Chairman, thank you for your leadership on these issues, both of our Chairmen, excuse me. I want to assure you that EPA will continue our coordination with our Federal partners and we will continue our outreach to the public and the elected officials to provide information on our monitoring results.

Thank you so much.

[The prepared statement of Ms. Jackson follows:]

STATEMENT OF LISA P. JACKSON, ADMINISTRATOR, U.S. ENVIRONMENTAL PROTECTION AGENCY

Good morning, Madam Chairman, Chairman Carper and Members of the Committee. I am pleased to be here today to discuss EPA's role in monitoring for radiation associated with the Fukushima Daiichi nuclear power plant emergency in Japan and the possible implications for the United States. Let me begin by expressing my sympathy for those who have lost loved ones from the earthquake and tsu-

nami and my support to those who are working to control the radiation at the Fukushima Daiichi plant in Japan. Their efforts are selfless and deserve our recognition.

EPA MONITORING

As part of its ongoing radiation monitoring program, EPA regularly monitors and tracks radiation and radionuclide releases into the environment in the United States. Monitoring allows us to track known releases and to watch for contaminants when there is an actual, potential, or unexpected release. In addition, EPA may bring monitoring equipment to the scene of an incident to look for localized radiation and to help protect people and the environment.

EPA's nationwide radiation monitoring system, RadNet, contains 124 fixed, or stationary air monitors across the United States (of which 122 are currently operational), and 40 deployable air monitors that can be sent to take readings anywhere in the United States or its territories. The RadNet network continuously monitors the Nation's air and regularly monitors drinking water, milk, and precipitation for a variety of radionuclides (e.g., iodine-131) and radiation types (e.g., gross gamma (γ)). The near-real-time air monitoring data is continuously reviewed by computer, and if the results show an unusual increase in radiation levels, EPA laboratory staff is alerted immediately and further analyzes additional data from the monitor. RadNet data provides a means to estimate levels of radioactivity in the environment, including background radiation as well as radioactive fallout from past atomic weapons testing, nuclear accidents, and other large-scale releases of radioactive materials. RadNet also provides the historical data needed to estimate long-term trends in environmental radiation levels.

In the event of a threat of a significant radiation release, EPA typically will increase the frequency of RadNet sampling and generate many more data records for a given period of time compared to its routine operation. As a result of the events at the Fukushima nuclear plant in Japan, several EPA monitors have detected very low levels of radioactive material in the United States consistent with releases from the damaged nuclear reactors. In an effort to provide additional geographic coverage to areas in close proximity to the releases in Japan, EPA shipped 8 deployable monitors to islands in the Pacific, including Guam and the Commonwealth of the Northern Mariana Islands, and the Western United States, including Hawaii, Idaho, and Alaska. EPA has also accelerated its monitoring of precipitation, milk, and drinking water in response to the radiation concerns from the Japanese nuclear reactors. While the detections in air, precipitation, and milk were expected, the levels detected have been far below levels of public-health concern.

EPA, along with the Nuclear Regulatory Commission, Department of Energy, Department of Defense, and the Department of Health and Human Services (FDA, CDC) are among the many Federal agencies taking roles in monitoring and assessing radiation emissions from the Japanese nuclear facilities and modeling the potential dose assessments of radiation that might reach the United States. As part of the Federal Government's ongoing effort to make our activities and science transparent and available to the public, EPA will continue to post all RadNet data in the current on-line data base, accessible through the EPA Web site: *www.epa.gov/japan2011*. In the highly unlikely event that radiation levels begin to approach levels of concern for public health, the Federal Government will coordinate with State and local governments to ensure that public health and safety precautions are communicated to the public.

MONITORING RESULTS

EPA's RadNet radiation air monitors across the United States have shown typical fluctuations in background radiation levels. The levels detected are far below levels of concern. Results of EPA's drinking water sampling, precipitation sampling, milk sampling, and air filter and cartridge analysis have detected very low levels of radioactive material consistent with releases from the damaged Japanese nuclear reactors.

Keep in mind that all of us are exposed to radiation every day, both from natural sources such as minerals in the ground, and from man-made sources such as medical x-rays. Scientists estimate that the average person in the United States receives a dose of about 310 millirem of radiation per year from natural background sources. Over the course of a lifetime, a person will average an additional ~300 millirem per year from medical procedures. The amount of radiation that will have an impact on a person's health depends on the type of radiation and the sensitivity of the individual to the radiation exposure. Differences such as age, gender and even previous exposure are factors that might influence a person's reaction to radiation exposure.

Air samples obtained through the RadNet system have, to date, contained very small amounts of iodine, cesium, and tellurium, which are consistent with possible releases from the damaged Japanese reactors. The largest amounts were found in samples from Alaska on March 19 and 24, 2011, but all of the radiation levels detected during the detailed filter analysis are hundreds of times below levels of concern.

Drinking water samples taken at various locations throughout the U.S. during the week of April 4, 2011, ranged from non-detects to trace amounts of iodine-131—approximately 1.6 picocuries per liter (piC/L). (An infant would have to consume over 200 gallons of this water at the highest detection level to receive a radiation dose equivalent to a day's worth of the natural background radiation exposure we experience continuously from natural sources of radioactivity in our environment.) Drinking water samples from across the country are currently being analyzed. After all data are appropriately reviewed, EPA will release analysis results and will post the results on our Web site.

Early precipitation samples collected by EPA indicated low levels of radioactivity. Given the sampling results in other environmental media, EPA expected to find very low levels of radiation in precipitation samples. Similar findings are to be expected in the coming weeks as radioactive materials are dispersed through the air from Japan. While the levels in some of the rainwater exceed the applicable *Maximum Contaminant Level (MCL)* of 3piC/L for drinking water, it is important to note that the corresponding MCL for iodine-131 was calculated based on long-term chronic exposures over the course of a lifetime 70 years. The levels seen in rainwater are expected to be relatively short in duration and are not expected to present any threat to public health.

Results from samples of milk taken March 28, 2011 in Phoenix, Arizona and Los Angeles, California showed approximately 3 pCi/L of iodine-131, which is more than 1,500 times lower than the Derived Intervention Level set by the U.S. Food and Drug Administration. These types of findings are to be expected in the coming days and are far below levels of public health concern, including for infants and children. Iodine-131 has a very short half-life of approximately 8 days, and the level detected in milk and milk products is, therefore, expected to drop relatively quickly. Additional information about the broader Federal response can be found at: *http://www.usa.gov/Japan2011.*

CONCLUSION

Since the events in Japan occurred, EPA's Web site has had thousands of views and we have received many positive comments from the public on the information we have made available. The Agency will continue to provide monitoring results to the public in a very open and transparent manner. While we do not expect radiation from the damaged Japanese reactors to reach the United States at harmful levels, I want to assure you that EPA will continue our coordination with our Federal partners to monitor the air, milk, precipitation and drinking water for any changes, and we will continue our outreach to the public and the elected officials to provide information on our monitoring results.

Madam Chairman, Mr. Chairman, thank you for the opportunity to testify. I welcome any questions you may have.

Senator CARPER. Thank you much, very much, Administrator Jackson.

Before you testify, Mr. Chairman, I just want to say to you, to the other Commissioners, to the folks on your staff at the Nuclear Regulatory Commission, how much we appreciate the way you have stepped up and to respond to try to be as helpful as we can to the people of Miyagi and to say we appreciate your continued vigilance and we just encourage you not to let up.

Thank you. Please proceed.

STATEMENT OF GREGORY B. JACZKO, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Mr. JACZKO. Well, thank you, Mr. Chairman, and Madam Chairman and Ranking Member Barrasso. I also appreciate the opportunity to appear before you to address the response of the Nuclear Regulatory Commission to the recent tragic events in Japan.

People across the country and around the world who have been touched by the magnitude and scale of this disaster are closely following the events in Japan and the repercussions in this country and in many other countries around the world.

As many have indicated, our hearts go out to all those who have been dealing with the aftermath of these natural disasters.

About 2 weeks ago, I made a brief visit to Japan to convey a message of support and cooperation to our Japanese counterparts there and to assess the ongoing situation. As part of that visit, I met with senior Japanese government and TEPCO officials and consulted with the NRC team of experts who are in Japan as part of our efforts to support U.S. Government assistance to Japan.

Just to briefly recap, on Friday, March 11, when the earthquake and tsunami struck, the NRC's headquarters Operations Center began to operate on a 24 hour basis consistent with the emergency authorities and responsibilities of the agency under the Reorganization Act of 1980.

For the past 3 weeks, the Operations Center has been monitoring and analyzing events in Japan. In spite of the evolving situation, the long hours and the intensity of the efforts, the NRC staff has approached their responsibilities with dedication, determination and professionalism. They still remain focused on our central safety and security mission for reactors and facilities here in the United States. I am, needless to say, incredibly proud of their work.

As regards the current situation of the reactors in Japan, from the information we have, we believe the situation currently is static and we do not see significant changes on a day-to-day basis with the reactors. It is not yet, however, what we believe to be stable, namely that, given additional events or other circumstances, that there would not be the potential for significant additional problems at the reactors.

So, the efforts continue to be on these efforts, I think, to transition from static to stable to ensure long-term, ultimately, the ability to cool the reactors and to provide cooling for the spent fuel pools.

Looking forward to the work that we have as an agency dealing with facilities in this country, on Monday, March 21st, only 10 days after the events in Japan, the Commission acted quickly to move forward and establish a senior level task force to conduct a comprehensive review of our processes and regulations to determine whether the agency should make improvements to our regulatory system. This is a responsibility that we have to the American people, to undertake a systematic and methodical review of the safety of our own domestic nuclear facilities in light of the Japan situation.

This review will be conducted in the short term and a longer term timeframe. The short-term review, which will take approximately 90 days, has already begun and will identify potential or preliminary near-term operational or regulatory issues. A longer term review will begin as soon as we have sufficient information from Japan. But we expect that review to be completed within 6 months from the beginning of the evaluation and, in fact, the Commission tasked our staff to do it in that time.

As we move forward with these efforts, we also recognize the importance of sharing our lessons learned with other regulatory counterparts in other countries throughout the world. I recently returned from the Fifth Review Meeting of the Convention on Nuclear Safety which provided an important opportunity for participating nations to address the events in Japan and begin to formulate plans for short- and long-term cooperation.

In conclusion, I want to reiterate that we continue to take our domestic responsibilities for licensing and oversight of the U.S. licensees as our top priority and that, I want to stress, we believe that plants in the United States continue to operate safely. Based on the 90-day review and the longer term review that we have undertaken, we will take all appropriate actions necessary to ensure the continuing safety of the American people.

On behalf of the Commission, I thank you for the opportunity to appear before you today and would be happy to answer any questions that you may have.

Thank you.

[The prepared statement of Mr. Jaczko follows:]

STATEMENT OF GREGORY B. JACZKO, CHAIRMAN, U.S. NUCLEAR REGULATORY COMMISSION

Chairman Boxer, Ranking Member Inhofe, Chairman Carper, Ranking Member Barrasso, and Members of the Committee, I appreciate the opportunity to appear before you to address the response of the United States Nuclear Regulatory Commission (NRC) to the recent tragic events in Japan. People across the country and around the world who have been touched by the magnitude and scale of this disaster are closely following the events in Japan and the repercussions in this country and in other countries.

I would first like to reiterate my condolences to all those who have been affected by the earthquake and tsunami in Japan. Our hearts go out to all who have been dealing with the aftermath of these natural disasters, and we are mindful of the long and difficult road they will face in recovering. We know that the people of Japan are resilient and strong, and we have every confidence that they will come through this horrific time and move forward, with resolve, to rebuild their vibrant country. Our agency stands together with the people of Japan at this most difficult and challenging time. As part of that, I made a brief visit to Japan 2 weeks ago. I wanted to convey a message of support and cooperation to our Japanese counterparts there and to assess the ongoing situation. I also met with senior Japanese government and TEPCO officials, and consulted with our NRC team of experts who are in Japan as part of our assistance effort.

The NRC is an independent regulatory safety agency, with approximately 4000 staff. We play a critically important role in protecting the American people and the environment. Our agency sets the rules by which commercial nuclear power plants operate, and nuclear materials are used in thousands of academic, medical and industrial settings in the United States. We have at least two resident inspectors who work full-time at every nuclear plant in the country, and we are proud to have world-class scientists, engineers and professionals representing nearly every scientific discipline.

Since Friday, March 11th, when the earthquake and tsunami struck, the NRC's headquarters 24-hour Emergency Operations Center has been fully activated, with staffing augmented to monitor and analyze events at nuclear power plants in Japan. At the request of the Japanese government, and through the United States Agency for International Development (USAID), the NRC sent a team of its technical experts to provide on-the-ground support, and we have been in continual contact with them. Within the United States, the NRC has been working closely with other Federal agencies as part of our government's response to the situation.

During these past several weeks, our staff has remained focused on our essential safety and security mission. I want to recognize their tireless efforts and their critical contributions to the U.S. response to assist Japan. In spite of the evolving situation, the long hours, and the intensity of efforts over the past week, NRC staff has approached their responsibilities with dedication, determination and profes-

sionalism, and I am incredibly proud of their efforts. The American people also can be proud of the commitment and dedication within the Federal workforce, which is exemplified by our staff every day.

The NRC's primary responsibility is to ensure the adequate protection of the public health and safety of the American people. Toward that end, we have been very closely monitoring the activities in Japan and reviewing all currently available information. Review of this information, combined with our ongoing inspection and licensing oversight, gives us confidence that the U.S. plants continue to operate safely. To date, there has been no reduction in the licensing or oversight function of the NRC as it relates to any of the U.S. licensees.

Our agency has a long history of conservative safety decisionmaking. We have been intelligently using risk insights to help inform our regulatory process, and, for more than 35 years of civilian nuclear power in this country, we have never stopped requiring needed improvements to plant designs, and modifying our regulatory framework as we learn from operating experience.

At the same time the NRC is providing a very high level of support in response to the events in Japan, we continue to remain focused on our domestic responsibilities.

I'd like to begin with a brief overview of our immediate and continuing response to the events in Japan. I then want to further discuss the reasons for our continuing confidence in the safety of the U.S. commercial nuclear reactor fleet, and the path forward for the NRC in order to learn all the lessons we can, in light of these events.

On Friday, March 11th, an earthquake hit Japan, resulting in the shutdown of more than 10 reactors. The ensuing tsunami appears to have caused the loss of normal and emergency alternating current power to the six unit Fukushima Daiichi site. It is those six units that have received the majority of our attention since that time. Units One, Two, and Three were in operation at the time of the earthquake. Units Four, Five, and Six were in previously scheduled outages.

Shortly after 4 o'clock AM EDT on Friday, March 11th, the NRC Emergency Operations Center made the first call, informing NRC management of the earthquake and the potential impact on U.S. plants. We went into monitoring mode later that morning at our Emergency Operations Center, and the NRC's first concern was possible impacts of the tsunami on U.S. plants and radioactive materials on the West Coast, and in Hawaii, Alaska, and U.S. Territories in the Pacific. We were in communication with licensees and NRC resident inspectors at Diablo Canyon Power Plant and San Onofre Nuclear Generating Station in California, and the Radiation Control Program Directors for California, Washington, Oregon and Hawaii.

On that same day, we began interactions with our Japanese regulatory counterparts and dispatched two experts to Japan to help at the U.S. embassy in Tokyo. By Monday, March 14, we had dispatched a total of 11 NRC staff to provide technical support to the American embassy and the Japanese government. We have subsequently rotated in additional staff to continue our on-the-ground assistance in Japan. The areas of focus for this team are: (1) to assist the Japanese government and respond to requests from our Japanese regulatory counterparts; and (2) to support the U.S. Ambassador and the U.S. Government assistance effort.

On Wednesday, March 16th, we collaborated with other U.S. government agencies and decided to advise American citizens to evacuate within a 50-mile range around the plant. The 50-mile evacuation recommendation that the NRC made to the U.S. Ambassador in Japan was made in the interest of protecting the health and safety of U.S. citizens in Japan. We based our assessment on the conditions as we understood them at the time. Since communications with knowledgeable Japanese officials were limited and there was a large degree of uncertainty about plant conditions at the time, it was difficult to accurately assess the potential radiological hazard. In order to determine the proper evacuation distance, the NRC staff performed a series of calculations using NRC's RASCAL computer code to assess possible offsite consequences. The computer models used meteorological model data appropriate for the Fukushima Daiichi vicinity. Source terms were based on hypothetical, but not unreasonable, estimates of fuel damage, containment, and other release conditions. These calculations demonstrated that the Environmental Protection Agency's (EPA's) Protective Action Guidelines could be exceeded at a distance of up to 50 miles from the Fukushima site, if a large-scale release occurred from the reactors or spent fuel pools. The U.S. emergency preparedness framework provides for the expansion of emergency planning zones as conditions require. Acting in accordance with this framework, and with the best information available at the time, the NRC determined that evacuation out to 50 miles for U.S. citizens was a prudent course of action, and would be consistent with what we would do under similar cir-

cumstances in the United States, and we made that recommendation to the Ambassador and other U.S. Government agencies.

We have an extensive range of stakeholders with whom we have ongoing interaction regarding the Japan situation, including the White House, congressional staff, our State regulatory counterparts, a number of other Federal agencies, and international regulatory bodies around the world.

The NRC response in Japan and our Emergency Operations Center continue with the dedicated efforts of over 250 NRC staff on a rotating basis. The entire agency is coordinating and working together in response to this event so that we can provide assistance to Japan while continuing the vital activities necessary to fulfill our domestic responsibilities.

It is important to note that the U.S. government has an extensive network of radiation monitors across this country. Monitoring by nuclear power plants and the EPA's system has not identified any radiation levels that affect public health and safety in this country. In fact, natural background radiation from sources such as rocks, the sun, and buildings, is 100,000 times more than doses attributed to any level that has been detected in the U.S. to date. Therefore, based on current data, we feel confident that there is no reason for concern in the United States regarding radioactive releases from Japan.

There are many factors that assure us of ongoing domestic reactor safety. We have, since the beginning of our regulatory programs, used a philosophy of Defense-in-Depth, which recognizes that nuclear reactors require the highest standards of design, construction, oversight, and operation, and does not rely on any single layer of protection for public health and safety. Designs for every individual reactor in this country take into account site-specific factors and include a detailed evaluation for natural events, such as earthquakes, tornadoes, hurricanes, floods, and tsunamis, as they relate to that site.

There are multiple physical barriers to radiation in every reactor design. Additionally, there are both diverse and redundant safety systems that are required to be maintained in operable condition and frequently tested to ensure that the plant is in a high condition of readiness to respond to any situation.

We have taken advantage of the lessons learned from previous operating experience to implement a program of continuous improvement for the U.S. reactor fleet. We have learned from experience across a wide range of situations, including most significantly, the Three Mile Island accident in 1979. As a result of those lessons learned, we have significantly revised emergency planning requirements and emergency operating procedures. We have addressed many human factors issues regarding how control room employees operate the plant, added new requirements for hydrogen control to help prevent explosions inside of containment, and created requirements for enhanced control room displays of the status of pumps and valves.

The NRC requires licensees to have a post-accident sampling system that enables the monitoring of radioactive material release and potential fuel degradation. One of the most significant changes after Three Mile Island was an expansion of the Resident Inspector Program, which now has at least two full-time NRC inspectors onsite at each nuclear power plant. These inspectors have unfettered access to all licensees' activities related to nuclear safety and security.

As a result of operating experience and ongoing research programs, severe accident management guidelines have been developed for use at nuclear power plants. These procedures were developed to ensure that, in the event all of the above-described precautions failed and a severe accident occurred, the plant would still protect public health and safety. Severe accident management guidelines have been in effect for many years and are evaluated by the NRC inspection program.

As a result of the events of September 11, 2001, we identified important equipment that, regardless of the cause of a significant fire or explosion at a plant, the NRC requires licensees to have available and staged in advance, as well as new procedures and policies to help deal with a severe situation.

Our program of continuous improvement, based on operating experience, will now include evaluation of the significant events in Japan and what we can learn from them. We already have begun enhancing inspection activities through temporary instructions to our inspection staff, including the resident inspectors and the region-based inspectors in our four Regional offices, to look at licensees' readiness to deal with both design-basis accidents and beyond-design-basis accidents.

We have also issued an information notice to licensees to make them aware of the events in Japan, and the kinds of activities they should undertake to verify the continued operability of these mitigation measures. It is expected that licensees review the information related to their capabilities to mitigate conditions that result from severe accidents, including the loss of significant operational and safety systems.

During the past several decades, there have been a number of new rulemakings that have enhanced the domestic fleet's preparedness against some of the problems we are seeing in Japan. The "station blackout" rule requires every plant in this country to analyze what the plant response would be if it were to lose all alternating current electricity so that it could respond using batteries for a period of time, and then have procedures in place to restore alternating current electricity to the site and provide cooling to the core.

The hydrogen control rule requires modifications to reduce the impacts of hydrogen generated for beyond-design-basis events and core damage. There are equipment qualification rules that require equipment, including pumps and valves, to remain operable under the kinds of environmental temperature and radiation conditions that you would see under a design-basis accident.

With regard to the type of containment design used by the most heavily damaged plants in Japan, the NRC has had a Boiling Water Reactor Mark I Containment Improvement Program since the late 1980s. This program resulted in the installation of hardened vent systems for containment pressure relief, as well as enhanced reliability of the automatic depressurization system.

A final factor that underpins our belief in the ongoing safety of the U.S. fleet is the emergency preparedness and planning requirements in place that provide ongoing training, testing, and evaluations of licensees' emergency preparedness programs. In coordination with our Federal partner, the Federal Emergency Management Agency (FEMA), these activities include extensive interaction with State and local governments, as those programs are evaluated and tested on a periodic basis.

Along with our confidence in the safety of U.S. nuclear power plants, our agency has a responsibility to the American people to undertake a systematic and methodical review of the safety of our domestic facilities, in light of the natural disaster and the resulting nuclear situation in Japan.

Examining all available information is an essential part of the effort to analyze the event and understand its impact on Japan and its implications for the United States. Our focus is always on keeping nuclear plants and radioactive materials in this country safe and secure.

On Monday, March 21, my colleagues on the Commission and I met to review the status of the situation in Japan and identify the steps needed to conduct that review. We consequently decided to establish a senior level agency task force to conduct a comprehensive review of our processes and regulations to determine whether the agency should make additional improvements to our regulatory system, and to make recommendations to the Commission for its policy direction.

The review will be conducted in both a short-term and a longer-term timeframe. The short-term review has already begun, and the task force will brief the Commission after 30, 60, and 90 day intervals and these meetings will be public web-cast meetings. At the 90-day interval, the staff will produce a public report to identify potential or preliminary near-term operational or regulatory issues. The task force then will undertake a longer-term review as soon as NRC has sufficient information from the events in Japan. That longer-term review will be completed in 6 months from the beginning of the evaluation.

The task force will evaluate all technical and policy issues related to the event to identify additional potential research, generic issues, changes to the reactor oversight process, rulemakings, and adjustments to the regulatory framework that may warrant action by the NRC. We also expect to evaluate potential interagency issues, such as emergency preparedness, and examine the applicability of any lessons learned to non-operating reactors and materials licensees. We expect to seek input from all key stakeholders during this process. A report with appropriate recommendations will be provided to the Commission within 6 months of the start of this evaluation. Both the 90-day and final reports will be made publicly available.

As we move forward with these efforts, we also recognize the importance to sharing our lessons learned with our regulatory counterparts. I recently returned from the Fifth Review Meeting of the Convention on Nuclear Safety, which provided an important opportunity for participating nations to address the events in Japan and begin to formulate plans for short- and long-term cooperation. We look forward to continuing this dialog. We also commend International Atomic Energy Agency (IAEA) Director General Amano's announcement of the Agency's intention to host a ministerial-level conference in June. We are pleased to support the IAEA as it works to address and incorporate the events at Fukushima into its activities, as well as continuing its work in areas that have already been identified as nuclear safety and security priorities.

In conclusion, I want to reiterate that we continue to make our domestic responsibilities for licensing and oversight of the U.S. licensees our top priority and that the U.S. plants continue to operate safely. In light of the events in Japan, there will

be a near-term evaluation of their relevance to the U.S. fleet, and we are continuing to gather the information necessary to take a longer, more comprehensive and thorough look at the events in Japan and their lessons for us. Based on these efforts, we will take all appropriate actions necessary to ensure the continuing safety of the American people.

Chairman Boxer, Ranking Member Inhofe, Chairman Carper, Ranking Member Barrasso, and Members of the Committee, on behalf of the Commission, thank you for the opportunity to appear before you. I look forward to continuing to work with you to advance the NRC's important safety mission.

RESPONSE BY GREGORY B. JACZKO TO ADDITIONAL QUESTIONS FROM SENATOR BOXER

Question 1. On April 11, PG&E asked the NRC to delay issuance of the Diablo Canyon license renewal until after PG&E has completed the 3-D seismic studies and submitted a report to the NRC addressing the results. According to press accounts, the NRC is moving forward with safety and other reviews of Diablo Canyon in preparation for a ruling on PG&E's request for a license extension. What specifically did PG&E communicate to the NRC regarding its request for a license extension? Why is the NRC continuing its review of PG&E's application?

Will the NRC ensure that all stakeholders, including local citizens, are able to comment on the relevance of the 3-D seismic studies as part of the normal NRC relicensing process?

Response. The NRC received a letter dated April 10, 2011, from Pacific Gas and Electric Company (PG&E) requesting that the NRC not issue renewed operating licenses for the Diablo Canyon nuclear power plants, if approved, until after PG&E has completed 3-D seismic studies and submitted a report to the NRC addressing the results of those studies. PG&E also noted that it believes it would be prudent to complete the seismic studies prior to issuance of the coastal consistency certification that is required under the Coastal Zone Management Act (CZMA). PG&E indicated that the 3-D studies and the report addressing the study results are expected to be completed by December 2015. On April 12, 2011, counsel for PG&E sent a letter to the NRC's Atomic Safety and Licensing Board that states "PG&E has not requested any suspension or delay in the NRC staff's ongoing safety and environmental reviews of the [Diablo Canyon] license renewal application." It further notes that "PG&E also is not requesting any delay in the schedule for the licensing hearing process."

As a result of PG&E's requested deferral of issuance of renewed operating licenses for the Diablo Canyon nuclear power plants, the NRC staff has updated the staff's review schedule and milestones to reflect the delays in the license review process associated with the projected completion of the seismic studies and the CZMA's coastal consistency certification. While the staff review schedule delays are not a stay or suspension of the license renewal process, the revised review schedule allows for the time to consider information associated with the anticipated 3-D seismic studies.

Stakeholders, including local citizens, will be able to comment on the relevance of the 3-D seismic studies in at least one of two ways. Stakeholders will be able to comment on the Environmental Impact Statement (EIS) regarding the Diablo Canyon license renewal application when it is published. After the EIS is published, members of the public will have the opportunity to comment on the EIS in person at an NRC-sponsored public meeting to be held near the plant or in writing through *www.regulations.gov.* Stakeholders may also petition the NRC for an action on the Diablo Canyon license renewal at any time. Please see *www.nrc.gov/about-nrc/regulatory/enforcement/petition.html* for a complete discussion of this process.

Question 2. The NRC license renewal process does not require a review of emergency planning, security, current safety performance or seismic issues because, according to the NRC, these items are dealt with on an ongoing basis. As a Commissioner you argued that "considering emergency preparedness during the license renewal process would be good public policy and a very valuable exercise." Do you still believe in the value of this analysis?

Are there other issues that could be appropriately addressed within the license renewal process?

Response. Yes, I believe consideration of additional review areas, such as emergency preparedness, as part of license renewal continues to have merit; however, it is unlikely that the agency would change our regulations given the number of plants that used the existing requirements and past considerations used in developing the license renewal regulations.

If we were to adopt more of a full scope license renewal review process, an additional area for consideration would be review of a plant's design basis and supporting analysis.

Question 3. Do you have an estimate of how long it will take before the Japanese are safely able to maintain cooling and effectively shutdown the reactors? How long does the NRC expect to have staff on the ground in Japan?

Response. Based on the information available, it appears that Tokyo Electric Power Company (TEPCO) is able to effectively maintain the reactors in shutdown condition and maintain cooling.

The reactors at Fukushima were shut down immediately after the earthquake and remain shutdown today. It is unlikely that damaged cores such as those present in the Fukushima Daiichi plants can achieve a geometry and material composition to spontaneously restart. In June, TEPCO installed a circulating cooling system for the Fukushima Daiichi Units 1 through 3. The normal reactor injection system consists of two independent trains of three injection pumps. TEPCO also installed redundant and diverse systems as backup for cooling the reactors, which includes a train consisting of three pumps to inject fresh water via an alternate injection path. Additionally, TEPCO has six dedicated fire trucks capable of injecting into Units 1 through 3. Finally, TEPCO placed additional fire trucks on high ground, which should survive another severe tsunami.

The NRC has reduced the staff on the ground in Japan from the initial level sent over shortly after the accident. The NRC anticipates having some presence in Japan for the foreseeable future to advise the US Ambassador on the safety of American citizens and military assets in Japan. Additional NRC objectives are to gather lessons learned that can be applied to US plants.

Question 4. Can you describe the enhanced inspection activities your resident inspectors are undertaking here in the U.S. in response to the disaster in Japan?

Response. Inspections were performed to assess licensee preparations that have been put in place at every operating power reactor to prevent or mitigate possible loss of functions (due to large fires or explosions), station blackout (loss of all alternating current), flooding, and flooding with earthquakes. The associated inspection reports were issued on May 13. NRC inspectors found that all the reactors would be kept safe even in the event that their regular safety systems were affected by these events. The NRC will use its Reactor Oversight Process to further evaluate the inspection results and ensure any issues are fixed.

Inspections were also completed to assess licensees' readiness to implement their severe accident management guidelines. These guidelines outline licensee actions in the event of severe accidents beyond what the plant was licensed for. The associated inspection results were issued on June 6, 2011. Overall, the NRC believes plants are safe; however, NRC inspectors found many of the plants should improve either training of their staff on these procedures, or ensure the guidelines are appropriately updated. The NRC's task force incorporated these inspection results into its short-term review to help determine if any immediate changes to NRC requirements are called for. The inspection results will also help inform the NRC's long-term review of possible revisions to agency licensing and oversight processes.

Question 5. The NRC recently issued an information notice to licensees to make them aware of events in Japan and the kind of activities they should undertake. It is my understanding that this notice does not require specific action, but encourages it. Is this understanding correct? If so, do you expect the NRC will issue new requirements (rather than just recommendations) in response to the disaster in Japan?

Response. Information Notices are issued to provide significant recently identified information about safety, safeguards, or environmental issues. Recipients are expected to review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. Information Notices do not require action per se.

The NRC's task force studied the events at Fukushima and assessed their impacts on U.S. plants, and issued its report with recommendations to the Commission on July 12, 2011. The Task Force developed a comprehensive set of 12 recommendations including improvements in dealing with a loss of power, dealing with earthquakes, flooding, spent fuel pools, venting and preparedness and updating the regulatory framework so that it is more logical, systematic and coherent. The Commission continues to deliberate on the Task Force report, and will vote on the recommendations, supplemented by additional staff papers that the Commission directed the staff to provide, that require a Commission policy decision.

As described in the response to Question 4, the NRC also issued two temporary instruction procedures to assess licensee's preparedness for events that exceed the design basis of the plant. Also, on May 11, 2011 the NRC issued Bulletin 2011–01 to companies licensed to operate U.S. nuclear power plants, requesting information on how the plants are complying with requirements to deal with the potential loss of large areas of the plant after extreme events. The Bulletin sought information on the plants' approach to ensuring their strategies remain effective over time. Plants responded to the Bulletin in June 10, 2011 with information confirming their mitigative-strategy equipment is in place and available, and that the strategies can be carried out with current plant staffing. Plants also responded to the Bulletin in July with further information in areas including:

- how essential resources are maintained, tested, and controlled to ensure availability;
- how strategies are re-evaluated if plant conditions or configurations change; and
- how arrangements are reached and maintained with local emergency response organizations.

RESPONSE BY GREGORY B. JACZKO TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. Please provide a list of all dates when the NRC Operations Center was activated in a response mode since 1980. Please include the basis for its activation, the duration of its activation, which mode it was in, and a description of the various response modes.

Response. For an incident at a specific licensed facility, the NRC response mode is determined by consideration of the licensee emergency classification (Table 1) and the NRC's independent assessment of incident conditions. The NRC response mode for other types of incidents (e.g., a transportation incident involving regulated material, regional electric grid incident affecting multiple licensed facilities, large-scale natural disaster, international disaster, national-level domestic threat, and/or terrorist threat/attack not focused at a specific facility) is determined by the NRC's independent assessment of the aggregate of available incident-related information, including information from licensees and other sources.

- Since 1980, the NRC Headquarters Operations Center (HOC) has never entered the EXPANDED ACTIVATION Mode.
- Since 1980, the NRC HOC has never entered the ACTIVATION Mode.
- Since 1980, the NRC has staffed its HOC on 15 occasions while in the MONITORING Mode. The basis and durations for these 15 events are listed below. Please note, however, that prior to 2001, the NRC Events Data base was not used to document the agency's entrance into MONITORING Mode. Thus, the duration of the NRC's response for events prior to 2001 is not available.

  - Davis Besse Loss of Feedwater Event (06/09/85)
  - Sequoyah Fuels Uranium Hexafluoride (UF6) Release Event (01/04/86)
  - Chernobyl Reactor Event (04/26/86)
  - Vogtle Station Blackout Event (03/20/90)
  - GE Wilmington Potential Criticality event (05/29/91)
  - Hurricane Andrew (08/23/92)
  - TMI Security Intrusion Event (02/07/93)
  - Tokaimura Criticality Event (09/30/99)
  - 9/11 Terrorist Attacks (09/11/01)
  - Northeastern U.S. Electrical Blackout (08/14/03 @ 16:40–8/15/03 @ 20 o'clock)
  - BWXT-Lynchburg Criticality Alarm Event (07/13/05 @ 23:20–07/14/05 @ 00:26)
  - Hurricane Katrina (08/28/05 @ 17 o'clock –09/06/05 @ 19 o'clock)
  - BWXT-Lynchburg Material Event (08/02/07 @ 12:15–08/02/07 @ 14:15)
  - B&W N.O.G-Lynchburg Fuel Event (07/15/09 @ 20:47–07/16/09 @ 01:03)
  - Japan Earthquake/Tsunami (03/11/11 @ 09:46–05/16/11)

- Unless otherwise designated, the NRC is in a constant State of readiness or NORMAL Mode. NORMAL Mode is the NRC's routine, or normal State of operations.

The NRC's response is flexible and tailored to the specific incident(s). Pre-designated response modes enable the agency to activate response capabilities in a structured manner and focus the agency's response, as appropriate, at the region, headquarters, or incident site. This flexibility permits the NRC response to be com-

mensurate with incident characteristics and severity and with licensee activities. The NRC's response modes are described below:

• NORMAL Mode.—The routine, or normal, State of NRC operations includes all activities designed to maintain incident response readiness, such as 24/7 staffing by Headquarters Operations Officers (HOOs). In addition, the NRC is poised to respond at its alternate Continuity of Operations (COOP) site. The regional offices are prepared to back up each other and headquarters. When warranted, such as during national special security events, the NRC may dispatch staff to the Department of Homeland Security's (DHS) National Operations Center (NOC) and other sites to enhance coordination and communications.

• MONITORING Mode.—The NRC escalates to the MONITORING mode, a heightened State of readiness for incident assessment, upon a decision by designated headquarters and regional managers. For a facility-specific or region-specific incident, the responsible regional office has the lead for agency response and appropriately staffs its incident response center. Headquarters supports the region and may have specific individuals participating in monitoring and/or analysis activities, but the HOC is not staffed and activated.

The NRC may escalate to the MONITORING mode for situations that are not facility or region-specific, including but not limited to, natural phenomena potentially involving one or more licensees, multi-region electric grid incident, international incident, or terrorism-related incidents. For such situations, headquarters has the lead for agency response and the regions provide appropriate support.

• ACTIVATION Mode .—The NRC escalates to the ACTIVATION mode if an incident is sufficiently complex or uncertain that it warrants extensive analysis and evaluation by the agency, if it warrants consideration for sending an NRC site team to the vicinity of the incident, or if the incident involves terrorist activities. In the ACTIVATION mode, the lead for agency response shifts from the region to headquarters. The HOC is fully staffed by the needed support teams under the leadership of the Executive Team (ET). As conditions develop and the incident is better understood, staffing may be reduced accordingly. For a facility-specific or location-specific incident such as a transportation incident, the responsible regional office continues staffing of its incident response center and may prepare a site team to travel to the licensee's site or the location of the incident. Headquarters and the regional office maintain continuous communication, evaluate available information, make appropriate notifications, and prepare for escalation of response should it be necessary. Other regional offices provide appropriate support.

• EXPANDED ACTIVATION Mode.—The NRC escalates to the EXPANDED ACTIVATION mode if the incident severity and/or situation uncertainty warrants the dispatch of a site team, delegation of selected authority to the Site Team Director, and turnover to the site team. EXPANDED ACTIVATION may be initiated in response to a facility-specific incident at a licensee's site, incident(s) involving multiple licensees' facilities, terrorist attack or other incidents in which the site team capabilities of the NRC are needed to support the overall Federal response. Headquarters continues to lead the agency's response in the EXPANDED ACTIVATION mode. The ET Director leads the agency response, and the HOC maintains full staffing by the ET and support teams. Team membership is tailored to the specific incident. The regional office incident response center maintains full staffing which is adjusted to accommodate the site team. Other regional offices may partially staff their incident response centers or provide resources and/or personnel to the NRC site team.

The EXPANDED ACTIVATION mode involves dispatch of an NRC site team to the licensee's site or the vicinity of an incident under the leadership of the Regional Administrator or designee. The Site Team Director may be delegated specific authorities from the ET Director to lead NRC response activities. The focus of NRC response is at the incident site, and the site team may have the lead for most of the agency response. At the site, the Site Team Director may assume supervision of NRC personnel, may represent NRC in interactions with other agencies (e.g., represents the NRC locally as coordinating agency or cooperating agency in accordance with the national response framework), and may decide what response actions must be taken, consistent with the delegated authority. The ET Director retains any authority not specifically delegated to the Site Team Director.

Table 1 - Licensee Emergency Classes

A. Nuclear Power Plants *

Notification of Unusual Event	Alert	Site Area Emergency	General Emergency
Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No release of radioactive materials requiring offsite response or monitoring are expected unless further degradation of safety system occurs.	Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the Environmental Protections Agency (EPA) Protective Action Guideline exposure levels.	Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to exceed the EPA Protective Action Guideline exposure levels except near the site boundary.	Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Release can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

* "Criteria for Preparation and Evaluation of Radiological Emergency Response Plants and Preparedness in Support of Nuclear Power Plants, " NUREG-0654/FEMA-REP-1, Rev.1, November 1980

B. Regulated Material Facilities and Gaseous Diffusion Plants **

Alert	Site Area Emergency
Events may occur, are in progress, or have occurred that could lead to a release of radioactive material, but the release is not expected to require a response by an offsite organization to protect persons off site.	Events may occur, are in progress, or have occurred that could lead to a significant release of radioactive material and that could require a response by offsite response organizations to protect persons off site.

** 10 CFR Part 76, "Certification of Gaseous Diffusion Plants;" 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material;" 10 CFR Part 40, "Domestic Licensing of Source Material;" and 10 CFR Part 30, "Domestic Licensing of Byproduct Material"

Question 2. Please provide a list of all the occasions since 1980 that an NRC Chairman has exercised emergency authority granted under Section 3 of the Reorganization Plan of 1980. Please indicate the basis for and duration of the exercise of emergency authority.

Response. A list of the times and the associated duration in which the NRC has responded to an emergency situation is contained in the response to the previous question.

Question 3. Please provide a comprehensive list of all actions you have taken under your emergency authority since March 11th.

Response. I have kept my fellow Commissioners currently and fully informed of the NRC response to the events in Japan. These information exchanges have taken the form of direct briefings of Commissioners once per day in the first week after the accident (including one planning for a Commission meeting) and on an ad hoc basis after March 18. The Commissioners' staffs received numerous briefings from the Executive Team in the NRC Operations Center, as well as written status report at regular and frequent intervals.

Specifically, I orally briefed the Commission as a collegial body on nine separate occasions on the Japan accident, and individual Commissioners on ten separate occasions.

Commissioner's Assistants received 62 briefings from the Executive Team between March 11 and May 4. Three of these briefings occurred within the first 12 hours after the NRC entered into the mode of monitoring the accident on March 11 and a fourth was conducted within the first 24 hours.

As of May 4, the Commission had also received 96 written status updates from NRC's Headquarters Operations Officer. In addition, the Commission received other written information and one page documents with pertinent information and analysis, and had access to the internal NRC Website where all of those reports were maintained.

In addition, I worked with my fellow Commissioners to create a Task Force to examine the agency's regulatory requirements, programs, processes, and implementation in light of information from the accident following the March 11 earthquake and tsunami. The Task Force presented its report to the Commission on July 12, proposing recommendations on improving several safety-related areas.

Question 4a. and b. On April 1st, the NRC appointed a task force to examine the agency's regulatory requirements, programs, processes, and implementation in light of information from the Fukushima Daiichi site in Japan, following the March 11 earthquake and tsunami.

How much do you estimate this review will cost?

Will the Commission need to reprogram funds from other programs to support this review? If so, from which programs?

Response. The cost in fiscal year associated with NRC staff efforts to respond to the situation in Japan is $19 million. This amount was contained in the NRC's fiscal year reprogramming action that was approved by Congress. The cost in fiscal year to implement the task force's near-term recommendations to ensure that the NRC's regulations, requirements and processes reflect the lessons learned from the Fukushima nuclear emergency is still to be determined, and depends on what actions are approved by the Commission.

Question 4c. On April 1st, the NRC appointed a task force to examine the agency's regulatory requirements, programs, processes, and implementation in light of information from the Fukushima Daiichi site in Japan, following the March 11 earthquake and tsunami.

In addition to the announced task force members, how many staff will support this review. Please indicate the offices and programs where they currently work and the estimated time they will spend in support of the review.

Response. The task force members have consulted with senior management and technical staff in various offices, including the Office of Nuclear Reactor Regulation, the Office of New Reactors, the Office of Nuclear Regulatory Research, the Office of Nuclear Security and Incident Response, and the Regional Offices on specific topics that are being addressed. The Task Force spent over 100 hours talking to agency staff, in addition to e-mails and other written communications.

Additionally, during the task force's deliberations, the importance of severe accident management guidelines (SAMG) was highlighted. In order to evaluate the current status of SAMGs onsite and determine the need for any further recommendations, a temporary instruction (TI) inspection was issued on April 29, 2011, requesting that information regarding SAMGs at the 65 operating power reactor sites be gathered, assessed, and summarized. Approximately 900 direct inspection hours by NRC inspectors were spent to complete the TI inspection requirements.

Question 5. What, if any additional resources are needed to ensure that adequate funding of the Fukushima task force does not impair progress on new plant licensing and design certification.

Response. As discussed in the response to Question 4, the NRC reprogrammed $19 million in fiscal year from prior year unobligated carryover funds to cover the costs of the near and long term evaluation of the need for NRC actions following the events of Japan. Accordingly, the NRC did not require additional resources in fiscal year to continue efforts devoted to new reactor plant licensing and design certification reviews. Depending on how the Commission votes on the Task Force recommendations, and supplementary staff papers, the agency will likely be required to adjust its fiscal year budget to address potential changes to NRC's regulatory requirements, programs, and processes.

Question 6. Please provide a list of the fees billed under 10 CFR 170 to license renewal applicants currents under review and the 20 most recently issued license renewals.

Response. See the attached tables starting on the next page.

FEES BILLED FOR LICENSE RENEWAL

TAC NO.	DOCKET NO.	HOURS	NON REG HOURS	TOTAL HOURS	RATE	HOURLY AMT	CONTRACT COST	INVOICE NO.	DATE INVOICED	TAC TITLE
MB8426	050-00260	33.7	1.0	34.7	156	5413.20	0.00	RL0490-04	4/19/2004	BROWNS FERRY 2 - License Renewal Pre-Application Activities
MB8426	050-00260	9.5	0.0	9.5	156	1482.00	0.00	RL0302-04	2/4/2004	BROWNS FERRY 2 - License Renewal Pre-Application Activities
MB8426	050-00260	1.7	0.0	1.7	156	265.20	0.00	RL0671-03	7/28/2003	BROWNS FERRY 2 - License Renewal Pre-Application Activities
MB8427	050-00296	1.7	0.0	1.7	156	265.20	0.00	RL0671-03	7/28/2003	BROWNS FERRY 3 - License Renewal Pre-Application Activities
MB8427	050-00296	9.0	0.0	9.0	156	1404.00	0.00	RL0302-04	2/4/2004	BROWNS FERRY 3 - License Renewal Pre-Application Activities
MB8427	050-00296	31.3	1.0	32.3	156	5038.80	0.00	RL0490-04	4/19/2004	BROWNS FERRY 3 - License Renewal Pre-Application Activities
MB8429	050-00259	2.0	0.0	2.0	156	312.00	0.00	RL0671-03	7/28/2003	BROWNS FERRY 1 - License Renewal Pre-Application Activities
MB8429	050-00259	8.5	0.0	8.5	156	1326.00	0.00	RL0302-04	2/4/2004	BROWNS FERRY 1 - License Renewal Pre-Application Activities
MB8429	050-00259	26.2	0.8	27.0	156	4212.00	0.00	RL0490-04	4/19/2004	BROWNS FERRY 1 - License Renewal Pre-Application Activities
MC0691	050-00220	33.0	0.0	33.0	156	5148.00	0.00	RL0722-04	8/9/2004	NINE MILE POINT 1 - License Renewal Pre-application Activities
MC0691	050-00220	6.8	0.0	6.8	156	1060.80	0.00	RL0531-04	4/19/2004	NINE MILE POINT 1 - License Renewal Pre-application Activities
MC0692	050-00410	6.7	0.0	6.7	156	1045.20	0.00	RL0531-04	4/19/2004	NINE MILE POINT 2 - License Renewal Pre-application Activities
MC0692	050-00410	33.0	0.0	33.0	156	5148.00	0.00	RL0722-04	8/9/2004	NINE MILE POINT 2 - License Renewal Pre-application Activities
MC1522	050-00334	0.0	0.0	0.0	0	0.00	19556.69	RL0683-05	7/25/2005	BEAVER VALLEY 1 - License Renewal Pre-Application Activities
MC1522	050-00334	0.0	0.0	0.0	0	0.00	3302.09	RL0683-05	7/25/2005	BEAVER VALLEY 1 - License Renewal Pre-Application Activities
MC1522	050-00334	20.0	2.0	22.0	157	3454.00	0.00	RL0500-05	4/18/2005	BEAVER VALLEY 1 - License Renewal Pre-Application Activities
MC1522	050-00334	13.5	0.0	13.5	156	2106.00	0.00	RL0678-04	8/9/2004	BEAVER VALLEY 1 - License Renewal Pre-Application Activities
MC1522	050-00334	27.0	0.0	27.0	156	4212.00	0.00	RL0487-04	4/19/2004	BEAVER VALLEY 1 - License Renewal Pre-Application Activities
MC1522	050-00334	3.0	0.0	3.0	156	468.00	0.00	RL0299-04	2/4/2004	BEAVER VALLEY 1 - License Renewal Pre-Application Activities
MC1523	050-00412	4.0	1.0	5.0	157	785.00	0.00	RL0500-05	4/18/2005	BEAVER VALLEY 2 - License Renewal Pre-Application Activities
MC1523	050-00412	0.0	0.0	0.0	0	0.00	3302.09	RL0683-05	7/25/2005	BEAVER VALLEY 2 - License Renewal Pre-Application Activities
MC1523	050-00412	0.0	0.0	0.0	0	0.00	19556.69	RL0683-05	7/25/2005	BEAVER VALLEY 2 - License Renewal Pre-Application Activities
MC1704	050-00259	698.2	55.0	753.2	157	118252.40	0.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	1596.66	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	5303.33	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	278.78	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	1602.33	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	1328.99	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	248.91	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	6591.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	219.0	8.6	227.6	157	35733.20	0.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	3292.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	2950.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	6873.24	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	9580.56	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	11089.66	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	20496.33	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	161.7	7.2	168.9	205	34624.50	0.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	2167.38	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	800.94	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	1409.94	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	7578.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	454.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	16654.00	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	725.6	36.2	761.8	157	119602.60	0.00	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	34020.67	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	44610.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	37486.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	4799.33	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review

MC1704	050-00259	0.0	0.0	0.0	0	0.00	7218.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	5271.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	864.79	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	603.7	28.0	631.7	157	99176.90	0.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	4630.72	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	6960.39	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	1108.43	RL0490-04	4/19/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	7287.33	RL0490-04	4/19/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	6678.37	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	3230.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	977.4	47.8	1025.2	157	160956.40	0.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	424.2	43.9	468.1	156	73023.60	0.00	RL0490-04	4/19/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	155.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	3408.94	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	2552.15	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	14752.05	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	13537.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	1248.5	68.1	1316.6	156	205389.60	0.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	1354.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	31398.57	RL0612-06R2	11/30/2006	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	219.7	15.3	235.0	205	48175.00	0.00	RL0433-06	4/17/2006	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	185.85	RL0250-06R3	2/13/2006	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	321.81	RL0250-06R3	2/13/2006	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	119.8	8.8	128.6	205	26363.00	0.00	RL0612-06R2	11/30/2006	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	1322.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	979.72	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	74.53	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	0.0	0.0	0.0	0	0.00	205.33	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review
MC1704	050-00259	490.9	20.5	511.4	205	104837.00	0.00	RL0250-06R3	2/13/2006	BROWNS FERRY 1 - License Renewal Safety Review
MC1705	050-00260	461.0	34.3	495.3	156	77266.80	0.00	RL0490-04	4/19/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	6960.39	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	2167.38	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	454.00	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	800.94	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	1328.99	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	622.3	21.8	644.1	157	101123.70	0.00	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	6873.24	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	34020.67	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	1596.66	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	44610.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	248.90	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	37486.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	1409.94	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	864.80	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	11089.66	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	4630.72	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	4799.33	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	6678.38	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	9580.56	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	954.7	29.4	984.1	157	154503.70	0.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	5303.33	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	3408.94	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	502.1	30.6	532.7	157	83633.90	0.00	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Safety Review

MC1705	050-00260	0.0	0.0	0.0	0	0.00	1602.33	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	610.8	13.3	624.1	157	97983.70	0.00	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	278.77	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	20496.33	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	2552.14	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	14752.05	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	1130.1	45.1	1175.2	156	183331.20	0.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	7287.33	RL0490-04	4/19/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	1108.43	RL0490-04	4/19/2004	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	74.53	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	205.33	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	185.85	RL0250-06R3	2/13/2006	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	321.81	RL0250-06R3	2/13/2006	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	426.4	19.8	446.2	205	91471.00	0.00	RL0250-06R3	2/13/2006	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	117.7	9.2	126.9	205	26014.50	0.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	183.8	15.4	199.2	205	40836.00	0.00	RL0433-06	4/17/2006	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	979.71	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	102.5	6.2	108.7	205	22283.50	0.00	RL0612-06R2	11/30/2006	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	0.0	0.0	0.0	0	0.00	31398.57	RL0612-06R2	11/30/2006	BROWNS FERRY 2 - License Renewal Safety Review
MC1705	050-00260	204.1	7.0	211.1	157	33142.70	0.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	3408.95	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	9580.56	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	447.6	33.0	480.6	156	74973.60	0.00	RL0490-04	4/19/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	1596.66	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	573.8	21.3	595.1	157	93430.70	0.00	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	248.90	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	278.78	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	5303.34	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	11089.66	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	20496.33	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	498.7	25.0	523.7	157	82220.90	0.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	4630.72	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	577.9	31.0	608.9	157	95597.30	0.00	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	864.80	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	6678.37	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	7287.34	RL0490-04	4/19/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	14752.05	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	1108.42	RL0490-04	4/19/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	454.00	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	6873.24	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	2552.14	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	44610.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	898.5	36.3	934.8	157	146763.60	0.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	1047.9	46.4	1094.3	156	170710.80	0.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	4799.33	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	1602.34	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	37486.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	34020.67	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	800.93	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	2167.38	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	6960.39	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	1328.99	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	100.0	5.2	105.2	205	21566.00	0.00	RL0612-06R2	11/30/2006	BROWNS FERRY 3 - License Renewal Safety Review

MC1706	050-00296	116.5	6.4	122.9	205	25194.50	0.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	31398.57	RL0612-06R2	11/30/2006	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	185.85	RL0250-06R3	2/13/2006	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	321.81	RL0250-06R3	2/13/2006	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	198.0	7.8	205.8	157	32310.60	0.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	395.3	20.7	416.0	205	85280.00	0.00	RL0250-06R3	2/13/2006	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	205.34	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	979.72	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	0.0	0.0	0.0	0	0.00	74.53	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Safety Review
MC1706	050-00296	169.2	12.8	182.0	205	37310.00	0.00	RL0433-06	4/17/2006	BROWNS FERRY 3 - License Renewal Safety Review
MC1768	050-00259	99.0	10.5	109.5	156	17082.00	0.00	RL0490-04	4/19/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	1.3	0.0	1.3	157	204.10	0.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	2206.14	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	2591.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	314.00	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	13403.00	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	534.66	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	1349.00	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	3458.00	RL0490-04	4/19/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	1003.59	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	1206.76	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	301.07	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	6806.00	RL0490-04	4/19/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	11885.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	19561.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	7736.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	807.67	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	1003.59	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	30.94	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	772.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	2274.08	RL0490-04	4/19/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	50.18	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	2591.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	1129.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	2691.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	60.2	1.8	62.0	157	9734.00	0.00	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	4660.33	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	49.0	3.8	52.8	157	8289.60	0.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	966.67	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	572.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	1513.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	2898.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	17.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	2024.00	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	439.66	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	172.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	4421.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	56.33	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	-2.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	12969.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	1.66	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	79.6	4.9	84.5	157	13266.50	0.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	175.0	12.5	187.5	156	29250.00	0.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review

MC1768	050-00259	0.0	0.0	0.0	0	0.00	340.37	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	2809.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	7945.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	3250.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	11257.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	82.8	4.5	87.3	157	13706.10	0.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	6325.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.8	0.0	0.8	205	164.00	0.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	885.00	RL0681-04	8/9/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	13701.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	11581.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	-114.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	-16.67	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	1327.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1768	050-00259	0.0	0.0	0.0	0	0.00	-114.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	17.00	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	439.66	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	1513.00	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	2898.00	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	1206.76	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	56.33	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	2274.08	RL0490-04	4/19/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	52.5	3.5	56.0	157	8792.00	0.00	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	534.66	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	572.00	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	2024.00	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	13403.00	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	1349.00	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	6325.00	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	301.07	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	98.0	4.5	102.5	157	16092.50	0.00	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	7945.00	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	11581.00	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	3458.00	RL0490-04	4/19/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	-2.00	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	1.66	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	92.0	1.0	93.0	156	14508.00	0.00	RL0490-04	4/19/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	148.0	10.0	158.0	156	24648.00	0.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	11885.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	1003.59	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	6806.00	RL0490-04	4/19/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	19561.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	1003.59	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	30.94	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	50.18	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	772.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	314.00	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	1129.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	2691.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	7736.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	59.6	1.7	61.3	157	9624.10	0.00	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	2591.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	340.37	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review

MC1769	050-00260	0.0	0.0	0.0	0	0.00	2591.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	11257.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	13701.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	2206.14	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	12969.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	77.0	4.5	81.5	157	12795.50	0.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	172.00	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	4660.33	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	966.67	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	807.67	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	4421.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	885.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	2809.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	3250.00	RL0681-04	8/9/2004	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	-16.67	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	-114.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.7	0.0	0.7	205	143.50	0.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	1327.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	1.2	0.0	1.2	157	188.40	0.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1769	050-00260	0.0	0.0	0.0	0	0.00	-114.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	885.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	340.37	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	4660.33	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	3250.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	4421.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	19561.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	2809.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	7736.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	807.67	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	11885.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	1129.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	772.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	69.9	2.5	72.4	157	11366.80	0.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	50.18	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	13701.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	30.94	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	2591.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	1003.59	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	137.0	4.5	141.5	156	22074.00	0.00	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	12969.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	11257.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	2591.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	966.67	RL0681-04	8/9/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	2206.14	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	2274.08	RL0490-04	4/19/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	6806.00	RL0490-04	4/19/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	3458.00	RL0490-04	4/19/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	70.5	0.5	71.0	156	11076.00	0.00	RL0490-04	4/19/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	2691.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	1003.59	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	1206.76	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	534.66	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	48.2	4.0	52.2	157	8195.40	0.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Environmental Review

MC1770	050-00296	0.0	0.0	0.0	0	0.00	1349.00	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	572.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	56.33	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	11581.00	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	97.0	3.0	100.0	157	15700.00	0.00	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	7945.00	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	67.7	1.0	68.7	157	10785.90	0.00	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	301.07	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	2024.00	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	-2.00	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	439.66	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	6325.00	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	13403.00	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	314.00	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	1513.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	1.66	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	2898.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	17.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	172.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	-114.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	1327.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.8	0.0	0.8	205	164.00	0.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	1.0	0.0	1.0	157	157.00	0.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	-16.66	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1770	050-00296	0.0	0.0	0.0	0	0.00	-114.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Environmental Review
MC1773	050-00296	2.5	0.0	2.5	157	392.50	0.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - Contract Management for License Renewal App
MC1825	050-00336	0.0	0.0	0.0	0	0.00	2038.50	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	7435.99	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	8.8	0.0	8.8	205	1804.00	0.00	RL0291-06	1/23/2006	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	8493.85	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	447.3	16.5	463.8	156	72352.80	0.00	RL0529-04	4/19/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	728.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	2468.65	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	3506.75	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	1191.53	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	7.5	0.0	7.5	205	1537.50	0.00	RL0291-06	1/23/2006	MILLSTONE STATION - ACRS MANPOWER
MC1825	050-00336	219.5	8.3	227.8	157	35764.60	0.00	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	1926.54	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	2372.56	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	1560.56	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	101.0	0.0	101.0	157	15857.00	0.00	RL0726-05	7/25/2005	MILLSTONE STATION 2 - ACRS HOURS LICENSE RENEWAL
MC1825	050-00336	0.0	0.0	0.0	0	0.00	4792.02	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	7975.50	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	14232.50	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	337.25	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	2301.11	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	41821.12	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	12312.93	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	8878.87	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	24.3	0.0	24.3	205	4981.50	0.00	RL0132-06	10/17/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	601.44	RL0291-06	1/23/2006	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	445.7	41.0	486.7	157	76411.90	0.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	25.5	0.0	25.5	157	4003.50	0.00	RL0542-05R1	10/17/2005	MILLSTONE STATION - LICENSE RENEWAL - ACRS MANPOWER

MC1825	050-00336	1321.8	63.3	1385.1	156	216075.60	0.00	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	113.50	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	58.50	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	25.5	0.0	25.5	205	5227.50	0.00	RL0132-06	10/17/2005	MILLSTONE STATION - ACRS MANPOWER
MC1825	050-00336	1.0	0.0	1.0	157	157.00	0.00	RL0132-06	10/17/2005	MILLSTONE STATION - ACRS MANPOWER
MC1825	050-00336	956.0	111.8	1067.8	157	167644.60	0.00	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	80.3	2.8	83.1	157	13046.70	0.00	RL0132-06	10/17/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	587.4	47.6	635.0	157	99695.00	0.00	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	3966.50	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	-171.50	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Safety Review
MC1825	050-00336	0.0	0.0	0.0	0	0.00	39333.54	RL0653-06R1	12/2/2006	MILLSTONE 2 - License Renewal Application Safety Review
MC1826	050-00423	1259.1	70.2	1329.3	156	207370.80	0.00	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	8878.87	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	12312.94	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	41821.11	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	8.7	0.0	8.7	205	1783.50	0.00	RL0291-06	1/23/2006	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	79.2	5.7	84.9	157	13329.30	0.00	RL0132-06	10/17/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	14232.50	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	7975.50	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	21.2	0.0	21.2	205	4346.00	0.00	RL0132-06	10/17/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	1560.55	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	403.2	8.8	412.0	156	64272.00	0.00	RL0529-04	4/19/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	601.45	RL0291-06	1/23/2006	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	1191.53	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	4792.02	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	337.25	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	2301.12	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	593.8	43.1	636.9	157	99993.30	0.00	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	3966.50	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	25.5	0.0	25.5	205	5227.50	0.00	RL0132-06	10/17/2005	MILLSTONE 3 - ACRS MANPOWER
MC1826	050-00423	1.0	0.0	1.0	157	157.00	0.00	RL0132-06	10/17/2005	MILLSTONE STATION - ACRS MANPOWER
MC1826	050-00423	24.5	0.0	24.5	157	3846.50	0.00	RL0542-05R1	10/17/2005	MILLSTONE STATION - LICENSE RENEWAL - ACRS MANPOWER
MC1826	050-00423	0.0	0.0	0.0	0	0.00	8493.85	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	2038.50	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	58.50	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	113.50	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	728.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	-171.50	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	203.5	9.7	213.2	157	33472.40	0.00	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	84.0	0.0	84.0	157	13188.00	0.00	RL0726-05	7/25/2005	MILLSTONE STATION 3 - ACRS HOURS LICENSE RENEWAL
MC1826	050-00423	0.0	0.0	0.0	0	0.00	7435.99	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	2468.65	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	3506.74	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	967.7	78.7	1046.4	157	164284.80	0.00	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	2372.56	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	445.2	50.3	495.5	157	77793.50	0.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	1926.54	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Safety Review
MC1826	050-00423	0.0	0.0	0.0	0	0.00	39333.54	RL0653-06R1	12/2/2006	MILLSTONE 3 - License Renewal Application Safety Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	18786.00	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	43715.00	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	18911.00	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	10.00	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	17065.00	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review

MC1827	050-00336	0.0	0.0	0.0	0	0.00	753.00	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	250.90	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	112.0	7.3	119.3	157	18730.10	0.00	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	1113.94	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	3160.04	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	618.00	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	43189.00	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	13904.00	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	2785.00	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	209.6	17.7	227.3	157	35686.10	0.00	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	5998.18	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	11268.00	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	5918.00	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	3883.00	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	4264.00	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	16174.00	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	1519.13	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	197.1	6.9	204.0	156	31824.00	0.00	RL0720-04	8/9/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	100.5	3.5	104.0	156	16224.00	0.00	RL0529-04	4/19/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	3867.00	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	1806.46	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	1991.00	RL0085-05	10/18/2004	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	1902.97	RL0348-05	3/7/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	-1264.00	RL0291-06	1/23/2006	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	8.0	0.0	8.0	205	1640.00	0.00	RL0291-06	1/23/2006	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	919.00	RL0132-06	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	919.00	RL0132-06	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	9289.00	RL0132-06	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	305.1	16.7	321.8	157	50522.60	0.00	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	1.5	0.0	1.5	205	307.50	0.00	RL0132-06	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	425.00	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	1419.00	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	2857.00	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	3249.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	-23.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	170.2	16.4	186.6	157	29296.20	0.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	3672.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	4100.00	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	20183.00	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	2923.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	12276.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	32.5	3.6	36.1	157	5667.70	0.00	RL0132-06	10/17/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1827	050-00336	0.0	0.0	0.0	0	0.00	14874.00	RL0726-05	7/25/2005	MILLSTONE 2 - License Renewal Application Environmental Review
MC1828	050-00423	304.1	18.8	322.9	157	50695.30	0.00	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	425.00	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	1419.00	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	17065.00	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	2857.00	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	18786.00	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	1806.46	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	1902.97	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	3867.00	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	4100.00	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Environmental Review

MC1828	050-00423	0.0	0.0	0.0	0	0.00	20183.00	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	5998.18	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	18911.00	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	16174.00	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	43715.00	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	618.00	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	1991.00	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	4264.00	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	112.0	7.4	119.4	157	18745.80	0.00	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	10.00	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	250.90	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	14874.00	RL0726-05	7/25/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	753.00	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	213.7	17.0	230.7	157	36219.90	0.00	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	3160.04	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	1113.94	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	13904.00	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	11268.00	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	43189.00	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	2785.00	RL0348-05	3/7/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	1519.13	RL0085-05	10/18/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	5918.00	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	3883.00	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	190.9	6.9	197.8	156	30856.80	0.00	RL0720-04	8/9/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	101.0	3.0	104.0	156	16224.00	0.00	RL0529-04	4/19/2004	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	-1264.00	RL0291-06	1/23/2006	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	-23.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	3249.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	2923.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	919.00	RL0132-06	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	12276.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	8.0	0.0	8.0	205	1640.00	0.00	RL0291-06	1/23/2006	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	9289.00	RL0132-06	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	3672.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	0.0	0.0	0.0	0	0.00	919.00	RL0132-06	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	164.8	16.3	181.1	157	28432.70	0.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	1.5	0.0	1.5	205	307.50	0.00	RL0132-06	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC1828	050-00423	33.0	3.2	36.2	157	5683.40	0.00	RL0132-06	10/17/2005	MILLSTONE 3 - License Renewal Application Environmental Review
MC2049	050-00266	23.3	0.0	23.3	156	3634.80	0.00	RL0541-04	4/19/2004	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	2346.00	RL0554-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	8200.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	4950.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	1.3	0.0	1.3	205	266.50	0.00	RL0303-06R2	1/23/2006	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	3700.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	192.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	385.3	20.5	405.8	157	63710.60	0.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	-300.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	20110.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	-50.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	10604.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	8112.00	RL0554-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	37762.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	150.00	RL0554-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application

MC2049	050-00266	0.0	0.0	0.0	0	0.00	11850.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	18878.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	38000.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	22877.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	10650.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	5251.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	181.3	3.4	184.7	157	28997.90	0.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	550.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	7594.00	RL0732-04R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	2005.00	RL0554-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	260.0	4.5	264.5	156	41262.00	0.00	RL0732-04R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	5270.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	3256.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	213.2	5.2	218.4	157	34288.80	0.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	235.0	0.5	235.5	157	36973.50	0.00	RL0554-05R2	10/18/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	7412.00	RL0303-06R2	1/23/2006	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	17264.00	RL0144-06	10/17/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	-50.00	RL0144-06	10/17/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	0.0	0.0	0.0	0	0.00	5450.00	RL0144-06	10/17/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	26.1	0.0	26.1	205	5350.50	0.00	RL0144-06	10/17/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2049	050-00266	71.3	1.6	72.9	157	11445.30	0.00	RL0144-06	10/17/2005	POINT BEACH 1 - Point Beach Unit 1 License Renewal Application
MC2050	050-00301	21.7	0.0	21.7	156	3385.20	0.00	RL0541-04	4/19/2004	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	3700.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	235.0	0.5	235.5	157	36973.50	0.00	RL0554-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	18878.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	22877.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	150.00	RL0554-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	7412.00	RL0303-06R2	1/23/2006	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	8112.00	RL0554-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	1.2	0.0	1.2	205	246.00	0.00	RL0303-06R2	1/23/2006	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	38000.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	5251.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	2005.00	RL0554-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	8200.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	10604.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	4950.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	213.1	4.8	217.9	157	34210.30	0.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	3256.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	2346.00	RL0554-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	11850.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	17264.00	RL0144-06	10/17/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	10650.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	-50.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	20110.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	7594.00	RL0732-04R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	5450.00	RL0144-06	10/17/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	192.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	-50.00	RL0144-06	10/17/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	71.2	1.4	72.6	157	11398.20	0.00	RL0144-06	10/17/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	5270.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	380.5	19.0	399.5	157	62721.50	0.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	26.2	0.0	26.2	205	5371.00	0.00	RL0144-06	10/17/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	37762.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application

MC2050	050-00301	254.5	3.5	258.0	156	40248.00	0.00	RL0732-04R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	180.7	3.1	183.8	157	28856.60	0.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	300.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2050	050-00301	0.0	0.0	0.0	0	0.00	550.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - Point Beach Unit 2 License Renewal Application
MC2099	050-00266	85.2	5.5	90.7	156	14149.20	0.00	RL0541-04	4/19/2004	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	167.00	RL0144-06	10/17/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	3351.00	RL0144-06	10/17/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	164.3	18.5	182.8	157	28699.60	0.00	RL0144-06	10/17/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	148.7	29.3	178.0	205	36490.00	0.00	RL0144-06	10/17/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	99.5	0.0	99.5	157	15621.50	0.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - ACRS HOURS LICENSE RENEWAL
MC2099	050-00266	0.0	0.0	0.0	0	0.00	5123.00	RL0732-04R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	12260.00	RL0732-04R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	7867.00	RL0144-06	10/17/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	-26.00	RL0144-06	10/17/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	-4.00	RL0144-06	10/17/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	18.0	0.5	18.5	205	3792.50	0.00	RL0485-06	4/17/2006	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.5	0.0	0.5	205	102.50	0.00	RL0144-06	10/17/2005	POINT BEACH 1 - ACRS MANPOWER
MC2099	050-00266	1.0	0.0	1.0	205	205.00	0.00	RL0485-06	4/17/2006	POINT BEACH 1 - ACRS MANPOWER
MC2099	050-00266	811.9	38.8	850.7	157	133559.90	0.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	13397.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	-2.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	786.0	99.3	885.3	157	138992.10	0.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	35362.38	RL0669-06R1	12/2/2006	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	2.5	0.0	2.5	157	392.50	0.00	RL0144-06	10/17/2005	POINT BEACH 1 - ACRS MANPOWER
MC2099	050-00266	723.1	45.5	768.6	156	119901.60	0.00	RL0732-04R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	159840.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	27866.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	21641.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	3348.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	3385.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	32266.00	RL0097-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	235.9	49.4	285.3	205	58486.50	0.00	RL0303-06R2	1/23/2006	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	79.3	0.0	79.3	205	16256.50	0.00	RL0303-06R2	1/23/2006	POINT BEACH 1 - ACRS MANPOWER
MC2099	050-00266	0.0	0.0	0.0	0	0.00	146.00	RL0738-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	2892.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	11097.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	1363.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	7102.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	966.00	RL0554-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	0.0	0.0	0.0	0	0.00	-51.00	RL0554-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	1035.5	136.7	1172.2	157	184035.40	0.00	RL0554-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2099	050-00266	792.3	41.7	834.0	157	130938.00	0.00	RL0360-05R2	10/18/2005	POINT BEACH 1 - License Renewal Application Safety Review
MC2100	050-00301	65.0	1.0	66.0	156	10296.00	0.00	RL0541-04	4/19/2004	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	159840.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	27866.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	32266.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	21641.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	664.8	44.1	708.9	156	110588.40	0.00	RL0732-04R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	3351.00	RL0144-06	10/17/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	799.2	33.0	832.2	157	130655.40	0.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	3348.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	5123.00	RL0732-04R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	12260.00	RL0732-04R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review

MC2100	050-00301	0.0	0.0	0.0	0	0.00	-26.00	RL0144-06	10/17/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	35362.38	RL0669-06R1	12/2/2006	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	167.00	RL0144-06	10/17/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	3385.00	RL0097-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	7867.00	RL0144-06	10/17/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	-4.00	RL0144-06	10/17/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	851.1	48.3	899.4	157	141205.80	0.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	172.3	50.5	222.8	205	45674.00	0.00	RL0144-06	10/17/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	158.9	17.8	176.7	157	27741.90	0.00	RL0144-06	10/17/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.5	0.0	0.5	205	102.50	0.00	RL0144-06	10/17/2005	POINT BEACH 2 - ACRS MANPOWER
MC2100	050-00301	1.5	0.0	1.5	157	235.50	0.00	RL0144-06	10/17/2005	POINT BEACH 2 - ACRS MANPOWER
MC2100	050-00301	0.0	0.0	0.0	0	0.00	2892.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	-2.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	59.3	0.0	59.3	205	12156.50	0.00	RL0303-06R2	1/23/2006	POINT BEACH 2 - ACRS MANPOWER
MC2100	050-00301	1009.8	114.0	1123.8	157	176436.60	0.00	RL0554-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	1363.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	18.0	0.5	18.5	205	3792.50	0.00	RL0485-06	4/17/2006	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	11097.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	1.0	0.0	1.0	205	205.00	0.00	RL0485-06	4/17/2006	POINT BEACH 2 - ACRS MANPOWER
MC2100	050-00301	232.3	47.2	279.5	205	57297.50	0.00	RL0303-06R2	1/23/2006	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	13397.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	92.5	0.0	92.5	157	14522.50	0.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - ACRS HOURS LICENSE RENEWAL
MC2100	050-00301	0.0	0.0	0.0	0	0.00	966.00	RL0554-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	7102.00	RL0360-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	-51.00	RL0554-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	0.0	0.0	0.0	0	0.00	146.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2100	050-00301	764.0	105.7	869.7	157	136542.90	0.00	RL0738-05R2	10/18/2005	POINT BEACH 2 - License Renewal Application Safety Review
MC2330	050-00336	4.0	0.0	4.0	156	624.00	0.00	RL0529-04	4/19/2004	MILLSTONE 2 - Contract management
MC2330	050-00336	4.0	0.0	4.0	157	628.00	0.00	RL0348-05	3/7/2005	MILLSTONE 2 - Contract management
MC2330	050-00336	3.0	0.0	3.0	157	471.00	0.00	RL0542-05R1	10/17/2005	MILLSTONE 2 - Contract management
MC2331	050-00423	3.0	0.0	3.0	157	471.00	0.00	RL0542-05R1	10/17/2005	MILLSTONE 3 - Contract Management
MC2331	050-00423	5.0	0.0	5.0	156	780.00	0.00	RL0529-04	4/19/2004	MILLSTONE 3 - Contract Management
MC2331	050-00423	5.0	0.0	5.0	157	785.00	0.00	RL0348-05	3/7/2005	MILLSTONE 3 - Contract Management
MC2362	050-00219	116.0	12.2	128.2	157	20127.40	0.00	RL0731-05	7/25/2005	OYSTER CREEK - License Renewal Pre-Application Activities
MC2362	050-00219	82.5	6.0	88.5	157	13894.50	0.00	RL0137-06	10/17/2005	OYSTER CREEK - License Renewal Pre-Application Activities
MC2362	050-00219	1.5	0.0	1.5	157	235.50	0.00	RL0547-05	4/18/2005	OYSTER CREEK - License Renewal Pre-Application Activities
MC3272	050-00220	0.0	0.0	0.0	0	0.00	111.38	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	614.67	RL0475-06	4/17/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	8147.57	RL0475-06	4/17/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	102.0	1.5	103.5	157	16249.50	0.00	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	3628.41	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	1192.61	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	-57.42	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	172.9	7.0	179.9	156	28064.40	0.00	RL0722-04	8/9/2004	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	1268.2	74.0	1342.2	157	210725.40	0.00	RL0087-05	10/18/2004	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	3967.33	RL0293-06	1/23/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	859.1	44.8	903.9	157	141912.30	0.00	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	17770.74	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	3785.12	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	20066.22	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	6922.40	RL0293-06	1/23/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	1845.54	RL0293-06	1/23/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	7312.08	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Safety Review

MC3272	050-00220	0.0	0.0	0.0	0	0.00	306.90	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	2683.63	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	1506.1	59.6	1565.7	157	245814.90	0.00	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	13453.72	RL0087-05	10/18/2004	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	35650.64	RL0087-05	10/18/2004	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	1532.5	61.4	1593.9	205	326749.50	0.00	RL0293-06	1/23/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	440.8	15.1	455.9	205	93459.50	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	577.4	40.2	617.6	205	126608.00	0.00	RL0475-06	4/17/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	7230.53	RL0087-05	10/18/2004	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	233.6	12.6	246.2	157	38653.40	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	4252.20	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	12501.69	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	2417.79	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	2182.72	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	311.90	RL0357-07	1/22/2007	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	826.47	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	44093.56	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	1928.01	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	-1928.01	RL0565-07	4/16/2007	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	108.5	0.0	108.5	217	23544.50	0.00	RL0357-07	1/22/2007	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	1928.01	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	99.5	4.0	103.5	205	21217.50	0.00	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	-59.04	RL0565-07	4/16/2007	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	177.10	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	59.04	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	80.0	0.0	80.0	217	17360.00	0.00	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	0.0	0.0	0.0	0	0.00	59.04	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3272	050-00220	500.6	13.1	513.7	205	105308.50	0.00	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Safety Review
MC3273	050-00410	160.1	4.0	164.1	156	25599.60	0.00	RL0722-04	8/9/2004	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	35650.63	RL0087-05	10/18/2004	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	1164.4	74.1	1238.5	157	194444.50	0.00	RL0087-05	10/18/2004	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	7230.53	RL0087-05	10/18/2004	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	588.2	36.6	624.8	205	128084.00	0.00	RL0475-06	4/17/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	614.68	RL0475-06	4/17/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	12501.69	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	3785.12	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	13453.72	RL0087-05	10/18/2004	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	20066.23	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	17770.74	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	3628.41	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	1481.4	75.1	1556.5	157	244370.50	0.00	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	7312.08	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	855.7	33.2	888.9	157	139557.30	0.00	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	112.2	1.5	113.7	157	17850.90	0.00	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	228.9	8.2	237.1	157	37224.70	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	8147.57	RL0475-06	4/17/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	2683.62	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	306.91	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	4252.19	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	1465.9	43.6	1509.5	205	309447.50	0.00	RL0293-06	1/23/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	424.7	12.2	436.9	205	89564.50	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	111.37	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	1192.61	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Safety Review

MC3273	050-00410	0.0	0.0	0.0	0	0.00	57.41	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	6922.40	RL0293-06	1/23/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	3967.32	RL0293-06	1/23/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	82.5	2.0	84.5	205	17322.50	0.00	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	89.0	0.0	89.0	217	19313.00	0.00	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	-1928.01	RL0565-07	4/16/2007	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	-59.03	RL0565-07	4/16/2007	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	59.03	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	311.89	RL0357-07	1/22/2007	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	123.5	0.0	123.5	217	26799.50	0.00	RL0357-07	1/22/2007	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	2417.79	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	59.03	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	44093.56	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	1928.01	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	2182.72	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	177.11	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	826.46	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	484.7	9.4	494.1	205	101290.50	0.00	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3273	050-00410	0.0	0.0	0.0	0	0.00	1928.01	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Safety Review
MC3274	050-00220	0.0	0.0	0.0	0	0.00	9980.00	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1550.00	RL0475-06	4/17/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	46.41	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	29550.00	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	12637.50	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	81.3	11.0	92.3	205	18921.50	0.00	RL0475-06	4/17/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	4587.00	RL0475-06	4/17/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1377.15	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1156.50	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	3004.00	RL0475-06	4/17/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	9900.00	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1896.50	RL0087-05	10/18/2004	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	77.7	9.0	86.7	157	13611.90	0.00	RL0087-05	10/18/2004	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1706.50	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	15.0	0.0	15.0	156	2340.00	0.00	RL0722-04	8/9/2004	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	-250.00	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	7850.00	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	50.18	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	103.1	13.0	116.1	157	18227.70	0.00	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	10100.00	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	900.00	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	18900.00	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1039.50	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.3	0.0	0.3	157	47.10	0.00	RL0728-05	7/25/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	26510.12	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	2297.50	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1592.67	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	2789.08	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	12695.50	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	5566.00	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	122.1	8.3	130.4	157	20472.80	0.00	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	417.73	RL0087-05	10/18/2004	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1724.85	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1340.00	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental

MC3274	050-00220	0.0	0.0	0.0	0	0.00	3532.00	RL0350-05	3/7/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	22850.00	RL0087-05	10/18/2004	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	6800.00	RL0544-05	4/18/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	-400.00	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	13.0	2.0	15.0	157	2355.00	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	61.3	7.0	68.3	205	14001.50	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	2500.00	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	-50.00	RL0293-06	1/23/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	151.6	9.4	161.0	205	33005.00	0.00	RL0293-06	1/23/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	900.00	RL0293-06	1/23/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	3050.00	RL0293-06	1/23/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1987.50	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	1850.50	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	615.00	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	4.0	0.0	4.0	217	868.00	0.00	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	81.7	6.6	88.3	205	18101.50	0.00	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	5.0	0.0	5.0	205	1025.00	0.00	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	750.00	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	-188.00	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	37350.00	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	-17.50	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	4450.00	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	450.00	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	500.00	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	872.00	RL0655-06R2	12/2/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	-90.50	RL0151-07	10/16/2006	NINE MILE POINT 1 - License Renewal Application Environmental
MC3274	050-00220	0.0	0.0	0.0	0	0.00	-305.00	RL0357-07	1/22/2007	NINE MILE POINT 1 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1039.50	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	900.00	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1706.50	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	-250.00	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1156.50	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	12695.50	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.2	0.0	0.2	157	31.40	0.00	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	10100.00	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	2789.08	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1377.15	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1340.00	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1592.67	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	2297.50	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	6800.00	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	102.8	12.6	115.4	157	18117.80	0.00	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	50.18	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	46.41	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1724.85	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	18900.00	RL0728-05	7/25/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	5566.00	RL0544-05	4/18/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	121.9	8.2	130.1	157	20425.70	0.00	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	12637.50	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	3532.00	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	9900.00	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	7850.00	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	9980.00	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental

MC3275	050-00410	0.0	0.0	0.0	0	0.00	417.73	RL0087-05	10/18/2004	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1896.50	RL0087-05	10/18/2004	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	22650.00	RL0087-05	10/18/2004	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	79.5	9.0	88.5	157	13894.50	0.00	RL0087-05	10/18/2004	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	4.0	0.0	4.0	156	624.00	0.00	RL0722-04	8/9/2004	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	29550.00	RL0350-05	3/7/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	4587.00	RL0475-06	4/17/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	13.0	2.0	15.0	157	2355.00	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	3004.00	RL0475-06	4/17/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1550.00	RL0475-06	4/17/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	80.7	9.3	90.0	205	18450.00	0.00	RL0475-06	4/17/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	151.4	10.5	161.9	205	33189.50	0.00	RL0293-06	1/23/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	900.00	RL0293-06	1/23/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	61.7	6.8	68.5	205	14042.50	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	3050.00	RL0293-06	1/23/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	-50.00	RL0293-06	1/23/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1850.50	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	615.00	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	1987.50	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	-400.00	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	2500.00	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	872.00	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	-188.00	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	750.00	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	4.0	0.0	4.0	205	820.00	0.00	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	-322.50	RL0357-07	1/22/2007	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	450.00	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	-90.50	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	77.5	8.1	85.6	205	17548.00	0.00	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	4450.00	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	37350.00	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	0.0	0.0	0.0	0	0.00	500.00	RL0657-06R2	12/2/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3275	050-00410	4.0	0.0	4.0	217	868.00	0.00	RL0153-07	10/16/2006	NINE MILE POINT 2 - License Renewal Application Environmental
MC3624	050-00325	116.5	17.0	133.5	157	20959.50	0.00	RL0310-05	3/7/2005	BRUNSWICK 1 - License Renewal Pre-Application Activities
MC3624	050-00325	36.0	0.0	36.0	157	5652.00	0.00	RL0045-05	10/18/2004	BRUNSWICK 1 - License Renewal Pre-Application Activities
MC3625	050-00324	30.0	0.0	30.0	157	4710.00	0.00	RL0045-05	10/18/2004	BRUNSWICK 2 - License Renewal Pre-Application Activities
MC3625	050-00324	110.5	22.5	133.0	157	20881.00	0.00	RL0310-05	3/7/2005	BRUNSWICK 2 - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	73443.00	RL0133-06	10/17/2005	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	13823.00	RL0133-06	10/17/2005	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	22319.00	RL0133-06	10/17/2005	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	-3081.00	RL0474-06	4/17/2006	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	782.00	RL0727-05	7/25/2005	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	7433.00	RL0474-06	4/17/2006	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	1254.00	RL0474-06	4/17/2006	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	4239.00	RL0292-06	1/23/2006	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	75.9	8.0	83.9	157	13172.30	0.00	RL0543-05	4/18/2005	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	39.7	4.0	43.7	157	6860.90	0.00	RL0727-05	7/25/2005	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	-83.00	RL0292-06	1/23/2006	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	1997.00	RL0150-07	10/16/2006	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	1844.00	RL0654-06R1	12/2/2006	MONTICELLO - License Renewal Pre-Application Activities
MC3626	050-00263	0.0	0.0	0.0	0	0.00	4320.00	RL0150-07	10/16/2006	MONTICELLO - License Renewal Pre-Application Activities
MC3627	050-00255	62.0	5.5	67.5	157	10597.50	0.00	RL0548-05	4/18/2005	PALISADES - License Renewal Pre-Application Activities
MC3627	050-00255	75.0	9.1	84.1	157	13203.70	0.00	RL0732-05	7/25/2005	PALISADES - License Renewal Pre-Application Activities

MC4240	050-00259	18.2	1.8	20.0	157	3140.00	0.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review - New Scope
MC4240	050-00259	31.0	2.0	33.0	157	5181.00	0.00	RL0044-05	10/18/2004	BROWNS FERRY 1 - License Renewal Safety Review - New Scope
MC4240	050-00259	92.6	5.3	97.9	157	15370.30	0.00	RL0686-05	7/25/2005	BROWNS FERRY 1 - License Renewal Safety Review - New Scope
MC4240	050-00259	91.2	1.5	92.7	157	14553.90	0.00	RL0309-05	3/7/2005	BROWNS FERRY 1 - License Renewal Safety Review - New Scope
MC4240	050-00259	75.6	9.0	84.6	157	13282.20	0.00	RL0503-05	4/18/2005	BROWNS FERRY 1 - License Renewal Safety Review - New Scope
MC4240	050-00259	2.5	0.0	2.5	205	512.50	0.00	RL0092-06	10/17/2005	BROWNS FERRY 1 - License Renewal Safety Review - New Scope
MC4240	050-00259	11.5	0.0	11.5	205	2357.50	0.00	RL0250-06R3	2/13/2006	BROWNS FERRY 1 - License Renewal Safety Review - New Scope
MC4241	050-00260	86.7	0.5	87.2	157	13690.40	0.00	RL0309-05	3/7/2005	BROWNS FERRY 2 - License Renewal Safety Review - New Scope
MC4241	050-00260	79.7	2.1	81.8	157	12842.60	0.00	RL0686-05	7/25/2005	BROWNS FERRY 2 - License Renewal Safety Review - New Scope
MC4241	050-00260	32.0	2.5	34.5	157	5416.50	0.00	RL0044-05	10/18/2004	BROWNS FERRY 2 - License Renewal Safety Review - New Scope
MC4241	050-00260	76.4	5.0	81.4	157	12779.80	0.00	RL0503-05	4/18/2005	BROWNS FERRY 2 - License Renewal Safety Review - New Scope
MC4241	050-00260	0.5	0.0	0.5	205	102.50	0.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Safety Review - New Scope
MC4241	050-00260	19.5	1.3	20.8	157	3265.60	0.00	RL0092-06	10/17/2005	BROWNS FERRY 2 - License Renewal Safety Review - New Scope
MC4241	050-00260	11.3	0.0	11.3	205	2316.50	0.00	RL0250-06R3	2/13/2006	BROWNS FERRY 2 - License Renewal Safety Review - New Scope
MC4242	050-00296	74.8	2.9	77.7	157	12198.90	0.00	RL0686-05	7/25/2005	BROWNS FERRY 3 - License Renewal Safety Review - New Scope
MC4242	050-00296	86.5	0.5	87.0	157	13659.00	0.00	RL0309-05	3/7/2005	BROWNS FERRY 3 - License Renewal Safety Review - New Scope
MC4242	050-00296	33.7	3.5	37.2	157	5840.40	0.00	RL0044-05	10/18/2004	BROWNS FERRY 3 - License Renewal Safety Review - New Scope
MC4242	050-00296	69.1	7.8	76.9	157	12073.30	0.00	RL0503-05	4/18/2005	BROWNS FERRY 3 - License Renewal Safety Review - New Scope
MC4242	050-00296	11.2	0.0	11.2	205	2296.00	0.00	RL0250-06R3	2/13/2006	BROWNS FERRY 3 - License Renewal Safety Review - New Scope
MC4242	050-00296	19.2	1.5	20.7	157	3249.90	0.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Safety Review - New Scope
MC4242	050-00296	0.5	0.0	0.5	205	102.50	0.00	RL0092-06	10/17/2005	BROWNS FERRY 3 - License Renewal Safety Review - New Scope
MC4639	050-00325	0.0	0.0	0.0	0	0.00	1849.00	RL0310-05	3/7/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	533.5	43.3	576.8	157	90557.60	0.00	RL0310-05	3/7/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	45458.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	39783.00	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	41986.50	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	1448.5	88.2	1536.7	157	241261.90	0.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	10688.00	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	3415.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	14067.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	85488.50	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	27097.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	3800.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	1737.9	80.2	1818.1	157	285441.70	0.00	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	151.00	RL0613-06R1	12/1/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	334.6	4.3	338.9	205	69474.50	0.00	RL0613-06R1	12/1/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	1045.00	RL0109-07	10/16/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	62.8	0.0	62.8	205	12874.00	0.00	RL0613-06R1	12/1/2006	BRUNSWICK 1 LICENSE RENEWAL ACRS MANPOWER
MC4639	050-00325	510.9	30.0	540.9	205	110884.50	0.00	RL0434-06	4/17/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	2149.00	RL0434-06	4/17/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	638.4	48.0	686.4	205	140712.00	0.00	RL0251-06	1/23/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	246.5	16.3	262.8	205	53874.00	0.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	2.0	0.0	2.0	205	410.00	0.00	RL0109-07	10/16/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	22670.55	RL0613-06R1	12/1/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	460.9	37.2	498.1	157	78201.70	0.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	927.00	RL0613-06R1	12/1/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	2268.00	RL0613-06R1	12/1/2006	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	1333.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	-1679.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	0.0	0.0	0.0	0	0.00	1232.50	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Safety Review
MC4639	050-00325	67.8	0.0	67.8	205	13899.00	0.00	RL0434-06	4/17/2006	BRUNSWICK 1 - ACRS MANPOWER
MC4640	050-00324	0.0	0.0	0.0	0	0.00	1849.00	RL0310-05	3/7/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	3415.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Safety Review

MC4640	050-00324	0.0	0.0	0.0	0	0.00	45458.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	1431.8	93.7	1525.5	157	239503.50	0.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	39783.00	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	41986.50	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	1694.0	89.5	1783.5	157	280009.50	0.00	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	10688.00	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	3800.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	535.2	36.4	571.6	157	89741.20	0.00	RL0310-05	3/7/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	14067.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	27097.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	85488.50	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	235.7	16.2	251.9	205	51639.50	0.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	443.7	37.0	480.7	205	98543.50	0.00	RL0251-06	1/23/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	463.9	24.3	488.2	157	76647.40	0.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	1232.50	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	1333.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	-1679.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	330.9	0.2	331.1	205	67875.50	0.00	RL0613-06R1	12/1/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	1045.00	RL0109-07	10/16/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	22670.55	RL0613-06R1	12/1/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	74.0	0.0	74.0	205	15170.00	0.00	RL0434-06	4/17/2006	BRUNSWICK 2 - ACRS MANPOWER
MC4640	050-00324	510.1	24.5	534.6	205	109593.00	0.00	RL0434-06	4/17/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	2.0	0.0	2.0	205	410.00	0.00	RL0109-07	10/16/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	64.8	0.0	64.8	205	13284.00	0.00	RL0613-06R1	12/1/2006	BRUNSWICK 2 LICENSE RENEWAL ACRS MANPOWER
MC4640	050-00324	0.0	0.0	0.0	0	0.00	927.00	RL0613-06R1	12/1/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	2268.00	RL0613-06R1	12/1/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	151.00	RL0613-06R1	12/1/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4640	050-00324	0.0	0.0	0.0	0	0.00	2149.00	RL0434-06	4/17/2006	BRUNSWICK 2 - License Renewal Application - Safety Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	851.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	16932.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	218.1	17.3	235.4	157	36957.80	0.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	30.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	13501.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	118.0	7.3	125.3	157	19672.10	0.00	RL0310-05	3/7/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	5179.00	RL0310-05	3/7/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	371.31	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	5306.00	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	6516.14	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	3564.50	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	-136.50	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	4329.03	RL0687-05	7/25/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	4154.50	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	1338.00	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	250.4	12.7	263.1	157	41306.70	0.00	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	23525.00	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	9912.00	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	42513.00	RL0504-05	4/18/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	266.8	10.1	276.9	205	56764.50	0.00	RL0434-06	4/17/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	1033.00	RL0434-06	4/17/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	1270.00	RL0251-06	1/23/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	2994.90	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	1673.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	530.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review

MC4641	050-00325	0.0	0.0	0.0	0	0.00	16385.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	16285.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	2599.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	105.5	3.8	109.3	205	22406.50	0.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	299.5	6.3	305.8	205	62689.00	0.00	RL0251-06	1/23/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	199.00	RL0251-06	1/23/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	23928.00	RL0109-07	10/16/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.5	0.0	0.5	217	108.50	0.00	RL0314-07	1/22/2007	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	99.2	6.5	105.7	157	16594.90	0.00	RL0093-06	10/17/2005	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	2.0	0.8	2.8	217	607.60	0.00	RL0109-07	10/16/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	-105.50	RL0314-07	1/22/2007	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	147.0	13.1	160.1	205	32820.50	0.00	RL0613-06R1	12/1/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4641	050-00325	0.0	0.0	0.0	0	0.00	59.00	RL0613-06R1	12/1/2006	BRUNSWICK 1 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	4154.50	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	42513.00	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	9912.00	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	1338.00	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	23525.00	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	242.1	12.3	254.4	157	39940.80	0.00	RL0504-05	4/18/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	5179.00	RL0310-05	3/7/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	108.5	6.2	114.7	157	18007.90	0.00	RL0310-05	3/7/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	215.9	16.8	232.7	157	36533.90	0.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	-136.50	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	-30.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	6516.14	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	4329.03	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	5306.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	16932.00	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	3564.50	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	371.31	RL0687-05	7/25/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	2994.90	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	23928.00	RL0109-07	10/16/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	530.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	283.5	6.5	290.0	205	59450.00	0.00	RL0251-06	1/23/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	1673.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	16385.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	102.5	3.7	106.2	205	21771.00	0.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	2599.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	146.0	13.5	159.5	205	32697.50	0.00	RL0613-06R1	12/1/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	59.00	RL0613-06R1	12/1/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	199.00	RL0251-06	1/23/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	1270.00	RL0251-06	1/23/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	1033.00	RL0434-06	4/17/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	266.7	4.4	271.1	205	55575.50	0.00	RL0434-06	4/17/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	2.0	0.7	2.7	217	585.90	0.00	RL0109-07	10/16/2006	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	16385.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	93.5	6.2	99.7	157	15652.90	0.00	RL0093-06	10/17/2005	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.5	0.0	0.5	217	108.50	0.00	RL0314-07	1/22/2007	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC4642	050-00324	0.0	0.0	0.0	0	0.00	-105.50	RL0314-07	1/22/2007	BRUNSWICK 2 - License Renewal Application - Environmental Review
MC5724	050-00220	4.0	0.0	4.0	205	820.00	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 1 - Review of New LRA Section B2.1.36 - Bolt
MC5725	050-00410	4.0	0.0	4.0	205	820.00	0.00	RL0134-06R1	10/17/2005	NINE MILE POINT 2 - Review of New LRA Section B2.1.36 - Bolt
MC5725	050-00410	0.5	0.0	0.5	157	78.50	0.00	RL0544-05	4/18/2005	NINE MILE POINT 2 - Review of New LRA Section B2.1.36 - Bolt
MC5913	050-00412	205.8	10.5	216.3	157	33959.10	0.00	RL0500-05	4/18/2005	BEAVER VALLEY 2 - License Renewal Application Safety Review

MC5913	050-00412	20.0	1.0	21.0	157	3297.00	0.00	RL0683-05	7/25/2005	BEAVER VALLEY 2 - License Renewal Application Safety Review
MC5914	050-00334	14.0	1.0	15.0	157	2355.00	0.00	RL0683-05	7/25/2005	BEAVER VALLEY 1 - License Renewal Application Safety Review
MC5914	050-00334	162.7	6.5	169.2	157	26564.40	0.00	RL0500-05	4/18/2005	BEAVER VALLEY 1 - License Renewal Application Safety Review
MC5915	050-00412	1.0	0.0	1.0	157	157.00	0.00	RL0683-05	7/25/2005	BEAVER VALLEY 2 - LICENSE RENEWAL APPLICATION ENVIRONMENTAL
MC5915	050-00412	22.5	3.6	26.1	157	4097.70	0.00	RL0500-05	4/18/2005	BEAVER VALLEY 2 - LICENSE RENEWAL APPLICATION ENVIRONMENTAL
MC5916	050-00334	21.5	3.4	24.9	157	3909.30	0.00	RL0500-05	4/18/2005	BEAVER VALLEY 1 - LICENSE RENEWAL APPLICATION ENVIRONMENTAL
MC5916	050-00334	1.0	0.0	1.0	157	157.00	0.00	RL0683-05	7/25/2005	BEAVER VALLEY 1 - LICENSE RENEWAL APPLICATION ENVIRONMENTAL
MC6433	050-00255	1338.9	115.7	1454.6	157	228372.20	0.00	RL0732-05	7/25/2005	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	146.28	RL0159-07	10/16/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	12692.38	RL0663-06R2	12/5/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	442.5	50.8	493.3	205	101126.50	0.00	RL0479-06R2	8/15/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	1105.7	65.0	1170.7	205	239993.50	0.00	RL0297-06	1/23/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	50.0	0.0	50.0	205	10250.00	0.00	RL0663-06R2	12/5/2006	PALISADES LICENSE RENEWAL ACRS MANPOWER
MC6433	050-00255	0.0	0.0	0.0	0	0.00	521.68	RL0479-06R2	8/15/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	2.0	0.0	2.0	205	410.00	0.00	RL0479-06R2	8/15/2006	PALISADES - ACRS MANPOWER
MC6433	050-00255	0.0	0.0	0.0	0	0.00	7521.53	RL0138-06	10/17/2005	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	6313.86	RL0297-06	1/23/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	4209.12	RL0159-07	10/16/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	35225.98	RL0138-06	10/17/2005	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	12977.90	RL0138-06	10/17/2005	PALISADES - License Renewal Safety Review
MC6433	050-00255	1110.9	47.6	1158.5	157	181884.50	0.00	RL0138-06	10/17/2005	PALISADES - License Renewal Safety Review
MC6433	050-00255	903.7	67.9	971.6	205	199178.00	0.00	RL0138-06	10/17/2005	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	2282.19	RL0297-06	1/23/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	2280.86	RL0663-06R2	12/5/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	237.00	RL0663-06R2	12/5/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	9236.74	RL0663-06R2	12/5/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	606.2	77.0	683.2	205	140056.00	0.00	RL0663-06R2	12/5/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	-6313.86	RL0479-06R2	8/15/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	71381.95	RL0663-06R2	12/5/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	6910.06	RL0479-06R2	8/15/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	8697.60	RL0479-06R2	8/15/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	1846.67	RL0297-06	1/23/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	228.4	24.1	252.5	205	51762.50	0.00	RL0159-07	10/16/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	181.8	16.6	198.4	217	43052.80	0.00	RL0159-07	10/16/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	9453.01	RL0159-07	10/16/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	761.15	RL0159-07	10/16/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	868.94	RL0159-07	10/16/2006	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	3254.44	RL0362-07R1	1/22/2007	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	3172.54	RL0362-07R1	1/22/2007	PALISADES - License Renewal Safety Review
MC6433	050-00255	363.9	50.0	413.9	217	89816.30	0.00	RL0362-07R1	1/22/2007	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	343.15	RL0570-07	4/16/2007	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	932.53	RL0362-07R1	1/22/2007	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	-9236.74	RL0570-07	4/16/2007	PALISADES - License Renewal Safety Review
MC6433	050-00255	0.0	0.0	0.0	0	0.00	73.16	RL0362-07R1	1/22/2007	PALISADES - License Renewal Safety Review
MC6433	050-00255	69.5	19.3	88.8	217	19269.60	0.00	RL0570-07	4/16/2007	PALISADES - License Renewal Safety Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	500.00	RL0732-05	7/25/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	181.2	16.0	197.2	157	30960.40	0.00	RL0732-05	7/25/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	31763.00	RL0138-06	10/17/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	58684.00	RL0138-06	10/17/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	12627.00	RL0138-06	10/17/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	3300.00	RL0138-06	10/17/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	5200.00	RL0138-06	10/17/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	405.5	36.6	442.1	205	90630.50	0.00	RL0297-06	1/23/2006	PALISADES - License Renewal Environmental Review

MC6434	050-00255	339.2	17.8	357.0	157	56049.00	0.00	RL0138-06	10/17/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	600.00	RL0297-06	1/23/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	-4467.00	RL0362-07R1	1/22/2007	PALISADES - License Renewal Environmental Review
MC6434	050-00255	193.7	9.5	203.2	205	41656.00	0.00	RL0138-06	10/17/2005	PALISADES - License Renewal Environmental Review
MC6434	050-00255	9.3	0.0	9.3	217	2018.10	0.00	RL0362-07R1	1/22/2007	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	1600.00	RL0297-06	1/23/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	3166.00	RL0663-06R2	12/5/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	99.9	0.8	100.7	205	20643.50	0.00	RL0479-06R2	8/15/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	1200.00	RL0479-06R2	8/15/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	98640.00	RL0479-06R2	8/15/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	1389.00	RL0362-07R1	1/22/2007	PALISADES - License Renewal Environmental Review
MC6434	050-00255	107.0	0.5	107.5	205	22037.50	0.00	RL0159-07	10/16/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	47.0	0.5	47.5	217	10307.50	0.00	RL0159-07	10/16/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	600.00	RL0159-07	10/16/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	24160.00	RL0159-07	10/16/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	21552.00	RL0159-07	10/16/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	10417.00	RL0159-07	10/16/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	231.1	25.8	256.9	205	52664.50	0.00	RL0663-06R2	12/5/2006	PALISADES - License Renewal Environmental Review
MC6434	050-00255	0.0	0.0	0.0	0	0.00	19194.00	RL0663-06R2	12/5/2006	PALISADES - License Renewal Environmental Review
MC6440	050-00263	1207.0	86.6	1293.6	157	203095.20	0.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	1625.2	135.1	1760.3	205	360861.50	0.00	RL0292-06	1/23/2006	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	919.1	63.8	982.9	205	201494.50	0.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	2119.1	124.5	2243.6	157	352245.20	0.00	RL0727-05	7/25/2005	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	670.0	69.8	739.8	205	151659.00	0.00	RL0474-06	4/17/2006	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	145.7	16.5	162.2	205	33251.00	0.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	0.0	0.0	0.0	0	0.00	51674.25	RL0654-06R1	12/2/2006	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	137.5	24.0	161.5	217	35045.50	0.00	RL0355-07	1/22/2007	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	727.6	79.2	806.8	205	165394.00	0.00	RL0654-06R1	12/2/2006	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6440	050-00263	183.4	23.5	206.9	217	44897.30	0.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL SAFETY REVIEW
MC6441	050-00263	337.3	32.8	370.1	157	58105.70	0.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	206.2	20.0	226.2	205	46371.00	0.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	705.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	705.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	1055.99	RL0292-06	1/23/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	710.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	25200.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	64500.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	10671.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	-584.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	7067.50	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	4478.57	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	2775.71	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	30500.00	RL0292-06	1/23/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	1803.00	RL0474-06	4/17/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	337.7	41.1	378.8	205	77654.00	0.00	RL0474-06	4/17/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	3333.00	RL0133-06	10/17/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	7300.00	RL0474-06	4/17/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	228000.00	RL0292-06	1/23/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	4328.71	RL0727-05	7/25/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	35.00	RL0727-05	7/25/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	752.00	RL0474-06	4/17/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	6440.28	RL0727-05	7/25/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	573.7	53.4	627.1	157	98454.70	0.00	RL0727-05	7/25/2005	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW

MC6441	050-00263	0.0	0.0	0.0	0	0.00	22800.00	RL0292-06	1/23/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	343.9	62.3	406.2	205	83271.00	0.00	RL0292-06	1/23/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	568.00	RL0292-06	1/23/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	144.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	605.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	75.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	54.2	24.3	78.5	217	17034.50	0.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	-23.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	112.1	15.9	128.0	205	26240.00	0.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	3900.00	RL0654-06R1	12/2/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	6900.00	RL0654-06R1	12/2/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	9500.00	RL0654-06R1	12/2/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	27.00	RL0654-06R1	12/2/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	-43.00	RL0654-06R1	12/2/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	214.8	0.0	214.8	205	44034.00	0.00	RL0654-06R1	12/2/2006	MONTICELLO - ACRS MANPOWER
MC6441	050-00263	0.0	0.0	0.0	0	0.00	27700.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	29300.00	RL0150-07	10/16/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	278.9	37.7	316.6	205	64903.00	0.00	RL0654-06R1	12/2/2006	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	24.0	5.5	29.5	217	6401.50	0.00	RL0355-07	1/22/2007	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6441	050-00263	0.0	0.0	0.0	0	0.00	-78.00	RL0355-07	1/22/2007	MONTICELLO - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MC6465	050-00412	2.0	0.0	2.0	157	314.00	0.00	RL0683-05	7/25/2005	BEAVER VALLEY 2 - License Renewal - preapplication activities
MC6465	050-00412	20.3	0.0	20.3	157	3187.10	0.00	RL0089-06R1	10/17/2005	BEAVER VALLEY 2 - License Renewal - preapplication activities
MC6465	050-00412	1.0	0.0	1.0	217	217.00	0.00	RL0114-08	10/15/2007	BEAVER VALLEY 2 - License Renewal - preapplication activities
MC6465	050-00412	1.0	0.0	1.0	217	217.00	0.00	RL0519-07	4/16/2007	BEAVER VALLEY 2 - License Renewal - preapplication activities
MC6466	050-00334	20.2	0.0	20.2	157	3171.40	0.00	RL0089-06R1	10/17/2005	BEAVER VALLEY 1 - License Renewal - preapplication activities
MC6466	050-00334	2.0	0.0	2.0	157	314.00	0.00	RL0683-05	7/25/2005	BEAVER VALLEY 1 - License Renewal - preapplication activities
MC6466	050-00334	1.0	0.0	1.0	217	217.00	0.00	RL0519-07	4/16/2007	BEAVER VALLEY 1 - License Renewal - preapplication activities
MC6466	050-00334	1.0	0.0	1.0	217	217.00	0.00	RL0114-08	10/15/2007	BEAVER VALLEY 1 - License Renewal - preapplication activities
MC7624	050-00219	0.0	0.0	0.0	0	0.00	1892.77	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	16776.97	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	432.53	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	-2441.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	-940.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	422.39	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	522.7	47.3	570.0	205	116850.00	0.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	11105.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	-6882.00	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	78580.00	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	131998.00	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	61257.00	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	746.6	49.3	795.9	205	163159.50	0.00	RL0137-06	10/17/2005	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	805.92	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	2121.9	120.9	2242.8	205	459774.00	0.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	476.5	55.2	531.7	217	115378.90	0.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	61573.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	12273.76	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	33623.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	32594.56	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	4511.84	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	2225.1	135.1	2360.2	205	483841.00	0.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	2342.6	171.2	2513.8	205	515329.00	0.00	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	13444.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	16664.55	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Safety Review

MC7624	050-00219	0.0	0.0	0.0	0	0.00	14418.17	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	910.7	29.5	940.2	217	204023.40	0.00	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	4019.84	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	-3969.55	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	102672.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	232.2	10.8	243.0	157	38151.00	0.00	RL0137-06	10/17/2005	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	1988.06	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	785.9	44.1	830.0	217	180110.00	0.00	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	11547.24	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	45978.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	1147.62	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	88.53	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	34419.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	13366.23	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	18.0	0.0	18.0	258	4644.00	0.00	RL0784-08	7/21/2008	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	16.5	1.0	17.5	258	4515.00	0.00	RL0305-08	1/21/2008	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	135.0	0.0	135.0	217	29295.00	0.00	RL0163-08	10/15/2007	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	456.0	25.8	481.8	217	104550.60	0.00	RL0728-07	7/23/2007	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	220.0	49.7	269.7	238	64188.60	0.00	RL0559-09	4/13/2009	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	201.5	27.5	229.0	238	54502.00	0.00	RL0778-09	7/20/2009	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	16551.90	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	27.0	1.0	28.0	238	6664.00	0.00	RL0341-09	1/19/2009	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	6144.87	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	2514.59	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	15.0	0.0	15.0	238	3570.00	0.00	RL0128-09	10/13/2008	OYSTER CREEK - License Renewal Safety Review
MC7624	050-00219	0.0	0.0	0.0	0	0.00	3226.37	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Safety Review
MC7625	050-00219	385.4	55.1	440.5	205	90302.50	0.00	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	3417.86	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	8721.00	RL0296-06	1/23/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	60.2	10.3	70.5	205	14452.50	0.00	RL0137-06	10/17/2005	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	283.1	40.3	323.4	205	66297.00	0.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	12737.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	15865.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	9223.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	136307.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	81227.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	44680.00	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	7178.06	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	5488.32	RL0478-06	4/17/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	6.0	0.0	6.0	157	942.00	0.00	RL0137-06	10/17/2005	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	218.1	14.8	232.9	205	47744.50	0.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	5401.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	43.1	2.2	45.3	217	9830.10	0.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	10978.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	7684.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	2884.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	9175.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	5693.00	RL0158-07	10/16/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	327.9	15.6	343.5	205	70417.50	0.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	-4130.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	2.0	0.0	2.0	238	476.00	0.00	RL0128-09	10/13/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	102.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	31964.00	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Environmental Review

MC7625	050-00219	0.0	0.0	0.0	0	0.00	1862.50	RL0662-06R1	12/2/2006	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	80.0	20.0	100.0	217	21700.00	0.00	RL0163-08	10/15/2007	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	514.11	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	-1985.00	RL0728-07	7/23/2007	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	41383.00	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	27.0	12.8	39.8	217	8636.60	0.00	RL0728-07	7/23/2007	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	17768.00	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	6617.00	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	51.8	6.8	58.6	217	12716.20	0.00	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	1813.00	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	45.0	3.5	48.5	258	12513.00	0.00	RL0784-08	7/21/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	3.5	0.0	3.5	205	717.50	0.00	RL0662-06R1	12/2/2006	OYSTER CREEK - ACRS MANPOWER
MC7625	050-00219	3.0	1.0	4.0	258	1032.00	0.00	RL0580-08	4/14/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	-58.00	RL0305-08	1/21/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	1285.00	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	40433.00	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	395.9	41.8	437.7	217	94980.90	0.00	RL0361-07R1	8/18/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	803.00	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.5	0.0	0.5	258	129.00	0.00	RL0128-09	10/13/2008	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	-500.00	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	5865.00	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Environmental Review
MC7625	050-00219	0.0	0.0	0.0	0	0.00	4950.00	RL0569-07	4/16/2007	OYSTER CREEK - License Renewal Environmental Review
MC8260	050-00255	12.5	2.5	15.0	205	3075.00	0.00	RL0138-06	10/17/2005	PALISADES - ASLB Hearing Support
MC8260	050-00255	14.5	0.0	14.5	205	2972.50	0.00	RL0479-06R2	8/15/2006	PALISADES - ASLB Hearing Support
MC8260	050-00255	6.0	0.0	6.0	205	1230.00	0.00	RL0663-06R2	12/5/2006	PALISADES - ASLB Hearing Support
MC8260	050-00255	83.5	1.0	84.5	205	17322.50	0.00	RL0297-06	1/23/2006	PALISADES - ASLB Hearing Support
MC8260	050-00255	4.0	0.0	4.0	205	820.00	0.00	RL0159-07	10/16/2006	PALISADES - ASLB Hearing Support
MC8634	050-00271	35.0	3.0	38.0	205	7790.00	0.00	RL0327-06R2	1/23/2006	VERMONT YANKEE - Vermont Yankee License Renewal Pre-Application
MC8634	050-00271	157.5	9.6	167.1	205	34255.50	0.00	RL0507-06R1	4/17/2006	VERMONT YANKEE - Vermont Yankee License Renewal Pre-Application
MC9668	050-00271	27.7	0.0	27.7	259	7174.30	0.00	RL0185-11	10/25/2010	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	64.3	4.1	68.4	257	17578.80	0.00	RL0185-11	10/25/2010	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	7584.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	1944.3	107.3	2051.6	205	420578.00	0.00	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	518.7	53.9	572.6	205	117383.00	0.00	RL0507-06R1	4/17/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	932.0	55.1	987.1	205	202355.50	0.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	782.1	16.0	798.1	217	173187.70	0.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	1924.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	778.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	2731.00	RL0507-06R1	4/17/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	16642.00	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	29176.00	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	15314.00	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	113.4	3.5	116.9	257	30043.30	0.00	RL0604-10	4/26/2010	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	113.4	3.5	116.9	257	30043.30	0.00	RL0604-10	4/26/2010	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	14.0	1.3	15.3	257	3932.10	0.00	RL0424-10	2/1/2010	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	3.0	0.0	3.0	257	771.00	0.00	RL0213-10	10/26/2009	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	59.5	0.0	59.5	238	14161.00	0.00	RL0213-10	10/26/2009	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	198.5	2.0	200.5	238	47719.00	0.00	RL0806-09	7/20/2009	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	553.2	21.5	574.7	238	136778.60	0.00	RL0587-09	4/13/2009	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	167.5	0.0	167.5	238	39865.00	0.00	RL0370-09R1	1/21/2009	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	2291.90	RL0758-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	4665.00	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	1752.00	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review

MC9668	050-00271	48.0	0.0	48.0	238	11424.00	0.00	RL0156-09R1	10/29/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	1295.7	93.6	1389.3	217	301478.10	0.00	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	5350.68	RL0194-08R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	58.5	0.0	58.5	258	15093.00	0.00	RL0156-09R1	10/29/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	1572.00	RL0194-08R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	13126.00	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	1794.00	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	212.7	0.0	212.7	258	54876.60	0.00	RL0194-08R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	518.0	26.8	544.8	217	118221.60	0.00	RL0194-08R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	9789.03	RL0758-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	1262.7	131.8	1394.5	217	302606.50	0.00	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	9818.00	RL0758-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	172.0	1.3	173.3	258	44711.40	0.00	RL0816-08	7/21/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	13957.56	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	250.3	1.5	251.8	257	64712.60	0.00	RL0865-10	8/2/2010	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	835.4	97.1	932.5	217	202352.50	0.00	RL0758-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	2368.40	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	11175.91	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	5021.71	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	179.00	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	3801.60	RL0610-08	4/14/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	1900.80	RL0194-08R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	1431.00	RL0336-08	1/21/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	21052.93	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	-1092.29	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	3027.00	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	4426.00	RL0194-08R1	8/18/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	293.4	22.8	316.2	258	81579.60	0.00	RL0336-08	1/21/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	401.4	60.2	461.6	258	119092.80	0.00	RL0610-08	4/14/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	2656.36	RL0336-08	1/21/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9668	050-00271	0.0	0.0	0.0	0	0.00	5657.78	RL0336-08	1/21/2008	VERMONT YANKEE - License Renewal Application Safety Review
MC9670	050-00271	0.0	0.0	0.0	0	0.00	29448.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	76985.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	369.2	19.5	388.7	217	84347.90	0.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	219.3	13.3	232.6	205	47683.00	0.00	RL0507-06R1	4/17/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	5410.61	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	5453.69	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	237.7	15.7	253.4	205	51947.00	0.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	75769.00	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	84086.00	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	785.45	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	913.03	RL0507-06R1	4/17/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	38.97	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	1005.29	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	25717.00	RL0188-07	10/16/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	717.1	52.1	769.2	205	157686.00	0.00	RL0690-06R1	12/2/2006	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	6.0	0.5	6.5	258	1677.00	0.00	RL0610-08	4/14/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	36.0	1.0	37.0	258	9546.00	0.00	RL0336-08	1/21/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	3.0	1.5	4.5	238	1071.00	0.00	RL0370-09R1	1/21/2009	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	5603.83	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	16218.00	RL0758-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	3583.62	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	504.5	56.1	560.6	217	121650.20	0.00	RL0758-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application - Environmental

MC9670	050-00271	0.0	0.0	0.0	0	0.00	25360.00	RL0758-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	172.5	3.6	176.1	217	38213.70	0.00	RL0194-08R1	8/18/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	1.8	0.0	1.8	258	464.40	0.00	RL0194-08R1	8/18/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	463.1	41.1	504.2	217	109411.40	0.00	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	5875.00	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	11686.00	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	64839.00	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	847.0	79.7	926.7	217	201093.90	0.00	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	1055.00	RL0602-07R1	8/18/2008	VERMONT YANKEE - License Renewal Application - Environmental
MC9670	050-00271	0.0	0.0	0.0	0	0.00	2805.90	RL0393-07	1/22/2007	VERMONT YANKEE - License Renewal Application - Environmental
MD0547	050-00387	41.5	11.8	53.3	205	10926.50	0.00	RL0184-07	10/16/2006	SUSQUEHANNA 1 - Susquehanna 1 License Renewal Pre-application
MD0547	050-00387	103.8	8.6	112.4	217	24390.80	0.00	RL0184-07	10/16/2006	SUSQUEHANNA 1 - Susquehanna 1 License Renewal Pre-application
MD0547	050-00387	31.1	6.3	37.4	205	7667.00	0.00	RL0686-06R1	12/6/2006	SUSQUEHANNA 1 - Susquehanna 1 License Renewal Pre-applicationn
MD0547	050-00387	61.3	6.5	67.8	217	14712.60	0.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - Susquehanna 1 License Renewal Pre-application
MD0548	050-00388	28.9	7.0	35.9	205	7359.50	0.00	RL0686-06R1	12/6/2006	SUSQUEHANNA 2 - Susquehanna 2 License Renewal Pre-application
MD0548	050-00388	41.5	11.2	52.7	205	10803.50	0.00	RL0184-07	10/16/2006	SUSQUEHANNA 2 - Susquehanna 2 License Renewal Pre-application
MD0548	050-00388	105.6	9.4	115.0	217	24955.00	0.00	RL0184-07	10/16/2006	SUSQUEHANNA 2 - Susquehanna 2 License Renewal Pre-application
MD0548	050-00388	61.0	6.5	67.5	217	14647.50	0.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - Susquehanna 2 License Renewal Pre-application
MD1077	050-00482	2.5	1.8	4.3	205	881.50	0.00	RL0193-07	10/16/2006	WOLF CREEK 1 - License Renewal Pre-Application Activities
MD1077	050-00482	36.0	6.0	42.0	205	8610.00	0.00	RL0695-06R1	12/2/2006	WOLF CREEK 1 - License Renewal Pre-Application Activities
MD1077	050-00482	259.0	32.3	291.3	217	63212.10	0.00	RL0193-07	10/16/2006	WOLF CREEK 1 - License Renewal Pre-Application Activities
MD1077	050-00482	74.0	20.1	94.1	217	20419.70	0.00	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Pre-Application Activities
MD1835	050-00333	15.0	0.0	15.0	205	3075.00	0.00	RL0632-06R1	12/2/2006	FITZPATRICK - Fitzpatrick License renewal pre-application activities
MD1835	050-00333	107.5	0.0	107.5	217	23327.50	0.00	RL0128-07	10/16/2006	FITZPATRICK - Fitzpatrick License renewal pre-application activities
MD1835	050-00333	57.5	5.0	62.5	217	13562.50	0.00	RL0333-07	1/22/2007	FITZPATRICK - License renewal pre-application activities
MD1835	050-00333	171.0	2.3	173.3	205	35526.50	0.00	RL0128-07	10/16/2006	FITZPATRICK - Fitzpatrick License renewal pre-application activities
MD2666	050-00333	0.0	0.0	0.0	0	0.00	105.60	RL0757-08	7/21/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	497.9	21.9	519.8	217	112796.60	0.00	RL0128-07	10/16/2006	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	686.40	RL0554-08	4/14/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	11710.00	RL0554-08	4/14/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	197.00	RL0554-08	4/14/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	247.00	RL0554-08	4/14/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	35.5	1.0	36.5	205	7482.50	0.00	RL0128-07	10/16/2006	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	152.5	4.0	156.5	258	40377.00	0.00	RL0554-08	4/14/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	4735.90	RL0554-08	4/14/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	3209.76	RL0278-08	1/21/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	5801.00	RL0278-08	1/21/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	271.0	5.5	276.5	258	71337.00	0.00	RL0136-08	10/15/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	122.2	1.0	123.2	258	31785.60	0.00	RL0278-08	1/21/2008	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	14661.00	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	3397.9	213.1	3611.0	217	783587.00	0.00	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	701.88	RL0541-07	4/16/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	4479.00	RL0699-07	7/23/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	57079.00	RL0541-07	4/16/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	1213.00	RL0699-07	7/23/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	158.00	RL0136-08	10/15/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	1985.2	86.4	2071.6	217	449537.20	0.00	RL0541-07	4/16/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	4911.57	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	83817.00	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	2396.66	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	1871.68	RL0541-07	4/16/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	105615.00	RL0541-07	4/16/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	501.00	RL0541-07	4/16/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal

MD2666	050-00333	0.0	0.0	0.0	0	0.00	15934.00	RL0541-07	4/16/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	13377.72	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	26416.00	RL0136-08	10/15/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	1852.18	RL0699-07	7/23/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	7319.00	RL0699-07	7/23/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	512.4	5.2	517.6	217	112319.20	0.00	RL0136-08	10/15/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	55606.00	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	8917.00	RL0699-07	7/23/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	157.00	RL0136-08	10/15/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	18113.00	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	1311.6	33.8	1345.4	217	291951.80	0.00	RL0699-07	7/23/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	18661.00	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2666	050-00333	0.0	0.0	0.0	0	0.00	32668.00	RL0333-07	1/22/2007	FITZPATRICK - Safety Review of the FitzPatrick NPP License Renewal
MD2667	050-00333	528.0	85.0	613.0	217	133021.00	0.00	RL0699-07	7/23/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	0.0	0.0	0.0	0	0.00	26000.00	RL0699-07	7/23/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	837.2	120.4	957.6	217	207799.20	0.00	RL0333-07	1/22/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	12.4	2.8	15.2	258	3921.60	0.00	RL0554-08	4/14/2008	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	71.2	8.0	79.2	258	20433.60	0.00	RL0136-08	10/15/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	68.4	5.0	73.4	258	18937.20	0.00	RL0278-08	1/21/2008	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	182.4	25.9	208.3	217	45201.10	0.00	RL0136-08	10/15/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	21.6	0.5	22.1	258	5701.80	0.00	RL0757-08	7/21/2008	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	561.0	64.1	625.1	217	135646.70	0.00	RL0541-07	4/16/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	352.1	34.1	386.2	217	83805.40	0.00	RL0128-07	10/16/2006	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	0.0	0.0	0.0	0	0.00	23700.00	RL0541-07	4/16/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	0.0	0.0	0.0	0	0.00	28700.00	RL0541-07	4/16/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	0.0	0.0	0.0	0	0.00	75200.00	RL0541-07	4/16/2007	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD2667	050-00333	26.8	2.5	29.3	205	6006.50	0.00	RL0128-07	10/16/2006	FITZPATRICK - Environmental Review of the FitzPatrick License Renewal
MD3019	050-00388	25.2	1.0	26.2	257	6733.40	0.00	RL0420-10	2/1/2010	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	283.3	16.7	300.0	217	65100.00	0.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	197.8	25.0	222.8	217	48347.60	0.00	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	686.9	60.9	747.8	217	162272.60	0.00	RL0754-07R1	7/23/2007	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	261.2	20.9	282.1	258	72781.80	0.00	RL0332-08	1/21/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	0.0	0.0	0.0	0	0.00	2172.00	RL0332-08	1/21/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	0.0	0.0	0.0	0	0.00	82.00	RL0332-08	1/21/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	220.2	19.3	239.5	238	57001.00	0.00	RL0802-09	7/20/2009	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	0.0	0.0	0.0	0	0.00	-124.00	RL0332-08	1/21/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	89.4	11.5	100.9	258	26032.20	0.00	RL0606-08	4/14/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	205.5	9.3	214.8	238	51122.40	0.00	RL0583-09	4/13/2009	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	785.6	42.2	827.8	238	197016.40	0.00	RL0365-09R1	1/21/2009	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	23.6	4.5	28.1	238	6687.80	0.00	RL0209-10	10/26/2009	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	158.0	13.1	171.1	258	44143.80	0.00	RL0152-09	10/13/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	11.3	0.0	11.3	257	2904.10	0.00	RL0209-10	10/26/2009	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	49.5	4.0	53.5	238	12733.00	0.00	RL0152-09	10/13/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	647.0	54.6	701.6	258	181012.80	0.00	RL0812-08	7/21/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	0.0	0.0	0.0	0	0.00	9578.00	RL0606-08	4/14/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	0.0	0.0	0.0	0	0.00	7929.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	342.6	31.9	374.5	217	81266.50	0.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	0.0	0.0	0.0	0	0.00	2644.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	0.0	0.0	0.0	0	0.00	1651.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3019	050-00388	134.5	7.3	141.8	258	36584.40	0.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Safety Review
MD3020	050-00387	198.5	11.5	210.0	238	49980.00	0.00	RL0583-09	4/13/2009	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	780.8	44.7	825.5	238	196469.00	0.00	RL0365-09R1	1/21/2009	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	282.1	17.6	299.7	217	65034.90	0.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Safety Review

MD3020	050-00387	133.2	6.7	139.9	258	36094.20	0.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	21.0	2.7	23.7	257	6090.90	0.00	RL0420-10	2/1/2010	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	342.1	29.4	371.5	217	80615.50	0.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	17.1	0.0	17.1	238	4069.80	0.00	RL0600-10	4/26/2010	SUSQUEHANNA 1 - LICENSE RENEWAL SAFETY REVIEW
MD3020	050-00387	49.5	3.7	53.2	238	12661.60	0.00	RL0152-09	10/13/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	629.5	56.1	685.6	258	176884.80	0.00	RL0812-08	7/21/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	161.4	10.1	171.5	258	44247.00	0.00	RL0152-09	10/13/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	216.0	18.2	234.2	238	55739.60	0.00	RL0802-09	7/20/2009	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	0.0	0.0	0.0	0	0.00	9578.00	RL0606-08	4/14/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	88.3	9.0	97.3	258	25103.40	0.00	RL0606-08	4/14/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	21.4	0.0	21.4	257	5499.80	0.00	RL0209-10	10/26/2009	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	23.4	4.5	27.9	238	6640.20	0.00	RL0209-10	10/26/2009	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	0.0	0.0	0.0	0	0.00	7929.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	17.1	0.0	17.1	238	4069.80	0.00	RL0600-10	4/26/2010	SUSQUEHANNA 1 - LICENSE RENEWAL SAFETY REVIEW
MD3020	050-00387	0.0	0.0	0.0	0	0.00	82.00	RL0332-08	1/21/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	0.0	0.0	0.0	0	0.00	-124.00	RL0332-08	1/21/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	0.0	0.0	0.0	0	0.00	2172.00	RL0332-08	1/21/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	259.3	19.9	279.2	258	72033.60	0.00	RL0332-08	1/21/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	0.0	0.0	0.0	0	0.00	1651.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	692.8	63.2	756.0	217	164052.00	0.00	RL0754-07R1	7/23/2007	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	21.0	0.0	21.0	257	5397.00	0.00	RL0861-10	8/2/2010	SUSQUEHANNA 1 - LICENSE RENEWAL SAFETY REVIEW
MD3020	050-00387	0.0	0.0	0.0	0	0.00	2644.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Safety Review
MD3020	050-00387	200.4	26.6	227.0	217	49259.00	0.00	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Safety Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	4356.00	RL0184-07	10/16/2006	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	2772.00	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	1126.50	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	2803.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	584.90	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	32.4	4.3	36.7	258	9468.60	0.00	RL0332-08	1/21/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	4620.00	RL0754-07R1	7/23/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	42.09	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	132.78	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	168.35	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	5886.49	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	-151.50	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	7676.12	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	48.3	10.9	59.2	258	15273.60	0.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	531.05	RL0209-10	10/26/2009	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	1175.00	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	177.60	RL0209-10	10/26/2009	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	10.0	0.0	10.0	238	2380.00	0.00	RL0365-09R1	1/21/2009	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	107.5	20.5	128.0	258	33024.00	0.00	RL0812-08	7/21/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	226.57	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	490.15	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	200.6	12.1	212.7	217	46155.90	0.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	2523.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	3184.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	5585.68	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	2433.02	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	5946.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	343.00	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	2236.47	RL0420-10	2/1/2010	SUSQUEHANNA 2 - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MD3021	050-00388	340.9	67.9	408.8	217	88709.60	0.00	RL0754-07R1	7/23/2007	SUSQUEHANNA 2 - License Renewal Environmental Review

MD3021	050-00388	0.0	0.0	0.0	0	0.00	935.84	RL0754-07R1	7/23/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	57.6	12.7	70.3	217	15255.10	0.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	1580.72	RL0190-08R1	8/25/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	3509.40	RL0754-07R1	7/23/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	1380.98	RL0332-08	1/21/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	276.24	RL0754-07R1	7/23/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	2236.47	RL0420-10	2/1/2010	SUSQUEHANNA 2 - LICENSE RENEWAL ENVIRONMENTAL REVIEW
MD3021	050-00388	0.0	0.0	0.0	0	0.00	348.39	RL0332-08	1/21/2008	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	303.8	35.4	339.2	217	73606.40	0.00	RL0598-07	4/16/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	11945.00	RL0754-07R1	7/23/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3021	050-00388	0.0	0.0	0.0	0	0.00	172.18	RL0754-07R1	7/23/2007	SUSQUEHANNA 2 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	4356.00	RL0184-07	10/16/2006	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	177.61	RL0209-10	10/26/2009	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	11955.91	RL0583-09	4/13/2009	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	204.85	RL0365-09R1	1/21/2009	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	2236.47	RL0420-10	2/1/2010	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	18686.98	RL0583-09	4/13/2009	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	531.05	RL0209-10	10/26/2009	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	6.5	0.0	6.5	238	1547.00	0.00	RL0365-09R1	1/21/2009	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	1175.00	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	490.15	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	226.57	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	1580.71	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	584.90	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	48.4	10.9	59.3	258	15299.40	0.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	53.4	13.5	66.9	217	14517.30	0.00	RL0190-08R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	2803.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	5946.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	1126.50	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	5585.69	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	2433.02	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	3184.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	2523.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	180.1	13.1	193.2	217	41924.40	0.00	RL0389-07R1	8/25/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	168.36	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	93.0	4.5	97.5	258	25155.00	0.00	RL0812-08	7/21/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	1.0	0.0	1.0	258	258.00	0.00	RL0606-08	4/14/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	31.6	4.2	35.8	258	9236.40	0.00	RL0332-08	1/21/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	348.39	RL0332-08	1/21/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	42.09	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	132.77	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	1380.98	RL0332-08	1/21/2008	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	276.24	RL0754-07R1	7/23/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	11946.00	RL0754-07R1	7/23/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	4620.00	RL0754-07R1	7/23/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	2772.00	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	172.18	RL0754-07R1	7/23/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	243.4	48.4	291.8	217	63320.60	0.00	RL0754-07R1	7/23/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	343.00	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	0.0	0.0	0.0	0	0.00	-151.50	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3022	050-00387	213.7	10.8	224.5	217	48716.50	0.00	RL0598-07	4/16/2007	SUSQUEHANNA 1 - License Renewal Environmental Review
MD3181	050-00482	0.0	0.0	0.0	0	0.00	9251.34	RL0341-08	1/21/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	491.7	42.1	533.8	258	137720.40	0.00	RL0615-08	4/14/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)

MD3181	050-00482	149.7	5.0	154.7	258	39912.60	0.00	RL0821-08	7/21/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	422.40	RL0341-08	1/21/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	18046.91	RL0341-08	1/21/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	4530.76	RL0821-08	7/21/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	844.80	RL0821-08	7/21/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	601.2	152.2	753.4	258	194377.20	0.00	RL0341-08	1/21/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	528.00	RL0615-08	4/14/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	19331.51	RL0615-08	4/14/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	14525.43	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	2274.8	245.5	2520.3	217	546905.10	0.00	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	690.9	154.2	845.1	217	183386.70	0.00	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	81.94	RL0375-09R1	1/21/2009	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	70.0	4.5	74.5	258	19221.00	0.00	RL0161-09R1	10/13/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	71.5	8.5	80.0	238	19040.00	0.00	RL0161-09R1	10/13/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	7105.98	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	3963.18	RL0161-09R1	10/13/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	5909.00	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	1.0	0.0	1.0	238	238.00	0.00	RL0375-09R1	1/21/2009	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	10490.47	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	245.82	RL0161-09R1	10/13/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	1790.6	214.5	2005.1	217	435106.70	0.00	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	13332.57	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	105.60	RL0821-08	7/21/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	11430.97	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	1169.80	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	726.48	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	10654.84	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	21807.15	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	3779.90	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	26380.25	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	912.6	63.8	976.4	217	211878.80	0.00	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	35967.18	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	7148.09	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	31593.31	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	235.9	31.0	266.9	258	68860.20	0.00	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	49198.41	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	34269.89	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	3787.87	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	1169.80	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3181	050-00482	0.0	0.0	0.0	0	0.00	19853.48	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (SAFETY Review)
MD3182	050-00482	148.2	3.0	151.2	258	39009.60	0.00	RL0821-08	7/21/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	96.5	4.5	101.0	258	26058.00	0.00	RL0615-08	4/14/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	147.5	24.7	172.2	258	44427.60	0.00	RL0341-08	1/21/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	7099.00	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	84.18	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	1431.48	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	2541.42	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	42.09	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	13370.52	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	4458.00	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	39688.00	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	517.9	68.0	585.9	217	127140.30	0.00	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	124.0	16.0	140.0	258	36120.00	0.00	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)

MD3182	050-00482	0.0	0.0	0.0	0	0.00	9870.00	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	10578.00	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	23373.00	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	685.3	115.7	801.0	217	173817.00	0.00	RL0607-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	2035.43	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	4780.84	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	2385.91	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	4402.00	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	638.1	111.9	750.0	217	162750.00	0.00	RL0398-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	5.0	0.0	5.0	238	1190.00	0.00	RL0161-09R1	10/13/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	10.5	2.0	12.5	258	3225.00	0.00	RL0161-09R1	10/13/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	455.4	68.4	523.8	217	113664.60	0.00	RL0763-07R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	0.0	0.0	0.0	0	0.00	11158.00	RL0199-08R1	9/9/2008	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	1.0	0.0	1.0	238	238.00	0.00	RL0591-09	4/13/2009	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3182	050-00482	29.5	0.0	29.5	238	7021.00	0.00	RL0375-09R1	1/21/2009	WOLF CREEK 1 - License Renewal Activities (Environmental Review)
MD3294	050-00400	64.0	3.2	67.2	217	14582.40	0.00	RL0341-07R1	1/22/2007	HARRIS 1 - Harris License Renewal pre-application activities
MD3611	050-00400	0.0	0.0	0.0	0	0.00	1283.48	RL0549-07	4/16/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	312.9	58.8	371.7	217	80658.90	0.00	RL0143-08	10/15/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	0.0	0.0	0.0	0	0.00	8167.33	RL0549-07	4/16/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	225.3	34.6	259.9	217	56398.30	0.00	RL0549-07	4/16/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	825.4	120.8	946.2	217	205325.40	0.00	RL0705-07R1	7/23/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	0.0	0.0	0.0	0	0.00	4277.24	RL0143-08	10/15/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	0.0	0.0	0.0	0	0.00	1602.21	RL0705-07R1	7/23/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	0.0	0.0	0.0	0	0.00	500.00	RL0549-07	4/16/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	0.0	0.0	0.0	0	0.00	5029.72	RL0705-07R1	7/23/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	0.0	0.0	0.0	0	0.00	1200.00	RL0705-07R1	7/23/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	58.5	8.8	67.3	258	17363.40	0.00	RL0559-08	4/14/2008	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	0.0	0.0	0.0	0	0.00	1389.37	RL0549-07	4/16/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	127.0	9.7	136.7	258	35268.60	0.00	RL0284-08	1/21/2008	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	90.1	14.6	104.7	258	27012.60	0.00	RL0143-08	10/15/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	0.0	0.0	0.0	0	0.00	4400.00	RL0549-07	4/16/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	1.5	1.5	3.0	258	774.00	0.00	RL0108-09	10/13/2008	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	122.9	11.7	134.6	217	29208.20	0.00	RL0341-07R1	1/22/2007	HARRIS 1 - License Renewal Application - Environmental Review
MD3611	050-00400	45.5	2.2	47.7	258	12306.60	0.00	RL0762-08	7/21/2008	HARRIS 1 - License Renewal Application - Environmental Review
MD5428	050-00424	28.5	2.6	31.1	217	6748.70	0.00	RL0195-08	10/15/2007	VOGTLE 1 - License Renewal Pre-Application Activities
MD5428	050-00424	80.5	6.1	86.6	217	18792.20	0.00	RL0759-07	7/23/2007	VOGTLE 1 - License Renewal Pre-Application Activities
MD5429	050-00425	80.5	5.5	86.0	217	18662.00	0.00	RL0759-07	7/23/2007	VOGTLE 2 - License Renewal Pre-Application Activities
MD5429	050-00425	28.0	2.5	30.5	217	6618.50	0.00	RL0195-08	10/15/2007	VOGTLE 2 - License Renewal Pre-Application Activities
MD5903	050-00424	1605.6	140.7	1746.3	258	450545.40	0.00	RL0337-08	1/21/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	14538.00	RL0337-08	1/21/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	11991.00	RL0337-08	1/21/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	8738.00	RL0337-08	1/21/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	32.65	RL0605-10	4/26/2010	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	32.65	RL0214-10	10/26/2009	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	27.1	1.8	28.9	238	6878.20	0.00	RL0807-09	7/20/2009	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	67.5	6.3	73.8	238	17564.40	0.00	RL0588-09	4/13/2009	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	143.2	3.1	146.3	238	34819.40	0.00	RL0371-09	1/19/2009	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	32.65	RL0605-10	4/26/2010	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	59.3	3.0	62.3	238	14827.40	0.00	RL0157-09	10/13/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	506.00	RL0611-08	4/14/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	170.7	3.0	173.7	258	44814.60	0.00	RL0195-08	10/15/2007	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	1302.52	RL0425-10	2/1/2010	VOGTLE 1 - LICENSE RENEWAL SAFETY REVIEW
MD5903	050-00424	72.2	2.0	74.2	258	19143.60	0.00	RL0157-09	10/13/2008	VOGTLE 1 - License Renewal Safety Review

MD5903	050-00424	454.4	20.0	474.4	258	122395.20	0.00	RL0817-08	7/21/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	96.1	1.5	97.6	217	21179.20	0.00	RL0195-08	10/15/2007	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	4160.40	RL0337-08	1/21/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	0.0	0.0	0.0	0	0.00	5936.76	RL0337-08	1/21/2008	VOGTLE 1 - License Renewal Safety Review
MD5903	050-00424	727.9	39.2	767.1	258	197911.80	0.00	RL0611-08	4/14/2008	VOGTLE 1 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	5936.76	RL0337-08	1/21/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	8738.00	RL0337-08	1/21/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	424.8	6.8	431.6	258	111352.80	0.00	RL0817-08	7/21/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	14538.00	RL0337-08	1/21/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	4160.40	RL0337-08	1/21/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	1488.5	161.4	1649.9	258	425674.20	0.00	RL0337-08	1/21/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	11991.00	RL0337-08	1/21/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	664.0	37.6	701.6	258	181012.80	0.00	RL0611-08	4/14/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	506.00	RL0611-08	4/14/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	91.9	0.0	91.9	217	19942.30	0.00	RL0195-08	10/15/2007	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	145.8	3.0	148.8	258	38390.40	0.00	RL0195-08	10/15/2007	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	132.2	5.6	137.8	238	32796.40	0.00	RL0371-09	1/19/2009	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	74.3	2.0	76.3	258	19685.40	0.00	RL0157-09	10/13/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	32.65	RL0605-10	4/26/2010	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	32.65	RL0605-10	4/26/2010	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	0.0	0.0	0.0	0	0.00	1302.52	RL0425-10	2/1/2010	VOGTLE 2 - LICENSE RENEWAL SAFETY REVIEW
MD5904	050-00425	0.0	0.0	0.0	0	0.00	32.65	RL0214-10	10/26/2009	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	26.9	1.7	28.6	238	6806.80	0.00	RL0807-09	7/20/2009	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	56.7	3.0	59.7	238	14208.60	0.00	RL0157-09	10/13/2008	VOGTLE 2 - License Renewal Safety Review
MD5904	050-00425	61.5	1.0	62.5	238	14875.00	0.00	RL0588-09	4/13/2009	VOGTLE 2 - License Renewal Safety Review
MD5905	050-00424	2.0	0.0	2.0	238	476.00	0.00	RL0588-09	4/13/2009	VOGTLE 1 - License Renewal Environmental Review
MD5905	050-00424	26.1	0.0	26.1	258	6733.80	0.00	RL0157-09	10/13/2008	VOGTLE 1 - License Renewal Environmental Review
MD5905	050-00424	276.9	33.2	310.1	258	80005.80	0.00	RL0337-08	1/21/2008	VOGTLE 1 - License Renewal Environmental Review
MD5905	050-00424	7.0	0.0	7.0	238	1666.00	0.00	RL0157-09	10/13/2008	VOGTLE 1 - License Renewal Environmental Review
MD5905	050-00424	33.0	1.6	34.6	238	8234.80	0.00	RL0371-09	1/19/2009	VOGTLE 1 - License Renewal Environmental Review
MD5905	050-00424	60.6	10.0	70.6	258	18214.80	0.00	RL0817-08	7/21/2008	VOGTLE 1 - License Renewal Environmental Review
MD5905	050-00424	85.1	8.2	93.3	258	24071.40	0.00	RL0195-08	10/15/2007	VOGTLE 1 - License Renewal Environmental Review
MD5905	050-00424	94.0	6.2	100.2	217	21743.40	0.00	RL0195-08	10/15/2007	VOGTLE 1 - License Renewal Environmental Review
MD5905	050-00424	217.6	14.4	232.0	258	59856.00	0.00	RL0611-08	4/14/2008	VOGTLE 1 - License Renewal Environmental Review
MD5906	050-00425	266.6	44.1	310.7	258	80160.60	0.00	RL0337-08	1/21/2008	VOGTLE 2 - License Renewal Environmental Review
MD5906	050-00425	94.3	5.2	99.5	217	21591.50	0.00	RL0195-08	10/15/2007	VOGTLE 2 - License Renewal Environmental Review
MD5906	050-00425	74.9	6.5	81.4	258	21001.20	0.00	RL0195-08	10/15/2007	VOGTLE 2 - License Renewal Environmental Review
MD5906	050-00425	41.1	3.0	44.1	258	11377.80	0.00	RL0817-08	7/21/2008	VOGTLE 2 - License Renewal Environmental Review
MD5906	050-00425	156.4	19.8	176.2	258	45459.60	0.00	RL0611-08	4/14/2008	VOGTLE 2 - License Renewal Environmental Review
MD5906	050-00425	23.4	0.0	23.4	258	6037.20	0.00	RL0157-09	10/13/2008	VOGTLE 2 - License Renewal Environmental Review
MD5906	050-00425	32.0	2.4	34.4	238	8187.20	0.00	RL0371-09	1/19/2009	VOGTLE 2 - License Renewal Environmental Review
MD6098	050-00219	1.0	0.0	1.0	258	258.00	0.00	RL0580-08	4/14/2008	OYSTER CREEK - coastal zone management
MD6098	050-00219	89.5	26.5	116.0	217	25172.00	0.00	RL0163-08	10/15/2007	OYSTER CREEK - coastal zone management
MD6098	050-00219	16.5	0.5	17.0	258	4386.00	0.00	RL0163-08	10/15/2007	OYSTER CREEK - coastal zone management
MD6593	050-00412	0.0	0.0	0.0	0	0.00	1035.17	RL0526-10	4/26/2010	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	17.6	0.0	17.6	238	4188.80	0.00	RL0526-10	4/26/2010	BEAVER VALLEY 2 - SAFETY REVIEW OF BVPS UNIT 2 LICENSE RENEW
MD6593	050-00412	4.5	0.0	4.5	238	1071.00	0.00	RL0788-10	8/2/2010	BEAVER VALLEY 2 - SAFETY REVIEW OF BVPS UNIT 2 LICENSE RENEW
MD6593	050-00412	11.5	0.0	11.5	257	2955.50	0.00	RL0788-10	8/2/2010	BEAVER VALLEY 2 - SAFETY REVIEW OF BVPS UNIT 2 LICENSE RENEW
MD6593	050-00412	0.0	0.0	0.0	0	0.00	1035.17	RL0526-10	4/26/2010	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	3.5	0.0	3.5	257	899.50	0.00	RL0346-10	2/1/2010	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	0.0	0.0	0.0	0	0.00	32.65	RL0346-10	2/1/2010	BEAVER VALLEY 2 - SAFETY REVIEW OF BVPS UNIT 2 LICENSE RENEW
MD6593	050-00412	0.0	0.0	0.0	0	0.00	1035.17	RL0135-10	10/26/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	118.3	5.3	123.6	238	29416.80	0.00	RL0135-10	10/26/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew

MD6593	050-00412	72.6	8.3	80.9	238	19254.20	0.00	RL0727-09	7/20/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	0.0	0.0	0.0	0	0.00	19491.50	RL0509-09	4/13/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	17.6	0.0	17.6	238	4188.80	0.00	RL0526-10	4/26/2010	BEAVER VALLEY 2 - SAFETY REVIEW OF BVPS UNIT 2 LICENSE RENEW
MD6593	050-00412	0.0	0.0	0.0	0	0.00	3596.86	RL0292-09R1	1/21/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	172.3	12.4	184.7	238	43958.60	0.00	RL0509-09	4/13/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	0.0	0.0	0.0	0	0.00	10199.47	RL0533-08	4/14/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	0.0	0.0	0.0	0	0.00	3027.00	RL0533-08	4/14/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	0.0	0.0	0.0	0	0.00	20.48	RL0078-09	10/13/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	143.8	1.0	144.8	238	34462.40	0.00	RL0078-09	10/13/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	830.2	42.5	872.7	258	225156.60	0.00	RL0734-08	7/21/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	563.9	41.6	605.5	238	144109.00	0.00	RL0292-09R1	1/21/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	303.4	12.1	315.5	258	81399.00	0.00	RL0078-09	10/13/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	746.0	71.5	817.5	258	210915.00	0.00	RL0533-08	4/14/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	0.0	0.0	0.0	0	0.00	5178.99	RL0255-08	1/21/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	0.0	0.0	0.0	0	0.00	8555.80	RL0255-08	1/21/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	303.3	14.6	317.9	258	82018.20	0.00	RL0255-08	1/21/2008	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	29.0	0.0	29.0	258	7482.00	0.00	RL0114-08	10/15/2007	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	0.0	0.0	0.0	0	0.00	14628.82	RL0292-09R1	1/21/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6593	050-00412	92.4	7.0	99.4	257	25545.80	0.00	RL0135-10	10/26/2009	BEAVER VALLEY 2 - Safety Review of BVPS Unit 2 License Renew
MD6594	050-00334	0.0	0.0	0.0	0	0.00	1035.18	RL0526-10	4/26/2010	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	46.5	0.0	46.5	257	11950.50	0.00	RL0788-10	8/2/2010	BEAVER VALLEY 1 - SAFETY REVIEW OF BVPS UNIT 1 LICENSE RENEW
MD6594	050-00334	128.7	3.0	131.7	238	31344.60	0.00	RL0078-09	10/13/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	290.4	15.4	305.8	258	78896.40	0.00	RL0255-08	1/21/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	294.3	12.9	307.2	258	79257.60	0.00	RL0078-09	10/13/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	0.0	0.0	0.0	0	0.00	5178.98	RL0255-08	1/21/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	29.5	0.0	29.5	257	7581.50	0.00	RL0346-10	2/1/2010	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	744.7	61.6	806.3	258	208025.40	0.00	RL0533-08	4/14/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	0.0	0.0	0.0	0	0.00	32.65	RL0346-10	2/1/2010	BEAVER VALLEY 1 - SAFETY REVIEW OF BVPS UNIT 1 LICENSE RENEW
MD6594	050-00334	0.0	0.0	0.0	0	0.00	3027.00	RL0533-08	4/14/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	599.6	47.1	646.7	238	153914.60	0.00	RL0292-09R1	1/21/2009	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	18.4	0.0	18.4	238	4379.20	0.00	RL0526-10	4/26/2010	BEAVER VALLEY 1 - SAFETY REVIEW OF BVPS UNIT 1 LICENSE RENEW
MD6594	050-00334	0.0	0.0	0.0	0	0.00	1035.18	RL0135-10	10/26/2009	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	4.5	0.0	4.5	238	1071.00	0.00	RL0788-10	8/2/2010	BEAVER VALLEY 1 - SAFETY REVIEW OF BVPS UNIT 1 LICENSE RENEW
MD6594	050-00334	166.5	12.6	179.1	238	42625.80	0.00	RL0509-09	4/13/2009	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	0.0	0.0	0.0	0	0.00	8555.80	RL0255-08	1/21/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	0.0	0.0	0.0	0	0.00	10199.47	RL0533-08	4/14/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	750.8	59.8	810.6	258	209134.80	0.00	RL0734-08	7/21/2008	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	18.4	0.0	18.4	238	4379.20	0.00	RL0526-10	4/26/2010	BEAVER VALLEY 1 - SAFETY REVIEW OF BVPS UNIT 1 LICENSE RENEW
MD6594	050-00334	0.0	0.0	0.0	0	0.00	1035.18	RL0526-10	4/26/2010	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	223.3	14.0	237.3	257	60986.10	0.00	RL0135-10	10/26/2009	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	191.2	5.2	196.4	238	46743.20	0.00	RL0135-10	10/26/2009	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	102.4	5.7	108.1	238	25727.80	0.00	RL0727-09	7/20/2009	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6594	050-00334	28.0	0.0	28.0	258	7224.00	0.00	RL0114-08	10/15/2007	BEAVER VALLEY 1 - Safety Review of BVPS Unit 1 License Renew
MD6595	050-00412	4.0	0.0	4.0	257	1028.00	0.00	RL0135-10	10/26/2009	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	0.0	0.7	0.7	257	179.90	0.00	RL0346-10	2/1/2010	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	25.3	1.8	27.1	258	6991.80	0.00	RL0114-08	10/15/2007	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	0.5	0.0	0.5	238	119.00	0.00	RL0727-09	7/20/2009	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	0.8	0.0	0.8	238	190.40	0.00	RL0509-09	4/13/2009	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	5.3	0.0	5.3	238	1261.40	0.00	RL0135-10	10/26/2009	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	2.6	1.0	3.6	258	928.80	0.00	RL0078-09	10/13/2008	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	0.8	0.0	0.8	238	190.40	0.00	RL0078-09	10/13/2008	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	11.8	0.0	11.8	238	2808.40	0.00	RL0292-09R1	1/21/2009	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	368.0	22.3	390.3	258	100697.40	0.00	RL0255-08	1/21/2008	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal

MD6595	050-00412	135.6	0.8	136.4	258	35191.20	0.00	RL0533-08	4/14/2008	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	0.0	0.0	0.0	0	0.00	177.90	RL0533-08	4/14/2008	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6595	050-00412	260.5	22.1	282.6	258	72910.80	0.00	RL0734-08	7/21/2008	BEAVER VALLEY 2 - Environmental Review of BVPS2 License Renewal
MD6596	050-00334	0.0	0.0	0.0	0	0.00	177.90	RL0533-08	4/14/2008	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	148.9	1.7	150.6	258	38854.80	0.00	RL0533-08	4/14/2008	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	357.9	20.2	378.1	258	97549.80	0.00	RL0255-08	1/21/2008	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	253.5	21.4	274.9	258	70924.20	0.00	RL0734-08	7/21/2008	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	2.5	0.0	2.5	238	595.00	0.00	RL0292-09R1	1/21/2009	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	8.7	0.0	8.7	238	2070.60	0.00	RL0078-09	10/13/2008	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	2.4	1.0	3.4	258	877.20	0.00	RL0078-09	10/13/2008	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	25.7	1.7	27.4	258	7069.20	0.00	RL0114-08	10/15/2007	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	1.7	0.0	1.7	238	404.60	0.00	RL0509-09	4/13/2009	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	0.5	0.0	0.5	238	119.00	0.00	RL0727-09	7/20/2009	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	1.2	0.0	1.2	238	285.60	0.00	RL0135-10	10/26/2009	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6596	050-00334	4.0	0.0	4.0	257	1028.00	0.00	RL0135-10	10/26/2009	BEAVER VALLEY 1 - Environmental Review of BVPS1 License Renewal
MD6617	050-00289	5.0	0.7	5.7	258	1470.60	0.00	RL0191-08	10/15/2007	Three Mile Island 1 - License Renewal Pre-Application Review
MD7701	050-00289	325.5	25.3	350.8	238	83490.40	0.00	RL0803-09R1	7/20/2009	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	16.5	0.0	16.5	238	3927.00	0.00	RL0601-10R1	4/26/2010	THREE MILE ISLAND 1 - LICENSE RENEWAL SAFETY REVIEW
MD7701	050-00289	823.7	85.7	909.4	238	216437.20	0.00	RL0584-09R1	4/13/2009	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	11.0	3.0	14.0	238	3332.00	0.00	RL0210-10R1	10/26/2009	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	0.0	0.0	0.0	0	0.00	522.50	RL0210-10R1	10/26/2009	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	1088.8	143.3	1232.1	238	293239.80	0.00	RL0366-09	1/19/2009	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	0.0	0.0	0.0	0	0.00	15.37	RL0210-10R1	10/26/2009	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	1.0	0.0	1.0	257	257.00	0.00	RL0421-10R1	2/1/2010	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	98.5	0.0	98.5	257	25314.50	0.00	RL0210-10R1	10/26/2009	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	413.5	58.5	472.0	238	112336.00	0.00	RL0153-09	10/13/2008	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	221.0	9.3	230.3	258	59417.40	0.00	RL0607-08	4/14/2008	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	966.0	83.7	1049.7	258	270822.60	0.00	RL0813-08	7/21/2008	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7701	050-00289	1438.9	130.5	1569.4	258	404905.20	0.00	RL0153-09	10/13/2008	THREE MILE ISLAND 1 - License Renewal SAFETY Review
MD7702	050-00289	305.2	11.3	316.5	258	81657.00	0.00	RL0607-08	4/14/2008	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	1124.9	87.7	1212.6	258	312850.80	0.00	RL0813-08	7/21/2008	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	2.7	0.0	2.7	257	693.90	0.00	RL0210-10R1	10/26/2009	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	3.7	0.8	4.5	238	1071.00	0.00	RL0210-10R1	10/26/2009	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	90.8	9.0	99.8	238	23752.40	0.00	RL0153-09	10/13/2008	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	475.5	47.0	522.5	258	134805.00	0.00	RL0153-09	10/13/2008	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	78.0	11.8	89.8	238	21372.40	0.00	RL0803-09R1	7/20/2009	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	27.0	0.0	27.0	238	6426.00	0.00	RL0584-09R1	4/13/2009	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	0.5	0.0	0.5	257	128.50	0.00	RL0421-10R1	2/1/2010	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD7702	050-00289	185.0	43.5	228.5	238	54383.00	0.00	RL0366-09	1/19/2009	THREE MILE ISLAND 1 - License Renewal ENVIRONMENTAL Review
MD9408	050-00305	0.0	0.0	0.0	0	0.00	141.00	RL0143-11	10/25/2010	KEWAUNEE - Kewaunee Power Station License Renewal - Safety Review
MD9408	050-00305	0.0	0.0	0.0	0	0.00	-1532.00	RL0143-11	10/25/2010	KEWAUNEE - Kewaunee Power Station License Renewal - Safety Review
MD9408	050-00305	233.6	39.5	273.1	259	70732.90	0.00	RL0143-11	10/25/2010	KEWAUNEE - Kewaunee Power Station License Renewal - Safety Review
MD9408	050-00305	498.3	18.4	516.7	257	132791.90	0.00	RL0143-11	10/25/2010	KEWAUNEE - Kewaunee Power Station License Renewal - Safety Review
MD9409	050-00305	61.2	22.3	83.5	257	21459.50	0.00	RL0143-11	10/25/2010	KEWAUNEE - Kewaunee Power Station- License Renewal - Env Review
MD9409	050-00305	0.0	0.5	0.5	259	129.50	0.00	RL0143-11	10/25/2010	KEWAUNEE - Kewaunee Power Station- License Renewal - Env Review
MD9524	050-00298	14.0	5.0	19.0	238	4522.00	0.00	RL0304-09	1/19/2009	COOPER - Cooper License Renewal Pre-Application Activities
MD9524	050-00298	61.0	17.0	78.0	238	18564.00	0.00	RL0090-09	10/13/2008	COOPER - Cooper License Renewal Pre-Application Activities
MD9524	050-00298	4.5	0.0	4.5	238	1071.00	0.00	RL0304-09	1/19/2009	COOPER - Cooper License Renewal Pre-Application Activities
MD9737	050-00298	41.7	0.5	42.2	257	10845.40	0.00	RL0120-11	10/25/2010	COOPER - License Renewal Environmental Review
MD9737	050-00298	0.0	0.0	0.0	0	0.00	3161.00	RL0148-10	10/26/2009	COOPER - License Renewal Environmental Review
MD9737	050-00298	0.0	0.0	0.0	0	0.00	2024.00	RL0148-10	10/26/2009	COOPER - License Renewal Environmental Review
MD9737	050-00298	406.3	5.0	411.3	257	105704.10	0.00	RL0359-10	2/1/2010	COOPER - License Renewal Environmental Review
MD9737	050-00298	0.0	0.0	0.0	0	0.00	14880.00	RL0359-10	2/1/2010	COOPER - License Renewal Environmental Review

MD9737	050-00298	281.7	0.5	282.2	257	72525.40	0.00	RL0539-10	4/26/2010	COOPER - License Renewal Environmental Review
MD9737	050-00298	0.0	0.0	0.0	0	0.00	452.00	RL0148-10	10/26/2009	COOPER - License Renewal Environmental Review
MD9737	050-00298	226.8	13.0	239.8	257	61628.60	0.00	RL0800-10	8/2/2010	COOPER - License Renewal Environmental Review
MD9737	050-00298	0.0	0.0	0.0	0	0.00	6238.00	RL0359-10	2/1/2010	COOPER - License Renewal Environmental Review
MD9737	050-00298	281.7	0.5	282.2	257	72525.40	0.00	RL0539-10	4/26/2010	COOPER - License Renewal Environmental Review
MD9737	050-00298	233.7	46.1	279.8	238	66592.40	0.00	RL0304-09	1/19/2009	COOPER - License Renewal Environmental Review
MD9737	050-00298	656.9	38.9	695.8	238	165600.40	0.00	RL0521-09	4/13/2009	COOPER - License Renewal Environmental Review
MD9737	050-00298	1303.2	86.1	1389.3	238	330653.40	0.00	RL0739-09	7/20/2009	COOPER - License Renewal Environmental Review
MD9737	050-00298	510.7	46.9	557.6	238	132708.80	0.00	RL0148-10	10/26/2009	COOPER - License Renewal Environmental Review
MD9737	050-00298	134.3	11.3	145.6	257	37419.20	0.00	RL0148-10	10/26/2009	COOPER - License Renewal Environmental Review
MD9763	050-00298	204.0	4.0	208.0	259	53872.00	0.00	RL0120-11	10/25/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	370.1	9.2	379.3	257	97480.10	0.00	RL0120-11	10/25/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	-236.00	RL0120-11	10/25/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	5792.00	RL0539-10	4/26/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	474.8	20.0	494.8	238	117762.40	0.00	RL0304-09	1/19/2009	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	27519.00	RL0148-10	10/26/2009	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	12091.00	RL0148-10	10/26/2009	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	2652.00	RL0539-10	4/26/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	986.00	RL0539-10	4/26/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	5792.00	RL0539-10	4/26/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	-15.2	0.0	-15.2	238	-3617.60	0.00	RL0539-10	4/26/2010	COOPER - LICENSE RENEWAL SAFETY REVIEW
MD9763	050-00298	-15.2	0.0	-15.2	238	-3617.60	0.00	RL0539-10	4/26/2010	COOPER - LICENSE RENEWAL SAFETY REVIEW
MD9763	050-00298	1103.6	85.3	1188.9	257	305547.30	0.00	RL0359-10	2/1/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	4645.0	423.4	5068.4	238	1206279.20	0.00	RL0739-09	7/20/2009	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	692.0	16.0	708.0	257	181956.00	0.00	RL0539-10	4/26/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	692.0	16.0	708.0	257	181956.00	0.00	RL0539-10	4/26/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	211.00	RL0800-10	8/2/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	638.4	22.8	661.2	238	157365.60	0.00	RL0521-09	4/13/2009	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	986.00	RL0539-10	4/26/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	1072.1	67.7	1139.8	257	292928.60	0.00	RL0148-10	10/26/2009	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	633.0	46.5	679.5	257	174631.50	0.00	RL0800-10	8/2/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	2652.00	RL0539-10	4/26/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	1127.00	RL0359-10	2/1/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	554.7	30.5	585.2	238	139277.60	0.00	RL0148-10	10/26/2009	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	173.00	RL0800-10	8/2/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9763	050-00298	0.0	0.0	0.0	0	0.00	282.00	RL0800-10	8/2/2010	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF
MD9769	050-00331	0.0	0.0	0.0	0	0.00	6117.00	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	83.28	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	129.74	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	27.56	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	129.74	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	199.8	0.0	199.8	259	51748.20	0.00	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	129.74	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	256.7	1.0	257.7	257	66228.90	0.00	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	69.96	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	82.7	0.0	82.7	238	19682.60	0.00	RL0310-09	1/19/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	35.0	0.0	35.0	238	8330.00	0.00	RL0527-09	4/13/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	476.5	36.0	512.5	238	121975.00	0.00	RL0745-09	7/20/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	1265.3	139.4	1404.7	257	361007.90	0.00	RL0545-10	4/26/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	54477.00	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	382.00	RL0545-10	4/26/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	1265.3	139.4	1404.7	257	361007.90	0.00	RL0545-10	4/26/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	15312.26	RL0545-10	4/26/2010	DUANE ARNOLD - License Renewal Application - Safety Review

MD9769	050-00331	0.0	0.0	0.0	0	0.00	382.00	RL0545-10	4/26/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	24323.00	RL0745-09	7/20/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	23272.00	RL0745-09	7/20/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	44758.00	RL0745-09	7/20/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	8342.91	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	35.72	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	11.99	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	1497.3	121.4	1618.7	257	416005.90	0.00	RL0365-10	2/1/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	843.7	80.9	924.6	257	237622.20	0.00	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	5251.00	RL0365-10	2/1/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	4368.52	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	6507.82	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	1031.00	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	60.00	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	4748.00	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	20921.00	RL0365-10	2/1/2010	DUANE ARNOLD - LICENSE RENEWAL APPLICATION - SAFETY REVIEW
MD9769	050-00331	0.0	0.0	0.0	0	0.00	17004.78	RL0365-10	2/1/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	2992.00	RL0365-10	2/1/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	259.48	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	20921.00	RL0365-10	2/1/2010	DUANE ARNOLD - LICENSE RENEWAL APPLICATION - SAFETY REVIEW
MD9769	050-00331	1028.1	136.4	1164.5	257	299276.50	0.00	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	1194.7	257.3	1452.0	238	345576.00	0.00	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	259.48	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9769	050-00331	0.0	0.0	0.0	0	0.00	259.48	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Safety Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	69.96	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	179.5	13.0	192.5	259	49857.50	0.00	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	-1452.00	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	84.7	0.0	84.7	257	21767.90	0.00	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	1897.00	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	4470.00	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	83.29	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	27.57	RL0125-11	10/25/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	12.00	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	44.0	5.7	49.7	238	11828.60	0.00	RL0310-09	1/19/2009	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	1685.00	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	166.8	34.5	201.3	257	51734.10	0.00	RL0545-10	4/26/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	16286.00	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	337.5	6.8	344.3	257	88485.10	0.00	RL0365-10	2/1/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	8342.92	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	151.2	5.5	156.7	257	40271.90	0.00	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	445.3	15.8	461.1	238	109741.80	0.00	RL0154-10	10/26/2009	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	122.5	0.0	122.5	238	29155.00	0.00	RL0527-09	4/13/2009	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	5297.00	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	1010.0	40.0	1050.0	238	249900.00	0.00	RL0745-09	7/20/2009	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	35.72	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	0.0	0.0	0.0	0	0.00	1319.81	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	241.8	64.6	306.4	257	78744.80	0.00	RL0806-10	8/2/2010	DUANE ARNOLD - License Renewal Application - Env Review
MD9770	050-00331	166.8	34.5	201.3	257	51734.10	0.00	RL0545-10	4/26/2010	DUANE ARNOLD - License Renewal Application - Env Review
ME0254	050-00528	191.8	36.2	228.0	257	58596.00	0.00	RL0159-11	10/25/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	152.6	11.3	163.9	259	42450.10	0.00	RL0159-11	10/25/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	1991.16	RL0159-11	10/25/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	2133.23	RL0159-11	10/25/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	306.28	RL0159-11	10/25/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review

ME0254	050-00528	0.0	0.0	0.0	0	0.00	60.34	RL0159-11	10/25/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	4745.33	RL0159-11	10/25/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	8043.00	RL0840-10	8/2/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	811.00	RL0840-10	8/2/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	991.86	RL0840-10	8/2/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	6360.00	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	126.1	3.0	129.1	238	30725.80	0.00	RL0187-10	10/26/2009	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	150.3	9.2	159.5	257	40991.50	0.00	RL0187-10	10/26/2009	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	26704.45	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	407.78	RL0840-10	8/2/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	842.00	RL0780-09	7/20/2009	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	2572.91	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	659.4	62.6	722.0	257	185554.00	0.00	RL0840-10	8/2/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	17659.00	RL0187-10	10/26/2009	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	763.7	33.8	797.5	257	204957.50	0.00	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	1322.00	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	1318.55	RL0840-10	8/2/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	8840.00	RL0187-10	10/26/2009	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	763.7	33.8	797.5	257	204957.50	0.00	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	585.00	RL0398-10	2/1/2010	PALO VERDE 1 - PALO VERDE LICENSE RENEWAL SAFETY REVIEW
ME0254	050-00528	189.9	4.0	193.9	238	46148.20	0.00	RL0561-09	4/13/2009	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	1240.6	162.2	1402.8	257	360519.60	0.00	RL0398-10	2/1/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	845.00	RL0398-10	2/1/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	222.1	8.0	230.1	238	54763.80	0.00	RL0780-09	7/20/2009	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	585.00	RL0398-10	2/1/2010	PALO VERDE 1 - PALO VERDE LICENSE RENEWAL SAFETY REVIEW
ME0254	050-00528	0.0	0.0	0.0	0	0.00	2572.91	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	58.00	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	666.00	RL0187-10	10/26/2009	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	1322.00	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	26704.45	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	6360.00	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	185.00	RL0398-10	2/1/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0254	050-00528	0.0	0.0	0.0	0	0.00	58.00	RL0578-10	4/26/2010	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	172.2	39.0	211.2	257	54278.40	0.00	RL0159-11	10/25/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	60.33	RL0159-11	10/25/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	4745.33	RL0159-11	10/25/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	1991.16	RL0159-11	10/25/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	2133.24	RL0159-11	10/25/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	306.27	RL0159-11	10/25/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	119.5	9.1	128.6	259	33307.40	0.00	RL0159-11	10/25/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	26704.45	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	811.00	RL0840-10	8/2/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	517.5	26.5	544.0	257	139808.00	0.00	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	6360.00	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	2572.91	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	517.5	26.5	544.0	257	139808.00	0.00	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	1322.00	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	8043.00	RL0840-10	8/2/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	991.87	RL0840-10	8/2/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	407.79	RL0840-10	8/2/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	6360.00	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	1322.00	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	58.00	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review

ME0255	050-00529	0.0	0.0	0.0	0	0.00	1318.55	RL0840-10	8/2/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	58.00	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	503.3	61.2	564.5	257	145076.50	0.00	RL0840-10	8/2/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	585.00	RL0398-10	2/1/2010	PALO VERDE 2 - PALO VERDE LICENSE RENEWAL SAFETY REVIEW
ME0255	050-00529	0.0	0.0	0.0	0	0.00	26704.45	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	585.00	RL0398-10	2/1/2010	PALO VERDE 2 - PALO VERDE LICENSE RENEWAL SAFETY REVIEW
ME0255	050-00529	0.0	0.0	0.0	0	0.00	2572.91	RL0578-10	4/26/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	842.00	RL0780-09	7/20/2009	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	126.9	3.0	129.9	238	30916.20	0.00	RL0187-10	10/26/2009	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	112.2	1.0	113.2	238	26941.60	0.00	RL0561-09	4/13/2009	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	8840.00	RL0187-10	10/26/2009	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	136.7	2.7	139.4	238	33177.20	0.00	RL0780-09	7/20/2009	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	666.00	RL0187-10	10/26/2009	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	845.00	RL0398-10	2/1/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	802.8	95.6	898.4	257	230888.80	0.00	RL0398-10	2/1/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	17659.00	RL0187-10	10/26/2009	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	0.0	0.0	0.0	0	0.00	185.00	RL0398-10	2/1/2010	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0255	050-00529	144.3	13.7	158.0	257	40606.00	0.00	RL0187-10	10/26/2009	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	113.1	20.4	133.5	259	34576.50	0.00	RL0159-11	10/25/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	172.0	40.2	212.2	257	54535.40	0.00	RL0159-11	10/25/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	306.28	RL0159-11	10/25/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	4745.33	RL0159-11	10/25/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	1991.16	RL0159-11	10/25/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	2133.24	RL0159-11	10/25/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	60.33	RL0159-11	10/25/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	143.4	13.2	156.6	257	40246.20	0.00	RL0187-10	10/26/2009	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	17659.00	RL0187-10	10/26/2009	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	8840.00	RL0187-10	10/26/2009	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	666.00	RL0187-10	10/26/2009	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	120.9	5.0	125.9	238	29964.20	0.00	RL0187-10	10/26/2009	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	842.00	RL0780-09	7/20/2009	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	130.9	7.3	138.2	238	32891.60	0.00	RL0780-09	7/20/2009	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	754.1	133.7	887.8	257	228164.60	0.00	RL0398-10	2/1/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	845.00	RL0398-10	2/1/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	585.00	RL0398-10	2/1/2010	PALO VERDE 3 - PALO VERDE LICENSE RENEWAL SAFETY REVIEW
ME0256	050-00530	0.0	0.0	0.0	0	0.00	2572.91	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	1318.55	RL0840-10	8/2/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	185.00	RL0398-10	2/1/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	585.00	RL0398-10	2/1/2010	PALO VERDE 3 - PALO VERDE LICENSE RENEWAL SAFETY REVIEW
ME0256	050-00530	0.0	0.0	0.0	0	0.00	991.87	RL0840-10	8/2/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	407.79	RL0840-10	8/2/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	8043.00	RL0840-10	8/2/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	99.2	2.8	102.0	238	24276.00	0.00	RL0561-09	4/13/2009	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	811.00	RL0840-10	8/2/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	503.9	66.3	570.2	257	146541.40	0.00	RL0840-10	8/2/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	26704.45	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	6360.00	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	507.8	26.4	534.2	257	137289.40	0.00	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	58.00	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	6360.00	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	1322.00	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	26704.45	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	1322.00	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review

ME0256	050-00530	0.0	0.0	0.0	0	0.00	58.00	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	0.0	0.0	0.0	0	0.00	2572.91	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0256	050-00530	507.8	26.4	534.2	257	137289.40	0.00	RL0578-10	4/26/2010	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review
ME0261	050-00528	103.8	14.0	117.8	257	30274.60	0.00	RL0159-11	10/25/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	63.2	5.0	68.2	259	17663.80	0.00	RL0159-11	10/25/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	-811.00	RL0159-11	10/25/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	1132.00	RL0159-11	10/25/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	1857.00	RL0159-11	10/25/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	96.7	3.8	100.5	238	23919.00	0.00	RL0780-09	7/20/2009	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	3375.00	RL0840-10	8/2/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	150.7	28.8	179.5	257	46131.50	0.00	RL0578-10	4/26/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	16455.00	RL0840-10	8/2/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	61.4	4.5	65.9	257	16936.30	0.00	RL0187-10	10/26/2009	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	6459.00	RL0578-10	4/26/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	4388.00	RL0578-10	4/26/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	58.1	5.0	63.1	238	15017.80	0.00	RL0187-10	10/26/2009	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	150.7	28.8	179.5	257	46131.50	0.00	RL0578-10	4/26/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	163.8	34.6	198.4	257	50988.80	0.00	RL0840-10	8/2/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	4388.00	RL0578-10	4/26/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	72.0	2.5	74.5	238	17731.00	0.00	RL0561-09	4/13/2009	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	222.2	27.7	249.9	257	64224.30	0.00	RL0398-10	2/1/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	6459.00	RL0578-10	4/26/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0261	050-00528	0.0	0.0	0.0	0	0.00	1407.00	RL0840-10	8/2/2010	PALO VERDE 1 - License Renewal - Environmental Review
ME0262	050-00529	101.4	14.0	115.4	257	29657.80	0.00	RL0159-11	10/25/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	-811.00	RL0159-11	10/25/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	1131.00	RL0159-11	10/25/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	1857.00	RL0159-11	10/25/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	67.3	5.0	72.3	259	18725.70	0.00	RL0159-11	10/25/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	6459.00	RL0578-10	4/26/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	94.8	4.7	99.5	238	23681.00	0.00	RL0780-09	7/20/2009	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	55.1	4.5	59.6	257	15317.20	0.00	RL0187-10	10/26/2009	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	4388.00	RL0578-10	4/26/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	53.9	5.5	59.4	238	14137.20	0.00	RL0187-10	10/26/2009	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	16455.00	RL0840-10	8/2/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	133.8	27.5	161.3	257	41454.10	0.00	RL0578-10	4/26/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	172.7	18.0	190.7	257	49009.90	0.00	RL0398-10	2/1/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	1407.00	RL0840-10	8/2/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	163.8	25.5	189.3	257	48650.10	0.00	RL0840-10	8/2/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	76.0	2.5	78.5	238	18683.00	0.00	RL0561-09	4/13/2009	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	3375.00	RL0840-10	8/2/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	133.8	27.5	161.3	257	41454.10	0.00	RL0578-10	4/26/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	6459.00	RL0578-10	4/26/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0262	050-00529	0.0	0.0	0.0	0	0.00	4388.00	RL0578-10	4/26/2010	PALO VERDE 2 - License Renewal - Environmental Review
ME0263	050-00530	101.1	15.7	116.8	257	30017.60	0.00	RL0159-11	10/25/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	1857.00	RL0159-11	10/25/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	1131.00	RL0159-11	10/25/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	-811.00	RL0159-11	10/25/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	55.2	5.0	60.2	259	15591.80	0.00	RL0159-11	10/25/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	67.6	2.5	70.1	238	16683.80	0.00	RL0561-09	4/13/2009	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	3374.00	RL0840-10	8/2/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	188.9	33.8	222.7	257	57233.90	0.00	RL0578-10	4/26/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	174.2	24.0	198.2	257	50937.40	0.00	RL0840-10	8/2/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	1406.00	RL0840-10	8/2/2010	PALO VERDE 3 - License Renewal - Environmental Review

ME0263	050-00530	188.9	33.8	222.7	257	57233.90	0.00	RL0578-10	4/26/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	16455.00	RL0840-10	8/2/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	4388.00	RL0578-10	4/26/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	52.0	5.3	57.3	238	13637.40	0.00	RL0187-10	10/26/2009	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	71.8	2.0	73.8	257	18966.60	0.00	RL0187-10	10/26/2009	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	4388.00	RL0578-10	4/26/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	6458.00	RL0578-10	4/26/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	246.9	39.0	285.9	257	73476.30	0.00	RL0398-10	2/1/2010	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	96.1	5.5	101.6	238	24180.80	0.00	RL0780-09	7/20/2009	PALO VERDE 3 - License Renewal - Environmental Review
ME0263	050-00530	0.0	0.0	0.0	0	0.00	6458.00	RL0578-10	4/26/2010	PALO VERDE 3 - License Renewal - Environmental Review

Docket Number	TAC/IR	TAC Title	Hours	Hourly Rate	Hourly Amount	Earning Code	PP End Date
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	0.75	$259.00	$194.25	CRE	10/9/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	3.5	$259.00	$906.50	REG	10/9/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	0.5	$259.00	$129.50	REG	10/23/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	REG	10/23/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2	$259.00	$518.00	REG	10/23/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	8	$259.00	$2,072.00	REG	11/6/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	0.25	$259.00	$64.75	REG	11/6/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	REG	11/6/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	11/6/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2	$259.00	$518.00	REG	11/20/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	CRE	11/20/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	7.5	$259.00	$1,942.50	REG	11/20/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	3	$259.00	$777.00	REG	12/4/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	5.5	$259.00	$1,424.50	REG	12/4/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2	$259.00	$518.00	CRE	12/18/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	3	$259.00	$777.00	REG	12/18/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	6	$259.00	$1,554.00	REG	12/18/2010
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2.5	$259.00	$647.50	REG	1/1/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4.25	$259.00	$1,100.75	REG	1/1/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	7	$259.00	$1,813.00	REG	1/1/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	0.5	$259.00	$129.50	CRE	1/1/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	10.5	$259.00	$2,719.50	REG	1/1/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	3	$259.00	$777.00	REG	1/1/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	10	$259.00	$2,590.00	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1.25	$259.00	$323.75	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	0.5	$259.00	$129.50	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	9.25	$259.00	$2,395.75	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	11	$259.00	$2,849.00	REG	1/15/2011

05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	9	$259.00	$2,331.00	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	5.5	$259.00	$1,424.50	REG	1/15/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	5	$259.00	$1,295.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	8	$259.00	$2,072.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	6.25	$259.00	$1,618.75	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2.75	$259.00	$712.25	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	5	$259.00	$1,295.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1.5	$259.00	$388.50	CRE	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	32.5	$259.00	$8,417.50	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	3	$259.00	$777.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	1/29/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	11.5	$259.00	$2,978.50	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	3	$259.00	$777.00	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	6.25	$259.00	$1,618.75	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	6.5	$259.00	$1,683.50	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2	$259.00	$518.00	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1.5	$259.00	$388.50	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4.75	$259.00	$1,230.25	CRE	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	45	$259.00	$11,655.00	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	5.5	$259.00	$1,424.50	REG	2/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	8.5	$259.00	$2,201.50	REG	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	CRE	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	8.5	$259.00	$2,201.50	REG	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	REG	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	2/26/2011

05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	0.5	$259.00	$129.50	REG	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	4	$259.00	$1,036.00	CRE	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	50.5	$259.00	$13,079.50	REG	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	10	$259.00	$2,590.00	REG	2/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2.5	$259.00	$647.50	CRE	3/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1.5	$259.00	$388.50	REG	3/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2	$259.00	$518.00	REG	3/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	3/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2	$259.00	$518.00	CRE	3/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	49	$259.00	$12,691.00	REG	3/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	1	$259.00	$259.00	REG	3/12/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	20	$259.00	$5,180.00	REG	3/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2	$259.00	$518.00	REG	3/26/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	3.25	$259.00	$841.75	REG	4/9/2011
05000271	MC9668	VERMONT YANKEE - License Renewal Application Safety Review	2	$259.00	$518.00	REG	4/9/2011
05000298	MD9737	COOPER - License Renewal Environmental Review	2	$259.00	$518.00	REG	12/4/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	2	$259.00	$518.00	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	4.5	$259.00	$1,165.50	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	1	$259.00	$259.00	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	5	$259.00	$1,295.00	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	72	$259.00	$18,648.00	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	2.5	$259.00	$647.50	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	2.75	$259.00	$712.25	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	2.5	$259.00	$647.50	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	2	$259.00	$518.00	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	6.5	$259.00	$1,683.50	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	1.5	$259.00	$388.50	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	8	$259.00	$2,072.00	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	3.5	$259.00	$906.50	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	0.75	$259.00	$194.25	CRE	10/9/2010

05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	1.5	$259.00	$388.50	OVT	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	5	$259.00	$1,295.00	REG	10/9/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	42	$259.00	$10,878.00	REG	10/23/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	66	$259.00	$17,094.00	REG	11/6/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	1	$259.00	$259.00	CRE	11/6/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	2	$259.00	$518.00	REG	11/6/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	0.5	$259.00	$129.50	CRE	11/20/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	8	$259.00	$2,072.00	REG	11/20/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	65	$259.00	$16,835.00	REG	11/20/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	0.5	$259.00	$129.50	REG	12/4/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	48	$259.00	$12,432.00	REG	12/4/2010
05000298	MD9763	COOPER - Cooper Nuclear Station, Unit 1, License Renewal SAF	4	$259.00	$1,036.00	REG	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	6	$259.00	$1,554.00	OVT	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	CRE	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	6	$259.00	$1,554.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	17	$259.00	$4,403.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1.5	$259.00	$388.50	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	66	$259.00	$17,094.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	7	$259.00	$1,813.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1.25	$259.00	$323.75	CRE	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	6.75	$259.00	$1,748.25	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	7.5	$259.00	$1,942.50	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	0.75	$259.00	$194.25	CRE	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	8.5	$259.00	$2,201.50	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3.5	$259.00	$906.50	REG	10/9/2010

05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	0.75	$259.00	$194.25	CRE	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	6	$259.00	$1,554.00	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	7.25	$259.00	$1,877.75	CRE	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	4	$259.00	$1,036.00	OVT	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	15.5	$259.00	$4,014.50	REG	10/9/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	58	$259.00	$15,022.00	REG	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3	$259.00	$777.00	CRE	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	9	$259.00	$2,331.00	REG	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	0.5	$259.00	$129.50	CRE	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	0.5	$259.00	$129.50	REG	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	0.5	$259.00	$129.50	CRE	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	5	$259.00	$1,295.00	REG	10/23/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	68	$259.00	$17,612.00	REG	11/6/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1.5	$259.00	$388.50	CRE	11/6/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	11/6/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	4	$259.00	$1,036.00	REG	11/6/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3	$259.00	$777.00	REG	11/20/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	50	$259.00	$12,950.00	REG	11/20/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	11/20/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	CRE	11/20/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	0.5	$259.00	$129.50	REG	11/20/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	11/20/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1.25	$259.00	$323.75	CRE	11/20/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3	$259.00	$777.00	REG	11/20/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3	$259.00	$777.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1.5	$259.00	$388.50	REG	12/4/2010

05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3	$259.00	$777.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	5.5	$259.00	$1,424.50	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	34	$259.00	$8,806.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3	$259.00	$777.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3.25	$259.00	$841.75	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	5.5	$259.00	$1,424.50	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	5	$259.00	$1,295.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	6	$259.00	$1,554.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1.5	$259.00	$388.50	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	CRE	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	7.5	$259.00	$1,942.50	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	4	$259.00	$1,036.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	3	$259.00	$777.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	7	$259.00	$1,813.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	6	$259.00	$1,554.00	REG	12/4/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	4	$259.00	$1,036.00	REG	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1.5	$259.00	$388.50	REG	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	30	$259.00	$7,770.00	REG	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	4	$259.00	$1,036.00	REG	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	5	$259.00	$1,295.00	TCE	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	2	$259.00	$518.00	REG	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	-5	$259.00	($1,295.00)	TCE	12/18/2010
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	42	$259.00	$10,878.00	REG	1/15/2011
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	26	$259.00	$6,734.00	REG	1/29/2011
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	34	$259.00	$8,806.00	REG	2/12/2011
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	2/26/2011
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	29	$259.00	$7,511.00	REG	2/26/2011
05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	1	$259.00	$259.00	REG	2/26/2011

05000305	MD9408	KEWAUNEE - Kewaunee Power Station License Renewal - Safety R	6	$259.00	$1,554.00	REG	3/12/2011
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	2	$259.00	$518.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	6	$259.00	$1,554.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	2.5	$259.00	$647.50	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	4.5	$259.00	$1,165.50	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	2	$259.00	$518.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	52	$259.00	$13,468.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	1.75	$259.00	$453.25	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	5	$259.00	$1,295.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	2.5	$259.00	$647.50	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	2	$259.00	$518.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	2	$259.00	$518.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	6.5	$259.00	$1,683.50	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	1.5	$259.00	$388.50	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	3	$259.00	$777.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	6	$259.00	$1,554.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	3.5	$259.00	$906.50	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	5	$259.00	$1,295.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	0.75	$259.00	$194.25	CRE	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	1.5	$259.00	$388.50	OVT	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	5	$259.00	$1,295.00	REG	10/9/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	43.5	$259.00	$11,266.50	REG	10/23/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	1	$259.00	$259.00	REG	11/6/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	3	$259.00	$777.00	REG	11/6/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	39.5	$259.00	$10,230.50	REG	11/6/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	5	$259.00	$1,295.00	REG	11/20/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	1.25	$259.00	$323.75	REG	11/20/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	1.5	$259.00	$388.50	REG	11/20/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	62	$259.00	$16,058.00	REG	11/20/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	1	$259.00	$259.00	REG	11/20/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	1.5	$259.00	$388.50	REG	11/20/2010

05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	45.5	$259.00	$11,784.50	REG	12/4/2010
05000331	MD9769	DUANE ARNOLD - License Renewal Application - Safety Review	62.5	$259.00	$16,187.50	REG	12/18/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	1	$259.00	$259.00	REG	10/9/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	1	$259.00	$259.00	REG	10/9/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	1	$259.00	$259.00	REG	10/9/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	64.5	$259.00	$16,705.50	REG	10/9/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	1	$259.00	$259.00	REG	10/9/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	64.5	$259.00	$16,705.50	REG	10/9/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	3.25	$259.00	$841.75	REG	10/23/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	1.5	$259.00	$388.50	OVT	10/23/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	2.5	$259.00	$647.50	REG	10/23/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	3.25	$259.00	$841.75	REG	10/23/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	1.5	$259.00	$388.50	OVT	10/23/2010
05000331	MD9770	DUANE ARNOLD - License Renewal Application - Environmental R	2.5	$259.00	$647.50	REG	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	16.5	$259.00	$4,273.50	REG	10/9/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	OVT	10/9/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	10/9/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	7.5	$259.00	$1,942.50	REG	10/9/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	11.5	$259.00	$2,978.50	REG	10/9/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	10/9/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	10/9/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CTE	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	13.75	$259.00	$3,561.25	REG	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	OVT	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	10/23/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	10/23/2010

05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CTE	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	19.5	$259.00	$5,050.50	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	OVT	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	CRE	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	4	$259.00	$1,036.00	OVT	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	4.5	$259.00	$1,165.50	REG	11/6/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	-1	$259.00	($259.00)	CTE	11/20/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	CTE	11/20/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	17.5	$259.00	$4,532.50	REG	11/20/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.75	$259.00	$453.25	REG	11/20/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/20/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	11/20/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	REG	11/20/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/20/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	CTE	12/4/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	14.5	$259.00	$3,755.50	REG	12/4/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/4/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	12/4/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/4/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	5.5	$259.00	$1,424.50	REG	12/4/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/4/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	12/4/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	12/4/2010

05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	5	$259.00	$1,295.00	CTE	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	17	$259.00	$4,403.00	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	4.25	$259.00	$1,100.75	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	6.5	$259.00	$1,683.50	REG	12/18/2010
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	13	$259.00	$3,367.00	REG	1/1/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	4	$259.00	$1,036.00	REG	1/1/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	HRS	1/1/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.75	$259.00	$453.25	REG	1/1/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	1/15/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	16.75	$259.00	$4,338.25	REG	1/15/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	4.5	$259.00	$1,165.50	REG	1/15/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	1/15/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	1/29/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	13.5	$259.00	$3,496.50	REG	1/29/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	1/29/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	1/29/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	CRE	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	15	$259.00	$3,885.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	3.25	$259.00	$841.75	REG	2/12/2011

05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	6	$259.00	$1,554.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	2.75	$259.00	$712.25	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	5	$259.00	$1,295.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	7	$259.00	$1,813.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	6.75	$259.00	$1,748.25	REG	2/26/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	10	$259.00	$2,590.00	REG	3/12/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	20.5	$259.00	$5,309.50	REG	3/26/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	3/26/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	3/26/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	3/26/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	14	$259.00	$3,626.00	REG	4/9/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	REG	4/9/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	4/23/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	10	$259.00	$2,590.00	REG	4/23/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	4/23/2011
05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	4/23/2011

05000528	ME0254	PALO VERDE 1 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	5/21/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	-1	$259.00	($259.00)	CTE	9/25/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	9/25/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	10/9/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	6	$259.00	$1,554.00	REG	10/9/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	10/23/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	2.5	$259.00	$647.50	REG	10/23/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	10/23/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	10.5	$259.00	$2,719.50	REG	10/23/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	2.75	$259.00	$712.25	REG	11/6/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	2	$259.00	$518.00	CRE	11/6/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	9	$259.00	$2,331.00	REG	11/6/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	0.5	$259.00	$129.50	CRE	11/20/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1.5	$259.00	$388.50	REG	11/20/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	0.25	$259.00	$64.75	REG	11/20/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	11/20/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	REG	11/20/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	4	$259.00	$1,036.00	HRS	11/20/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	11/20/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	11	$259.00	$2,849.00	REG	11/20/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	0.75	$259.00	$194.25	REG	12/4/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	0.5	$259.00	$129.50	REG	12/4/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	0.75	$259.00	$194.25	REG	12/4/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	HRS	12/4/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	3	$259.00	$777.00	CTE	12/4/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	14	$259.00	$3,626.00	REG	12/4/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	2	$259.00	$518.00	CTE	12/18/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	14	$259.00	$3,626.00	REG	12/18/2010
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	REG	1/1/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	1/1/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	6	$259.00	$1,554.00	REG	1/1/2011

05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	0.25	$259.00	$64.75	REG	1/15/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	1/15/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	12	$259.00	$3,108.00	REG	1/15/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	7	$259.00	$1,813.00	REG	1/29/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	3	$259.00	$777.00	REG	2/12/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	6	$259.00	$1,554.00	REG	2/26/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	3/12/2011
05000528	ME0261	PALO VERDE 1 - License Renewal - Environmental Review	4	$259.00	$1,036.00	REG	3/26/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	19.5	$259.00	$5,050.50	REG	10/9/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	OVT	10/9/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	10/9/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	7.25	$259.00	$1,877.75	REG	10/9/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	10/9/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	10/9/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CTE	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	14.25	$259.00	$3,690.75	REG	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	OVT	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	10/23/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	CTE	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	20.25	$259.00	$5,244.75	REG	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	OVT	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	11/6/2010

05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	4	$259.00	$1,036.00	OVT	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	4.5	$259.00	$1,165.50	REG	11/6/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	-1	$259.00	($259.00)	CTE	11/20/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	CTE	11/20/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	18.75	$259.00	$4,856.25	REG	11/20/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.75	$259.00	$453.25	REG	11/20/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/20/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	REG	11/20/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/20/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	CTE	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	15.5	$259.00	$4,014.50	REG	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	5.5	$259.00	$1,424.50	REG	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	12/4/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	4.5	$259.00	$1,165.50	CTE	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	18.75	$259.00	$4,856.25	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	4.25	$259.00	$1,100.75	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	12/18/2010

05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	6.5	$259.00	$1,683.50	REG	12/18/2010
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	14.5	$259.00	$3,755.50	REG	1/1/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	4	$259.00	$1,036.00	REG	1/1/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.75	$259.00	$453.25	REG	1/1/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	1/15/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	17.25	$259.00	$4,467.75	REG	1/15/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	4.5	$259.00	$1,165.50	REG	1/15/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	1/15/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	1/29/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	14	$259.00	$3,626.00	REG	1/29/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	1/29/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	1/29/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	1/29/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	CRE	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	17.5	$259.00	$4,532.50	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	3.25	$259.00	$841.75	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011

05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	2.75	$259.00	$712.25	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	5	$259.00	$1,295.00	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	7.5	$259.00	$1,942.50	REG	2/26/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	10.5	$259.00	$2,719.50	REG	3/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	3/12/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	21	$259.00	$5,439.00	REG	3/26/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	3/26/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	3/26/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	3/26/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	14	$259.00	$3,626.00	REG	4/9/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	REG	4/9/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	CRE	4/23/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	11.75	$259.00	$3,043.25	REG	4/23/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	4/23/2011
05000529	ME0255	PALO VERDE 2 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	5/21/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	-1	$259.00	($259.00)	CTE	9/25/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	9/25/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	10/9/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	6	$259.00	$1,554.00	REG	10/9/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	10/23/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2.5	$259.00	$647.50	REG	10/23/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	10/23/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	10.5	$259.00	$2,719.50	REG	10/23/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2.75	$259.00	$712.25	REG	11/6/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	11/6/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	9	$259.00	$2,331.00	REG	11/6/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	0.5	$259.00	$129.50	CRE	11/20/2010

05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1.5	$259.00	$388.50	REG	11/20/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	0.25	$259.00	$64.75	REG	11/20/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	11/20/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	REG	11/20/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2	$259.00	$518.00	HRS	11/20/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	11/20/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	14	$259.00	$3,626.00	REG	11/20/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	0.75	$259.00	$194.25	REG	12/4/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	0.5	$259.00	$129.50	REG	12/4/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	0.75	$259.00	$194.25	REG	12/4/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	HRS	12/4/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2	$259.00	$518.00	CTE	12/4/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	16	$259.00	$4,144.00	REG	12/4/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	12/18/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	12	$259.00	$3,108.00	REG	12/18/2010
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	REG	1/1/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2.5	$259.00	$647.50	CTE	1/1/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	5	$259.00	$1,295.00	REG	1/1/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	0.25	$259.00	$64.75	REG	1/15/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	1/15/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	11	$259.00	$2,849.00	REG	1/15/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	7	$259.00	$1,813.00	REG	1/29/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	2/12/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	5	$259.00	$1,295.00	REG	2/26/2011
05000529	ME0262	PALO VERDE 2 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	3/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	18	$259.00	$4,662.00	REG	10/9/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	OVT	10/9/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	10/9/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	7.5	$259.00	$1,942.50	REG	10/9/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	10/9/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	10/9/2010

05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CTE	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	14.75	$259.00	$3,820.25	REG	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	OVT	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	10/23/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CTE	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	20.5	$259.00	$5,309.50	REG	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	OVT	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	4	$259.00	$1,036.00	OVT	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	4.5	$259.00	$1,165.50	REG	11/6/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	-1	$259.00	($259.00)	CTE	11/20/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	CTE	11/20/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	19	$259.00	$4,921.00	REG	11/20/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.75	$259.00	$453.25	REG	11/20/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/20/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/20/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	11/20/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	CTE	12/4/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	16	$259.00	$4,144.00	REG	12/4/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/4/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	12/4/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	12/4/2010

05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	5.5	$259.00	$1,424.50	REG	12/4/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/4/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	12/4/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	3	$259.00	$777.00	REG	12/4/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	5	$259.00	$1,295.00	CTE	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	18.5	$259.00	$4,791.50	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	4.25	$259.00	$1,100.75	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	6.5	$259.00	$1,683.50	REG	12/18/2010
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	15	$259.00	$3,885.00	REG	1/1/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	4	$259.00	$1,036.00	REG	1/1/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.75	$259.00	$453.25	REG	1/1/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	1/15/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	18.25	$259.00	$4,726.75	REG	1/15/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	CRE	1/15/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	3.5	$259.00	$906.50	REG	1/15/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	1/15/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	CRE	1/29/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	14.5	$259.00	$3,755.50	REG	1/29/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	1/29/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	1/29/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	CRE	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	16	$259.00	$4,144.00	REG	2/12/2011

05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	3.25	$259.00	$841.75	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.5	$259.00	$388.50	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2.75	$259.00	$712.25	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1.25	$259.00	$323.75	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.5	$259.00	$129.50	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	5	$259.00	$1,295.00	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	REG	2/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	8	$259.00	$2,072.00	REG	2/26/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	10	$259.00	$2,590.00	REG	3/12/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	2	$259.00	$518.00	CRE	3/26/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	17	$259.00	$4,403.00	REG	3/26/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	3/26/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	CRE	3/26/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	REG	3/26/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	14	$259.00	$3,626.00	REG	4/9/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.75	$259.00	$194.25	REG	4/9/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	1	$259.00	$259.00	CRE	4/23/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	12.25	$259.00	$3,172.75	REG	4/23/2011
05000530	ME0256	PALO VERDE 3 - Palo Verde License Renewal SAFETY Review	0.25	$259.00	$64.75	REG	4/23/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	-1	$259.00	($259.00)	CTE	9/25/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	9/25/2010

05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	10/9/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	6	$259.00	$1,554.00	REG	10/9/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	10/23/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	2.5	$259.00	$647.50	REG	10/23/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	10.5	$259.00	$2,719.50	REG	10/23/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	2.75	$259.00	$712.25	REG	11/6/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	11/6/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	9	$259.00	$2,331.00	REG	11/6/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	0.5	$259.00	$129.50	CRE	11/20/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1.5	$259.00	$388.50	REG	11/20/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	0.25	$259.00	$64.75	REG	11/20/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	11/20/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1	$259.00	$259.00	REG	11/20/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1	$259.00	$259.00	CRE	11/20/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	9	$259.00	$2,331.00	REG	11/20/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	0.75	$259.00	$194.25	REG	12/4/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	0.5	$259.00	$129.50	REG	12/4/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	0.75	$259.00	$194.25	REG	12/4/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	12/4/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	18.5	$259.00	$4,791.50	REG	12/4/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	3	$259.00	$777.00	CTE	12/18/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	10	$259.00	$2,590.00	REG	12/18/2010
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1	$259.00	$259.00	REG	1/1/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	2.5	$259.00	$647.50	CTE	1/1/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	7	$259.00	$1,813.00	REG	1/1/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	0.25	$259.00	$64.75	REG	1/15/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	1	$259.00	$259.00	CTE	1/15/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	11	$259.00	$2,849.00	REG	1/15/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	7	$259.00	$1,813.00	REG	1/29/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	2	$259.00	$518.00	REG	2/12/2011
05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	4	$259.00	$1,036.00	REG	2/26/2011

05000530	ME0263	PALO VERDE 3 - License Renewal - Environmental Review	5	$259.00	$1,295.00	REG	5/21/2011

Senator CARPER. Well, thanks to both of you for your testimonies. Madam Chairman, Chairman Boxer?

Senator BOXER. Thank you so much, Mr. Chairman.

First, I want to thank both of you because you have been available to those of us on both sides of the aisle here to answer our questions. I appreciate that so much.

I want to put in the record something I got from USGS that shows how many earthquakes, because Senator Barrasso said look, this earthquake happened over in Japan, it did not happen here. Obviously. But, how many earthquakes, I would say to my friend, have we had in America that they have managed to document? It is 157 earthquakes all over this great Nation and in every part of this country. So, I want to put that into the record. These are over 6.0.

Senator CARPER. Without objection.

[The referenced material was not received at time of print.]

Senator BOXER. One hundred fifty-seven earthquakes over 6.0.

I also ask for the documentation on tsunami. What I do have is the areas where the highest risks are. That would be Alaska, Hawaii, very high, West Coast, high, Puerto Rico, Virgin Islands, high, the others low to very low. So, I am going to put those, both, in the record.

Senator CARPER. Without objection.

[The referenced material was not received at time of print.]

Senator BOXER. Thank you.

Mr. Jaczko, I know you have been very involved, Mr. Chairman, in helping the people in Japan. We, every one of us on both sides, are grateful because I think America is at its best when we are there for our friends and we certainly are.

Well, right now you described, you said that it is a static situation, not a stable situation. So let me ask you, what is the best thing that could happen right now with those reactors, and what is the worst thing that could happen?

Mr. JACZKO. Well, I am reluctant to speculate on what the worst thing is that could happen because, again, there is always things that one could postulate that are possible although very unlikely.

Senator BOXER. Well, I think it is important. What is the worst thing could happen? I think we all believe you have to look at this. What is the best thing that could happen, what is the worst? Now, we all hope for the best, but what is the worst thing that could happen?

Mr. JACZKO. Well, right now what our focus is on, it focuses on ensuring that we can continue to provide, or the Japanese can continue to provide, cooling to the reactor and water into the spent fuel pools. That is a process that is working right now.

As I said, it is not necessarily the most stable configuration. So, for instance, there was an aftershock, I believe it was last night, and as a result they had to remove some individuals from the site. They lost some of the offsite power. So, some of the pumps in the systems that were working were not able to continue to work for about 50 minutes.

So what we want to see is to move into a situation in which that kind of situation would be dealt with in a more predictable manner and with less possibility of the loss of the cooling systems. So,

every day that the reactors continue to have cooling and continue to receive water and other types of cooling, the likelihood of a more significant release continues to go down.

Senator BOXER. So the cooling, obviously here, is the key and there is nothing else that could happen in your mind, that could go wrong?

Mr. JACZKO. That really is——

Senator BOXER. If there is cooling going on.

Mr. JACZKO. That is correct. The primary focus is to maintain cooling. If you lose the ability to cool the reactor cores, then you have the possibility of a further degradation in the fuel which could lead to possibly a greater release than what is going on now.

Senator BOXER. Are the leaks still going on into the ocean?

Mr. JACZKO. We believe right now that some of them have been stopped. But there is the possibility that there are other leaks and other material being released.

Senator BOXER. How radioactive is that water?

Mr. JACZKO. Right now, the Japanese are surveying the water that is going out and being, into the ocean, and they are doing surveys. I have not seen the latest figures about that level of contamination.

Senator BOXER. Would you let me know, as soon as you know, what contamination is flowing into that ocean?

Mr. JACZKO. Absolutely. We can provide you with detailed information about that.

Senator BOXER. OK. Administrator Jackson, your Scientific Advisory Board found that EPA's fixed radiation monitors had a potential sampling bias against the collection of larger particles which could include hot particles. Have you taken any actions to address the SAB's concerns?

Ms. JACKSON. Yes, Chairman, we have. That report was done several years ago, and since that report was done, EPA responded to the request from the SAB to do an additional study on the efficacy of our monitoring equipment in capturing all sizes of particles. The really problematic ones are the smaller ones, and what we found through that study is that our fixed monitors can collect the very smallest particles reasonably effectively.

Now, I do want to say, having newer monitors, there are newer monitors out there that get even greater capture, but if you look at the purpose of the system, which is to give broad levels of background for events that are known, the current system is certainly effective.

Senator BOXER. Well, my time has expired. I just want to say to Chairman Jaczko, I have these two nuclear plants that were built a very long time ago and now apparently PG&E and Southern California Edison have withdrawn their re-licensing processing now.

I guess what I want to say, and you do not need to answer this, but I am going to be talking to you about this, for me. Again, nobody has to respond to this. It is just, I am thinking common sense. You have now 7.4 million people that live within a 50-mile radius of one of my plants, and you have got about a half a million that live within a 50-mile radius of the other. Both of these sit on or near earthquake faults.

So, all I am going to say to you and the other Commissioners when we do get a chance to speak with the others, and I think we will, is that to my mind, I think the Commission, when you are relicensing, have to look at this as if it is a new opportunity. Would you license a plant that came to you now with that circumstance, right by or near earthquake faults, studies that say there will be more frequent earthquakes, both involved near tsunamis, or the one is more vulnerable to a potential tsunami?

I just hope that you, and again, I do not, I am not asking you to answer this because you have got to think a long, hard time about this. But to me, as someone whose highest responsibility is the health and safety of all of these millions of people, if you would say no to a new operator, I hope you will think about how it makes any sense to just keep on going unless there is major reinforcements and hardening of some of these buildings and the rest.

So, I just leave you with that thought. Those are my concerns.

Senator CARPER. Thank you, Madam Chair.

Senator Barrasso.

Senator BARRASSO. Thank you very much Mr. Chairman.

I appreciate both of you being here today and Chairman Jaczko, I appreciate the time you have been available to me by phone, visiting in the office and addressing some of these various concerns that are critical and questions that need to be answered. So, I appreciate that.

I noted that last week the California Coastal Commission concluded that "a nuclear emergency such as is occurring in Japan is extremely unlikely at the State's two operating nuclear power plants." Would you agree with that California Coastal Commission's conclusion?

Mr. JACZKO. We think it is very unlikely to see a large earthquake and a tsunami.

Senator BARRASSO. They went on to say that the combination of a strong ground motion and massive tsunami that occurred in Japan cannot be generated by the kind of faults that exist close to the, in the vicinity of, the two plants, nuclear plants in California. Do you agree with their assessment there?

Mr. JACZKO. It is my understanding that the type of fault in Japan was a different type of fault that does not exist off the coast of California.

Senator BARRASSO. OK. Thank you.

Administrator Jackson, I mentioned in my opening statement that an April 6th Inside EPA story was entitled Activists Step Up Efforts to Strengthen Oversight on Uranium Recovery and I mentioned how those activist groups are using the nuclear emergency in Japan as a reason to place additional red tape on approving uranium mines domestically here in the United State.

Do you see a connection between the Japanese nuclear emergency and the uranium mining in the United States?

Ms. JACKSON. No direct kind of connection, Senator.

Mr. BARRASSO. Thank you.

Mr. Chairman, when we last had an opportunity to visit in my office, I discussed my concerns about the delay in approving permits for uranium mines in Wyoming. You had mentioned that the delay was because you were still working things out with the EPA

and you thought that we had finally achieved the resolution that was necessary. You thought you now had a template to move forward with approving additional uranium mines.

Do you believe you have worked out any of those issues now with the EPA in terms of uranium mining permitting so that now we can proceed with a faster permitting process?

Mr. JACZKO. Well, I believe we have worked out, come to a good understanding of, how we deal with our environmental impact statements. We are, however, continuing to work through issues that are our responsibilities under, to consult with tribal governments as part of other requirements, and that is the last activity that we are working on as we finalize our efforts on these uranium recovery applications. That is not necessarily an issue involving the EPA.

Senator BARRASSO. So then, Administrator Jackson, you are comfortable with that statement? Do you commit to work with any issues that we need to resolve between the NRC and EPA in a timely manner?

Ms. JACKSON. I remain committed to working to resolve any issues we might have with respect to Wyoming. I do not believe the article in question actually referenced any sites in Wyoming but——

Senator BARRASSO. Just the overall approval. Thank you.

I wanted to get back, Mr. Chairman, with the NRC's response in Japan and I know you have about 250 NRC staff working on a rotating basis, full functioning, and working hard on this.

Given the commitment of the NRC's resources to Japan, if we had any sort of an emergency in the United States, would you be able to redeploy in a way that we would not put ourselves at a disadvantage?

Mr. JACZKO. Absolutely. As this event has gone forward, we have looked at our staffing levels and actually we have transitioned our approach now to the staff in our Operations Center to have a smaller team there who can respond quickly but then would reach back to our larger agency to get information requests as they need. So, it is, it allows us to respond in the same timely way, but to do it in a way that allows us to continue with our other important responsibilities.

Senator BARRASSO. Finally, I think Senator Inhofe raised the issue about your invoking of emergency powers as a result of this. Could you describe to me how that, how you interacted with your fellow Commissioners during this nuclear incident? Have you relied on them for some of their expertise in making decisions as well?

Mr. JACZKO. Sir, there is not so much, I think, invoking of, through the emergency authorities, that is an authority that the Chairman has. But most of the activities that I have engaged in as part of this response have been in my normal supervisory authorities over the staff at the agency and my communication responsibilities.

I would note, and we could provide this information for the record, but immediately after we entered our monitoring mode on March 11th, an email was sent out indicating that we had done that. Within the first 24 hours, we had had four briefings of the assistants to each of the Commissioners. Over the last several

weeks, I have done at least 26 briefings to my colleagues on the Commission, including one public Commission meeting that was held about a week after the event started.

There have been about, overall, 60 briefings to staff of the Commission assistants and about 80 products have been provided to the Commission indicating the status of our response efforts and the activities that are ongoing.

So, I think there has been very good communication with the Commission about what we are doing and how we are dealing with the response.

Senator BARRASSO. Thank you, Mr. Chairman, and thank you, Mr. Chairman.

Senator BOXER. Mr. Chairman, as a point of personal privilege, since the Senator mentioned the plants in my State, I appreciate his concern, let me put into the record two letters by the California Coastal Commission saying that before there is a re-licensing they want new earthquake studies. That is No. 1.

No. 2, what my friend said about the fact that it would be unlikely we would have such an accident in California, absolutely very unlikely. It is unlikely. That is exactly what they said about Japan. To the word. So, we have got to move beyond talk and get to the serious question of what do we do to everything in our power to make it safe.

Senator CARPER. Is there objection to the request? Hearing none, so ordered.

Alright. I would ask a question, my first question, of Chairman Jaczko if I could.

You have, I think, heard me say before that I like to quote Albert Einstein. Albert Einstein once said, in adversity lies opportunity. When Chairman Boxer asked the question, what is the worst that can happen, following up on this tragedy, one of the worst things in my mind that could happen is that we would not learn anything from it. That is one of the worst things that I think could happen.

We have had not a whole lot of time, but some time has passed since this sad chapter began unfolding. Talk to us about some of the lessons that we have learned in the past weeks and maybe that would suggest that what we are doing is appropriate, good, smart, safe, and maybe some things that we have learned that would suggest that we could do better.

Mr. JACZKO. Well, I think one of the issues that we have really come to recognize is that the station blackout event is a very serious event. I think the good aspect about it is that we have always known that that is a very serious type of event. It is a situation in which you lose all of the ability to have electrical power to the site.

Fundamentally, right now, we think that is really the primary cause of the problem. What we are really working to establish is why exactly they got into this situation where the station blacked out and what were really the lead factors affecting that.

I think we have seen the importance of emergency planning and having the ability to respond and provide emergency guidance to the population around a nuclear power plant and we have seen that that carries on its intended function, which is it moves people

out of an area in which they can be exposed to harmful levels of radiation.

So, if we just look at the kinds of things that we have right now, those are, I think, some of the big lessons that we have learned.

We have this 90-day task force that is going to be looking at some very specific things in the next 2 months, 2½ months, and I do not want to get too far in front of the work that they are doing because I think we have put together some really talented people at the agency who are going to do a good, thorough look at this, and I do not want them to start giving the answers that they hear me say at a hearing.

So, I think at this point, I think that if there is any one other lesson I could say that we have learned is that after Three Mile Island we learned that it was very important to go about this kind of review in a systematic and methodical way with the appropriate sense of urgency and the need to move expeditiously.

I think that is what we are doing, and that will be the continued focus that I have with the agency because we want to make sure that we put in place the kind of changes that make safety better, and not the kind of changes that in the end wind up undermining safety. So, that is why it is so important that we do it systematically and methodically.

Senator CARPER. OK. Thank you.

I think it was Senator Alexander who said earlier, mentioned that if you took all of the spent fuel in this country and you stacked it up on a football field it would be about 20 or 25 feet high. To some that might sound like a lot, to others not so much.

We have a Blue Ribbon Commission that has been working at the direction of the President to consider what we should be doing with that spent fuel. Give us some idea when we expect to hear back from that Commission? I think what they find or recommend to us might actually tie in closely with what they are facing in Japan.

Mr. JACZKO. Well, I think that we are anticipating, I think an interim report from the commission sometime this summer and then with a final report sometime later, by the end of the year. When we look at these issues of spent fuel, this is something, again, the agency, the Commission, has put a strong focus on, on making sure that spent fuel can be stored safely and securely.

The structures, whether in pools or whether in dry cask storage, are very robust structures that are designed to deal with a large earthquake, that are designed to deal with natural disasters and significant security-related events. So, we have kind of a multi-tiered system of protection that exists at all of our plants and that includes these unlikely events like these natural disasters and then a layer of protection on that to look at, if that kind of unlikely event happens and all the safety systems do not function well, we have additional procedures in place to address that kind of situation and ultimately equipment that is put in the plants to kind of do that last line of defense in terms of providing cooling to the pools or, ultimately, to the reactor core.

Senator CARPER. All right. Thanks.

We have 104 nuclear power plants. I said earlier that I thought the first one was built about 50 years ago. I think it was built 42

years ago, not 50 years ago. But there are a number of plants that are up for re-licensure and some have already been relicensed. We have a number of applications before the Nuclear Regulatory Commission to build new plants with new technology, new design.

How do the events from Japan, the tragic events from Japan, how do they figure into the re-licensing process for the, oh, I do not know, the dozen or so that are before the Commission today, or will soon be, for re-licensure? How do the lessons learned figure into the approval process, the review process, for the new design?

Mr. JACZKO. Fundamentally, we think about these issues not necessarily for a plant that is 41 years old or 42 years old or 1-year old or 10 years old. We think about this in terms of the plants that are there now and the safety of the existing fleet of reactors.

So, the reviews that we are doing, the first review is really to identify any issues that we would need to address immediately. So, we would not wait for re-licensing or any other type of activity related to license extension to make changes to the plants. So, fundamentally, the kinds of changes we are looking at or possibly would need to make would be applicable to all of the plants in the country, whether they are getting their license extended or not.

In addition, we have a very robust process of reviewing the license applications and the renewed license applications that gives the public an opportunity for input, that gives them an opportunity to raise issues. We think those procedures and processes are robust enough to deal with the new issues that come about from the Japan situation.

But fundamentally, some of these changes may take time to implement and in the interim we will evaluate every situation as it comes up. If there is something we need to do to slow down, we will slow down. If we can move forward appropriately, we will move forward appropriately. But I think we will know, we will be in a much better position, after this 90-day review is done to see if there are any real immediate actions that need to be taken.

Senator CARPER. All right. Thank you very much.

Senator Alexander, you are next.

Senator ALEXANDER. Thanks, Mr. Chairman. Thank you both for your testimony.

Ms. Jackson, as we look at electricity produced in the United States, we use about, I think, about 25 percent of all electricity in the world for our country. I believe about 44 percent is produced by coal, 20 percent by nuclear power, 23 percent by natural gas, 7 percent by hydroelectric power, we usually think of those as base load powered, base load electricity, electricity that is reliable over long periods of time, about 3 percent is wind, much less than 1 percent is solar.

What would be the effect on our country's ability to comply with EPA's clean air standards if we did not, if we replaced nuclear power with either coal plants or natural gas plants?

Ms. JACKSON. Well, nuclear powerplant emissions are low to zero for the pollutants that EPA regulates so there would be, presumably, an increase in pollution. Even with the best pollution control technology, fossil fuel plants are going to have higher emissions, including greenhouse gas pollution which nuclear power does not have.

Senator ALEXANDER. But probably half our coal plants do not have that——

Ms. JACKSON. About half of our coal plants in the country are not controlled for air toxics like mercury, arsenic, cadmium, acid gases. In fact, we just recently proposed a rule to address that issue. When it comes to carbon pollution, of course it is quite different.

Senator ALEXANDER. We have a lot of discussion, Senator Carper and I have worked a long time on the mercury issue. But the point is, to keep it in perspective, nuclear power provides about 20 percent of our electricity but about 70 percent of our emissions-free electricity, which is important as we think about clean air and climate change.

Mr. Jaczko, how, for how long can the 104 reactors we have safely store spent fuel onsite?

Mr. JACZKO. Well, the Commission recently restated what we refer to as our Waste Confidence Finding and that said that we believe at least about 40 years beyond the expected lifetime, I am sorry, about 60 years beyond the expected lifetime of a plant we can safely store spent fuel. That gets you generally to about 100 years of time that you could store this fuel safely and securely.

We actually, as part of this recent decision, asked the staff to go back and really look longer than that and see are there, if there are any issues right now that would make it challenging to store that fuel for 200 or 300 years or a longer timeframe. So we expect to begin looking at that in the next year and have an answer in probably a couple of years about that question.

But right now, we do not see any major issues that would present a significant challenge for that longer term storage of the fuel.

Senator ALEXANDER. For purposes of understanding what we are trying to store, does it sound about right to say, as I did earlier, that all of the used nuclear fuel that has been produced in the last 35 years would fill a football field then about 20 feet high?

Mr. JACZKO. I have heard that statistic many times. I have actually never sat down and calculated it and made sure that it is right. But it sounds reasonable as an approximation.

Senator ALEXANDER. Now, the Nuclear Waste Policy Act of 1982 established a fund into which ratepayers, those of us who pay our electric bills, have paid about $30 billion to build a final resting place for used nuclear fuel. A second step of the Obama administration's plan for used nuclear fuel, which I heartily endorse, is not just to store it safely onsite but then to do advanced research to find a better way to reuse nuclear fuel which will greatly reduce the mass of it and permit it to be used over and over again.

But in the end, are we not still going to have some stuff left that needs to be stored over a long period of time? We still have this football field full of nuclear fuel spread around at 104 sites. Where are we going to put that? I mean, we have got $23 billion sitting in a fund we have collected from electric bills. Should we not be using it to find a way to put that since Yucca Mountain does not seem to be going anywhere?

Mr. JACZKO. Well, from the NRC's perspective, our job is to make sure that that fuel, regardless of how it is being used, or stored, or reprocessed, or whatever the approach may be, is done safely

and securely. So that is our No. 1 focus. We, of course, work with the industry, we communicate with the rest of the Federal Government as approaches are being developed to possibly deal with that in the long term.

The Commission staff have been briefing the Blue Ribbon Commission and providing them with information about our approach to safety and security as they work to formulate their opinions about ultimately what could be done with this fuel in the long term.

Senator ALEXANDER. Thank you.

Senator CARPER. You are welcome. Thank you.

Senator Lautenberg.

Senator LAUTENBERG. Thanks to each of you for the knowledge and energy that you bring and I use that term directly. Obviously, we feel pretty comfortable. However, the long history that Japan had with nuclear power and established nuclear regulatory system looked like Japanese installations were absolutely safe. But clearly, they were not.

Now, what assurances do we have that our nuclear plants are as prepared as we could get for our worse case scenario?

Mr. JACZKO. Well that, Senator, I would say that there are really three or four levels of protection that we have at the plants. First and foremost, the plants are designed for these very unlikely events based on what we think the maximum historical natural phenomenon is, so, like a hurricane or an earthquake or a tsunami. So, we start with that and we design the plants to be able to deal with that kind of a situation.

Then, on top of that, all of the plants have a set of procedures and guidelines for what you would do in the situation that all of those systems that you built in to deal with the situation fail. Those are what we refer to as Severe Accident Management Guidelines. Those give you the procedures, the approaches to dealing with these very severe events if they were ever to occur. For that to occur, a lot of safety systems that are redundant and have a lot of backups would have to fail and not work properly.

Even beyond that, if all of those systems were to fail, we have required all of the plants in this country to have an additional set of procedures to deal with very extreme damage conditions at the plant, much like you are seeing in Japan. We required all of the utilities to put equipment in place to respond and ultimately to be able to supply cooling to the reactors and cooling to the spent fuel pools.

So, we have a robust system to really ensure that we can minimize or mitigate any potential releases to the public.

Senator LAUTENBERG. What we see is rather frightening in scope because almost no matter what you do, you cannot guaranty that there will be zero risk in the production of nuclear energy and nuclear facilities. So, we keep on developing new policies as a result of, unfortunately, some terrible experience, and we have, we hope that we have no further terrible incidences.

Ms. Jackson, you know New Jersey is home to four nuclear reactors, including the oldest nuclear plant in the country, the Oyster Creek Nuclear Generating Station, 2 years older than the damaged Japanese plant.

Now, with your long experience of protecting health and the environment in New Jersey, how confident can we be that the nuclear plants in our State are sufficiently safe to protect all of our people at all times?

Ms. JACKSON. Well, I would defer to the Chairman on the safety issue, except to note what was recently announced, which is that that plant is voluntarily, the owners of that plant have agreed to shut it down. I think it is part of the solution with respect to that particular facility.

Senator LAUTENBERG. Well, we are, it is little reassurance, honestly, because if they said OK, we will even cut short the period that the license covers, which means that there is an element to worry out there, and they cannot be——

Mr. JACZKO. Senator, if I could just comment? My understanding of the, part of the reason for not extending the plant operation was motivated by the cost and some of the economic factors. Certainly, from the NRC's perspective, we did not see a safety reason for the plant to not operate beyond, I think, 2019 when the plant will operate.

Again, when we do our license renewal, what we do is we add on additional requirements to the licensees for them to monitor the plant to make sure that as the plant equipment and the systems that are important for safety get older, that they have the way to monitor and make sure that those, that aging of those equipment does not have any adverse impact on safety.

So, in addition to the standards in the regular strong safety program that we have, we add on top of that these additional requirements to make sure that as the plants age they do it in a way that is protective of public health and safety.

Senator LAUTENBERG. Tom, I have one more question. One last question. The rest, beyond that, I will send to you for the record and look for a response.

The NRC requires evacuation plans only within 10 miles of a plant. But the American Government has warned Americans in Japan to stay at least 50 miles away from the damaged reactor. They only confirmed that when we turned our ships around about 50 or 60 miles out, I am not really sure.

I guess, when all else fails, we have to be absolutely certain that a way to evacuate these areas is foolproof in terms of its ability and its durability. Would it make sense to require evacuation plans in our country to address the same distance to U.S. facilities for new plants?

Mr. JACZKO. Well, that is something we are going to look at as part of the reviews that we are doing. The 10-mile evacuation zones that we currently have are designed to be the region in which you pre-stage and pre-prepare evacuations. If conditions were to warrant some additional option beyond that, those options, of course, could always be taken.

But I think, as we have seen in Japan, nuclear events tend to develop over a long period of time. This is 3 weeks into this event and we have had the time and ability to make protective option recommendations and to update those and modify them as conditions at the plant change.

So that 10 miles is really based around the idea of what you need to have prepared right away so if you have an event that develops quickly, you can address that and have pre-staged and pre-prepared what to do. But there is always the possibility to go farther, if necessary, or to modify the plans to deal with the existing conditions and the exact conditions on the ground.

But I also want to stress that this is something we are going to take a look at as part of the reviews that we are doing to see if there are changes we should make to the requirements for emergency preparedness.

Senator LAUTENBERG. Thanks very much and thanks to each of you.

Senator CARPER. Thank you, Senator Lautenberg.

Senator Merkley.

Senator MERKLEY. Thank you, Mr. Chair, and thank you all for your testimony.

The first question I want to ask about, Mr. Jaczko, is, the venting system to release the hydrogen in the Japanese plants succeeded in getting the hydrogen outside of the core only to have it explode outside.

The United States went through, in the 1980s, a hardening of our vent systems on our Mark I reactors and I understand the Japanese plants also went through an upgrade. But what is our initial understanding of why the venting system did not succeed in disposing of the hydrogen such that it would not explode after it left the core? Is there a difference in the venting system between the Japanese plants and the U.S. plants that should give us confidence that we would not have a similar problem?

Mr. JACZKO. Well, at this point, it is not exactly clear what the source of the hydrogen was. Obviously, we saw hydrogen, or some fires, in the Unit 4 reactor. Well, that likely came from the spent fuel pools, the spent fuel pool in that building, because the reactor core there was not, did not have fuel in it.

So, at this point, we do not have definitive information about the source of the hydrogen. It is possible that it came from the spent fuel pools and not necessarily from the venting operation. That is something that we will look into as we get some more, really as we get past the more emergent crisis in Japan, we will get the detailed information about that effort.

But I would say that, really, the fundamental issue that we see here really is the station blackout event. In the United States, when we are talking about a station blackout event, we have a lot of protections in place to prevent that complete loss of electrical power to the site. We require each plant to have at least two diesel generators for each reactor. So, if there a multiple reactor site, they will have at least four diesel generators on the site. Those diesel generators have to have their fuel in an area that is protected so that it can be, it can supply the diesel generators in the event of some type of natural hazard.

Then, beyond that, we have something that we call our station blackout or coping requirements which requires the utilities to be able to deal with that loss of offsite power until they are able to restore the offsite power.

Senator MERKLEY. I am going to interrupt you because I only have a limited amount of time and actually you dodged the basic question which was, is our venting system different from the Japanese system?

Also, I think it is understood that a fair amount of hydrogen in 1 and 3 came from both the splitting of water molecules and from probably explosion of the zirconium clouding. So, in that situation, and understanding that scenario, why did the hydrogen explode after it was vented rather than be dispersed safely into the atmosphere?

If we have no insight, that is fine. But again, back to the core question, is our venting system different in some significant way?

Mr. JACZKO. At this point, we do not have the detailed information to know.

Senator MERKLEY. Let me go on to a second question then.

In at least one of the reactors, I believe it is vessel 2, that there was discussion of plugs in the bottom of the reactor vessel, the core, that were used for loading fuel in and the concern that that design left a vulnerability and that plugs that were inserted after fuel was put in melted at a lower temperature than the rest of the containment, the rest of the core containment vehicle, and could have been a flaw that would allow, if you will, fuel to escape.

Is that just specific to that one reactor or is that a common design? Has that been a discussed concern in the past? Do we have that design in the United States?

Mr. JACZKO. We can get you specific information on that design. But again, I would stress that right now the information about the condition of all of the reactors is very preliminary and very uncertain. You indicated the hydrogen explosion. Again, it is correct that that is a result of, usually of exposure of fuel. But that can, of course, occur both in the spent fuel pools as well as in the reactor core.

So again, the exact source of the hydrogen at this point is not clearly understood and it probably will be some time before we know definitively where that hydrogen came from, whether it was an interaction with the zirconium clouding in the spent fuel pool or the reactor core itself. That is where there is a bit of, some uncertainty right now.

Senator MERKLEY. Here again you did not answer my core question which is, these plugs that are apparently in the design of at least one of those reactors that are on the bottom side, are those, do we have a similar design and that is a concern in American nuclear power plants?

Mr. JACZKO. Again, as I said, we can get you that information. I do not have that off the top of my head right now. But again, I do not want to speculate necessarily that that was a contributing cause to any of the condition in Reactor 2 at this point.

Senator MERKLEY. OK. Another issue is really the containment vessel itself. In 1972, there was a report from the predecessor organization, the Atomic Energy Commission, that recommended the Mark I system be discontinued because of unacceptable safety risks, basically because of the smaller containment design and it was susceptible to explosion and rupture from a buildup in hydrogen, obviously something that seems like it was an interesting in-

sight given what we have now witnessed. Indeed, apparently the reason for this smaller and lighter container vehicle was simply the cost of the heavier and stronger containment vehicle.

There was later, in the 1980s, discussion. An NRC official noted that Mark I reactors had a 90 percent probability of bursting if fuel rods overheat and melt.

Have we, but there has been some changes to containment vehicles. Have we, do we feel like we have satisfactorily addressed the issues about the weakness of the containment vessel that were raised in the 1970s and the 1980s?

Mr. JACZKO. Fundamentally, the issues, the actions that were taken were, as I think you indicated, one was to provide hardened venting which provides a release path, a sensor to release material as pressure builds up in the containment, to release that pressure and to do it in a way that you release, that you prevent as much of the release of radioactive material as possible when you do that process.

The other thing that was done was efforts to do what is called inerting, or nitrogen inerting, which essentially means you introduce nitrogen into that containment atmosphere and based on the chemistry of that you reduce the likelihood of a hydrogen combustion.

So, those came out of results and studies that were done in the late 1980s in what we called our Individual Plant Examinations and then a series of followup studies that looked at what are these kinds of severe accident risks and how do you ultimately mitigate them.

So, for the Mark I containments, that was, those were the changes that were made to address that. Now, again, we are going to look at the information from Japan to see how similar or different their designs were at the time of the accident to our designs to see if there are additional lessons that we would learn to apply to those particular containments.

Senator MERKLEY. Thank you.

Senator CARPER. You are welcome. Thank you.

Madam Chair.

Senator BOXER. Thanks.

I want to followup on earthquake faults because we have written the Commission and we have asked you for an explanation of how many of our reactors, or let us just say our plants, are located on or near seismically actively faults? Do you have that number for me today?

Mr. JACZKO. The number, and I think you mentioned it in your initial statement——

Senator BOXER. I know.

Mr. JACZKO. Generally, we would say that there are two plants that are near, in high seismic areas, and about nine plants that are in more medium areas.

But I want to stress, we design, require all plants in the United States to be designed to deal with seismic events. Some of us who are here in Washington know, it was only a couple of months ago that we felt an earthquake here in Washington.

So, they are all designed to deal with seismic events and we design them, again, based on the accelerations that the plant itself

would feel, or the actions and motions that the plant would feel at the actual site of the plant rather than based on the magnitudes of the earthquake because——

Senator BOXER. OK, before you get into all that, I do not have a lot of time. In Japan, they would give the same answer. They gave the same answer. TEPCO said we are proud of the robustness of our containment vessels. In the case of an earthquake, everything would safely stop, blah, blah, blah. I would put this into the record if I could.

Senator CARPER. No objection.

Senator BOXER. Not the blah, blah, blah, but the actual words——

[Laughter.]

Senator CARPER. No, I think we should put in the blah, blah, blah.

[Laughter.]

Senator BOXER. The point is it is eerie to me because I do not sense enough humility from all of us here. We are, as some great scientist once said, we think we have all the answers but Mother Nature may not agree with us.

A lot of what you are saying is the same thing that they said. You are right, you are being conservative because even though plants do not sit on or near, you are being, you are thinking ahead. But the fact is, if you take one of my, we have the two plants that are high intensity seismic areas, one is built to, they are both built to withstand a certain level of earthquake, and yet, so was the Japanese plant, it was, I believe, 7.5 it was built to withstand. They got a 9.0.

We cannot know for sure what is going to happen. So I guess, are you doing a major inspection as Senator Feinstein and I asked you to, the NRC, of our two plants that are in these high propensity earthquake zones?

Mr. JACZKO. Well, we are looking at all the plants to make sure that we have——

Senator BOXER. I am asking about my two plants.

Mr. JACZKO. We are not doing anything specific to those two plants, but we are looking at all the plants in this country to see if there are lessons learned from Japan——

Senator BOXER. Well, you just said that there are two plants that are in the highest risk and yet you are not treating them any differently. That is a little worrisome to me.

Mr. JACZKO. Well, Senator, I would not necessarily say that they are in the highest risk.

Senator BOXER. Well, you said there were two plants on the highest seismic activity areas and those two are my plants in our State.

Mr. JACZKO. What we look at, ultimately, is the consequences. The plants that are in California are designed to deal with much, much higher seismic activity than any other plants in the country.

Senator BOXER. Well, there may be a reason for that, Mr. Chairman——

Mr. JACZKO. Absolutely.

Senator BOXER. Because they are more at risk. Look, we just had the new report that says that they are not built to high enough earthquake-proof standards because we have reports there is a new

fault at Diablo. We will hear that from Senator Blakeslee, who is coming forward. We, and in the case of San Onofre, there are reports that say there will be much more frequent activity than were suspected, both in perhaps tsunami and this.

So look, I am asking you again. I do not know if we got the letter back from them on this, a response? If you could just, you know how Senator Feinstein and I feel. We, it is on our watch. I do not know how many people are in the States of Delaware? How many people in Delaware?

Senator CARPER. Almost 1 million.

Senator BOXER. How many in your State? Half a million. I have got a half million people who live within 50 miles of one of my plants, and 7.4 million who live within 50 miles of my other. So, this is not about some theoretical catastrophe if something went wrong.

I know you feel you do ongoing inspections and all the rest. Well, some of those ongoing inspections found some safety problems, too. So, let me just press you. I know Senator Blakeslee is coming up. He is from the other political party and we are working together on this. I think that is an important point. This has nothing to do with partisanship.

If I will not be here for his testimony, can I send you his testimony and ask you to take another look because, we have both of these plants are up for renewal, although their licenses run until about 2022, something like that, 2027, 2022? So, they are not going anywhere. But they are up.

They are both now going to undertake new 3D earthquake studies, which is great, and I praise both of the operators for doing that. But it seems to me that while that is happening, correct me if I am wrong, but I think Congressman Bilbray said, tell me if I heard him right, that the chance of something like this happening, an event like this, is between 7,000 and 10,000 years——

Mr. JACZKO. I think he said the frequency of a 7.0 magnitude earthquake is about every 7,000 years, approximately.

Senator BOXER. OK.

Mr. JACZKO. But I do not want to speak for the Congressman.

Senator BOXER. But again, I would say to you, take a look at the record and the 157 earthquakes we have had over 6.0. So, and as we know, listen, I was told when I was a County Supervisor they said 100 year flood, we have to plan for a 100-year flood. I was a lot younger then and I said, oh, gosh, do we really need to do this? It is a 100-year flood. Well, that does not mean it is going to happen in 100 years. It could happen seven times within 10 years, and then not happen again, as you know.

So, we have got to respond in a much different way. I just do not feel the humility from all sides here. I do not think we are humble enough in the face of what Mother Nature could do. I think that is, although I have to admit that the statements made by all parties here, I thought were very reasoned.

But I just think we need to inject a little more humility in this because look at what happened in Japan. They are so proud, they are bragging about how this could never happen. They arrogantly boasted of their world best nuclear power technology. Now, they

cannot even figure out how to stop the darn thing from leaking and all the rest.

So, anyway, enough said. Thank you.

Senator CARPER. Thank you.

Senator Barrasso? All right.

Administrator Jackson, I do not want you to feel like you are being ignored here, so I am going to——

[Laughter.]

Ms. JACKSON. I am happy.

Mr. JACZKO. I thought since she was here I would not get so many questions.

Ms. JACKSON. I very much appreciate it.

Senator CARPER. You can barely see her lips move when you speak, Mr. Chairman.

[Laughter.]

Senator CARPER. Administrator Jackson, if you could, we were talking earlier, I do not know if it was Senator Alexander or somebody else, we were talking about the number of people who have died in the 41, 42-year history of nuclear power plants in this country because of the radiation, folks either, folks who worked in those plants or lived in the area around those.

I think I asked this question of Chairman Jaczko the last time he was here and I think he said, to the best of his knowledge, no one has died of radiation poisoning or sickness. Is that close to what you said?

Mr. JACZKO. At nuclear power plants. There have been in some of the related industries, some accidents that let to fatalities. But in the nuclear power, at the plants themselves, no, there have not been.

Senator CARPER. OK. Thanks.

Administrator Jackson, you have been great to work with us on a wide range of clear air issues involving sulfur dioxide emissions, nitrogen oxide emissions, mercury emissions, and I do not know, I do not want to put you on the spot.

But, I would like to just get a sense for the range of injuries, death, brain damaged children born, babies born, because of emissions from fossil fuel plants that put out not just CO_2 but also sulfur dioxide and nitrogen oxide and mercury. Can you just give us a sense for that?

I think we are talking about people who, we are talking about the loss of not just tens of lives or hundreds of lives but far greater. Can you just give us a sense of that over, I do not know, 40 years? Just give us a sense of the magnitude. Are we talking about thousands of folks who lives have been shortened, whose lives have been taken? Just give us a sense of that magnitude.

Ms. JACKSON. I would be happy to. But first let me thank you for your leadership on clean air issues. You have a long and outstanding record.

Senator CARPER. Thanks for saying that.

Ms. JACKSON. Why do I not simply say that we recently released a proposed rule to deal with mercury and other toxic emissions from fossil fuel plants, primarily power plants that burn coal, and the estimates were annual estimates of tens of thousands of fewer

bronchitis incidents, and 150,000, I believe the number was, fewer asthma-related doctor or hospital visits.

When it comes to fine particle pollution, it is not just sickness, it is death. So, literally tens of thousands per year of avoided deaths, premature deaths, as a result, each and every year.

So I do not have a number for 40 years that accumulates, but of course, the Clean Air Act has been around for 40 years and has a long and proud history of, I think the most recent estimate was $2 trillion in avoided health costs and benefits by 2020 alone. Of course money is not the same as lives saved and the tragedy of a sick child, but it has quite, those emissions have real impact for public health.

Senator CARPER. One of our colleagues earlier in the hearing made the point that for almost any source of electricity in this country, there are risk concerns related to them. Obviously, we have the kind of concern, the risk has been borne in Japan. We need to be mindful of, to learn as much from this as we can, to make sure that kind of tragedy does not occur here or hopefully in any other country.

But whether it is coal-fired plants, in our State we want to deploy offshore windmill farms and hopefully we will start doing that in about a year or so, but there are people who think they are unsightly, there are people who are concerned about the lives of birds. We have concerns with respect to tapping the great reserves of natural gas that we are happy to have found but there are concerns raised about the fracking. There are concerns with respect to solar panels and some of the materials that we use to create those.

There are all kinds of concerns. What we have to have here at the end is to be as vigilant as we can for all of them. But I would just ask us to be as mindful and concerned about our air pollution problems that relate to fossil fuel plants as we are the potential loss of life or endangerment of health due to nuclear power plants. Sometimes, I think we lose our sense of balance.

I want to ask you, as a followup to that, Administrator Jackson, about the EPA's radiation monitoring, if I could. In the next panel, we have got several State and local officials. Let me just ask, how does the EPA inform State and local officials about potentially high levels of radiation in milk or water in their community, and what actions will be taken if high levels of radiation are found by EPA monitoring?

Ms. JACKSON. Let me first State that every model we have seen, and we agree with the inputs to the model, do not show that we will see any high levels. We have not seen high levels. If anything, I would characterize them as trace increases from background. One of the wonderful things about our RadNet system is that we have decades of background data. So, we have a good understanding of what is normal, if you will, for these monitors.

What we have done is set up a system where we do post the data for rainwater and drinking water and milk, we post those on our Web site along with the air monitoring data which is both near real time. There is about a 4-to 6-hour delay, as well as some filter and cartridge data that takes a longer period of time.

Even when we see a trace, a blip above background levels, we alert the States, entities that are affected where those monitors.

We work very closely with our partners at Health and Human Services, because the CDC and FDA, depending on whether we are talking about foodstuffs like milk or other issues, it is very important that the health officials in those States are not surprised by even trace increases. Because we want them to feel comfortable that they know what the data says, what they mean, and to conceptualize that for citizens because most people are not used to speaking of radiation or understand some of these units that are coming at them.

So, we have worked very hard at that. We have not gotten it perfect every time. We also work with elected officials, so that includes Members of Congress and Governors' offices as well.

Senator CARPER. All right. I am going to stop. A number of our colleagues, some of them were here, some of them were not, will have questions to submit in writing. How long do they have to submit them, do we know? Two weeks. So, colleagues have 2 weeks to submit their questions in writing if they wish and we would just ask that you promptly respond to those.

Thank you so much for being here and for testifying today. Again, our thanks to you and the teams that you lead at EPA and at the NRC for the continued vigilance that has been demonstrated in response to this disaster. Thanks so much.

With that, we invite up our second panel, actually third panel. As our third panel participants take their seats, I am going to go ahead and begin the introductions.

The first introduction is that of California State Senator Sam Blakeslee of the 15th District of California. Next we have Mr. James Boyd who serves as Vice Chair of the California Energy Commission.

Next we have a familiar face and a friend from Delaware, Lew Schiliro. Mr. Schiliro retired from the FBI before becoming a Cabinet Secretary of Delaware's Department of Safety and Homeland Security. You are welcome. It is great of you to come.

Next we have Mr. Curtis S. Sommerhoff and he is the Director of Miami-Dade County's Department of Emergency Management. Thanks so much. Next we have Mr. Charles Pardee. Actually, Charles Pardee is quite a notable citizen in the State of Delaware, so you have a namesake who you can be proud of in our State. This Charles Pardee is Chief Operating Officer at Exelon Generation.

Finally we have Dr. Thomas B. Cochran, whose initials are the same as many of my colleagues and me, and he is a Senior Scientist with the Nuclear Program at the Natural Resources Defense Council. I welcome Dr. Cochran.

For all of your statements, if you would actually use, I will give you about 5 minutes. Do not try to go much over that. If you do, I will have to rein you in a little bit. But 5 minutes, and your full statements will be included in the record.

Let me start with Senator Blakeslee. My first question is to you. How many State Senators are there in California? We know you have 53 House Representatives.

Mr. BLAKESLEE. We have 40 State Senators in California representing about 37 million people. So, just a little bit under 1 million constituents per Senator.

Senator CARPER. How many State Reps do you have?

Mr. BLAKESLEE. Fifty-three Members of Congress and 80 members of the Lower House.

Senator CARPER. All right. Great. Thanks. Please proceed.

STATEMENT OF SAM BLAKESLEE, SENATOR, CALIFORNIA STATE SENATE, DISTRICT 15

Mr. BLAKESLEE. Thank you very much, Mr. Chair.

My name is Sam Blakeslee. I am a California State Senator and, as Chairman Boxer indicated, I am a Republican. In fact, I am the former Minority Leader in the Lower House.

I am a former research scientist who earned his doctorate for California Earthquake Studies from U.C. Santa Barbara, and as a geophysicist I worked for a number of years in the oil and gas industry for Exxon in Houston, Texas. I now live with my wife and two daughters in San Luis Obispo, 10 miles from Diablo Canyon.

The seismic setting for the Diablo Canyon site has been a source of well-documented controversy for over four decades. In 1967, the operator of Diablo Canyon, PG&E, stated in their initial permit application the site had only "insignificant faults that are showing no movement for at least 100,000 years and possibly millions of years."

Four years later, using oil industry seismic data, researchers discovered the Hosgri fault only three miles offshore which the USGS has estimated is capable of producing a magnitude 7.3 earthquake. In the end, it took 15 years, major retrofits, and more than $4.4 billion in cost overruns before the plant became operational.

Upon being elected to the California legislature in 2005, I called on Pacific Gas & Electric to use more sophisticated oil and gas 3D seismic imaging technologies to assess the complex seismic setting just off the coast. PG&E's response to my call was a column written by a PG&E Vice President stating "Freshman Assemblyman Sam Blakeslee's proposed legislation to conduct another seismic survey of Diablo Canyon is unnecessary and bad policy for California customers."

Well, in 2006, Governor Schwarzenegger signed the legislation directing the Energy Commission to perform an independent review of the data to assess the potential seismic vulnerability of the State's nuclear power plants and to provide recommendations.

That same year, PG&E moved to initiate the process to relicense the facility though there was no compelling need to rush the process as their current licenses last through 2024 and 2025. Then, in 2007 while the Energy Commission study was being performed, a magnitude 6.8, not 9.0, 6.8 struck Japan and the largest nuclear power plant in the world was damaged with three of its reactors still shut down to this day.

In 2008, the Energy Commission issued their report stating that uncertainties did in fact exist near the Diablo Canyon plant and that 3D seismic studies were recommended. PG&E's written response to the Commission was "we believe there is no uncertainty regarding the seismic setting and hazard at the Diablo Canyon site."

Mere weeks later, the USGA discovered the active Shoreline fault running within some hundreds of yards offshore from PG&E's

nuclear power plant and with an orientation that could potentially intersect with the much larger and very powerful Hosgri fault.

Within mere days, PG&E rushed to declare "we don't see anything that exceeds the plants design basis." The statement was made before collecting the data necessary to determine the precise location, length and relationship of the Shoreline fault to the nearby Hosgri.

Fast forward to the events of just 1 month ago when a magnitude 9.0 earthquake struck offshore Japan on a fault system believed capable of only a magnitude 7.9. Like the 2007 Japanese earthquake, the 2011 earthquake far exceeded the utilities seismic and engineering assumptions.

Three weeks ago, at a California Senate hearing on this issue, I asked PG&E is they still continue to maintain, did they believe their previous assertion that there was no uncertainty in the seismic setting near their plant. This time PG&E responded that, although there is always some uncertainty, they were "not concerned."

I then asked PG&E to suspend or withdraw their license application with the NRC until the seismic data is in hand to allow regulators to make informed decisions because, although PG&E may not be concerned about the seismic uncertainty, my community was very concerned. Yesterday, 1 day before this hearing, PG&E agreed to take this action.

After 6 years of calling for these seismic studies, State legislation, recommendations by the Energy Commission, direction from the California Public Utilities Commission, two devastating Japanese earthquakes, and now a nuclear disaster of Chernobyl proportions, the utility is finally willing to slow its relicensing effort to collect long-overdue seismic information.

In closing, I have two questions for Federal regulators. First, in the aftermath of the Japan crisis, will the NRC strengthen its own earthquake hazard review procedures that are conducted during the relicensing process for these two nuclear facilities that the NRC itself has identified as being located in the Nation's highest seismic hazard area?

Second, given the longstanding reluctance of PG&E to accept even the need for such studies, what procedures will the NRC put in place to ensure there is independent peer review analysis so that we have accurate, scientifically-robust conclusions that are drawn by those who have looked at the data independently rather than relying solely upon the utility and in-house NRS staff?

Thank you for the opportunity to present to this body.

[The prepared statement of Mr. Blakeslee follows:]

STATEMENT OF SAM BLAKESLEE, STATE SENATOR, CALIFORNIA STATE SENATE, DISTRICT 15

I am a California State senator who represents the 15th District on the Central Coast. For the previous 6 years I was the State Assembly Member representing the 33d District and served as Republican Leader immediately prior to being elected to the State Senate. I am a former research scientist who earned bachelors and masters in Geophysics from UC Berkeley and a Ph.D. for earthquake studies at UC Santa Barbara. I worked for Exxon as a research geophysicist and later as a strategic planner at their research lab in Houston Texas. I live with my wife and two young daughters in San Luis Obispo, 8 miles from Diablo Canyon, one of two operating nuclear power plants in the State of California.

The seismic setting of the Diablo Canyon site has been a source of well-documented controversy for more than four decades. In 1967, the operator of Diablo Canyon, Pacific Gas and Electric (also known as PG&E) stated in their initial permit application the site had only "insignificant faults that have shown no movement for at least 100,000 and possibly millions of years." Four years later in 1971, researchers discovered the Hosgri fault about three miles offshore, which the USGS estimates is capable of a magnitude 7.3 earthquake. This significant discovery led to major seismic retrofits. In 1981, PG&E realized that the retrofit blueprints had been reversed—structural supports that were meant for one reactor were actually built for the other reactor. In the end, it took 15 years and more than $4.4 billion in cost overruns before the plant was operational.

After reviewing the geophysical work performed by PG&E, I became increasingly concerned that they did not appreciate the potential complexity of the seismotectonic setting of major fault blocks near the plant. Upon being elected to the California legislature in 2005 I called on my local utility to use more sophisticated geophysical methods to assess the complex seismic setting on the coast. My experience as an industry scientist had allowed me to become intimately familiar with the power of 3D seismic imaging techniques to directly image complex fault systems, particularly in marine settings.

PG&E's response to my call was a column written by the nuclear power plant's vice president stating, "Freshman Assemblyman Sam Blakeslee's proposed legislation to conduct another seismic study of Diablo Canyon . . . is unnecessary and bad policy for our California customers".

I then drafted Assembly Bill 1632, which was passed by the California legislature and signed by Governor Schwarzenegger in 2006, which directed the California Energy Commission to perform their own independent review the data and to assess the potential seismic vulnerability of the state's nuclear power plants and to provide recommendations. That same year PG&E moved to initiate the process to relicense the nuclear power plant though there was no compelling need to rush the process as their current licenses last through 2024 and 2025.

While the California Energy Commission was being performed a Magnitude 6.8 earthquake struck Japan in July 2007. The shaking far exceeded what the Japanese utility expected was possible for the offshore fault and the largest nuclear power plant in the world was badly damaged. Today, nearly 4 years later, 3 of the 7 reactors remain offline with cumulative energy replacement costs in the billions.

In 2008, the California Energy Commission issued their report, pursuant to AB1632, which stated that the uncertainties did in fact exist near the Diablo Canyon Nuclear Power Plant, and that 3D seismic studies were recommended. PG&E's written response to the Commission was, I quote, [we] "believe there is no uncertainty regarding the seismic setting and hazard at the Diablo Canyon Site".

Mere weeks later, the U.S. Geological Survey discovered the Shoreline fault running within some hundreds of yards offshore from PG&E's nuclear power plant and with an orientation that could potentially intersect with the powerful Hosgri fault.

Within days, PG&E declared, "We don't see anything that exceeds the plant's design basis." This statement was made before having completed any of the necessary analysis to determine the precise location, length, and relationship to the dangerous Hosgri fault. The USGS scientist who discovered the fault, in conversations with me, expressed her deep concern that PG&E would rush to make these assertions prior to completing the necessary research to determine the facts.

In a California Assembly hearing as recently as 2009 PG&E stated "we're willing to go to the 3D, but right now we just don't think you jump right there as the prudent thing to do". This foot dragging on acquiring the necessary seismic data has continued; all the while, PG&E has moved rapidly to finalize relicensing with the Nuclear Regulatory Commission.

Fast forward to the events of this last month, when yet another Japanese earthquake struck. This time, a 9.0 magnitude earthquake struck offshore Japan on a fault system believed capable of a 7.9 magnitude quake. This massive earthquake caused explosions at three reactors at the Fukushima Daiichi Nuclear Power Plant. Like the 2007 Chūetsu earthquake, the Tōhoku earthquake far exceeded both the seismic and engineering assumptions. The devastating series of unexpected events revealed unknown vulnerabilities at the nuclear facility and their backup safety systems.

Professor Akira Omoto of the Japan Atomic Energy Commission, who was involved in the construction of the Fukushima Daiichi nuclear facility, admitted that the engineering assumptions and redundant failsafe systems believed by experts to guard against a nuclear disaster, in the end, simply proved inadequate. "We thought we had taken adequate precautions . . . but what happened was beyond our expectation." Despite having filed with the California Public Utilities Commission to ob-

tain authorization for ratepayer funding for seismic studies that included an offshore 3-D survey, PG&E recently told local press that it is still evaluating whether to complete the studies.

Three weeks ago the California Senate held a hearing on the Japanese earthquake, tsunami, and resulting nuclear crisis. I asked PG&E directly if they still continued to support their earlier assertion to the California Energy Commission that there was no uncertainty in the seismic setting near the plant. PG&E responded by saying that although there is always some uncertainty they had no concerns about that uncertainty. Under repeated questioning they said that they were not concerned about the uncertainty.

In the wake of their repeated denials regarding any seismic uncertainty, their denial of any concerns, their documented resistance to acquiring necessary geophysical data, their premature assertions that all is safe without first obtaining the necessary data to support their conclusions, their rush to relicense a dozen years before their current licenses expire, and the tragic events producing the damage and destruction of two coastal nuclear plants due to two separate offshore earthquakes, I asked that PG&E suspend or withdraw its license application with the NRC until the seismic data is in hand to allow regulators to make informed decisions. They refused to answer my question at the hearing but said they would get back to me. I followed up a week later and called asking for a meeting with their President to discuss the issue. They refused to allow the meeting to occur. They have not yet responded to my request. That is why I am here today to seek your help as the utility appears determined to race to re-licensure before the seismic data can be acquired and analyzed.

We are at a critical juncture in California. In the aftermath of the two Japanese earthquakes and nuclear accidents policymakers have a duty to ensure that State and Federal regulators have all the necessary data to make informed decisions regarding the conditions of re-licensure for California's two coastal nuclear power plants.

Failures by Federal and State regulators to provide adequate independent oversight and responsibly enforce appropriate safety measures has recently led to catastrophic human and environmental disasters in the past.

The Deepwater Horizon Gulf oil spill, the most significant environmental tragedy in the history of the Nation, was attributed by experts as both an industry and governmental regulatory failure. Mineral Management Services adopted a passive check-the-box mentality and failed to provide rigorous oversight.

And here we face another potentially threatening scenario, yet again, with Diablo Canyon confirmed by Federal regulators as one of two nuclear power plants in the highest risk seismic areas in the Nation. It is unquestionable that there remains significant uncertainty about the seismic potential and risk around Diablo Canyon Nuclear Power Plant, and this uncertainty is of great concern to the California local and State regulators and authorities. In recent years, elected officials and regulators with oversight responsibility have reiterated requests that PG&E first conclude the necessary seismic work prior to pursuing relicensing. The data that would be collected from these studies must be available to the Nuclear Regulatory Commission before the relicensing application process is completed. As the current operating licenses for Diablo Canyon are valid through 2024 and 2025, we believe that there is more than sufficient time for advanced seismic studies and review to be properly performed. Relicensing prior to the completion of this rigorous analysis would be premature.

It is our sincere hope that PG&E will earn the trust of local residents, regulators, and elected officials by voluntarily withdrawing or suspending its re-licensing activities until the geophysical has been completed. If PG&E will not voluntarily do so, I would request that this body direct the NRC to suspend its consideration of PG&E's application until it has received the critical information it needs to make a thorough and responsible decision.

APPENDIX A

Preliminary Findings and Lessons Learned from the 16 July 2007 Earthquake at Kashiwazaki-Kariwa NPP

Excerpts from the International Atomic Energy Agency, *Mission Report: Volume 1*
Available online at: http://www.iaea.org/newscenter/news/pdf/kashiwazaki060807_vol1.pdf

Background (p. 3)
Kashiwazaki-Kariwa nuclear power plant is the biggest nuclear power plant site in the world. It is operated by Tokyo Electric Power Company (TEPCO). The site has seven units with a total of 7965 MW net installed capacity. Five reactors are of BWR type with a net installed capacity of 1067 MW each. Two reactors are of ABWR type with 1315 MW net installed capacity each. The five BWR units entered commercial operation between 1985 and 1994 and the two ABWRs in 1996 and 1997 respectively.

At the time of the earthquake, four reactors were in operation: Units 2, 3 and 4 (BWRs) and Unit 7 (ABWR). Unit 2 was in start-up condition but was not connected to the grid. The other three reactors were in shutdown conditions for planned outages: Units 1 and 5 (BWRs) and Unit 6 (ABWR).

A strong earthquake with a moment magnitude of 6.6 (MJMA=6.8 according to the Japanese Meteorological Agency) occurred at 10:13 h local time on 16 July 2007 with its epicentre about 16 km north of the site of the Kashiwazaki-Kariwa NPP and its hypocentre below the seabed of the Jo-chuetsu area in Niigata prefecture (37° 33' N, 138° 37'E).

The earthquake caused automatic shutdown of the operating reactors, a fire in the in-house electrical transformer of Unit 3, release of a very limited amount of radioactive material to the sea and the air and damage to non-nuclear structures, systems and components of the plant as well as to outdoor facilities, as reported by TEPCO on their web page.

Preliminary data indicated that the design basis ground motion for the plant may have been exceeded, with possible significant effects on the behaviour of the plant systems, structures and components.

Exceedance of the Design Basis Ground Motion by the Observed Earthquake (p.8)
Comparisons of the seismic response spectra used for the design of structures, systems and components with the response spectra that were obtained from the time histories recorded by the installed site accelerometers during the 16 July 2007 Niigataken Chuetsu-Oki earthquake show that at the base mat elevation (which is considered as input for the seismic analysis) there is significant exceedance of the design basis levels by the observed values for a very wide range of spectral frequencies.

In spite of the exceedance of the seismic input, from the presentations made by TEPCO experts as well as from reports by the regulatory authority (NISA), and as was confirmed by the plant walkdowns performed by the IAEA team, it is indicated that the safety related structures, systems and components of all seven units of the plant (in operating, start-up and shut down conditions) demonstrated good apparent performance in ensuring the basic safety functions concerning control of reactivity, cooling and confinement.

Therefore, it is important to understand all the elements involved in the derivation of the seismic design basis and identify the sources of conservatism as well as sources that contributed to the exceedance of the seismic design basis by the observations from the earthquake. The chain that makes up the process of the derivation of the seismic design basis and the actual design of the plant structures, systems and components has a multitude of links that have varying degrees of uncertainty and that are evaluated by earth scientists, hazard analysts, geotechnical, civil, mechanical, electrical and systems engineers. As the design basis response spectra and thus the seismic design are composite products, a systematic approach is needed for this process to identify the sources of uncertainties and conservatisms.

Exceedance of the Design Basis Ground Motion by the Earthquake (p.13)
Recent studies for the evaluation of seismic hazard for new and operating nuclear facilities have consistently shown significantly higher values compared to those evaluated in previous decades. Also in the past two years, two nuclear power plants in Japan experienced earthquakes that exceeded the design basis response spectra without any damage to safety related structures, systems and components.

As a result of this, the IAEA started an extra-budgetary programme on the seismic evaluation of existing nuclear power plants (hazard and design evaluation) supported by, among other Member States, Japan where TEPCO is a major contributor. Therefore, although the 16 July 2007 Niigataken Chuetsu-Oki was a major earthquake that exceeded very significantly the design basis response spectra of the plant at the base mat level, its occurrence was not totally unexpected by the plant because of the awareness brought by earlier events and the related ongoing international interaction.

When there are significant contributions to the seismic hazard by active faults in the site vicinity or the near region (see the IAEA Safety Guide NS-G-3.3 for definitions of the terms site vicinity and near region), source parameters such as the fault mechanism and directivity effects may play an important role. This may cause variations in the hazard even within areas very close to each other. Ways of including these effects in seismic hazard studies need to be considered when such active faults are present in close proximity to NPP sites.

Need for strengthening of the database to decrease uncertainties (p.18)
A significant amount of investigations both on land and offshore are foreseen in the upcoming programme for the re-evaluation of the seismic hazard at the Kashiwazaki-Kariwa nuclear power plant site. It is expected that these investigations will provide information relating to the identification and the characterization of the faults in the region. This would significantly enhance the geological database and help in reducing uncertainties regarding their existence, location and characterization.

Faults in the near region (p.18)
The faults in the near region of Kashiwazaki-Kariwa nuclear power plant site will also be of interest for the modelling of the attenuation relationship and how new methods such as empirical Green's functions can be applied within the context of a nuclear power plant seismic hazard evaluation. Source related parameters such as fault mechanism and directivity were observed to play an important role in the recent earthquake. It is expected that new methods may provide more information relating to these issues.

APPENDIX B

An Assessment of California's Operating Nuclear Power Plants: AB 1632 Report

Excerpts from California Energy Commission (2008), *An Assessment of California's Operating Nuclear Power Plants: AB 1632 Committee Report*, CEC-100-2008-108-CTF
Available online at: http://www.energy.ca.gov/2008publications/CEC-100-2008-009/CEC-100-2008-009-CMF.PDF

Executive Summary (p. 1)
Assembly Bill 1632 (Blakeslee, Chapter 722, Statutes of 2006) directs the California Energy Commission (Energy Commission) to assess the potential vulnerability of California's largest baseload power plants, which are California's two operating commercial nuclear power plants, to a major disruption due to seismic event or plant aging. The Energy Commission is directed to adopt this assessment on or before November 1, 2008, and include it in the 2008 Integrated Energy Policy Report Update (2008 IEPR Update). The legislation also directs the Energy Commission to assess the impacts that such a disruption would have on California's energy system reliability, public safety, and the economy; assess the costs and impacts from nuclear waste accumulating at these plants; and evaluate other major policy and planning issues affecting the future role of these plants in the state's energy portfolio. AB 1632 also requires updates of the seismic vulnerability assessment to be performed as part of future Integrated Energy Policy Reports and that these updates take into account new data or new understandings of seismic hazards for these plants.

Seismic Hazards at Diablo Canyon (p.3-5)
The offshore Hosgri Fault zone, 4.5 kilometers west of Diablo Canyon, creates the primary seismic hazard at the plant site. Over the years there has been uncertainty regarding the tectonic setting of this fault zone, and the characterization of the Hosgri Fault as either a lateral strike-slip fault or as a thrust fault. The distinction is significant for the ground motion hazard at the Diablo Canyon site: a strike-slip fault is steeply (i.e. close to vertically) inclined, and a thrust fault has a shallower angle and extends diagonally beneath the surface. If the Hosgri Fault were a thrust fault with an eastward dip, the fault would extend closer to the Diablo Canyon site, and the ground motion from an earthquake could be greater.

Another potential seismic hazard at Diablo Canyon occurs from the possibility of an earthquake directly beneath the plant. Based on seismologic interpretations and conclusions from investigations of the 2003 San Simeon earthquake (magnitude 6.5) that occurred approximately 35 miles north of the Diablo Canyon site, the tectonic (geologic plate) setting where this earthquake occurred appears similar to the local tectonic setting of Diablo Canyon. The deep geometry of faults that bound the San Luis-Pismo structural block, where Diablo Canyon sits, is not understood sufficiently to rule out a San Simeon-type earthquake directly beneath the plant. It is necessary to better define the deep geometry of bounding faults of the San Luis-Pismo block and to better understand the lateral continuity of these fault zones. Although these fault zones are unlikely to replace the Hosgri Fault as the dominant source of seismic hazard at the plant, improved characterizations of these fault zones would refine estimates of the ground motion that is likely to occur at different frequencies. This information may be significant for engineering vulnerability assessments.

The Diablo Canyon seismic setting has been extensively studied, largely under PG&E's Long Term Seismic Program (LTSP), and PG&E continues to study it. Further study using advanced technology may help resolve remaining uncertainties. For example, high quality three-dimensional geophysical seismic reflection

mapping could resolve questions about the characterization of the Hosgri Fault and might change estimates of the seismic hazard at the plant. Similarly, direct imaging of the subsurface structure at Diablo Canyon could determine if faults exist near the site that do not break to the surface and could also serve to refine knowledge of the deep geometry, continuity, and interaction of poorly expressed faults that comprise the structural boundaries of the San Luis–Pismo Block. A permanent global positioning system (GPS) array, currently under development in the onshore region of the Diablo Canyon site, could refine models of tectonic block movements in the plant vicinity. Results of these surveys might alter fault parameters that are used in existing seismic hazard assessments.

Additional information on the seismic hazards at Diablo Canyon can be derived from the "Uniform California Rupture Forecast, Version 2 (UCERF-2)" database of faults and rupture probabilities in California, which was recently updated by the USGS, California Geological Survey, and the Southern California Earthquake Center. This database, used in conjunction with USGS models, would provide additional useful information regarding the seismic hazards at Diablo Canyon. To obtain accurate seismic hazard data, the USGS models must be modified to reflect site-specific conditions at the plants.

Finally, since Diablo Canyon was built, scientists have learned more about the ground motions that could result from an earthquake rupture. One important finding is that ground motion can be highly variable in the region near a rupture, with significant amplification of ground motion in some areas. This could be important at Diablo Canyon since the plant lies within five kilometers of the Hosgri Fault. PG&E is working collaboratively with the USGS to study earthquake hazards along the coastline in central and northern California, including the area surrounding Diablo Canyon.

Recommendations (p. 6)
The Energy Commission acknowledges PG&E's ongoing efforts to understand the seismic hazards affecting the Diablo Canyon site through its Long Term Seismic Program (LTSP), and recommends that this work continue. As part of future IEPR assessments, beginning with the 2009 IEPR, PG&E should report to the Energy Commission on the overall status and results of its research efforts. As ground motion models are refined to account for a greater understanding of the motion near an earthquake rupture, it will be important for PG&E to consider whether the models indicate larger than expected seismic hazards at Diablo Canyon and, if so, whether the plant was built with sufficient design margins to continue operating reliably after experiencing these larger ground motions.

The California Energy Commission recommends that PG&E should use three-dimensional geophysical seismic reflection mapping and other advanced techniques to explore fault zones near Diablo Canyon. PG&E should report on their progress and their most recent seismic vulnerability assessment for Diablo Cnyon in the 2009 IEPR. This action will supplement PG&E's Long Term Seismic Program and help resolve uncertainties surrounding the seismic hazard at Diablo Canyon. Given the potential for an extended plant shutdown following a major seismic event, the Energy Commission, in consultation with appropriate state agencies, should evaluate whether these studies should be required as part of the Diablo Canyon license renewal feasibility study for the CPUC.

APPENDIX C

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October 22, 2008

ELECTRONIC DELIVERY

Barbara Byron
California Energy Commission
Attn: Docket No. 07-AB-1632-1
1516 Ninth Street, MS-36
Sacramento, CA 95814-5512

Re: ***PG&E's Comments on the Draft Committee Report AB 1632 Assessment of California's Operating Nuclear Power Plants, dated September 2008***

Dear Ms. Byron:

Attached are Pacific Gas and Electric Company's (PG&E) Comments on the Draft Committee Report, entitled "An Assessment of California's Nuclear Power Plants: AB 1632 Committee Report," dated October 2008. PG&E appreciates the opportunity to participate in the Commission's AB 1632 study process. We provided comments on the Study Plan, responded thoroughly to data requests, provided comments on the Draft Consultant Report and participated in all workshops including bringing experts to help assist the Committee in understanding PG&E's operations of the Diablo Canyon Power Plant. We have reviewed the Draft Committee Report and provide the attached comments and urge the Committee to make the modifications responsive to these comments in the final Committee Report. We also urge the Committee to direct that the Draft Consultant's Report be modified in accordance with our earlier submitted comments. Our comments can generally be divided into three categories; jurisdiction, the purpose and role of the feasibility study as it relates to the NRC and CPUC processes, and the difference between license renewal efforts and ongoing operational efforts.

In addition, PG&E would like to reiterate our comments stated at the October 20 workshop, that PG&E largely concurs with the recommendations and statements provided by the California Seismic Safety Commission in their letter dated October 17, 2008, and appreciates their thorough review and participation. We have additional comments on a few areas addressed in that letter which will be submitted under separate cover.

PG&E appreciates the opportunity to participate in the study process and looks forward to working with the Commission to ensure the Commission understands the important role of the Diablo Canyon Power Plant to the electricity system and its role in assisting California meet its greenhouse gas emission reduction targets.

Sincerely,

Mark K

AB 1632 NUCLEAR ASSESSMENT

COMMENTS ON DRAFT COMMITTEE REPORT

INTRODUCTION

PG&E acknowledges the legitimate state interest in understanding and planning for emergency events that could result in the loss of energy supply from the State's two nuclear facilities and on that basis supported this AB 1632 study. However, care should be taken to develop recommendations that focus on the legitimate state interest underpinning the AB 1632 legislation and do not infringe upon the exclusive jurisdiction of the Nuclear Regulatory Commission (NRC).

As noted in the Committee Report, in its decision authorizing ratepayer funding of the license renewal feasibility study (D. 07-03-044), the CPUC directed PG&E to file an application submitting to the CPUC the final license renewal feasibility study addressing the cost-effectiveness of license renewal and whether license renewal is in the best interest of PG&E's ratepayers. The decision also directed PG&E to incorporate the findings and recommendations of the report issued by the CEC pursuant to AB 1632 in its feasibility study. PG&E does not interpret these directives to require PG&E to include in the license renewal feasibility study issues that are outside the scope of license renewal. Nor do they require PG&E to include in the CPUC application any showing on issues that are not within the CPUC's jurisdiction.

As PG&E set forth in the written and oral testimony supporting its request for ratepayer funding of the Diablo Canyon license renewal feasibility study, the issues addressed in the context of the feasibility study are specific to the question of whether Diablo Canyon can safely operate for an additional twenty years after the existing operating licenses expire in 2024 and 2025. By contrast, many of the items the Committee recommends including in the license renewal feasibility study are already being addressed in ongoing programs under the existing operating licenses. These efforts include: the analysis of seismic and tsunami hazards, emergency planning, and safety culture assessment all of which are directly relevant to the safe operation of Diablo Canyon under the current licenses and, more importantly, are subject to ongoing analysis, update and NRC review. As such, the license renewal feasibility study appropriately does not include analysis of these issues.

Finally, the Committee appears to be under the impression that "the CPUC will ... decide as part of PG&E's 2011 General Rate Case whether PG&E should pursue license renewal." (Report at p. 31) This is incorrect. In the Application referenced by the CEC, the CPUC will consider the cost-effectiveness and benefit to ratepayers of an additional 20 years of operation of Diablo Canyon.

We provide the following specific comments and suggested modifications to the recommendations consistent with these broad principles.

Recommendations 1-9

As described during these proceedings, PG&E is already committed to continue updating its knowledge of the seismicity surrounding the Diablo Canyon Site. PG&E is performing ongoing research and analysis as part of the long term seismic program, which is a requirement of the existing operating licenses for the plant. PG&E believes that it is relevant for the Commission to understand the seismic setting to help determine what generation planning efforts the Commission may undertake to prepare for such an unlikely event and will report its findings to the CEC as requested. However, these efforts should not be undertaken as part of PG&E's license renewal feasibility study.

In addition, as we discussed in our written and oral comments on the Draft Consultant Report, we believe there is no uncertainty regarding the seismic setting and hazard at the Diablo Canyon Site. While ongoing study to incorporate new information or techniques is prudent and will be undertaken to expand PG&E's knowledge base, we believe the characterization in both the Draft Consultant Report and the Committee Report that there are uncertainties understates the wealth of information already gathered and developed about the Diablo Canyon seismic setting. Therefore we recommend that the first sentence of the recommendation should be modified as follows:

> The California Energy Commission, in cooperation with other appropriate state agencies and in coordination with PG&E, should evaluate the degree to which using three-dimensional geophysical seismic reflection mapping should be pursued, if warranted by a cost-benefit analysis, to supplement PG&E's ongoing seismic research programs ~~to resolve uncertainties surrounding the seismic hazard at Diablo Canyon~~.

Similarly, Recommendation 4 should be modified as follows:

> The California Energy Commission, in cooperation with other appropriate state agencies, should consider the relevance of the USGS National Seismic Hazard Mapping Project models and the UCERF-2 database ~~in the context of the studies required as part of the license renewal feasibility assessment at Diablo Canyon for the CPUC. Updated seismic hazard analyses incorporating these inputs would provide additional information for regulators and the public regarding the seismic hazard at the plant site~~.

APPENDIX D

Calls heat up for reviews of California nuclear plants

Ken Bensinger and David Sarno, *Los Angeles Times*
March 21, 2011
Available online at: http://articles.latimes.com/2011/mar/21/business/la-fi-cal-nukes-20110321

State and federal officials are pushing for comprehensive checkups of the San Onofre and Diablo Canyon facilities, which have been cited repeatedly in recent years for safety lapses.

Pointing to Japan's nuclear crisis, state and federal officials have begun pushing for comprehensive reviews of California's two commercial nuclear plants, which are near powerful fault lines and have been cited repeatedly in recent years for safety lapses.

If reviewers identify new problems, it could lead to added safety measures — or potentially, delays or denials for renewals of the operating permits for the plants. The two plants, which have been online for decades, supply nearly 15% of the state's electricity.

"The fundamental question is whether these facilities should be located next to active faults and whether they are operated safely," said state Sen. Sam Blakeslee (R-San Luis Obispo), who holds a doctorate in geophysics. "With what's unfolding in Japan, why would anyone approve a permit for these plants to keep operating until every question is answered?"

Federal regulators have cited Southern California Edison's 2,350-megawatt San Onofre nuclear power plant near San Clemente dozens of times in recent years for safety violations that include failed emergency generators, improperly wired batteries and falsified fire safety data, records show.

At Pacific Gas & Electric's 2,240-megawatt Diablo Canyon facility on the Central Coast, inspectors in late 2009 found that safety valves designed to allow cooling water into the reactor core in emergencies had been stuck shut for 18 months.

In light of the crisis at Japan's Fukushima reactors, some state and federal lawmakers are now questioning whether the two utilities have underestimated the severity of earthquakes that could strike the plants.

Less than three years ago, a previously unknown fault was discovered within a mile of Diablo Canyon, and although regulators have asked the companies to conduct further seismic studies, neither has sought permits necessary to do so.

Edison has said that its facility, which houses two reactors, could withstand the equivalent of a magnitude 7 quake and is protected by a 30-foot seawall that is higher than the calculated maximum tsunami for the area.

PG&E, for its part, said that Diablo Canyon's two reactors could survive a magnitude 7.5 temblor, noting that it's built on a cliff 85 feet above sea level.

The reactors at these facilities are a different type — which experts say may be more robust — than the one at the Fukushima plant in Japan.

But some lawmakers and regulators point to the still-uncontrolled nuclear crisis in Japan after the massive quake and tsunami there as a strong justification for taking a hard look at the safety of this state's reactors and for possibly requiring additional retrofitting or even the eventual closure of the plants.

Blakeslee plans to ask PG&E to withdraw its application to the U.S. Nuclear Regulatory Commission to extend permits for its two reactors to operate until 2045 until further seismic studies are completed. Edison has not yet decided whether it would submit its own renewal application.

The NRC licenses each nuclear reactor separately. Licenses for the two reactors at Diablo Canyon expire in 2024 and 2025, while those for San Onofre both expire in 2022.

On Monday, the state Senate Select Committee on Earthquake and Disaster Preparedness will conduct a hearing on nuclear safety, focusing on lessons learned from Japan.

Last week, California's Public Utilities Commission said it was delaying an April hearing on extending the Diablo Canyon license to take into account events in Japan. And at the federal level, California's two senators asked the NRC last week to conduct a complete safety review of both facilities.

"Our two plants need immediate inspections and investigations, and they need to look at the increased risk of serious earthquakes, an increased risk of tsunamis and at the safety cultures at those plants," said Sen. Barbara Boxer (D-Calif.). She noted that more than 7 million people live within 50 miles of San Onofre, while nearly half a million are within that distance from Diablo Canyon.

In 2006, state lawmakers passed a bill calling on the California Energy Commission to review the safety at both plants; the commission in turn urged both utilities to conduct new high-tech surveys to update earthquake risk assessments.

San Onofre's chief nuclear officer, Pete Dietrich, said SCE was seeking more funds from the state before obtaining permits for new geological surveys. Dietrich said the utility hadn't decided whether it would apply to renew federal licenses for its two reactors.

Regarding Diablo Canyon, the PUC had asked PG&E to complete a thorough seismic review of the area before submitting its renewal application to the federal government.

But in 2009, PG&E applied to renew the licenses without having performed the new studies. The renewal application, which would allow the plant to operate until 2045, is now being considered by the NRC.

PG&E spokesman Paul Flake said that although the company began work on some new seismic surveys in January, it had not yet sought permits for the most conclusive testing urged by regulators.

"Our license renewal application and our seismic studies are two separate issues," Flake said.

Dan Hirsch, a nuclear policy lecturer at UC Santa Cruz and president of the Committee to Bridge the Gap, an anti-nuclear group, said California's reactors were built when the seismic risks involved were not well understood.

In Diablo Canyon's 1967 application to the PUC, PG&E said the site had only "insignificant faults that have shown no movement for at least 100,000 and possibly millions of years." Four years later, researchers discovered the Hosgri fault about three miles offshore, which led to expensive retrofitting of the plant.

In 2008, PG&E argued to the state Assembly that it had thoroughly reviewed its local geography and that no further seismic risks existed.

Yet weeks later, the U.S. Geological Survey revealed that it had found a second fault less than a mile from Diablo Canyon. That fault, called Shoreline, is thought by geologists to be capable of producing a magnitude 6.5 quake, while the Hosgri fault is rated up to 7.3.

Geophysicist Jeanne Hardebeck of the USGS helped discover the Shoreline fault. She said that the network of faults in the area appeared to be connected and that she feared a rupture at one could compound into a larger quake.

"There is a real issue of uncertainty when we put a magnitude on a fault," Hardebeck said, noting that the Japan quake occurred on a fault with a predicted maximum potential quake of magnitude 7.9, but in fact reached 9.

In its 2008 report, the California Energy Commission warned that San Onofre "could experience larger and more frequent earthquakes than had been anticipated when the plant was designed."

NRC spokesman Scott Burnell said that the quake risk at the two plants was acceptable. "All 104 licensed reactors in the country are meeting the agency's requirements to operate safely," he said.

Even so, NRC reports show that Diablo Canyon operated for 18 months with flawed valves that would have prevented cooling water from automatically flowing into the reactor core in an emergency. The problem was discovered in October 2009, and the NRC issued several sanctions against the plant.

The Union of Concerned Scientists, an environmental group, called the event a "near miss," singling it out as one of the most serious incidents at an American reactor in the last several years.

PG&E spokesman Flake contended that valves could still have been opened manually in an emergency. "PG&E has a very strong safety record," he said.

APPENDIX E

Preliminary report of the 2011 off the Pacific coast of Tohoku Earthquake

Excerpts from National Research Institute for Earth Science and Disaster Prevention (NIED) *Preliminary report of the 2011 off the Pacific coast of Tohoku Earthquake*, by Yoshimitsu Okada, President of NIED
Available online at: http://www.bosai.go.jp/e/international/Preliminary_report110328.pdf

Main shock (p. 1)
Main shock occurred on 14:46 of March 11, 2011 (JST). Seismic intensity of 7 in JMA (Japan Meteorological Agency) scale was recorded at Kurihara City, Miyagi Pref., and intensity of 6+ or 6- were observed in wide area along Pacific region ranging from Iwate Pref. to Ibaraki Pref.

Peak ground acceleration of 2,933gal (composite of three components) was observed at Tsukidate, Kurihara City, one of the NIED K-NET station.

It was the third time that intensity of 7 was recorded in Japan following the 1995 Kobe Earthquake (M7.3) and 2004 mid-Niigata Earthquake (M6.8). JMA named this earthquake "2011 off the Pacific coast of Tohoku Earthquake".

Hypocenter locates off Sanriku at 130km ESE of Oshika Peninsula with the focal depth of 24km. Magnitude of the earthquake was initially announced as M7.9 (Quick) by JMA and was revised to M8.4 (Prelim.) in 16:00 and M8.8 (Prelim.) in 17:30.

It was finally determined as M9.0 in March 13, CMT solution of this earthquake was thrust type with a pressure axis in WNW-ESE direction as shown in the inset of Fig.1. This means that this earthquake was generated as a typical inter-plate earthquake which is caused by the rebound of a continental plate (North American plate) against a subducting oceanic plate (Pacific plate) at Japan trench.

Tsunami (p. 3)
It is usual that an inter-plate earthquake occurred at trench region accompanies tsunami. Since the magnitude of this earthquake was as large as M9.0, the scale of generated tsunami was also huge one. In Japan, large tsunami attacked the Pacific coast ranging from Hokkaido to Okinawa and the tsunami was also observed at the coast of the Japan Sea, the Okhotsk Sea, and the East China Sea. The tsunami also propagated to the coast of Hawaii, northern and southern America continents, and the Pacific countries.

At Kamaishi, Ishinomaki, and Ofunato, the first arrival of tsunami was at 14:46, which means that the tsunami reached to these coastal cities at the same time of the earthquake occurrence. The tsunami of maximum height attacked these cities around 15:20, i.e. 30 minutes later of the earthquake. Fig.4 shows the distribution of maximum height of tsunami along the coast of the whole Japan. It was recorded more than 8.5m at Miyako, Iwate Pref., more than 8.0m at Ofunato, Iwate Pref., more than 7.3m at Soma, Fukushima Pref., 4.2m at Oarai, Ibaraki Pref., and so on.

Japan Meteorological Agency issued Tsunami Warning (Major tsunami) at 14:49, i.e. 3 minutes later of the earthquake, to Iwate, Miyagi, and Fukushima Prefectures. It was extended to Aomori, Ibaraki, and Chiba at 15:14, and was followed by Japan Sea side, Bonin Islands, Sagami Bay, Shizuoka and Wakayama

Prefectures. They were in series downgraded to Tsunami Warning (tsunami) and Tsunami Advisory for each region, and were completely cleared on 17:58, March 13.

Long-Term Forecasting (p. 7)
The Earthquake Committee of HERP (the Headquarters for Earthquake Research Promotion) has announced the Long-term Forecast about the occurrence potentials of subduction-zone earthquakes off the Pacific coast of the eastern Japan including the focal region of this M9.0 event.

The target area has been divided into the regions shown in Fig.10 and the estimated magnitude, occurrence probability within coming 30 years, and average recurrence interval have been estimated as in Table 1.

Table 1 Long-term forecast of subduction-zone earthquakes off the Pacific coast of Japan (HERP)

Region	Estimated magnitude		Occurrence probability within coming 30 years	Average interval
off northern Sanriku	~M8.0		0.5%~10%	~97 yrs
off central Sanriku	(cannot evaluate due to the lack of records)			
off southern Sanriku	~M7.7	~M8.0	80%~90%	~105 yrs
off Miyagi	~M7.5	if coupled	99%	37 yrs
off Fukushima	~M7.4 (multiple)		less than ~7%	> 400 yrs
off Ibaraki	M6.7~M7.2		more than ~90%	~21 yrs
off Boso	(cannot evaluate due to the lack of records)			
Trench zone	~M8.2(Tsunami Eq.)		~20%	~133 yrs
	~M8.2(Normal F. Eq.)		4%~7%	400~750 yrs

In "off Miyagi" region, six events were repeated in the past 200 years with average interval of 37.1 years. They occurred in 1793(M8.2; coupled), 1835(M7.3), 1861(M7.4), 1897(M7.4), 1936(M7.4), and 1978(M7.4), which results the occurrence probability of 99%, the highest value in Japan.

In this region, an earthquake of M7.2 has occurred in August, 2005. Since the M was less than estimated level of M7.5, it was evaluated that we cannot ease up our attention to this region.

Next, an earthquake of M7.3 occurred in the region of "off southern Sanriku" on March 9, two days before the M9.0 event. This time, there was an opinion that the occurrence probability of the coupled event of "off Miyagi" and "off southern Sanriku" may be lowered.

However this was a foreshock of the M9.0 event and the main shock involved five regions from "off central Sanriku" to "off Ibaraki" as well as "trench zone".

Historically, it was known that a great earthquake associated with huge tsunami occurred in 869 (Jogan) in Heian Era and killed more than 1,000 people at Tagajo, Miyagi Prefecture. But one could hardly imagine that such a event would recur nor the greater event would happen in the land of the living.

APPENDIX F

"It was like pulling teeth."
Oversight—and Oversights—in Regulating Deepwater Energy Exploration and Production in the Gulf of Mexico

Excerpts from the *National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, Chapter 3*
Available online at: http://www.oilspillcommission.gov/sites/default/files/documents/4_OSC_CH_3.pdf

The Deepwater Horizon rig sank on April 22, 2010, two days after the Macondo well blowout and explosion that killed 11 workers. Not long after the tragedy, its repercussions shifted to the Minerals Management Service (MMS), the federal agency responsible for overseeing the well's drilling and operation. Nineteen days after the rig sank, Secretary of the Interior Ken Salazar announced his intention to strip MMS's safety and environmental enforcement responsibilities away from its leasing, revenue collection, and permitting functions, and to place the former within a "separate and independent" entity. A week later, he announced MMS would be reorganized into three separate entities with distinct missions: a Bureau of Ocean Energy Management; a Bureau of Safety and Environmental Enforcement; and an Office of Natural Resources Revenue.2 And, by June 19, the Secretary had discarded the "MMS" name altogether.3 Like the Deepwater Horizon, MMS had ceased to exist. (pg. 1)

The Macondo Well

NEPA. MMS performed no meaningful NEPA review of the potentially significant adverse environmental consequences associated with its permitting for drilling of BP's exploratory Macondo well. MMS categorically excluded from environmental impact review BP's initial and revised exploration plans—even though the exploration plan could have qualified for an "extraordinary circumstances" exception to such exclusion, in light of the abundant deep-sea life in that geographic area and the biological and geological complexity of that same area. MMS similarly categorically excluded from any NEPA review the multiple applications for drilling permits and modification of drilling permits associated with the Macondo well. The justification for these exclusions was that MMS had already conducted NEPA reviews for both the Five-Year Program and the Lease Sale that applied to the Macondo well. The flaw in that agency logic is that both those prior NEPA reviews were conducted on a broad programmatic basis, covering huge expanses of leased areas of which the Macondo well was a relatively incidental part. Neither, moreover, included a "worst case analysis" because the President's Council on Environmental Quality had eliminated the requirement for such analysis under NEPA for all federal agencies in 1986. As a result, none of those prior programmatic reviews carefully considered site-specific factors relevant to the risks presented by the drilling of the Macondo well.*

Oil Pollution Act of 1990 and Oil Spill Response Plans. Under the Oil Pollution Act of 1990, as supplemented by a Presidential Executive Order, MMS is responsible for oilspill planning and preparedness as well as select response activities for fixed and floating facilities engaged in exploration, development, and production of liquid hydrocarbons and for certain oil pipelines. The agency requires all owners or operators of offshore oil-handling, storage, or transportation facilities to prepare Oil Spill Response Plans. MMS regulations detail the elements of the response plan (an emergency-response action plan, oil-spill response equipment inventory, oil-spill response contractual agreements, acalculation of the worst-case discharge scenario, plan for dispersant use, in-situ burning plan, and information regarding oil-spill

response training and drills). The emergency response plan is supposed to be the core of the overall plan, and in turn is required to include information regarding the spill-response team; the types and characteristics of oil at the facilities; procedures for early detection of a spill; and procedures to be followed in the case of a spill.

But neither BP, in crafting its Oil Spill Response Plan for the Gulf of Mexico applicable to the Macondo well, nor MMS in approving it, evidenced serious attention to detail. For instance, the BP plan identified three different worst-case scenarios that ranged from 28,033 to 250,000 barrels of oil discharge and used identical language to "analyze" the shoreline impacts under each scenario. To the same effect, half of the "Resource Identification" appendix (five pages) to the BP Oil Spill Response Plan was copied from material on NOAA websites, without any discernible effort to determine the applicability of that information to the Gulf of Mexico. As a result, the BP Oil Spill Response Plan described biological resources nonexistent in the Gulf—including sea lions, sea otters, and walruses.

Even more troubling, the MMS Gulf of Mexico Regional Office approved the BP plan without additional analysis. There is little in that approval to suggest that BP and MMS gave close scrutiny to the contents of the Oil Spill Response Plan. The Regional Office's routine practice was to review and approve oil-spill response plans within 30 days of their receipt. Absent any legal requirement to do so, the office did not distribute submitted plans to other federal agencies for review or comment, nor did it seek public review or comment.

The inescapable conclusion is striking, and profoundly unsettling. Notwithstanding statutory promises of layers of required environmental scrutiny—by NEPA, the Magnuson-Stevens Act, the Outer Continental Shelf Lands Act, and the Oil Pollution Act—and the potential application of some of the nation's toughest environmental restrictions—the Endangered Species Act and Clean Water Act—none of these laws resulted in site-specific review of the drilling operations of the Macondo well. The agency in charge, MMS, lacked the resources and committed agency culture to do so, and none of the other federal agencies with relevant environmental expertise had adequate resources or sufficient statutory authority to make sure the resulting gap in attention to environmental protection concerns was filled.

Federal oversight of oil and gas activities in the Gulf of Mexico—almost the only area where substantial amounts of drilling were taking place—took a generally minimalist approach in the years leading up to the Macondo explosion. The national government failed to exercise the full scope of its power, grounded both in its role as owner of the natural resources to be developed and in its role as sovereign and responsible for ensuring the safety of drilling operations. Many aspects of national environmental law were ignored, resulting in less oversight than would have applied in other areas of the country. In addition, MMS lacked the resources and technical expertise, beginning with its leadership, to require rigorous standards of safety in the risky deepwater and had fallen behind other countries in its ability to move beyond a prescription and inspection system to one that would be based on more sophisticated risk analysis.

In short, the safety risks had dramatically increased with the shift to the Gulf 's deepwaters, but Presidents, members of Congress, and agency leadership had become preoccupied for decades with the enormous revenues generated by such drilling rather than focused on ensuring its safety. With the benefit of hindsight, the only question had become not whether an accident would happen, but when. On April 20, 2010, that question was answered. (pgs. 82-85)

RESPONSES BY SAM BLAKESLEE TO ADDITIONAL QUESTIONS FROM SENATOR BOXER

Question 1. On April 11th, PG&E asked the Nuclear Regulatory Commission to delay issuance of the Diablo Canyon license renewal until after PG&E has completed the 3-D seismic studies and submitted a report to the NRC addressing the results. We have subsequently learned that PG&E did not request a delay in the license hearing process, but merely a delay in the final issuing of the license until after PG&E has completed the 3-D study.

Why is it important for the results of the 3-D seismic study to be considered as part of the license renewal hearing process? Do you believe that all stakeholders, including local citizens, should be able to comment on the relevance of the study's results as part of a normal NRC relicensing process?

Response. The critical safety threat to Diablo Canyon is seismic risk. The dominant seismic feature and greatest seismic risk, according to the NRC, is the Shoreline Fault. The NRC cannot adequately conduct a safety review without knowing the potential shaking of the site. Strong ground motion shaking is directly related to the proximity of the plant to the fault, the total length and size of the fault, and the degree to which the fault interacts the Hosgri Fault. This information must be in hand while the NRC is conducting the safety review, not after. After reviewing the completed seismic studies, the NRC may find it appropriate to condition relicensing on retrofits, which should be part of the safety review.

Three dimensional seismic reflection mapping is necessary to understand the complex geologic setting of Diablo Canyon. Diablo Canyon was designed to withstand a 7.5 M seismic event on the Hosgri Fault. The Shoreline Fault was not considered at the time Diablo Canyon was originally reviewed and approved by the NRC. Our current understanding of the Shoreline Fault is based on data from a number of micro earthquakes that delineate a portion of the fault. The actual seismically active segment of the fault could be much larger and could tie directly into the Hosgri Fault. An intersection of the two faults would dramatically change our understanding of the seismic setting of the plant and force a reconsideration of the plant's current design.

In addition to my own efforts, the County of San Luis Obispo Board of Supervisors, the California Energy Commission, California Public Utilities Commission, California Coastal Commission, and Congresswoman Lois Capps have all either recommended and/or required the completed 3-D study in advance of any decisions regarding relicensing of Diablo Canyon. The only entity not making the seismic study a priority is the very entity charged with the greatest responsibility for ensuring the safety of the plant, the NRC.

The most pressing issue facing Diablo Canyon and the NRC is to resolve the seismic uncertainty, not immediate approval of the license renewal application. The current operating licenses do not expire until 2024 and 2025, well over a decade from when the seismic studies should be complete. It is both perplexing and disturbing that the NRC would insist on making a decision on the license renewal application uninformed by the completed 3-D seismic study.

Question 2. The NRC license renewal process does not review emergency planning, security, current safety performance or seismic issues because, according to the NRC, these items are dealt with on an ongoing basis. Do you agree with this approach?

Do you believe that the use of this information in relicensing could help officials determine the true costs to Californians of relicensing the facility by providing information on the costs of potentially needed retrofits or whether such retrofits could address plant safety issues?

Response. Seismic issues at nuclear power plants in active fault zones, like Diablo Canyon, should be reviewed in a comprehensive, systematic manner during license renewal. This punctuated higher level review should analyze plant systems and how they operate in potential events. The analysis should include the expertise of a broad range of third parties and include an independent peer review to ensure the data and conclusions are thoroughly vetted. An analysis of this caliber is more robust than routine day-to-day monitoring. Ongoing monitoring should not preclude a punctuated higher level analysis during license renewal. These activities are not mutually exclusive.

Senator CARPER. Thanks so much. Thanks for coming here to testify for us today. Very, very good testimony. Thank you.

Mr. Boyd, please. Welcome.

STATEMENT OF JAMES D. BOYD, VICE CHAIRMAN, CALIFORNIA ENERGY COMMISSION, CALIFORNIA LIAISON OFFICER TO THE U.S. NUCLEAR REGULATORY COMMISSION

Mr. BOYD. Thank you, Senator, and to Senator Barrasso, thank you for being here.

I am Jim Boyd, Energy Commissioner, and I happen to be the State's Liaison Officer to the U.S. Nuclear Regulatory Commission, which may indicate why, perhaps, I am here. I appreciate this opportunity. I appreciate you having this hearing.

Senator CARPER. A quick question, Mr. Boyd. Are you appointed by the Governor and confirmed by the Senate? How does it work in California?

Mr. BOYD. Yes.

Senator CARPER. OK. How long have you served?

Mr. BOYD. Nine, I am in my tenth year.

Senator CARPER. OK. Thanks very much. Please proceed.

Mr. BOYD. This tragic 9.0 magnitude earthquake and its impacts on the Japanese people and this power plant certainly underscore the importance relating to seismic understandings in a State like California.

You have heard all about our two plants. You have heard from Senator Blakeslee in detail the difficulties we have had with the operator of one plant and the need for seismic studies. We have another plant, San Onofre, which, the recommendations apply equally. The 2008 study found that there are seismic concerns there that affect tsunami potential as well.

Subsequently, you heard from Senator Boxer, earlier, who referenced that my agency and the PUC directed the two agencies, the operators of these plants, to undertake the studies. But that resulted in a race by PG&E to file for relicensing well in advance of what anyone thought would be necessary.

This new technology, technology that Senator Blakeslee has indicated, has been used by the oil industry for years. PG&E has done some studies, mainly because the NRC ordered them to have an active seismic study after all the fiasco of many years ago and to have a need to redesign the plant.

Unfortunately, while we had been pushing for this, the NRC has to date indicated that the license renewal review process does not include an assessment of seismic vulnerabilities. It does not require that these advanced seismic studies be included within the scope of their review.

Until yesterday, when we learned that PG&E has changed their mind and they want to hold up their license, we felt that the NRC was going to finish their review in 2012, and these studies would not even be done until 2013.

So, I thank you for having a hearing that may have had an impact upon PG&E. But, in spite of that, we still need a condition from Southern California Edison, the operator of San Onofre, that they will do the same types of studies, and they told me they are reconsidering their position.

For us, lessons learned are first that we are looking to the NRC to carry out its short-term and long-term review of events in Japan and if they do the good job that they did on Three Mile Island, we expect a lot of positive recommendations and results. But we need

to implore the Congress support the NRC, not only in these efforts but in implementing and ensuring that followup actions are taken and implemented at all U.S. reactors as soon as feasible after they finish their studies.

Not only should they include the lessons learns from Japan, but we have some thoughts we would like to pass on to the NRC, and have in previous correspondence, in addition to lessons learned studies that we have underway with regard to seismic.

First is in the Waste Confidence Decision. The Chairman referenced to that. The NRC's Waste Confidence Decision which concluded that spent nuclear fuel can be stored safely onsite at reactors for 100 years should be reexamined, particularly spent fuel stored in seismically active coastal areas. The safety of long-term storage of spent fuel in seismically active or tsunami prone areas need to be reevaluated in light of what is happening in Japan.

Second, spent fuel management. The Nation's spent fuel management systems and practices should be reevaluated, including the current practice of storing spent fuel in pools in tighter storage configurations than original plant designs called for.

The Energy Commission, in 2008, recommended that the utilities return their spent fuel pools to more open racking configurations as soon as feasible. Storing more spent fuel in pools in closer configuration creates greater heat load, thereby increasing the risk of fire and other possible problems.

As more and more spent fuel accumulates at reactor sites, plant owners have had to re-rack their pools multiple times to increase their onsite spent fuel storage capacity. This is an increasing safety issue at California's two plants, and the station blackout issue is another one that affects the operation of spent fuel pools.

So, in closing, I would say we would like to see that the two utilities in California undertake the studies that have been recommended. We would like to have these studies included in NRC's license renewal evaluation of these plants because they give no support in their routine oversight of a plant license for the activities that are being carried out and the recommendations that have been made.

We need to assure ourselves that when these studies are done, all of these activities that need to be taken with regard to equipment and process operations should be taken into account.

Thank you for this opportunity.

[The prepared statement of Mr. Boyd follows:]

Testimony Submitted by
James D. Boyd
Vice Chairman, California Energy Commission
California Liaison Officer to the
U.S. Nuclear Regulatory Commission
Before the Environment and Public Works Committee
Subcommittee on Air and Nuclear Safety
U.S. Senate
April 12, 2011

Review of the Nuclear Emergency in Japan and Implications for the U.S.

Thank you, Chairman Boxer, Chairman Carper, Ranking Members Inhofe and Barrasso, and Members of the Committee. I am Jim Boyd, Commissioner and Vice Chair, appearing on behalf of the California Energy Commission. I serve as the California Liaison Officer to the U.S. Nuclear Regulatory Commission (NRC). I appreciate the opportunity to appear before you today to discuss California's nuclear power plants in the wake of unfolding events at Japan's Fukushima Daiichi Nuclear Power Plant.

California's Nuclear Power Plants

The 9.0 earthquake, devastating tsunami, and their impacts on the Fukushima Daiichi Nuclear Plant in Japan underscore the importance of addressing seismic uncertainties at nuclear power plants. California has two large operating nuclear power plants located in earthquake prone areas on California's coastline and they are susceptible to tsunamis. Diablo Canyon Nuclear Power Plant, owned by Pacific Gas & Electric (PG&E), is a 2,160 MW two-unit plant located near San Luis Obispo. The San Onofre Nuclear Generating Station (SONGS) owned by Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E), is a 2,200 MW power plant located north of San Diego. These plants provide approximately 13 percent of California's overall electricity supply and are licensed to operate through the mid-2020s. Their construction permits were issued in the 1960-1970 timeframe and they began commercial operation in the mid-1980s. California also has three permanently shut down commercial power reactors: Rancho Seco, near Sacramento (closed in 1989), SONGS Unit 1 (closed in 1992) and Humboldt Bay 3 in northern California, which was closed in 1976 due to seismic concerns.

Seismic Safety Concerns at Diablo Canyon and San Onofre

Over the last few decades, earthquake and tsunami concerns have been raised at both Diablo Canyon and San Onofre. The Hosgri Fault, located only three miles offshore, was discovered during the construction of the Diablo Canyon plant. In January 1976, the USGS concluded that the Hosgri Fault should be considered capable of producing an earthquake with a magnitude 7.0 to 7.5. As a result, Diablo Canyon was redesigned

and upgraded for a 7.5 magnitude earthquake. Construction costs exceeded the initial $320 million estimate (1968 dollars) by more than $5 billion primarily due to required seismic upgrades. In 1978 the NRC required PG&E to implement a Long Term Seismic Program as a condition of Diablo Canyon's operating license. San Onofre, licensed and built before Diablo Canyon, was not under the same requirements.

In November 2008, the Energy Commission completed a two-year comprehensive study of the Diablo Canyon and San Onofre plants, as required by California legislation (Assembly Bill 1632, Blakeslee).[1] This assessment examined the vulnerability of these plants to a major disruption from an earthquake or plant aging, the impacts from such a disruption, and the costs and impacts of the accumulating nuclear waste at these plants.[2] Concurrent with the Energy Commission's adoption of this study and report in 2008, PG&E announced that the USGS had discovered a previously unknown major offshore fault—the Shoreline Fault—less than a mile from Diablo Canyon. This is the second major fault discovered near the plant. PG&E and NRC subsequently concluded that Diablo Canyon's design would withstand the potential ground motions from this fault. However, this fault's major characteristics are largely unknown including its length, whether it might extend beneath the plant, its relationship to the Hosgri Fault, and if these two faults may interact causing a larger earthquake than if either fault broke separately. The Energy Commission's 2008 study concluded that important data on Diablo Canyon's seismic hazard and plant vulnerabilities are incomplete and that advanced three-dimensional geophysical seismic reflection mapping and other advanced technologies could help resolve questions about the nature of the Hosgri Fault and change estimates of the seismic hazard at the plant.

The Energy Commission's study also found that data, which has become available since the San Onofre plant was built, indicate that this coastal power plant could experience larger and more frequent earthquakes than was anticipated when the plant was originally designed for a maximum 7.0 earthquake. A review in 2001 by the California Coastal Commission stated that, "there is credible reason to believe that the design basis earthquake approved by the NRC at the time of the licensing of SONGS 2 and 3... may underestimate the seismic risk at the time."[3] The Coastal Commission also recently concluded that, "more recent examinations indicate that a larger earthquake or a large submarine landslide could generate a tsunami larger than that considered by SCE or the NRC."[4] Although this new information does not necessarily imply that the facility is unsafe, since the plant was engineered with a large safety margin, the possibility that the safety margin is shrinking suggests that further study is essential to characterize the seismic and tsunami hazard for the site, especially since so much less is known about the seismic setting of SONGS than the seismic setting at Diablo Canyon.

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[1] California Energy Commission, *An Assessment of California's Nuclear Power Plants: AB 1632 Report,* November 2008, CEC-100-2008-009-CMF.
[2] The Energy Commission in 2008 adopted the study and report entitled "*An Assessment of California's Nuclear Plants*: *AB 1632 Report (AB 1632 Report)* and the *Integrated Energy Policy Report (IEPR 2008).*
[3] California Coastal Commission, http://www.coastal.ca.gov/energy/E-00-014-3mmi.pdf, page 19.
[4] Mark Johnsson, Coastal Commission. "The Tohoku Earthquake of March 11, 2011: A Preliminary Report on Implications for Coastal California, March 24, 2011.

California Agencies' Recommendations

The California Energy Commission and the California Public Utilities Commission (CPUC) in 2009 directed PG&E and SCE to undertake the studies recommended in the AB 1632 Report as part of their license renewal evaluations. These studies include using three-dimensional geophysical seismic reflection mapping and other advanced techniques, such as those used in oil and gas exploration, to supplement ongoing seismic research programs at Diablo Canyon and San Onofre. These studies also include reviewing the tsunami hazards at their plants in light of recent research and improved scientific understanding of tsunamis. The Energy Commission also recommended in 2008 that PG&E and SCE should return their spent fuel pools to more open racking configurations as soon as feasible.

PG&E has begun some of the recommended advanced seismic studies and plans to complete them in 2013. SCE has applied to the CPUC for funds for these studies and plans to complete them in 2016. The Energy Commission also recommended that the NRC should consider the findings from these studies in its relicensing review. The NRC, PG&E and SCE disagree with this recommendation.

Plant License Renewal Review Process

Recent events in Japan reinforce California officials' position that the advanced seismic studies for Diablo Canyon and San Onofre should be completed, independently reviewed, and that the study findings should be included in the CPUC's and the NRC's relicensing evaluations for these plants. NRC's plant license renewal evaluations for these plants should include the advanced studies recommended in the Energy Commission's AB 1632 Report. They also should include any major additional equipment or follow-up actions required in response to the lessons learned from Japan. The 9.0 magnitude earthquake and resulting tsunami at the Fukushima Daiichi plant far exceeded the original design basis (7.9 magnitude earthquake) for this plant and underscores the importance of addressing seismic risk uncertainties for Diablo Canyon and San Onofre during license renewal evaluations.

In November 2009, PG&E filed an application with the NRC to renew Diablo Canyon's operating licenses (15 years before the licenses expire) before PG&E had completed the AB 1632 Report studies. By filing before completing these studies, the company ignored the Energy Commission's and the CPUC's directives to them that they first complete these studies before filing for license renewal. The California Energy Commission in formal comments to the NRC in 2010 requested that the NRC include in their license renewal evaluation for Diablo Canyon site-specific and updated analyses of seismic/tsunami risks, spent nuclear fuel management, safeguards and security, emergency response planning, plant safety culture, energy alternatives, and once-through plant cooling. These analyses are imperative to evaluate the true cost and benefits of an additional 20 years of Diablo Canyon's operation. However, the NRC has indicated that their license renewal review process does not evaluate seismic vulnerabilities and does not require that advanced seismic studies be included within

the scope of their review of a license extension application. As a result, the NRC's license renewal review for Diablo Canyon is proceeding without the benefit of the updated advanced seismic/tsunami studies that the California officials directed PG&E to perform. NRC plans to issue a Final Supplemental Environmental Statement for Diablo Canyon's license renewal review in early 2012.

The NRC's license renewal process focuses on plant aging and plant hardware issues, such as metal fatigue, and evaluates the environmental impacts from an additional 20 years of plant operation. NRC does not evaluate site-specific seismic issues during license renewal reviews and excludes from its license renewal proceedings issues that states and public interest groups have raised that are not directly related to plant aging or deficiencies in the environmental assessment. For example, during license renewal reviews for the Indian Point Power Plant in New York, the NRC dismissed from the proceeding the State of New York's contentions regarding seismic vulnerability, plant vulnerability to a terrorist attack, risk of spent fuel pool fires, and the inadequacy of emergency plant evacuation plans.

While PG&E has undertaken some recent seismic evaluations and has received funding for the advanced seismic/tsunami studies at Diablo Canyon, PG&E has regularly indicated that these studies will not be completed during the NRC's license renewal proceeding. SCE has also indicated that seismic issues will not be part of their license renewal activities for SONGS.

Lessons Learned from Japan's Nuclear Plant Crisis

Several national and international organizations, including the International Atomic Energy Agency (IAEA), NRC, Nuclear Energy Institute (NEI), and the Institute for Nuclear Power Operations (INPO) will examine the events and lessons learned from the Fukushima Daiichi Nuclear Plant. Although it is too soon to identify any lessons learned from Japan, follow-up actions most certainly will be required from these studies. As was the case after the Three-Mile Island accident and 9/11, the costs associated with operating nuclear power plants likely will increase as additional measures and equipment are required to provide additional assurances that U.S. reactors will not be susceptible to events similar to those occurring at the Fukushima plant.

NRC should include the lessons learned from these studies in NRC's plant license renewal reviews and should more closely scrutinize significant plant or site-specific issues, including seismic and tsunami issues, in these proceedings. NRC has initiated a 30-day and a 90-day review related to the nuclear plant crisis in Japan to identify potential near-term actions that affect U.S. power reactors. These include actions related to spent fuel pools, station blackout (loss of all A/C power for a reactor), external events that could lead to a prolonged loss of cooling, plant capabilities for preventing or dealing with such circumstances and emergency preparedness. We strongly support these efforts. If normal or backup power had been restored at Fukushima before the back-up batteries were depleted, the devastating events at this plant likely could have been avoided.

In addition to the lessons learned studies already underway, we recommend that the following issues be reexamined:

1. **Waste Confidence Decision:** NRC's Waste Confidence Decision, which concluded that spent nuclear fuel can be stored safely onsite at reactor sites for at least 100 years, should be reexamined particularly spent fuel stored in seismically active coastal areas. The safety of long-term storage of spent fuel in seismically active or tsunami prone areas needs to be reevaluated in light of events at the Fukushima Daiichi plant.

2. **Spent Fuel Management:** The nation's spent fuel management system and practices should be reevaluated, including the current practice of storing spent fuel in pools in tighter storage configuration than original plant designs. Storing more spent fuel in pools in closer configuration creates greater heat loads thereby increasing the risks of potential fires. As more and more spent fuel accumulates at reactors sites, plant owners have had to rerack their spent fuel pools multiple times to increase their onsite spent fuel storage capacity. The National Research Council of the National Academies' in 2006 recommended that the NRC should analyze the vulnerabilities and consequences of loss-of-pool-coolant events that could lead to propagating fires and the release of large quantities of radioactive materials to the environment. They recommended that the NRC take actions to address any significant vulnerabilities identified. These recommendations are even more vital today, given events in Japan.

3. **Spent Fuel Pool Overheating:** The risks of loss-of-coolant events in spent fuel pools should be reexamined. Actions needed to reduce the consequences of such events should be recommended and implemented as soon as feasible. The severe spent fuel pool overheating problems at Fukushima highlight the importance of ensuring that plant operators take prompt and effective measures to reduce the consequences of loss-of-pool-coolant events in spent fuel pools that could lead to fires. The Energy Commission in 2008 recommended that PG&E and SCE should return their spent fuel pools to more open racking configurations as soon as feasible.

Conclusions

The 9.0 magnitude earthquake in Japan and resulting tsunami greatly exceeded the plant's earthquake design (7.9 magnitude) and tsunami predictions. These events and the resulting devastation at the Fukushima Daiichi plant underscore the importance of completing the advanced seismic and tsunami studies at Diablo Canyon and San Onofre and having these studies included in NRC's license renewal evaluations for these plants. Like the Fukushima Daiichi plant, California's nuclear power plants are older plants with significant inventories of spent nuclear fuel located near major earthquake faults on the coast.

Analyses of the lessons learned from Japan will be important to determine what measures and equipment might be necessary to ensure that US plants are not susceptible to conditions and events similar to those that occurred in Japan. The NRC has announced a short-term and long-term review of events at Fukushima. If their response to the Three Mile Island accident is any indication, we can expect a thorough investigation of the lessons learned with comprehensive recommendations for addressing the problems revealed in Japan. It is essential that Congress support the NRC in these efforts and help ensure that the necessary follow-up actions are implemented at U.S. reactors as soon as feasible. These studies should be completed as soon as feasible and any significant measures or major additional equipment needed to reduce potential vulnerabilities at U.S. plants should be identified and the costs included as part of license renewal evaluations.

That completes my prepared remarks. I would be happy to answer any questions.

RESPONSES BY JAMES D. BOYD TO ADDITIONAL QUESTIONS FROM SENATOR BOXER

Question 1. The NRC license renewal process does not review emergency planning, security, current safety performance or seismic issues because, according to the NRC, these items are dealt with on an ongoing basis. Do you agree with this approach? Do you believe that the use of this information in relicensing could help officials determine the true costs to Californians of relicensing the facility by providing information on the costs of potentially needed retrofits or whether such retrofits could address plant safety issues?

Response. While the NRC position of indicating that these issues should be dealt with on an ongoing basis is perhaps strategically correct, our experience is that it is not working properly, in California in the case of the license renewal process for Diablo Canyon Nuclear Power Plant. NRC has both not acted on the extensive discussions and correspondence on seismic issues at Diablo Canyon over the past years under their "ongoing basis" criteria, nor has it made it a factor to be considered in the current relicensing process. One can only assume the same practice if and when San Onofre files for license extension.

The NRC license renewal process should include a site-specific evaluation of significant issues, that vary from plant to plant, including emergency planning and preparedness, security, current safety performance and seismic issues. Such an analysis will provide information that is needed to determine the true costs and benefits of relicensing the facility. This is particularly true for seismic issues with respect to the San Onofre Nuclear Generating Station (SONGS) and Diablo Canyon Nuclear Plant, since they are located in the most seismically active areas when compared with other U.S. reactors.

In my attached letter to the NRC dated April 12, 2010, we identified a number of issues that PG&E and the NRC should analyze in depth regarding the possible environmental and safety impacts from renewing the operating licenses for Diablo Canyon. The issues we identified are: seismic risks, at-reactor accumulation of spent fuel, security, emergency planning, reactor vessel embrittlement, evaluation of energy alternatives, plant safety culture, and plant once-through cooling. A thorough analysis of these issues will provide information that is essential to assessing the true costs and benefits of renewing Diablo Canyon's operating licenses compared with alternatives and the potential environmental and safety impacts from license extension.

Seismic issues should be thoroughly evaluated during license renewal for California's nuclear power plants, particularly in light of the long history of seismic concerns at Diablo Canyon and SONGS and the fact that construction costs for both Diablo Canyon and SONGS greatly exceeded original estimates largely due to seismic retrofit costs. For example, Diablo Canyon's construction costs exceeded the initial $320 million estimate (1968 dollars) by more than $5 billion largely due to seismic retrofits.[1] Construction costs at SONGS also far exceeded initial estimates $436 million (1971 dollars) compared with $4.5 billion.

The discovery in 2008 of a new major fault—the Shoreline Fault—near the Diablo Canyon and recent tragic events at the Fukushima Daiichi plant following the 9.0 magnitude earthquake and tsunami on March 11 underscore the importance of analyzing seismic issues as part of California's license renewal evaluation. Although the NRC says they examine seismic issues on an ongoing basis, the NRC did not require PG&E and SCE to complete advanced seismic studies to address major uncertainties regarding seismic hazards at both sites. In addition, although the NRC required PG&E to develop a Long-Term Seismic Program, SCE was not required to have one nor were either utility required to have an Independent Peer Review Panel to review their study plans and findings. The NRC to date has consistently stated that they will not evaluate site-specific seismic issues during their license renewal evaluations.

The Energy Commission and its consultant conducted a 2-year comprehensive assessment of California's operating nuclear plants. Assembly Bill 1632 (Blakeslee, Chapter 722, Statutes of 2006) directed the Energy Commission to assess the potential vulnerability of "large baseload generation facilities of 1,700 megawatts or greater" to a major disruption due to a seismic event or plant age-related issues. The Energy Commission adopted this assessment in November 2008 as part of the 2008 Integrated Energy Policy Report (IEPR).[2] We believe that the studies rec-

[1] California Energy Commission, *Nuclear Power in California: Status Report: Final Consultant Report; Prepared for the 2005 Integrated Energy Policy Report, available at: http://www.energy.ca.gov/2006publications/CEC–150–2006–001/CEC–150–2006–001–F.PDF*

[2] California Energy Commission, *An Assessment of California's Nuclear Power Plants: AB 1632 Report, available at: [http:www.energy.ca.gov/2008publications/CEC–100–2008–009/CEC–100–*

ommended in the Energy Commission's AB 1632 Report and the 2008 and 2009 Integrated Energy Policy Reports (IEPRs), including the advanced seismic studies, must be included as part of license renewal review evaluations. If these seismic studies indicate that there are potentially greater risks or higher stresses for the plants' structural components and additional seismic retrofits are required, this information must be included in the cost-benefit analysis for license renewal. As noted in the 2009 IEPR, the comprehensiveness, completeness, and timeliness of these studies will be critical to license renewal assessments for Diablo Canyon and SONGS. Although PG&E is required to submit its license renewal feasibility assessment to the California Public Utilities Commission (CPUC) by June 30, 2011, PG&E does not expect to complete the advanced seismic hazard studies until 2013. In addition, the NRC's stated plans are to issue the Draft Safety Analysis Report and the Draft Environmental Impact Statement for Diablo Canyon's license renewal review in June 2011 before these advanced seismic studies have been completed. These license renewal evaluations, including NRC's safety and environmental impact analyses for Diablo Canyon's license renewal, must include the results of the AB 1632 Report recommended studies that the Energy Commission and the CPUC have directed PG&E to complete.

Question 2. According to a 2008 California Energy Commission (CEC) report, new seismic and geologic data indicates that San Onofre Nuclear Generating Station "could experience larger and more frequent earthquakes than had been anticipated when the plant was designed." Can you explain how you came to such a conclusion and how this information should be used by plant operators and the NRC?

Response. The AB 1632 Report concluded that the design basis for SONGS is based on a safe-shutdown earthquake (SSE) of magnitude 7.0 at a distance of 8 km on the Southcoast Offshore Fault Zone.[3] Following NRC review, SCE calculated the maximum bedrock acceleration from this earthquake at 0.67 g. As part of the subsequent Probabilistic Seismic Hazard Assessment (PSHA), SCE evaluated the SSE value of 0.67g to be associated with an annual probability corresponding to a return period of 7,194 years. The standard for nuclear plant design is a return period of 10,000 years. A more recently updated PSHA which accounted for blind thrust faults, newer ground motion attenuation relationships, and near-source ground motion effects evaluated the return period associated with the SSE bedrock acceleration to be 5,747 years. As a result, the AB 1632 Report concluded that advances in seismology have revealed that the SONGS site "could experience larger and more frequent earthquakes than had been anticipated when the plant was designed."[4] In addition, the California Coastal Commission's analysis indicated that "there is credible reason to believe that the design basis earthquake approved by U.S. Nuclear Regulatory Commission (NRC) at the time of the licensing of SONGS 2 and 3 . . . may underestimate the seismic risk at the site."[5]

Question 3. In your testimony you mentioned that the California Energy Commission recommended that PG&E and Southern California Edison change the way they are storing fuel in their spent fuel pools. Can you explain why the Commission made this recommendation and how it would increase safety?

Response. Due to the lack of a Federal permanent spent fuel disposal facility, the spent fuel pools at Diablo Canyon and SONGS have been "re-racked" to provide increased storage capability by placing the fuel assemblies closer together (Federal regulations permit reracking of spent fuel pools.) The more densely configured spent fuel pools are considered to have greater risk than a spent fuel pool that has a more open racking arrangement. A loss-of-coolant event precipitated by an accident or extreme event, such as a terrorist attack, earthquake, or tsunami, in a re-racked spent fuel pool with its spent fuel more closely packed than original designs, could result in extensive radiation release and contamination. Reconfiguring the spent fuel in the pools to more evenly distribute radioactive decay heat loads may help reduce the vulnerability of spent fuel pools. A 2006 study by the National Academies concluded that it appears to be feasible to reduce the likelihood of a fire involving spent

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2008–009–CMF.pdf]; also see AB 1632 Assessment of California's Operating Nuclear Plants: Final Consultant Report, MRW & Associates, Inc., October 2008, CEC–100–2008–005–F available at: [http://www.energy.ca.gov/2008publications/CEC–100–2008–005/CEC–100–2008–005–F.PDF

[3] MRW & Associates, AB 1632 Assessment of California's Operating Nuclear Plants, Final Consultant Report, October 2008, CEC–100–2008–005-F, pp. 58–59, available at [http://www.energy.ca.gov/2008publications/CEC–100–2008–005/CEC–100–2008–005-F.PDF]

[4] MRW & Associates, AB 1632 Assessment of California's Operating Nuclear Plants, Final Consultant Report, October 2008, CEC–100–2008–005-F, pp. 58–59, available at [http://www.energy.ca.gov/2008publications/CEC–100–2008–005/CEC–100–2008–005-F.PDF]

[5] California Coastal Commission, http:www.coastal.ca.gov/energy/E–00–014–3mmi.pdf,page 19.

fuel following a loss-of-pool-coolant event by using readily implemented measures including reconfiguring the spent fuel in the pools (redistributing the high decay-heat assemblies so that they are surrounded by low decay-heat assemblies.)[6]

Question 4. What are your recommendations for storing spent fuel at nuclear power plants in California?

Response. The Energy Commission's 2008 Integrated Energy Policy Report, recommended that PG&E and SCE should return the spent fuel pools to open racking arrangements as soon as feasible, while maintaining compliance with NRC spent fuel cask and pool storage requirements, and report to the Energy Commission on their progress in doing so.[7] The California utilities to date have not reported any progress in pursuing the Energy Commission's recommendation to modify their spent fuel pools' racking to a less dense configuration. With abandonment of the Yucca Mountain repository program, a Federal permanent geologic repository or centralized dry cask storage facility likely will not be available for decades. This means the accelerated additional and continued utilization of onsite dry cask storage. As a result, spent fuel will remain at Diablo Canyon and SONGS indefinitely.

Question 5. On April 11, PG&E asked the Nuclear Regulatory Commission to delay issuance of the Diablo Canyon license renewal until after PG&E has completed the 3-D seismic studies and submitted a report to the NRC addressing the results. We have subsequently learned that PG&E did not request a delay in the licensing hearing process, but merely a delay in the final issuing of the license until after PG&E has completed the 3-D seismic study. Why is it important for the results of the 3-D seismic study to be considered as part of the license renewal hearing process? Do you believe that all stakeholders, including local citizens, should be able to comment on the relevance of the study's results as part of a normal NRC relicensing process?

Response. It is essential that these advanced seismic studies be included in license renewal reviews because, as mentioned previously, new studies may indicate a greater seismic hazard for Diablo Canyon than previous estimates, which could have significant safety and cost implications if expensive seismic retrofits are required. There are major uncertainties regarding Diablo Canyon's earthquake hazard, for example, whether the Hosgri and Shoreline Faults may potentially interact together creating a larger magnitude earthquake than if either fault ruptured independently. PG&E in a January 2011 report to the NRC indicated that the Shoreline Fault is segmented. However, a recent USGS report indicated that there is no objective evidence supporting segmentation of the Shoreline Fault. Segmentation vs. nonsegmentation is important in estimating earthquake magnitude potential. For example, the Japanese greatly underestimated the 9.0 magnitude earthquake and tsunami on March 11 and had predicted that the large offshore fault zone was segmented and that these segments would rupture separately. However, five segments ruptured together, rather than independently, creating a much larger earthquake than had been predicted.

The Energy Commission in its 2008 and 2009 Integrated Energy Policy Reports recommended that PG&E and SCE complete certain studies and actions, including completing 3-D and other advanced seismic studies for Diablo Canyon and SONGS, and that these studies be included in the California Public Utilities Commission's and the NRC's license renewal reviews for Diablo Canyon and SONGS. The California Public Utilities Commission (CPUC) in June 2009 directed PG&E and SCE to complete these studies as part of these plants' license renewal evaluations. The CPUC approved funding for the advanced seismic studies at Diablo Canyon and in 2011 funded an Independent Peer Review Panel to review PG&E's study plans and findings.

The California Coastal Commission similarly notified the NRC on April 25, 2011 that the proposed relicensing for Diablo Canyon "is subject to Federal consistency review by the California Coastal Commission, completion of which is a necessary part of the NRC's eventual relicensing decision." To help conduct its review, the Coastal Commission has asked PG&E to provide the results from these advanced seismic studies. In addition, California Senator Sam Blakeslee, Congresswoman Lois Capps and the San Luis Obispo County Board of Supervisors have called for including these advanced seismic studies in Diablo Canyon's license renewal evaluations. Therefore, an increasing number of State and local officials are calling for completing these advanced seismic studies and including them in the license renewal

[6] National Academies, Safety and Security of Commercial Nuclear Fuel Storage, Public Report, 2006, p. 9.

[7] 2008 Integrated Energy Policy Report, p. 69, available at: [http://www.energy.ca.gov/2008_energypolicy/index.html]

evaluations for Diablo Canyon and SONGS. There is sufficient time to complete these studies, thoroughly analyze the results including independent peer review of the results, and include this information in cost-benefit evaluations of license renewal for Diablo Canyon. Diablo Canyon's operating licenses do not expire until 2024 and 2025 and SONGS' licenses do not expire until 2022. PG&E recently told the CPUC they plan to complete these advanced seismic studies by 2013.

I agree that stakeholders should be provided an opportunity to comment on the seismic study results as part of the NRC's license renewal review. Although PG&E has maintained an extensive Long-Term Seismic Program at Diablo Canyon as a condition of their operating license, PG&E did not discover the Shoreline Fault nor did they discover the Hosgri Fault. A Shell Oil scientist discovered the Hosgri Fault and USGS scientists discovered the Shoreline Fault. Independent reviews of earthquake hazard potential for Diablo Canyon are vital to understanding the seismic risks for the site. Interested stakeholders may have significant new data to contribute or different interpretations of PG&E's study results and should be allowed to comment on the study results as part of NRC's license renewal evaluation for Diablo Canyon.

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

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April 12, 2010

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Re: COMMENTS ON THE ENVIRONMENTAL SCOPE OF THE DIABLO CANYON NUCLEAR POWER PLANT (DCPP) UNITS 1 AND 2 LICENSE RENEWAL REVIEW (Federal Register Notice, Volume 75, No. 17, pp. 4427- 4428, January 27, 2010)

Dear Mr. Lesar:

We appreciate the opportunity to comment on the U.S. Nuclear Regulatory Commission's (NRC) Notice of Intent (NOI) in the Federal Register Notice referenced above to prepare an Environmental Impact Statement (EIS) related to the license renewal application and environmental scoping process for Diablo Canyon Nuclear Power Plant (DCPP) Units 1 and 2. Our enclosed comments identify issues that should be included in the plant-specific supplement to the NRC's "Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants" (NUREG-1437) regarding the application for renewal of the DCPP Units 1 and 2 operating licenses for an additional 20 years.

If you have any questions regarding these comments, please contact Barbara Byron at 916-654-4976 (bbyron@energy.state.ca.us) or Rachel MacDonald at 916-654-4862 (rmacdona@energy.state.ca.us).

Sincerely,

JAMES D. BOYD
Commissioner and Vice Chair
California State Liaison Officer to the
Nuclear Regulatory Commission

cc: Paul Lohaus, NRC
Bill Maier, NRC

Enclosure

Enclosure

Comments on the Environmental Scope of the NRC's Plant-Specific Supplement to the "*Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants*" (NUREG-1437) for the Applications for Renewal of the Diablo Canyon Nuclear Power Plant Units 1 and 2

California Energy Commission
April 12, 2010

Background

On November 23, 2009, Pacific Gas & Electric Company (PG&E) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the Operating License for Diablo Canyon Nuclear Power Plant (DCPP) Units 1 and 2. The current operating licenses for DCPP Units 1 and 2 expire on November 2, 2024, and August 26, 2025, respectively. NRC's license renewal process consists of a safety review, environmental review, plant inspections, and a separate review by the Advisory Committee on Reactor Safeguards. The safety review focuses on identifying and managing the detrimental effects of plant aging. The environmental review considers plant-specific impacts from license renewal, such as once-through cooling impacts.

The NRC will prepare an environmental impact statement (EIS) related to the review of the DCPP license renewal application and provide the public an opportunity to participate in the environmental scoping process, as defined in 10 CFR 51.29. PG&E submitted the environmental report (ER) as required in 10 CFR 51.53 and 10 CFR 54.23. NRC is required by 10 CFR 51.95 to prepare a supplement to the NRC's "Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants" to review the plant-specific environmental impacts of the renewal of the DCPP Units 1 and 2 operating licenses for an additional 20 years.[1] The GEIS covers the impacts that are considered common to all or most nuclear power plants. NRC recently issued for public comment a draft Revised GEIS for License Renewal of Nuclear Power Plants.[2] PG&E's license renewal application will use the older GEIS issued in 1996, rather than the recently issued revised GEIS. Possible alternatives to the proposed action (license renewal) include no action and reasonable alternative energy sources.

Under the NRC's environmental protection regulations in 10 CFR Part 51, renewal of a nuclear power plant operating license is identified as a major federal action significantly affecting the quality of the human environment, and thus an EIS is required for a plant's license renewal review. The EIS requirements for a plant-specific license renewal review are specified in 10 CFR Part 51. The NRC's public health and safety

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[1] *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report,* NUREG-1437, U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, 1996.

[2] *Update of the Generic Environmental Impact Statement for License Renewal of Nuclear Plants,* NUREG-1437, U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, Revision 1, July 2009.

requirements that must be met for the renewal of operating licenses for nuclear power plants are found in 10 CFR Part 54. Operating licenses may be renewed for up to 20 years beyond the 40-year term of the initial license. There are no limitations on the number of times the license may be renewed.

The Director of the NRC's Office of Nuclear Reactor Regulation makes the final decision to either approve or deny the request to renew the license. State agencies can specify conditions or reject permits that are required by the applicant. For example, California State Water Resources Control Board approval is needed to receive a National Pollutant Discharge Elimination System (NPDES) permit that is required for the continued operation of the nuclear plant's once-through cooling system. Similarly, California Coastal Commission approval is needed for a Coastal Development Permit (CDP) that would be required for the continued operation of DCPP through a license renewal period.[3] As a result, the NRC confers with state agencies as part of the environmental review and defers to agencies with appropriate regulatory authority.

Part 54 requires license renewal applicants to perform specified types of evaluations and assessments of their facility and to provide sufficient information for the NRC to determine whether or not continued operation of the facility during the renewal term would endanger public health and safety or the environment. Specifically, licensees are required to assess the effect of age-related degradation on certain long-lived, passive systems, structures, and components of the plant that are within the scope of Part 54. The purpose of the California Energy Commission's comments is to identify the issues that should be addressed in the plant-specific supplement to the GEIS and identify the significant issues that PG&E and the NRC should analyze in depth regarding the possible environmental impacts that could occur from renewing the licenses of DCPP.

The Energy Commission requests that the following issues be addressed as part of the plant--specific environmental impact analyses by PG&E and the NRC during the environmental impact review for DCPP license renewal:

1. Seismic Risks

As noted in the 1996 GEIS, the NRC staff has reviewed or performed detailed probabilistic assessments of external events, such as earthquakes, fires, and sabotage, at a number of plants. The 1996 GEIS' analysis of external events included a study completed in 1990 and reported in NUREG-1150 ("Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants," NRC). This report analyzed the risks of severe accidents at a nuclear power plant from internal and external events. It noted that in cases where external event risk was shown to be a significant contributor to the overall risk, the majority of the estimated risk arose from large beyond design basis earthquakes.[4]

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[3] A CDP is required by the Coastal Zone Management Act (CZMA), see 16 U.S.C. Section 1456(c)(3)(A) and 15 C.F.R. Section 930.60(a). Letter to James Becker, PG&E, from Tom Luster, California Coastal Commission, December 29, 2009.

[4] NUREG-1437, 1996, p. 5-17.

California's two operating nuclear power plants – Diablo Canyon Nuclear Power Plant and the San Onofre Nuclear Generating Station (SONGS) are located in highly seismically active areas on the Pacific Coast. The discovery in the late 1960s of a major offshore fault – the Hosgri Fault -- which is located 4.5 kilometers west of DCPP, resulted in years of investigations and hearings and the redesign and seismic retrofit of Diablo Canyon. That effort resulted in Unit 1 not becoming operational until 1984 -- about 15 years after work at the site began. In 1984, the NRC made it a condition of the operating license for Diablo Canyon that, "PG&E shall develop and implement a State-of-the-Art Program to revalidate the seismic design bases used for Diablo Canyon." In November 2008, PG&E and USGS announced the discovery of a previously unidentified offshore fault – called "the Shoreline Fault" – approximately one kilometer west of DCPP that has a capacity to generate a magnitude 6.5 earthquake. PG&E is working with the USGS to study earthquake hazards along the coastline in central and northern California, including in the vicinity of Diablo Canyon. The NRC and the USGS will conduct an independent review of PG&E's Long-Term Seismic Program (LTSP) in 2010.

In November 2008 the Energy Commission completed a comprehensive assessment of DCPP and SONGS, as required by Assembly Bill 1632 (Blakeslee, Chapter 722, Statutes of 2006). This assessment included a major consultant study by an interdisciplinary study team, public hearings, and review of academic, scientific, and government reports and data provided by California's nuclear plant owners. To assist with this seismic vulnerability assessment, the Energy Commission formed a Seismic Vulnerability Advisory Team made up of seismic safety experts from California's Seismic Safety Commission, California Geological Survey, and the California Coastal Commission.

The AB 1632 study confirmed that the Hosgri Fault is believed to pose the dominant seismic hazard for Diablo Canyon and can generate up to a magnitude 7.5 earthquake. The AB 1632 study also raised the possibility that ground motion at Diablo Canyon from the Hosgri Fault could be stronger than previously thought, based on recent research on near-source ground motion. In addition, just prior to completion of this study, PG&E announced the discovery of the Shoreline Fault less than half a mile offshore from Diablo Canyon, with an estimated maximum earthquake magnitude of 6.5. Moreover, the AB 1632 study found that important data on Diablo Canyon's seismic hazard and plant vulnerabilities were incomplete or outdated and that new seismic studies could resolve questions and might change conclusions about the seismic hazards for the plant and plant vulnerabilities. As a result of these uncertainties and the discovery of the Shoreline Fault, the Energy Commission adopted the AB 1632 study, as part of the Energy Commission's 2008 Integrated Energy Policy Report (IEPR), and recommended that PG&E conduct a number of additional advanced seismic hazard and plant vulnerability analyses. These studies include:

- Updated seismic/tsunami hazard studies, including using three- dimensional geophysical seismic reflection mapping and other advanced techniques to explore fault zones near Diablo Canyon;
- Assessments of the long-term seismic vulnerability and reliability of the plant, focusing on switchyards and other non-safety-related components;

- An evaluation of additional pre-planning or mitigation steps that the utility could take to minimize plant outage times following a major seismic event, such as the earthquake that struck the Kashiwazaki-Kariwa plant in Japan in 2007; and
- An evaluation of the adequacy of access roads to Diablo Canyon and surrounding roadways for allowing emergency personnel to reach the plant and local communities and plant workers to evacuate following a major earthquake.

PG&E plans to complete these advanced seismic studies in 2011- 2013, if the California Public Utilities Commission (CPUC) approves the utility's application for funding to support these studies. The CPUC directed PG&E to report on the major findings and conclusions from these studies as part of the utility's license renewal feasibility studies for Diablo Canyon.

PG&E's completion of these studies is particularly important in light of the recently discovered Shoreline Fault and the nearly 3-year outage of most units at the Kashiwazaki-Kariwa nuclear power plant following the 2007 magnitude 6.8 earthquake in Japan. These seismic studies are relevant to the NRC's evaluation of the environmental and safety implications of continuing to operate DCPP for an additional 20 years. For example, an updated seismic hazard assessment is needed to assess the vulnerability of aging plant components to a major earthquake. This is especially important for those aging reactor components, such as the reactor pressure vessel, that have experienced embrittlement due to neutron bombardment.

The tsunami hazard at Diablo Canyon should also be reexamined during license renewal reviews. The December 26, 2004, Sumatran earthquake that resulted in widespread and catastrophic tsunami impacts and loss of life around the Indian Ocean caused the automatic shut-down of the Kalpakkam nuclear power plant on the east coast of India. Currently available tsunami studies for DCPP are at least 10 years old and do not take advantage of modern tools and recent studies that could improve the quality of the assessments, such as new data from the National Oceanic and Atmospheric Administration, new probabilistic hazard assessments, and inundation modeling. In light of the new and significant seismic information that is available for the plant site since the original operating licenses for DCPP were issued, the seismic and tsunami hazards for nuclear power plants should be examined as plant-specific issues during license renewal reviews.

A significant increase in the seismic or tsunami hazard could have major ratepayer impacts. For example, the discovery of the Hosgri Fault after plant construction was well underway in the 1970s resulted in the subsequent seismic redesign of the Diablo Canyon plant and very costly plant retrofits. Similarly, the shutdown of the Kashiwazaki-Kariwa Nuclear Power Plant following the July 2007 earthquake in Japan will cost billions of dollars for plant retrofits and for purchases of replacement power. As such, the 2009 IEPR recommended that PG&E complete and report in a timely manner on all of the AB 1632 studies, including the three-dimensional seismic studies and the studies of the long-term seismic vulnerability and reliability of the plant, and make their findings available for consideration by the Energy Commission and available to the CPUC and the NRC during their reviews of the utilities' license renewal applications.

In light of the continuing and significant uncertainty about the seismic hazard at Diablo Canyon and the need to evaluate significant new information since the operating licenses for DCPP were first issued, the NRC, in cooperation with the Energy Commission and the CPUC, should require that these seismic studies be completed, independently peer reviewed, and made part of NRC's and PG&E's environmental assessment for DCPP license renewal studies, before the NRC takes any further action on DCPP license renewal. In addition, the plant-specific EIS should include an analysis of new significant seismological data for the Diablo Canyon site gathered since the plant was constructed.

Another concern is the potential for a major release of radioactive waste to the Pacific Ocean as the result of an accident or major event at Diablo Canyon. As noted by the California Regional Water Quality Control Board when the plant was originally licensed, "In your review of earthquake safety and design errors at this facility, we again request that you make sure that all structures and piping which may result in accidental or unauthorized discharge to the Pacific Ocean be thoroughly inspected and audited independently, and where necessary, brought up to the standards which will prevent chemical or radioactive contamination of the ocean."[5] The design and construction errors that were discovered at the plant associated with the seismic design of the plant were subjected to an Independent Design Verification Program so that its construction meets the approved seismic design criteria.[6] The NRC determined that the plant did not fall into the categories warranting more extensive consideration of Class 9 accidents because it did not fall into any of three categories: (1) high population density around the site, (2) A novel reactor design, and (3) a combination of a unique design and unique siting mode.

However, since the plant was licensed, the population density around the plant has increased. The NRC should reevaluate whether this increase would make the plant eligible for a more extensive consideration of Class 9 accidents. If it does qualify, a plant-specific evaluation for DCPP of the risk of Class 9 accident should be completed as part of the license renewal review taking into consideration the new seismic hazard studies for the site.

2. Accumulation of At-Reactor Spent Nuclear Fuel

Twenty additional years of plant operation will generate additional nuclear wastes of all classes (low, medium and high-level wastes), which would result in additional impacts from waste management, storage, transport and disposal. The long-term risk of at-reactor storage and accumulation of spent fuel on California's seismically active coastline should be reevaluated during license renewal reviews given the uncertainties of when a permanent repository or offsite interim storage facility will become available. The Obama Administration has ordered cessation of most activities relating to the licensing of the Yucca Mountain High-Level Nuclear Waste Repository. PG&E can no

[5] Letter to Chairman Nunzio Palladino, NRC, from Marit Evans, Chair, Central Coast Region, California Regional Water Quality Control Board, December 24, 1982, Docket Number 50-275 OL.
[6] Letter from Harold R. Denton, Director Office of Nuclear Reactor Regulation, Nuclear Regulatory Commission to Kenneth R. Jones, Executive Officer, California Regional Water Quality Control Board – Central Coast Region, July 21, 1982.

longer count on transferring spent fuel to a federal nuclear waste repository in the near or medium-term future. As a result, PG&E must continue indefinitely to store spent nuclear fuel at the reactor sites. For California, this means that about 6,700 assemblies of spent fuel (approximately 2,600 metric tons of uranium) that are currently being stored at operating and decommissioned nuclear plants in-state, combined with the spent fuel that will be generated in the coming years, will remain at these sites for the foreseeable future. The potential economic and environmental impacts from the long-term storage of nuclear wastes at Diablo Canyon, including low, medium, and high-level nuclear wastes, should be evaluated as part of the plant-specific license renewal environmental review. PG&E should describe the nuclear waste management plan for these wastes, including the plan for managing current and projected waste generated through the end of the 20-year license extension, and this plan should be evaluated in the plant-specific EIS.

3. Safeguards and Security

The 1996 GEIS analysis of the threat of sabotage and terrorist attack is severely outdated and inadequate. For example, p. 5-18 of the GEIS states that, "With regard to sabotage, quantitative estimates of risk from sabotage are not made in external event analyses because such estimates are beyond the current state of the art for performing risk assessments." This pre-9/11 analysis focuses on protection against malevolent use of vehicles, including land vehicle bombs, and mentions the NRC's requirement (amended 10 CFR Part 73) that licensees establish vehicle control measures, including vehicle barrier systems, to protect against vehicular sabotage. The GEIS does not take into consideration the risk of a possible air attack on a spent fuel storage pool or dry storage facilities and instead simply concludes that "the regulatory requirements under 10 CFR part 73 provide reasonable assurance that the risk from sabotage is small. Although the threat of sabotage events cannot be accurately quantified, the commission believes that acts of sabotage are not reasonably expected. Nonetheless, if such events were to occur, the commission would expect that resultant core damage and radiological releases would be no worse than those expected from internally initiated events."[7] Based on the above, the commission concluded that "the risk from sabotage and beyond design basis earthquakes at existing nuclear power plants is small and additionally, that the risks form [sic] other external events, are adequately addressed by a generic consideration of internally initiated severe accidents."

Clearly this discussion is out-of-date and inadequate in light of the September 11, 2001, attacks on the World Trade Center. A 2006 National Academy of Sciences Study on the safety and security of spent fuel storage concluded that, "it is not prudent to dismiss nuclear plants, including their spent fuel storage facilities, as undesirable targets by terrorists." [8] Also, "...attacks by knowledgeable terrorists with access to advanced weapons might cause considerable physical damage to a spent fuel storage facility, especially in a suicide attack." The NAS Committee further concluded that, "under some conditions, a terrorist attack that partially or completely drained a spent fuel pool could lead to a propagating zirconium cladding fire and the release of large quantities of

[7] NUREG-1437, 1996, p. 5-18.
[8] National Academies, *Safety and Security of Commercial Spent Nuclear Fuel Storage"*, 2006, p.35

radioactive materials to the environment."[9] The NAS Committee also concluded that, "The potential vulnerabilities of spent fuel pools to terrorist attacks are plant-design specific. Therefore, specific vulnerabilities can be understood only by examining the characteristics of spent fuel storage at each plant."[10]

The NRC states that security issues are not tied to a license renewal action but are considered to be issues that need to be dealt with constantly as part of the current license.[11] However, extending a plant's license to allow it to operate an additional 20 years will change the spent fuel-related security threat because of the larger quantities of spent fuel stored at the reactor site. These additional quantities of spent fuel could pose a richer and more attractive target for potential terrorists. License renewal results in a far greater accumulation of spent fuel stored at a reactor than was envisioned when the plants were first licensed.

The plant-specific studies for the DCPP license renewal should recognize the increased potential for terrorist attacks on nuclear power plants and spent fuel storage facilities, including air attacks similar to those that occurred on Sept. 11, 2001. The plant-specific environmental impact review for the DCPP license renewal should include meaningful analyses of the potential risks and environmental impacts from large-scale terrorist attacks on spent fuel storage at DCPP, taking into consideration the potentially affected population (i.e., residents, businesses, and workers) and available transport routes. Although some of the security information pertaining to nuclear power plants must remain "safeguarded" information, an appropriate level of information should be provided to the public during the license renewal review to help ensure that all reasonable efforts are being made to minimize the risks and consequences of a potential terrorist attack.

4. Aging Plant Issues

The Energy Commission requests that PG&E and NRC's plant-specific EIS should describe the aging management programs for DCPP plant components and how these programs will be evaluated, at what frequency, and how quality assurance programs will be maintained at DCPP. In the license renewal proceeding for the Pilgrim Nuclear Station the NRC judged the adequacy of the plant's Aging Management Program simply on whether it provided "reasonable assurance" that the components would perform the functions outlined in 10 C.F.R. Section 54.4(a) (1) – (3)." This standard appears to be vague and insufficient to ensure reactor safety over a 20-year license renewal period. The basis for such a finding should be provided as part of the GEIS and environmental review. For example, the problem of substandard or counterfeit plant replacement parts, including defective welds such as the ones found in SONGS new steam generators, should be addressed within a plant's aging management plans. Aging plant management plans should include plans for guarding against the procurement of substandard or counterfeit parts and for detailed inspections of all new parts.

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[9] Ibid, p. 57.
[10] Ibid. p. 58.
[11] NUREG-1437, 2009, p. 1-12.

In addition, as we enter an era of large numbers of aging and refurbished nuclear power plants, it is important that the NRC begin developing additional proactive methods for identifying age-related safety problems before they become significant. In NRC's license renewal application review, the DCPP should be evaluated in detail for aging issues and trends to identify preliminary or potential "anticipatory indicators" of safety problems related to plant aging. Trends could include steam generator tube cracking, vessel head corrosion, embrittlement, repeated unplanned reactor shutdowns, long-term problems, and/or repeated failures in safety-related equipment. These issues must be evaluated on a plant-specific basis rather than as part of the GEIS.

In the case of DCPP, which is located in a seismically active region, the combined effects of age-related degradation, including DCPP reactor pressure vessel embrittlement issues, and the risk and potential impacts of a major earthquake should be evaluated. For example, earthquakes are considered possible initiating events for the development of through-wall cracks that could challenge the integrity of a reactor pressure vessel. According to NUREG-1806, under NRC's old regulations for assessing the probability of a crack forming through the wall of a reactor pressure vessel, DCPP Unit 1 and nine other reactors would have exceeded the screening limit during a 20-year license extension.[12] If such a crack occurred, it could damage the reactor core and, in some cases, release radioactive materials into the environment.

The probability of crack formation relates directly to the extent of reactor pressure vessel embrittlement, which determines the ability of metals that make up the reactor pressure vessel to withstand stress without cracking. As such, these reactors would not have been eligible for license renewal unless they reduced the embrittlement rate or demonstrated that operating the reactor would not pose an undue public risk. Under NRC's new methodology, assessing the probability of a crack forming through the reactor pressure vessel wall results in a much lower calculated embrittlement for most reactors. Since DCPP Unit 1 has been identified as having significant reactor pressure vessel (RPV) embrittlement issues, the plant-specific DCPP EIS should examine the risk of a crack forming through the wall of an RPV at DCPP, explain the technical assumptions used in calculating RPV integrity, the frequency by which RPV integrity will be reevaluated over the remainder of the DCPP operating license (e.g., including the 20-year license extension period), and how new information from planned advanced seismic hazard studies for Diablo Canyon will be taken into consideration in these periodic reevaluations of RPV integrity.

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[12] The NRC recently revised its regulations to provide licensees with a new alternative for assessing the probability of a crack forming through the wall of a reactor pressure vessel. The old regulations required licensees to demonstrate that reactor pressure vessel embrittlement would not exceed a screening limit corresponding to a one-in-200,000-year probability of through-wall crack formation. The NRC's recently adopted regulations expand this requirement to a one-in-a-million-year probability, while allowing for the use of a less conservative methodology for assessing the probability. Using the new methodology, reactor vessel pressure embrittlement is no longer expected to limit any U.S. reactor from obtaining a 20-year license renewal. (NUREG-1806, p. xxii and Appendix D.)

5. Emergency Response Planning

The NRC recently considered the need for a review of emergency planning issues in the context of license renewal and concluded that programs for emergency preparedness at nuclear plants apply to all licensees, that all operating licensees must keep up with changing demographics and other site-related factors,[13] and that there is, therefore, no need for a special review of emergency planning issues in the context of a plant-specific environmental review for license renewal.[14] However, the public has expressed considerable concern about the adequacy of evacuation plans and emergency preparedness plans at DCPP, particularly with regard to access to emergency routes in the event of an earthquake or terrorist attack. Although the NRC, state and local agencies, and utilities routinely conduct table-top exercises, people are concerned about the lack of real testing of these plans and whether such plans will work in an actual emergency. Some have expressed concern that the infrastructure and roadways are not adequate to evacuate communities in a timely manner. Another common concern is that evacuation routes might be blocked due to traffic congestion or damaged roads, for example, following a major earthquake.

Clearly the population potentially impacted by the release of radioactive materials following an accident or attack on a nuclear power plant and the viability of emergency preparedness plans vary from plant to plant. As such, the NRC should include an evaluation of emergency planning as a plant-specific issue and should evaluate it in the supplemental plant-specific evaluation for DCPP, including how an earthquake might impact plant worker and community evacuation timeliness and planning.

6. Plant Safety Culture

The NRC noted recently that the license renewal environmental review is confined to environmental matters relevant to the extended period of operation requested by the applicant and that safety and security matters are considered outside the scope of the license renewal review.[15] However, the license renewal review for DCPP should also include an evaluation of the plant's safety culture. It is not just the pieces of hardware that are important in predicting a plant's overall safety and performance – it is also the people who operate and maintain the plant. Assessing the safety culture of a plant at the time of license renewal is essential for predicting future plant performance and safety.

When plants malfunction or accidents occur, human error or a degrading safety culture at a plant is often to blame. As NRC Chairman Jaczko recently noted, NRC has "increasingly focused on safety culture in recent years for the simple reason that we have found that a deteriorating safety culture is often associated with safety problems. Sound rules and procedures are certainly necessary to further safety, but the NRC and

[13] NUREG-1437, 2009, p. 1-11.
[14] NUREG-1437, 2009, p. 1-12.
[15] NUREG-1437, 2009, p. A-95.

our licensees all need to continually work to cultivate the type of open, collaborative organizational culture that will best enable us to meet our safety and security goals."[16]

A plant-specific review of safety culture is essential to evaluating the safety of a plant operating an additional 20 years. Investigations of the Columbia Space Shuttle disaster (2003), the Davis-Besse incident (2002), and the Challenger Space Shuttle disaster (1986) disclosed major deficiencies in risk and safety assessments and management practices that developed over time. The "lessons learned" from investigative reports of these events identified additional factors that are important to consider during program reviews. These lessons seem highly relevant to our nation's aging nuclear power plants, given the current emphasis on increased plant efficiencies, production, and cost-cutting measures – sometimes at the expense of plant safety. NRC should incorporate these lessons learned, as appropriate, into its nuclear power plant license renewal programs and in its plant-specific license renewal review of DCPP.

In its Response to Comments in the GEIS,[17] the NRC staff noted improvements in the NRC's inspection and assessment procedures following the Davis-Besse reactor head degradation and enhancements to the NRC's Reactor Oversight Program to more fully address licensee safety culture. However, a plant's safety culture merits reexamination during license renewal reviews, similar to the need to reexamine thoroughly aging plant components and hardware during license renewal reviews. Therefore, an evaluation of DCPP's management and safety culture during the license renewal review and during plant inspections is necessary to obtain a complete and accurate assessment of the plant's overall predicted safety and performance during the 20-year license extension. An evaluation of the DCPP safety culture should be included in the NRC's and PG&E's assessments of the adequacy of the licensee's aging management plans and should be evaluated in the DCPP plant-specific supplemental environmental evaluation for license renewal.

7. Evaluation of Energy Alternatives

The 1996 GEIS' discussion and evaluation of energy alternatives to license renewal is deficient and out-of-date and should be updated. The alternatives considered in the GEIS included wind energy, photovoltaic (PV) cells, solar thermal energy, hydroelectricity, geothermal energy, incineration of wood waste and municipal solid waste (MSW), energy crops, coal, natural gas, oil, advanced light water reactors, and delayed retirement of existing non-nuclear plants. Similarly, the discussion of the uranium fuel cycle and waste management impacts including transportation, storage and disposal of nuclear waste is out-of-date and needs to be updated.

In addition, the types of replacement power available and the environmental impacts from alternative energy sources vary substantially from region to region. For example, a portion of the electricity generated by Diablo Canyon could be replaced by renewable resources located in central California and augmented by dispatchable gas-fired

[16] NRC News, "NRC Chairman Gregory B. Jaczko Remarks at Today's meeting on NRC Safety Culture Initiatives", March 30, 2010, No. 10-056, p. 1.
[17] NUREG-1437, 2009, Vol. 2, p. A-84 and A-85.

resources. The latter, capable of cycling up and down, unlike the DCPP, would facilitate the integration of the intermittent resources that are expected to contribute significantly to meeting California's renewable energy goals.

The NRC should require regional or site-specific lifecycle evaluations of nuclear power and alternative electricity sources, including wind, solar, biomass, geothermal, and energy efficiency. In some regions base load renewable resources or a combination of intermittent renewable resources and gas-fired generation or energy storage could replace large quantities of nuclear power. Evaluations of the environmental impacts of these power options during license renewal reviews should include "cradle-to-grave" or lifecycle environmental impacts. Therefore, the plant-specific EIS for DCPP should include an analysis of the environmental impacts of the alternatives for replacement power that are specific to the DCPP region.

8. Once-Through Cooling

The State Water Resources Control Board (SWRCB) released a draft policy in June 2009 and a final policy on March 23, 2010, on the use of the Pacific Ocean for power plant cooling.[18] The SWRCB found that DCPP and SONGS' cooling systems are responsible for a major portion of all Once Through Cooling (OTC)-related impingement mortality and entrainment losses along the California coast.[19] The proposed policy calls for coastal power plants to cut water intake by 93 percent to reduce the harmful impacts on marine life. Power plants are given several options: (1) to be retrofitted for closed-cycle wet cooling, dry cooling towers, or other cooling means, (2) to be repowered with a non-OTC technology, or (3) to be shut down. However, in recognition that previous studies have found that, for California's nuclear plants, these options would be very expensive and possibly infeasible from an engineering perspective, the two California nuclear plants are given special consideration in the proposed policy. Therefore, the proposed policy would allow these nuclear plants to be exempted from the on-site mitigation requirements if the utilities demonstrate that the costs of compliance are excessive. A new round of mitigation cost studies will be required to be completed within three years under the supervision of the SWRCB and an advisory committee. The nuclear plants could also be exempted if the utilities demonstrated that full compliance would result in a conflict with the NRC's safety requirements. In both circumstances, the SWRCB could impose less stringent on-site compliance requirements on the plants, but would then impose off-site compliance mitigation requirements. The draft policy requires that any gap between onsite requirements and the basic standard for OTC compliance "shall be fully mitigated." The deadline for DCPP compliance with these new OTC requirements is 2022.

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[18] See [http://www.swrcb.ca.gov/water_issues/programs/npdes/cwa316.shtml].

[19] "Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling: Draft Substitute Environmental Document." State Water Resources Control Board and California Environmental Protection Agency, July 2009, page 47. http://www.swrcb.ca.gov/water_issues /programs/npdes/docs/cwa316/draft_sed.pdf ;State Water Resources Control Board (SWRCB), California Environmental Protection Agency. "Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling." SWRCB_1000_2008_001. March 2008, pages 13-16.

If the SWRCB's policy is approved (SWRCB meets May 4, 2010 to vote on the policy), the agency will direct PG&E and SCE to commission an independent study to assess the costs of alternative options for their facilities to meet the requirements of the SWRCB's policy. These studies and their consequences, in terms of compliance activities mandated by the SWRCB, should be coordinated with the studies required by NRC for license renewal.

9. Need for the NRC to Hold License Renewal Hearings near DCPP

NRC should provide an opportunity for the residents, plant workers, local officials, schools, and businesses located near DCPP to comment on the scope of the issues to be considered during the license renewal reviews. The NRC should conduct public meetings for the DCPP license renewal in the San Luis Obispo area both during the day and the evening to accommodate the work schedules of members of the public.

10. Public Comment Process

The NRC has stated that it will consider public comments that provide any information that is new and significant compared with that previously considered in the GEIS and will address these comments in the SEIS. The NRC should clearly explain what criteria are used to determine what is considered to be "new and significant information." In prior nuclear power plant license renewal proceedings, state representatives and members of the public have provided new and significant information related to seismic, emergency response, population demographics, the potential impacts particularly in largely populated areas from acts of sabotage or a terrorist attack, and other issues related to license renewal, and yet the NRC has found those issues to be non-admissible contentions. It is unclear why the NRC excludes from license renewal proceedings site-specific issues that clearly affect the safety and costs of the continued operation of a nuclear power plant.

Conclusions

California's two operating nuclear power plants provide about 14% of the state's total electricity generation and have operated approximately half of their 40-year initial license periods. PG&E has submitted a license renewal application to the NRC for Diablo Canyon and Southern California Edison Company is exploring the feasibility of seeking a 20-year license extension for SONGS. If granted, license renewals could keep Diablo Canyon and SONGS in operation until the mid-2040s. In past license renewal proceedings, the NRC has excluded an examination of seismic hazards, plant security, emergency preparedness, environmental review of spent fuel storage, and analysis of spent fuel storage options from the scope of NRC's license renewal review. The NRC's Office of Inspector General completed an audit of the license renewal process in September 2007 and concluded that NRC staff should improve their analyses and audits.[20] An important means for improving the NRC's license renewal process would be to revise the license renewal review to allow important site-specific

[20] *Audit Report: Audit of NRC's License Renewal Program,* Nuclear Regulatory Commission Office of Inspector General, OIG-07-A-15, September 6, 2007.

issues to be reexamined during this review rather than relying upon, as in the case of PG&E's license renewal review, an outdated GEIS (1996) that was published before the events of September 11, 2001, and before considerable new seismic research information has been developed. New and significant information has arisen since DCPP originally received its operating license and this information should be examined during its license renewal reviews.

The discovery, announced to the public in 2008, of a new Shoreline Fault near Diablo Canyon is an example of new and significant seismic information that should be reviewed during Diablo Canyon's license renewal review. The USGS and PG&E are conducting additional seismic research in the vicinity of Diablo Canyon, and the Energy Commission has recommended additional tsunami and seismic research at both Diablo Canyon and SONGS. The NRC and the USGS are beginning in January 2010 an independent assessment of Diablo Canyon's seismic research program. New and significant seismic research information resulting from these studies must be considered in Diablo Canyon's license renewal review. Seismic issues, particularly when new and significant seismic research information is available, should be considered plant-specific issues to be examined during license renewal review.

Plant safety culture has been an ongoing concern at plants throughout the U.S. and should receive as much scrutiny and attention during the NRC's license renewal review and plant-specific environmental impact assessment as attention is paid to the aging plant components, hardware, systems and materials. Plant management and plant workers' attitudes and strict adherence to proper maintenance and safety procedures are extremely important, particularly in aging reactors, as plant components and systems show signs of aging and stress.

We recommend that the NRC include seismic; emergency response planning; safety culture; evaluation of energy alternatives; once-through cooling; security issues; as well as at-reactor nuclear waste accumulation, transport, and disposal impacts among the plant-specific environmental impacts that will be addressed in NRC's and PG&E's analyses for DCPP license renewal. We also strongly urge the NRC to hold license renewal hearings in the vicinity of DCPP in the San Luis Obispo area.

Senator CARPER. Thank you, Mr. Boyd.

Next we will introduce Lew Schiliro, Secretary Schiliro. How long have you been Secretary now?

Mr. SCHILIRO. Just over 2 years, Senator.

Senator CARPER. Before that I know you spent a few years in the FBI. How many?

Mr. SCHILIRO. Twenty-five years, sir.

Senator CARPER. Twenty-five years. Thank you for your service to our country and to our State. We are delighted that you are here today.

Please proceed.

STATEMENT OF LEWIS D. SCHILIRO, J.D., CABINET SECRETARY, DELAWARE DEPARTMENT OF SAFETY AND HOMELAND SECURITY

Mr. SCHILIRO. Thank you, Senator, and good afternoon, Chairman.

I am Lew Schiliro, the Secretary of Delaware's Department of Safety and Homeland Security. On behalf of Governor Jack Markell, I am honored to be here today to address the important issue of Homeland Security as it relates to radiological emergency plans and preparedness. I would like to thank you for the attention and focus on this most important topic.

In the days and weeks that have followed the nuclear energy crisis in Japan, many citizens have raised concerns regarding radiological emergency preparedness in the United States. In Delaware, the citizens' concerns about the safety of nuclear energy facilities and the State's ability to handle a radiological emergency were directed to our Department.

Our Department is comprised of several Public Safety Divisions, including the Delaware State Police, Capital Police, the Office of Highway Safety and, most importantly, the Delaware Emergency Management Agency, which we refer to as DEMA.

While our divisions often work together during a public safety emergency, DEMA is primarily responsible for the State's Radiological Emergency Plan and preparedness activities. I would like to open my statement today with information on the nuclear energy utility located just off our State's shore and our State's Radiological Emergency Plan. I will then share some insight into our experiences with the utility.

Our State's location along the East Coast puts it within 50 miles of four nuclear generating stations. They are Limerick Nuclear Generating Station and Peach Bottom Atomic Energy Station, both in Pennsylvania, Calvert Cliffs Nuclear Generating Station in Maryland, and the Salem/Hope Creek Nuclear Generating Station in New Jersey. Of these four stations, Salem/Hope, which is a 740-acre site operated by PSE&G, is the closest, located just 2.5 miles from the Delaware shoreline. Together, these plants comprise the second largest nuclear generating facility in the United States and generate enough electricity for 3 million homes each day.

According to the 2010 Census, there are approximately 41,000 people in Delaware who currently live within a 10-mile radius of this utility. The area is more commonly known as the Emergency Planning Zone or EPZ. It should be noted that within the last 10

years, Delaware's population in the EPZ increased by over 17,000 citizens, according to the recent census. This increase necessitates a mandatory evaluation of our evacuation routes and times.

The close proximity of Salem/Hope makes it the most potential threat to our State and as such, DEMA's radiological staff continues to work closely with the nuclear people at PSE&G and the New Jersey State emergency management officials to maintain and update the State's radiological plan. This comprehensive plan, which is approved by FEMA, is DEMA's roadmap to provide command, control and coordination for any potential nuclear plant incident impacting our State.

As required by the Nuclear Regulatory Commission and FEMA, within a 6-year cycle, DEMA conducts three plume exercises which really test the State's emergency response capability within the EPZ and one injection exercise which tests the State's readiness to address needs within a 50-mile radius of the utility.

Historically, Delaware's Federally-graded exercises have received very high marks from FEMA and these are graded exercises that are quite thorough and exhaustive inasmuch as they test each and every State emergency response resource that could potentially have a role in any radiological emergency incident. They involve our first responders, our evacuation plans, reception centers which are registration and decontamination sites, traffic control access points, shelters, schools, hospitals and emergency worker decontamination centers.

In addition to that, FEMA conducts quarterly radiological drills with PSE&G and New Jersey that specifically focus on the EPZ and our responder resources. In 2010, 821 people received training specific to the REP Plan and Emergency Worker Equipment.

I am going to cut some of this short, Senator, but we have absolutely an excellent relationship with PSE&G and the emergency response officials in New Jersey.

I welcome the opportunity, as this goes on, to answer any questions that you may have regarding those plans.

Thank you.

[The prepared statement of Mr. Schiliro follows:]

STATEMENT OF LEWIS D. SCHILIRO, J.D., SECRETARY, DELAWARE DEPARTMENT OF SAFETY AND HOMELAND SECURITY

INTRODUCTION

Good Afternoon, Chairman Boxer, Ranking Member Inhofe, and members of the Subcommittees. I am Lewis D. Schiliro, Secretary of the Delaware Department of Safety and Homeland Security. On behalf of Governor Jack A. Markell, I am honored to be here today to address the important issue of homeland security as it relates to radiological emergency plans and preparedness. I would like to thank you for your attention and focus on this most important topic.

In the days and weeks that have followed the nuclear energy crisis in Japan, many citizens have raised concerns regarding radiological emergency preparedness in the U.S. In Delaware, citizen concerns about the safety of nuclear energy facilities and the State's ability to handle a radiological emergency were directed to our Department. Our Department is comprised of several public safety divisions including the Delaware State Police (DSP), Capitol Police and the Delaware Emergency Management Agency (DEMA). While our divisions often work together during a public safety emergency, DEMA is primarily responsible for the State's radiological emergency plan (REP) and preparedness activities. I would like to open my statement today with information on the nuclear energy utility located just off the State's

shore and our State's Radiological Emergency Plan. I will then share some insight into our experiences and relationship with the Utility.

NUCLEAR GENERATING STATIONS IN CLOSE PROXIMITY TO DELAWARE

Our State's location along the East Coast puts it with in 50-miles of four nuclear generating stations. They are Limerick Nuclear Generating Station and Peach Bottom Atomic Power Station, both in Pennsylvania; Calvert Cliffs Nuclear Generating Station in Maryland; and Salem/Hope Creek Nuclear Generating Station in New Jersey. Of these four stations, Salem/Hope Creek, a 740-acre site operated by PSEG Nuclear, is the closest, located just 2.5 miles from the Delaware shoreline. Together, the plants comprise the second largest nuclear generating facility in the U.S and generate enough electricity for three million homes each day. According to the 2010 Census, there are approximately 41,000 people in Delaware who currently live within a 10-mile radius of the Utility. This area is more commonly known the Emergency Planning Zone (EPZ). It should be noted that within the last 10 years, Delaware's population in the EPZ increased by over 17,000 citizens according to the recent census study. This increase necessitates a mandatory evaluation of our evacuation routes and times.

RADIOLOGICAL EMERGENCY PLAN, EXERCISES AND NOTIFICATION

The close proximity of Salem/Hope Creek makes it the most potential threat to our State and as such DEMA's Radiological Staff continues to work closely with PSEG Nuclear and New Jersey State Emergency Management officials to maintain and update the State's radiological emergency plan. This comprehensive plan, approved by FEMA, is DEMA's roadmap to provide command, coordination and support for any potential nuclear power plant incident impacting our State. As required by the Nuclear Regulatory Commission (NRC) and FEMA, within a 6-year cycle DEMA conducts three (3) plume exercises which test the State's emergency response capabilities within the EPZ and one (1) ingestion exercise which test the State's readiness to address needs within a 50-mile radius of the Utility. Historically, Delaware's federally graded exercises have received high marks from FEMA. These federally graded exercises are quite thorough and exhaustive in that they test each and every State emergency response resource that could potentially have a role in a radiological emergency incident. They involve our first responders; evacuation plans; reception centers which are registration and decontamination sites for the public; traffic access controls; shelters; schools; hospitals; and emergency worker decontamination centers. In addition, DEMA conducts quarterly radiological drills with PSEG and New Jersey that specifically focus on the EPZ emergency plans and responder resources. In 2010, 821 people received training specific to the State's REP Plan and Emergency Worker Equipment.

A. Partnerships with Multiple Governmental and Private Agencies

Over the years, DEMA has successfully forged partnerships with multiple Federal, state, county and local agencies to support our emergency response plans. DEMA currently maintains 22 Memorandums of Understanding with various agencies and organizations for resources and assistance. These agencies bring resources that would not otherwise be readily available to DEMA. For example, unlike other states, our Delaware National Guard is an integral part of our emergency plan. It provides support for field monitoring and air sampling as well as staffing for two reception centers and an Emergency Worker Decontamination Center. In 2010, Delaware participated in drills and exercises that involved 1,070 staff from private and governmental agencies.

B. Emergency Notification and Activation of Plan

DEMA has established a 24-hour contact through Delaware State Police (DSP) Communications for Salem/Hope Creek notifications. Within 15 minutes of a radiological emergency, PSEG shall send an alert to DEMA via DSP Communications. This alert triggers the activation of the State's Emergency Operations Center and will start the notification process to our emergency support resources including the State Division of Public Health, Department of Natural Resources and Environmental Control (DNREC), National Guard and Department of Agriculture as well Federal resources that include FEMA, U.S. Environmental Protection Agency, Department of Energy, U.S. Department of Agriculture and NRC.

C. Monitoring Sites

While notification of a radiological incident shall come from PSEG, DEMA also has seven (7) stand-alone monitoring sites within the EPZ. These units provide readings 24-hours a day and are equipped with battery powered back-ups. These

units are also programmed to send an alert to DSP Communications for the purpose of initiating the notification procedure. An alert from any of the stand-alone units would necessitate a call to PSEG to determine and confirm if there had been an incident of concern. If the alarm was not triggered by a PSEG release, DEMA would contact DNREC to investigate and determine the source and extent of the incident.

One additional stationary monitoring unit is located in Dover. This unit is managed and monitored by the USEPA through its RADNET program.

PUBLIC INFORMATION AND EDUCATION

On a nearly continual basis, DEMA participates in various outreach programs throughout the State. Emergency preparedness information provided to the general public covers public notification, evacuations, sheltering and distribution of potassium iodide. The public also receives information via the PSEG Nuclear Informational Calendar. It offers detailed planning guidance for residents living within the EPZ. DEMA also makes direct contact with civic associations, community groups, schools and businesses located in the EPZ to provide plans and training.

A. Potassium Iodide Distribution

For the past 10 years, Delaware has offered a potassium iodide public distribution program. The NRC has provided the recommended dosage of potassium iodide to all Delaware residents within 10-miles of the Salem/Hope Creek Nuclear Generating Stations. In determining the amount of potassium iodide Delaware requests, the anticipated growth of the population within the 10-mile Emergency Planning Zone was taken into consideration, to ensure all persons living within the EPZ are issued the appropriate dosage. Besides the public distribution, additional supplies in caches are maintained at the Registration sites for distribution to the public upon arrival, if warranted. Each year in the fall, DEMA and the Division of Public Health work together to host several potassium iodide public distribution events. In response to recent citizen requests, a potassium iodide distribution event was held last week.

EXPERIENCE AND RELATIONSHIP WITH PSEG NUCLEAR OFFICIALS

The Department and DEMA have a positive working relationship with PSEG Nuclear officials and have found them to be quite responsive to our needs and concerns. PSEG provides approximately $1.4 million each year to fund the State's radiological emergency preparedness program and activities. This is the State's only source of funding for its radiological program.

PSEG Nuclear has invited Department leaders and DEMA staff to the Salem/Hope Creek Generating Stations on several occasions for plant tours. More importantly, during the quarterly drills, several DEMA radiological staff and public information officers travel to Salem/Hope Creek Generating Station to work as a team with PSEG staff and New Jersey officials. This arrangement has allowed our staff to become very familiar with not only the emergency plans and procedures but with the PSEG facility and its staff. In addition, PSEG hosts annual training on utility emergency plans and procedures. Each year, PSEG officials partner with DEMA to host an awards luncheon for elementary school students who submit artwork for its radiological emergency information calendar that is distributed to residents within the Delaware portion of the EPZ. Likewise, a similar activity is sponsored by New Jersey & PSEG for the New Jersey portion of the EPZ.

CLOSING

At this time, the Department does not have any specific concerns regarding the Salem/Hope Creek Generating Stations or the other nearby nuclear energy facilities. I am confident that DEMA and its supporting partners are prepared to handle a radiological incident within our State.

Senator CARPER. Thank you very, very much, Mr. Secretary.

Welcome, again, Mr. Sommerhoff. Please proceed. Thank you for joining us.

STATEMENT OF CURTIS S. SOMMERHOFF, DIRECTOR, MIAMI-DADE DEPARTMENT OF EMERGENCY MANAGEMENT

Mr. SOMMERHOFF. Good afternoon, and I wanted to thank Environment and Public Works Committee Chairman Boxer, Ranking Member Inhofe, Clean Air and Nuclear Subcommittee Chairman

Carper, Ranking Member Barrasso, and the distinguished committee members.

I am Curtis Sommerhoff, Director of the Miami-Dade Department of Emergency Management. The community I serve spans nearly 2,000 square miles, includes 35 municipalities, and has a population of more than 2.5 million. We are a coastal community vulnerable to a number of natural and manmade disasters including the threat of hurricanes, flooding, fires, mass migration, oil spills and radiological events.

Miami-Dade County's response to emergencies and disasters is guided by a Comprehensive Emergency Management Plan, an all-hazards approach which supports the County's ability to respond to any type of emergency. Within our comprehensive plan we have a number of hazard-specific annexes, including a Radiological Emergency Preparedness Plan.

Our plans are regularly assessed and assumptions analyzed, revised and ultimately certified by the Federal Emergency Management Agency. Site visits and evaluated exercises bring together local, State and Federal agencies, as well as members of the utility, to enhance collaboration and programming. FEMA oversight and formal after action reports highlight significant areas that might need improvement.

In the event of an emergency at the nuclear power plant, we have a public alert and notification system that includes warning sirens in the area around the plant, identified support facilities for the delivery of emergency services, fully trained and equipped public safety response personnel, and protective measures that are adjusted to the threat level.

Our ability to effectively respond to a radiological or other threat lies not only in our comprehensive planning but our long history of implementing protective actions for the public. Over the past decade alone, evacuation orders have been issued to the public on 10 occasions as a result of hurricanes and tropical storms and, together with our partner agencies, we have coordinated the evacuation, transportation, sheltering, medical care and feeding of tens of thousands of evacuees.

Consider this. In the 10-mile Emergency Planning Zone surrounding the Turkey Point Nuclear Power Plant, there are approximately 180,000 residents. Within Miami-Dade's three designated Hurricane Evacuation Zones, there are more than half a million residents.

We have identified shelters for temporary housing with special consideration given to individuals with special needs. We have designated areas for the dissemination of emergency supplies, like water, ice, food and tarps in the event of widespread destruction or power outages.

We have ready-to-activate Disaster Assistance Centers to provide social services to residents in need of financial assistance, prescriptions refills, short- and long-term housing and first aid, and contracts and mutual aid agreements to ensure the continuity of operations during disaster response and recovery. In line with the National Response Framework, all of our plans are scalable, flexible and adaptable.

The County's Department of Emergency Management fosters an ongoing collaborative planning relationship with the County's mission essential departments and partner agencies to address life safety and property implications from existing hazards. We have a long-established state-of-the-art Emergency Operations Center, our nucleus for response and recovery efforts.

When disaster threatens, our emergency managers, private and non-profit sector partners, as well as our media partners, come together under one roof, a critical component for a coordinated response and timely and accurate information dissemination. Local, State and Federal coordination enables us to augment and resupply personnel and equipment as needed, even over extended periods.

Our strengths and experiences from hurricane response carry over to our ability to implement actions for a radiological event. Conversely, our planning for a potential radiological event has a positive effect on our ability to respond to other hazards.

Based on our experiences, we respectfully offer the following recommendations for consideration.

The recommendation of the Nuclear Regulatory Commission to evacuate Americans out to 50 miles from the Fukushima Daiichi Plant has raised many questions. We support analysis of the data and assumptions behind the recommendation to determine if Emergency Planning Zones in the United States need to be revised. Of course, a wholesale change to increase the plume exposure pathway must be carefully evaluated and weighed against the value of making the revision.

It is also important to note that local officials currently have the flexibility to revise public protective action based on accident parameters and the situation on the ground.

As we have seen in the crisis in Japan, as well as other disasters across the United States, interaction and coordination with Federal partners is sometimes hampered by the lack of familiarity of local and State response organizations with Federal processes and systems. Increasing the inclusion of FEMA and other Federal agencies in local and State training and exercises would make the transition from a local response to a Federally-integrated response more seamless and efficient.

Finally, it is essential to maintain and expand emergency management all-hazard funding programs such as the Emergency Management Performance Grant Program. This year alone, every EMPG dollar spent in Miami-Dade County is matched with over five local dollars to build emergency management capabilities that enhance our community's disaster preparedness.

EMPG dollars have also enabled us to invest in staff and resources that have been made available to communities throughout the country, including assistance we were able to deploy to New York after the 9/11 attacks and, more recently, to neighboring Florida counties directly impacted by 2004s record-breaking hurricane season.

Once again, I thank you for the opportunity to share our experiences, observations and recommendations.

[The prepared statement of Mr. Sommerhoff follows:]

STATEMENT OF CURTIS SOMMERHOFF, DIRECTOR, MIAMI-DADE DEPARTMENT OF EMERGENCY MANAGEMENT

INTRODUCTION

Thank you Environment and Public Works Committee Chairman Boxer, Ranking Member Inhofe, Clean Air and Nuclear Safety Subcommittee Chairman Carper, Ranking Member Barrasso, and distinguished committee members.

I am Curtis Sommerhoff, Director of the Miami-Dade Department of Emergency Management, and am pleased to have the opportunity to share with you Miami-Dade's approach to preparedness, response and recovery, including our plans in the event of a radiological emergency. The events at Japan's Fukushima Daiichi nuclear power station have rightly focused attention on the safety of existing nuclear power plants, the soundness of emergency plans, and the readiness of emergency responders.

Let me begin by sharing a bit about myself and Miami-Dade County. I have spent my career in and around emergency management—from addressing water and wastewater emergencies . . . to overseeing hazardous materials and response programs . . . to managing Miami-Dade County's Radiological Emergency Preparedness Plan. I have served during 8 Presidentially Declared or Major Disaster Declarations, including Hurricanes Wilma and Katrina, and was appointed Director of Miami-Dade Emergency Management in 2009.

The community I serve spans nearly 2,000 square miles, includes 35 municipalities and has a population of more than 2.5 million people. We are a coastal community vulnerable to a number of natural and man-made disasters, including the threat of hurricanes, flooding, fires, mass migration, oil spills and radiological events.

ABILITIES & STRENGTHS

Miami-Dade County's response to emergencies and disasters is guided by a Comprehensive Emergency Management Plan . . . an "all-hazards" approach which supports the county's ability to respond to any type of emergency. Within our comprehensive plan, we have a number of hazard specific annexes, including a Radiological Emergency Preparedness Plan.

The Turkey Point Power Plant operated by Florida Power and Light is located approximately 25 miles south of the city of Miami, and includes two nuclear power reactors. Miami-Dade County's vulnerability analysis accounts for the possible risks posed by nuclear power, and we have a robust planning, training and exercise program to ensure our response capabilities are appropriate.

Our plans are regularly assessed and assumptions analyzed, revised, and ultimately, certified by the Federal Emergency Management Agency (FEMA). Site visits and evaluated exercises bring together local, State and Federal agencies, as well as members of the utility to enhance collaboration and programming. FEMA oversight and formal after-action reports highlight significant areas that might need improvement.

In the event of an emergency at the nuclear power plant, we have a public alert and notification system that includes warning sirens in the area around the plant; identified support facilities for the delivery of emergency services; fully trained and equipped public safety response personnel; and protective measures that are adjusted to the threat level.

Our ability to effectively respond to a radiological—or other threat—lies not only in our comprehensive planning, but our long history of implementing protective actions for the public. Over the past decade alone, evacuation orders have been issued to the public on 10 occasions as a result of hurricanes or tropical storms; and together with our partner agencies, we have coordinated the evacuation and transportation, sheltering, medical care and feeding of tens of thousands of evacuees.

Consider this: In the 10-mile Emergency Planning Zone surrounding the Turkey Point Nuclear Plant, there are approximately 180,000 residents. Within Miami-Dade's three designated Hurricane Evacuation Zones, there are more than a half a million residents.

We have identified shelters for temporary housing, with special consideration given to individuals with special needs. We have designated areas for the dissemination of emergency supplies like water, ice, food and tarps in the event of widespread destruction or power outages. We have ready-to-activate Disaster Assistance Centers to provide social services to residents in need of financial assistance, prescription refills, short and long-term housing and first aid; and contracts and mutual aid agreements to ensure the continuity of operations during disaster response and re-

covery. In line with the National Response Framework (NRF), all of our plans are scalable, flexible and adaptable.

The County's Department of Emergency Management fosters an ongoing, collaborative planning relationship with the county's mission essential departments and partner agencies to address life-safety and property implications from existing hazards. We have a long-established, state-of-the-art Emergency Operations Center —our nucleus for response and recovery efforts. When disaster threatens, our emergency managers, private and non-profit sector partners, as well as our media partners, come together under one roof—a critical component for a coordinated response and timely and accurate information dissemination. Local, State and Federal coordination enables us to augment and resupply personnel and equipment, as needed, even for extended periods.

Our strengths and experience from hurricane responses carry over to our ability to implement actions for a radiological event. Conversely, our planning for a potential radiological event has a positive effect on our ability to respond to other hazards.

RECOMMENDATIONS

Based on our experiences, we respectfully offer the following recommendations for consideration:

(1) The recommendation by the Nuclear Regulatory Commission to evacuate Americans out to 50 miles from the Fukushima Daiichi Plant has raised many questions. We support analysis of the data and assumptions behind the recommendation to determine if Emergency Planning Zones in the U.S. need to be revised. Of course, a wholesale change to increase the plume exposure pathway must be carefully evaluated and weighed against the value of making any revision.

It is also important to note that local officials currently have the flexibility to revise public protective action based on accident parameters and the situation "on the ground".

(2) As we have seen with the crisis in Japan as well as with other disasters across the U.S., interaction and coordination with Federal partners is sometimes hampered by the lack of familiarity of local and State response organizations with Federal processes and systems. Increasing the inclusion of FEMA and other Federal agencies in local and State training and exercises would make the transition from a local response to a federally integrated response more seamless and efficient.

(3) We support recent revisions to radiological emergency preparedness regulations requiring greater variation in exercise scenarios. Variations that are infrequently exercised at the local level, but carry great importance include consideration of food embargos, legal and financial challenges to home and business owners, long-term displacement of residents, impacts to the environment and economy, and integration of American Nuclear Insurers into the recovery process.

(4) Because a nuclear event of Japan's magnitude invariably engenders a great deal of national and international interest, a centralized Web site similar to the Deepwater Horizon site "restorethegulf.gov" can provide a one-stop source for official information.

(5) Finally, it is essential to maintain and expand emergency management all-hazard funding programs such as the Emergency Management Performance Grant Program (EMPG). This year alone, every EMPG dollar spent in Miami-Dade County is matched with over five local dollars to build emergency management capabilities that enhance our community's disaster preparedness.

EMPG dollars have also enabled us to invest in staff and resources that have been made available to communities throughout the country, including assistance we were able to deploy to New York City in the aftermath of the 9/11 attacks, and more recently, to neighboring Florida counties directly impacted by 2004s record-breaking hurricane season.

Once again, thank you for the opportunity to share our experiences, observations and recommendations. I am pleased to answer any questions you may have.

Senator CARPER. Good. Thanks so much, Mr. Sommerhoff.

Mr. Pardee, you are now recognized. Please proceed. Thank you for joining us.

STATEMENT OF CHARLES PARDEE, CHIEF OPERATING OFFICER, EXELON GENERATION COMPANY

Mr. PARDEE. Good afternoon, Chairman Carper, members of the committee.

My name is Charles Pardee. I am the Chief Operating Officer at Exelon Generation and as such responsible for all of the company's generating assets, including 17 units at 10 sites in Illinois, Pennsylvania and New Jersey.

I appreciate the opportunity to appear this afternoon on behalf of the nuclear industry to discuss the safety of nuclear power plants here in the United States.

We have been following the events in Japan closely since the historic earthquake and tsunami struck the plant on March 11th. Many in the United States nuclear industry have both a professional and a personal interest in the events unfolding there.

Many of us, myself included, have been to Japan a number of times as part of international technical exchange programs to share operating experience with the Tokyo Electric Power Company and others. In fact, I was at the Fukishima Daiichi station about a week prior to the earthquake striking there on one such exchange.

Our hearts go out to the Japanese people as they respond to the humanitarian crisis they are facing. Currently, six Exelon employees are in Japan assisting with efforts there to secure, stabilize and ultimately decommission the Fukushima Daiichi reactors.

It is understandable that many Americans are asking if power plants in the United States are safe in light of the events in Japan. I firmly believe that they are safe, and I would like to make three primary points about the safety of nuclear plants in the United States to buttress this belief.

First, our plants are designed and licensed to withstand a variety of natural disasters including earthquakes, floods, tornadoes and, where appropriate, tsunamis. Plants are designed to withstand potential disasters based on the most extreme event known in their geographic location with significant margin added to that extreme event to ensure safety. Margins are reviewed and improved as necessary as additional information or experience becomes available to us.

Second, safety systems, equipment and emergency procedures at nuclear power plants are not frozen in time once the plant is built. In fact, safety is an issue that is being constantly examined by both the industry and our regulators. We have undertaken extensive safety enhancing upgrades to our plants in the aftermath of Three Mile Island, the events of 9/11, and other events such as Hurricanes Katrina and Andrew that have impacted the United States.

Particular attention has been paid to putting systems in place to avoid a buildup of hydrogen in containment areas, the likely cause of the explosions at the Japanese plants. In addition, we require multiple redundancies and back up power supplies in the event of a loss of offsite power, the precipitating factor in the loss of cooling water issues that have led to the most extensive damage at the Japanese reactors.

In addition, full capability simulators have been installed at each plant in the United States, giving every operating crew the ability to train under realistic conditions on extreme events, such as loss of all AC electrical power, to ensure our mitigation strategies are robust and our operators are fully qualified to respond. I earned an operating license at a plant similar to one of the Fukushima Daiichi reactors in the 1990s, and I personally went through this

training to learn how to combat scenarios such as the loss of all electrical power.

Third, while it may take months, if not years, to fully understand what happened at the Japanese reactors, the industry is not waiting to take action to incorporate lessons learned from this event. Indeed, I firmly believe that the nuclear industry is unparalleled in its ability to incorporate lessons learned to ensure excellence in operations.

There are two institutions, the U.S.-based Institute of Nuclear Power Operations and its international equivalent, the World Association of Nuclear Operators, that are devoted to ensuring excellence by sharing best practices, assessing and incorporating lessons learned from events such as this, and rigorously assessing plant performance to ensure sound operations.

In the United States, the Institute of Nuclear Power Operations ensures that reactor operators do not become complacent in any area of operations, particularly when it comes to safety-related issues. There is a focus on continuous learning from events, both large and small, that occur at other plants. Whenever a significant event occurs, INPO performs an analysis to determine relevant lessons learned that are then shared with all operators.

Within days of the earthquake and the tsunami, the industry issued directives to each of our plants to undertake a variety of actions to ensure that seismic and safety-related equipment was in good material condition and to review our emergency response plans including each plant's capability to manage a total loss of offsite power. These assessments are ongoing and I am confident that both industry and NRC will have additional action items in the coming weeks and months to further enhance our ability to operate safely.

Aside from the safety of nuclear reactors, I know that there are also concerns about the safety of spent fuel pools in light of the events in Japan. As with our reactors, we have taken a number of steps in the aftermath of Three Mile Island and 9/11 to bolster security to spent fuel pools. Back-up power systems, abundant onsite water supplies and additional high capacity pumps provide us with the defense and depth to ensure safety of these pools.

Let me conclude by recognizing the dedicated employees of the United States nuclear industry. Safety is, and continues to be, the primary focus of our industry, and we have tens of thousands of highly skilled, thoroughly trained employees working tirelessly every hour of every day such that our plants operate safely and efficiently.

Thank you for this opportunity.

[The prepared statement of Mr. Pardee follows:]

Statement of

Charles Pardee
Chief Operating Officer
Exelon Generation Company

Committee on Environment and Public Works
Subcommittee on Clean Air and Nuclear Safety

United States Senate

April 12, 2011

Chairman Boxer, Ranking Member Inhofe, and members of the subcommittee, thank you for the opportunity to appear before you today.

My name is Charles Pardee. I am Chief Operating Officer of Exelon Generation Company and former Chief Nuclear Officer of Exelon Nuclear. Exelon owns and operates 17 of the nation's 104 reactors. Our plants are located at 10 sites in Illinois, Pennsylvania, and New Jersey.

I appreciate your invitation to testify at today's hearing to discuss the status of the U.S. nuclear energy industry and the implications of the Fukushima nuclear accident on nuclear energy in the United States. I am testifying today on behalf of the Nuclear Energy Institute, the nuclear energy industry's Washington-based policy organization. NEI members include all companies licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

My remarks will cover four major points:

First, U.S. nuclear power plants are safe.

Second, safety is the U.S. nuclear energy industry's top priority.

Third, the U.S. nuclear energy industry has a long history, over several decades, of continuous learning from operational events, and we have incorporated lessons learned into our nuclear plant designs (through structural or systems upgrades) and our operating practices and training. We will do the same as a result of the Fukushima accident.

And fourth, the U.S. nuclear energy industry has already taken pro-active steps to verify and validate our readiness to manage extreme events. We took these steps early – without waiting for clarity on the sequence of events at Fukushima.

Before I address these four points, however, let me note that the U.S. nuclear energy industry works very hard not to grow complacent about safety. This is not always easy when our 104 nuclear power plants are operating well, with an average capacity factor above 90 percent for the

last 10 years. Similarly, we cannot be complacent about the accident at Fukushima. I am quite confident that we will learn important lessons from this experience and identify additional steps we can and will take to further improve safety and response capability at our nuclear plants.

U.S. Nuclear Power Plants Are Safe

That said, we do believe U.S. nuclear power plants are safe. They are designed and operated conservatively, to exacting standards, to manage the maximum credible challenges appropriate to each nuclear power plant site. U.S. nuclear power plants have also demonstrated their ability to maintain safety through extreme conditions, including floods, hurricanes and other natural disasters.

I can think of no better summary of the status of U.S. nuclear power plants than the one delivered by President Obama to the American people on March 17. President Obama said: "Our nuclear power plants have undergone exhaustive study, and have been declared safe for any number of extreme contingencies. But when we see a crisis like the one in Japan, we have a responsibility to learn from this event, and to draw from those lessons."

The industry invests heavily in our nuclear power plants to ensure safe, reliable operation. The industry invested approximately $7 billion in 2010 in our 104 reactors – to replace steam generators, reactor vessel heads and other equipment and in other capital projects.

U.S. reactors are designed to withstand earthquakes, tsunamis, hurricanes, floods, tornadoes and other natural events equal to the most significant historical event or the maximum projected event, plus an added margin for conservatism, without any breach of safety systems. We have many, many examples of U.S. nuclear power plants achieving safe shutdown during extreme events where offsite power was lost. During Hurricane Katrina in 2005, for example, the Waterford nuclear power plant in Louisiana shut down safely, lost all off-site power, and maintained safe shutdown on emergency diesel generators for three-and-a-half days until grid power was restored.

For earthquakes, nuclear plants are designed and constructed to withstand the maximum projected earthquake that could occur in its area, with additional margin added. Plant earthquake-induced ground motion is developed using a wide range of data and review of the impacts of historical earthquakes up to 200 miles away. Those earthquakes within 25 miles are studied in great detail. This research is used to determine the maximum potential earthquake that could affect the site. Each reactor is built to withstand the respective strongest earthquake; for example, a site that features clay over bedrock will respond differently during an earthquake than a hard-rock site.

It is important not to extrapolate earthquake and tsunami data from one location of the world to another when evaluating these natural hazards. These catastrophic natural events are location-specific, based on tectonic and geological fault line locations. The Tohoku earthquake that struck the Fukushima nuclear power plant occurred on a "subduction zone," the type of tectonic region that produces earthquakes of the largest magnitude. A subduction zone is a tectonic plate

boundary where one tectonic plate is pushed under another plate. Subduction zone earthquakes also produce the kind of massive tsunami seen in Japan.

In the continental United States, the only subduction zone is the Cascadia subduction zone which lies off the coast of northern California, Oregon and Washington. In an assessment released last week, the California Coastal Commission concluded that a "nuclear emergency such as is occurring in Japan is extremely unlikely at the state's two operating nuclear power plants. The combination of strong ground motion and massive tsunami that occurred in Japan cannot be generated by faults near the San Onofre Nuclear Generating Station and the Diablo Canyon Power Plant."

Safety Is the U.S. Nuclear Energy Industry's Top Priority

This leads to my second point: Safety is the U.S. nuclear energy industry's top priority, and complacence about safety performance is not tolerated.

Our industry operates in an unforgiving environment where the penalties for mistakes are high and where credibility and public confidence, once lost, are difficult to recover.

All of the safety-related metrics tracked by industry and the Nuclear Regulatory Commission demonstrate high levels of excellence. Forced plant outage rates, unplanned safety system actuations, worker radiation exposures, events with safety implications, and lost-time accident rates have all trended down, year over year, for a number of years.

We have confidence in nuclear plant safety based on those indicators, but we should derive even greater confidence from the process that produces those indicators, from the institutions we have created to share best practices, to establish standards of excellence and to implement programs that hold us to those standards.

After the 1979 accident at Three Mile Island, the nuclear industry created the Institute of Nuclear Power Operations (INPO). In INPO, the nuclear industry — unique among American industries — has established an independent form of self-regulation through peer review and peer pressure. In fact, the President's Oil Spill Commission, in its report on the Deepwater Horizon accident, identified INPO as the model for self-regulation by the offshore oil and gas industry.

INPO is empowered to establish performance objectives and criteria, and nuclear plant operating companies are obligated to implement improvements in response to INPO findings and recommendations. INPO has some 400 people monitoring nuclear plant operations and management on a daily basis. INPO evaluates every U.S. nuclear plant every two years, and deploys training teams to provide assistance to companies in specific areas identified as needing improvement during an evaluation.

INPO provides management and leadership development programs, and manages the National Academy of Nuclear Training, which conducts formal training and accreditation programs for those responsible for reactor operation and maintenance.

Among its many activities, INPO maintains an industrywide database called EPIX — for Equipment Performance and Information Exchange — and all companies are required to report equipment problems into the database. EPIX catalogues equipment problems and shows, for example, expected mean time between failures, which allows the industry to schedule predictive and preventive maintenance, replacing equipment before it fails, avoiding possible challenges to plant safety. INPO also maintains a system called Nuclear Network that allows companies to report and share information about operating events, to ensure that an unexpected event at one reactor is telegraphed to all, to ensure that an event at one plant is not repeated elsewhere, to ensure high levels of vigilance and readiness.

It may not be obvious to the outside world, but we have an enormous self-interest in safe operations. The industry preserves and enhances the asset value of our 104 operating plants first and foremost by maintaining focus on safety. Safety is the basis for regulatory confidence, and for political and public support of this technology.

A Commitment to Continuous Learning

The U.S. industry routinely incorporates lessons learned from operating experience into its reactor designs and operations. U.S. nuclear power plants have implemented numerous plant and procedural improvements over the past 30 years. Some of these improvements have been designed to mitigate severe natural and plant-centered events similar to those experienced at the Fukushima nuclear power plant. In addition, the equipment and procedures could be used to mitigate other severe abnormal events. The type of events include a complete and sustained loss of AC power, a sustained loss of vital cooling water pumps, major fires and explosions that would prevent access to critical equipment, hydrogen control and venting, and loss of multiple safety systems.

Starting in the 1990s, U.S. nuclear power plants developed guidelines to manage and mitigate these severe events that are beyond the normal design specifications. Plants evaluated site-specific vulnerabilities and implemented plant and procedural improvements to further improve safety. These severe accident management guidelines were developed in response to probabilistic risk assessments (PRAs), which identified several high-risk accident sequences. These guidelines provide operators and emergency managers with pre-determined strategies to mitigate these events The strategies focus on protecting the reactor containment structure as it assumes the zirconium cladding around the fuel and reactor cooling system are lost.

I could point to many, many examples of improvements made to U.S. nuclear power plants over the years in response to lessons learned from operational events. Let me list just a few:

- In the 1970s, concerns were raised about the ability of the BWR Mark I containment to maintain its design during an event when steam is vented to the torus. Subsequently, every U.S. operator with a Mark I containment implemented modifications to dissipate energy released to the suppression pool and stringent supports to accommodate loads that could be generated.
- As a result of the Three Mile Island accident, the industry made significant improvements to control room configuration and operator training – making it easier for operators to

respond to plant issues, without taking time to diagnose what had occurred. The industry also learned significant lessons about emergency preparedness and the importance of ensuring the public receives timely and accurate information during a plant event. It was after TMI that the NRC required all sites have emergency plans including both an Emergency Operations Facility and a Joint Information Center. These offsite facilities were mandated to ensure the states and NRC could have direct access to the information coming from the station and that there was a means for the state, utility and NRC to communicate directly through the media to the public.

- In 1988, the Nuclear Regulatory Commission concluded that additional Station Black Out (SBO) regulatory requirements were justified and issued the Station Black Out rule (10 CFR 50.63) to provide further assurance that a loss of both offsite and onsite emergency AC power systems would not adversely affect public health and safety. The SBO rule was based on several plant-specific probabilistic safety studies; operating experience; and reliability, accident sequence and consequence analyses completed between 1975 and 1988.
- Since the terrorist events of September 11, 2001, U.S. nuclear plant operators identified other beyond-design-basis vulnerabilities. As a result, U.S. nuclear plant designs and operating practices since 9/11 are designed to mitigate severe accident scenarios such as aircraft impact, which include the complete loss of offsite power and all on-site emergency power sources *and* loss of large areas of the plant. The industry developed additional methods and procedures to provide cooling to the reactor and the spent fuel storage pool, and staged additional equipment at all U.S. nuclear power plant sites to ensure that the plants are equipped to deal with extreme events and nuclear plant operations staff are trained to manage them.

The U.S. Nuclear Energy Industry Has Already Taken Steps in Response to Fukushima

The U.S. nuclear energy industry has already started an assessment of the events in Japan and is taking steps to ensure that U.S. reactors could respond to events that may challenge safe operation of the facilities. These actions include:

- Verifying each plant's capability to manage major challenges, such as aircraft impacts and losses of large areas of the plant due to natural events, fires or explosions. Specific actions include testing and inspecting equipment required to mitigate these events, and verifying that qualifications of operators and support staff required to implement them are current.
- Verifying each plant's capability to manage a total loss of off-site power. This will require verification that all required materials are adequate and properly staged and that procedures are in place, and focusing operator training on these extreme events.
- Verifying the capability to mitigate flooding and the impact of floods on systems inside and outside the plant. Specific actions include verifying required materials and equipment are properly located to protect them from flood.
- Performing walk-downs and inspection of important equipment needed to respond successfully to extreme events like fires and floods. This work will include analysis to identify any potential that equipment functions could be lost during seismic events

appropriate for the site, and development of strategies to mitigate any potential vulnerabilities.

Until we understand clearly what has occurred at the Fukushima Daiichi nuclear power plants, and any consequences, it is difficult to speculate about the long-term impact on the U.S. nuclear energy program. The U.S. nuclear industry, the U.S. Nuclear Regulatory Commission, the Institute of Nuclear Power Operations, the Nuclear Energy Institute, the World Association of Nuclear Operators and other expert organizations in the United States and around the world will conduct detailed reviews of the accident, identify lessons learned (both in terms of plant operation and design), and we will incorporate those lessons learned into the design and operation of U.S. nuclear power plants. When we fully understand the facts surrounding the event in Japan, we will use those insights to make nuclear energy even safer.

In the long-term, we believe that the U.S. nuclear energy enterprise is built on a strong foundation:

- reactor designs and operating practices incorporate a defense-in-depth approach and multiple levels of redundant systems
- oversight by a strong, independent regulatory infrastructure, which includes continuous assessment of every U.S. reactor by the Nuclear Regulatory Commission, with independent inspectors permanently on site and additional oversight from NRC regional offices and headquarters
- transparent regulatory process that provides for public participation in licensing decisions, and
- continuing and systematic processes to identify and incorporate lessons learned from operating experience.

I would like to take a moment to address an issue that came up during a hearing last week in the House Energy and Commerce Committee. The Union of Concerned Scientists (UCS) released excerpts of information they obtained from the NRC under a Freedom of Information Act request regarding the Commission's unfinished State-of-the-Art Reactor Consequence Analyses (SOARCA) project that has been undertaken to better understand the impact of severe accidents scenarios depending on whether steps to mitigate the accident are taken or not.

Exelon's Peach Bottom plant in Pennsylvania is one of two representative plants chosen by the NRC for analysis. According to the UCS memo released last week, even in extreme and "highly unlikely" disaster scenarios during which Peach Bottom's backup power sources are unavailable, the station would suffer no core damage or release radiation when all people and emergency equipment actually available at the site are factored in.

In the unlikely event of a loss of both off-site power and diesel generators, Peach Bottom has eight hours of battery power available and a direct, underground connection to a dedicated turbine at Conowingo Dam that would provide ample power to operate emergency cooling systems for an indefinite period of time. These emergency cooling systems include nineteen separate methods for cooling the reactors and spent fuel pool. Peach Bottom's emergency planning exercises and other regular NRC reviews have consistently confirmed our ability to

utilize a number of redundant systems to safely shut down its twin reactors in the event of a power loss.

And while I understand that analyses such as these can raise concerns if presented without context, risk-based improvements to our plants and operating strategies can only be identified and adopted if extreme scenarios such as these are generated and studied.

In conclusion, let me leave you with a short-term and a longer-term perspective.

In the short term, all of us involved with the production of electricity from nuclear energy in the United States stand in awe of the commitment and determination of our colleagues in Japan, as they struggle to bring these reactors to safe shutdown.

In the longer term, it will be some time before we understand the precise sequence of what happened at Fukushima, before we have a complete analysis of how the reactor performed, how equipment and fuel performed, and how the operators performed. As we learn from this event, however, you may rest assured that we will internalize those lessons and incorporate them into our designs and training and operating procedures.

Environment and Public Works Committee Hearing
April 12, 2011 Follow-Up Questions for Written Submission

Questions for and response of Charles Pardee

Questions from Senator Barbara Boxer:

1. On April 11th, PG&E asked the Nuclear Regulatory Commission to delay issuance of the Diablo Canyon license renewal until after PG&E has completed the 3-D seismic studies and submitted a report to the NRC addressing the results. We have subsequently learned that PG&E did not request a delay in the licensing hearing process, but merely a delay in the final issuing of the license until after PG&E has completed the 3-D seismic study.

Do you believe the results of the 3-D seismic study should be considered as part of the license renewal hearing process?

Do you believe that all stakeholders, including local citizens, should be able to comment on the relevance of the study's results as part of a normal NRC relicensing process?

Response:

The NRC's license renewal rule, 10 CFR Part 54, focuses primarily on the aging effects on a plant's structures, systems and components, as well as the environmental impact of extended operation for the renewal period (20 years). A foundational principle of this rule is that a plant's current licensing basis ("CLB") carries forward into the renewal period. A plant's CLB can be amended at any time by the NRC – pre-, during-, or post-license renewal – when the agency determines that a safety issue necessitates a change to the design or operation of the plant. Therefore, we do not believe that issues outside the construct of the license renewal rule should be considered during the NRC's license renewal proceedings. Issues outside of the context of license renewal, including seismic issues, can be dealt with at any time during a plant's licensed period, and public comment is a standard element of the NRC's regulatory process for considering such issues and potential changes.

2. In your opinion, what are the key similarities and differences between nuclear power plants in the U.S. and those in Japan?

Response:

Certainly a key and obvious difference is where the plants are located. The Fukushima units are located near a subduction zone that can generate frequent and significant earthquakes and tsunamis. No U.S. plants are within sufficient proximity to subduction zones to cause the same magnitude of tsunamis as experienced in Japan. While the basic reactor designs employed in the U.S. and Japan are similar, U.S. reactors and plants have undergone significant modification and upgrades since initial deployment. There have been a number of media reports that indicate there are significant differences between how U.S. and Japanese operators are trained to respond to severe accidents such as those that occurred in Japan. However, we do not have a good

understanding of Japan's severe accident management processes and training and what modifications were made to the Japanese designs since initial deployment, how Japan's regulatory requirements differ, what industry initiatives Japan may have taken, and, most importantly, what procedures Japan may or may not have in place for emergencies, including severe accidents, to identify the key similarities and differences between nuclear power plants in the U.S. and Japan. What we do know is that U.S. plants have undergone significant physical and operational improvements resulting from federal regulation, plant modifications and upgrades, enhanced emergency readiness and response, and severe accident management. Exelon, the nuclear industry, and the NRC have a long history of continuous learning and improvement based on lessons learned from incidents experienced at plants in the U.S. and around the world. U.S. reactors are constantly evaluated and lessons learned implemented to improve plant safety. It is imperative that we gain a full understanding of Japan's regulatory structure, plants, and the chronology and sequence of events and actions taken in response to the event to inform our assessment of potential changes to U.S. regulations and operating practices.

3. Have you implemented any changes since the Fukushima Daiichi disaster occurred? Have you begun to identify any lessons learned?

Response:

Following the September 11 terrorist attacks, Exelon and the industry implemented additional emergency response measures to protect the plant against catastrophic events that may result in losses of large areas of the plant. The measures focus on establishing cooling to the spent fuel pools through the use of a dedicated portable diesel drive pump, strategies for getting water into the reactor vessel, and ensuring the integrity of reactor containment. The post September 11 emergency measures are useful in responding to a Fukushima type event. Following the Fukushima events, each operating U.S plant reviewed its emergency response measures by conducting, as appropriate, tests, inspections, walkdowns, demonstrations, and a review of procedures to verify the capability to mitigate conditions that result from severe or extreme events, including internal and external flooding, fires, seismic events, and other events that could result in station blackouts. In some cases, sites made changes based on the specific events at Fukushima.

In addition, the NRC created a task force to conduct a comprehensive review of the information from the events at the Fukushima Daiichi nuclear complex and make recommendations for any improvements needed to the regulatory system. As part of this review, the NRC performed an independent assessment of each plant's review of its emergency response measures. The NRC has not identified any issues that undermine its confidence in the continued safety and emergency planning of U.S. nuclear power plants. The NRC task force will provide observations, conclusions and recommendations in a written report to the Commission that will be made public approximately ninety days after the start of their review.

Regarding lessons learned, there are two aspects of the events that are clear: 1) The Fukushima events were multi-unit events at a single station; and 2) the station was unable to take mitigative

actions in time to preclude damage to the fuel after it was no longer able to cope with station blackout conditions. Some lessons learned may emerge over the next several months, but it is likely to take more than a year before we have the complete picture of what occurred. As those lessons are identified however, the nuclear industry will evaluate and take appropriate action to address those lessons learned.

4. **In addition to the NRC review arising out of the Fukushima disaster, are you independently conducting a review of your plants and operations to ensure any needed improvements are made?**

Response:

In addition to taking the actions described in response to (3), above, Exelon also established an internal response team to thoroughly review and evaluate each Exelon nuclear power plant's off site infrastructure needs for longer station blackout response and improvements in emergency planning response given widespread flooding and to determine the sequence of events at Fukushima Daiichi and lessons learned. Based on recommendations from this internal response team, Exelon has taken a number of actions to enhance its ability to respond to and mitigate the impact of severe events.

Exelon also commissioned an independent team comprised of third party experts in the areas of seismic risk, flood risk, radiation protection, health physics, and severe accident and emergency preparedness to independently review Exelon's emergency response measures and make recommendations. The expert team has not identified any significant safety concerns for the Exelon plants.

Environment and Public Works Committee Hearing
April 12, 2011 Follow-Up Questions for Written Submission

Question from Senator James M. Inhofe:

1. **There has been considerable attention paid to how U.S. reactors differ from the Fukushima plants. Please describe some of the differences between Japanese regulatory processes and the NRC's, as you understand them.**

Response:

While the basic reactor designs employed in the U.S. and Japan are similar, we do not have a good understanding of what modifications were made to the Japanese designs since initial deployment, how their regulatory requirements differ, what industry initiatives they may have taken, and, most importantly, what procedures they may or may not have in place for emergencies including severe accidents to identify the key similarities and differences between nuclear power plants in the U.S. and Japan. What we do know is that U.S. plants have undergone significant physical and operational improvements resulting from federal regulation, plant modifications and upgrades, enhanced emergency readiness and response, and severe accident management. Exelon, the nuclear industry, and the NRC have a long history of continuous learning and improvement based on lessons learned from incidents experienced at plants in the U.S. and around the world. U.S. reactors are constantly evaluated and lessons learned implemented to improve plant safety. It is imperative that we gain a full understanding of Japan's regulatory structure, plants, and the chronology and sequence of events and actions taken in response to the events to inform our assessment of potential changes to U.S. regulations and operating practices.

Senator CARPER. Mr. Pardee, thank you so much for joining us today.

Dr. Thomas Cochran. We have a Senator named Cochran, Thad Cochran from Mississippi.

Mr. COCHRAN. Not related.

Senator CARPER. What was that? Uncle Thad?

[Laughter.]

Mr. COCHRAN. Not related.

Senator CARPER. Oh. OK.

STATEMENT OF THOMAS B. COCHRAN, PH.D., SENIOR SCIENTIST, NUCLEAR PROGRAM, NATURAL RESOURCES DEFENSE COUNCIL, INC.

Mr. COCHRAN. Chairman Carper, and also Chairman Boxer and members of the committee, I want to thank you for providing NRDC and me the opportunity to present our views on the Japanese nuclear disaster and its implications for nuclear power reactors in the United States.

I have submitted my complete statement for the record. I will briefly highlight a few things here.

You requested that I offer my views regarding the implications the disaster has for reactor safety in the United States. First, I think we all are in agreement that the first priority is to provide assistance to our friends in Japan. But, eventually, and even today, we are turning to the issue of the implications for the United States.

Before turning to that issue, I wish to make two observations. First, my colleague, Dr. Matthew McKinzie, and I made a rough preliminary estimate of the collective radiation dose from the external exposure based on monitoring data from Japan. We should be mindful that the uncertainties in the estimated exposures at this stage are quite large. There is much we simply do not know. With this caution, we find the collective dose from the external exposure to date, and the consequentially excess cancers that are projected to result, appear to be 10 to 100 times greater than the collective radiation dose resulting from the Three Mile Island accident.

After Chernobyl, the Fukushima nuclear accident ranks as the second most dangerous civil nuclear power reactor accident to date. The collective dose to date from the Fukushima accident appears to be in the neighborhood of 100 times less than that from the Chernobyl accident. Similarly, the long-term human health consequences are one to two orders of magnitude less than the immediate non-nuclear consequences of the earthquake and tsunami. This is a preliminary comparison and it may change as we learn more.

Second, Dr. McKinzie and I have reexamined the historical frequency of partial core melt accidents. We found the historical frequency of core melt accidents worldwide is far greater than what the NRC considers safe. By this measure, operational reactors worldwide are not sufficiently safe.

Because of differences in the numbers of reactors, the reactor safety cultures and the regulatory oversight, the next nuclear power plant disaster is more likely to occur abroad than in the United States. But if nuclear power is to have a long-term future,

greater attention should be given to current operational reactors. Older obsolete designs should be phased out rather than have their licenses extended.

Turning to the implications for U.S. nuclear power reactors, there are concerns raised by the Fukushima nuclear disaster that bear directly on the safe operation and regulation of our domestic fleet. While others will add to this list, our immediate concerns include:

Are old GE BWRs with poorly designed Mark 1 and Mark 2 containments and subsequent upgrades imposed by the NRC safe enough to continue operation or have their licenses extended?

What additional improvements should be made to cope with hydrogen production in the event of a fuel clad interaction with steam? What improvements must be made to extend the time reactors can cope with loss of offsite power?

The NRC is overdue in requiring that spent fuel be removed from wet pools to hardened dry casks as soon as the spent fuel has cooled sufficiently to be passively cooled in air.

Which reactor sites are located in areas that cannot be adequately evacuated? Which reactor stations impose an undue economic risk to local, State and even the U.S. economy in the event of a partial core melt accident? Which U.S. reactors should be upgraded or phased out due to the risk of earthquake, flooding or tornado that is beyond the design basis?

Potential radiological accidents caused by earthquakes and tsunamis should be addressed in emergency response plans for U.S. reactors. Nuclear plant owners and operators must assume a larger share of financial risk in the event of a catastrophic nuclear accident.

What are the implications of predicted sea level rise due to climate change on the safety of nuclear reactors near coasts? What are the implications for continued failure of the NRC to finalize and implement a fire protection rule?

What changes should be implemented regarding radiation monitoring during routine plant operations following an accident? Perhaps most importantly, what is the best process for addressing these concerns?

I would like to elaborate on a couple of these starting with the last, the need for an independent commission——

Senator CARPER. Doctor, I am going to ask you not to elaborate too much, if you will.

Mr. COCHRAN [continuing]. Similar to the Kemeny Commission that investigated the Three Mile Island accident. Such an independent body could engender public confidence by thoroughly examining nuclear safety issues including assessing the conclusions and proposed corrective actions arrived at by both the nuclear industry and the NRC's 90-day safety review.

I will just touch on one of these issues that I raised. The 20-year license extensions already granted to 23 U.S. operational BWRs with Mark 1 and Mark 2 containments should be shortened. Similarly, no 20-year license extension should be granted to the eight BWRs with Mark 1 and Mark 2 containments that have not received license extensions.

Mr. Chairman, thank you. I will stop there. I have some more but I have run out of time and look forward to your questions.

[The prepared statement of Mr. Cochran follows:]

Statement of

Thomas B. Cochran, Ph.D.
Senior Scientist, Nuclear Program,
Natural Resources Defense Council, Inc.

on the

Fukushima Nuclear Disaster and its Implications for U.S. Nuclear Power Reactors

Joint Hearings of the
Subcommittee on Clean Air and Nuclear Safety
and the
Committee on Environment and Public Works
United States Senate
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Introduction
Madam Chair and members of the Committee, thank you for providing the Natural Resources Defense Council (NRDC) and me the opportunity to present our views on the nuclear disaster at the Fukushima Daiichi Nuclear Power Station and its implication for nuclear power reactors in the United States. NRDC is an international, non-profit organization of more than 350 scientists, lawyers, and environmental specialists, dedicated to protecting public health and the environment. Founded in 1970, NRDC serves more than 1.3 million members, supporters and environmental activists from offices in New York, Washington, Los Angeles, San Francisco, Chicago and Beijing.

Scale of the Fukushima Accident
After Chernobyl, the Fukushima nuclear accident ranks as the second most disastrous civil nuclear power reactor accident to date.

On March 22, 2011, L'Institut de Radioprotection et de Sûreté Nucléaire (IRSN) in France published an assessment of radioactivity released at Fukushima Daiichi. IRSN estimated the releases through March 22were on the order of 10 percent of the releases from Chernobyl, but also cautioned against drawing a similar comparison regarding consequences because of differences in population distribution (Fukushima is on the coast) .and meteorology. We believe this release estimate is highly speculative. In the years to come a great deal of effort will be expended in estimating the radioactive "source term."

My colleague, Dr. Matthew McKinzie, and I have made a rough preliminary estimate of the collective radiation dose from external exposure based on radiation monitoring data from Japan. (Attached). We should be mindful that the uncertainties in the estimated exposures are quite large, the releases are still ongoing, the external gamma exposure dose excludes dose via inhalation, ingestion of water and dietary intake pathways, and *there is a lot that we simply do not know*. With these cautionary notes, we find the collective dose from external exposure *to date*—and consequentially excess cancers that are projected to result from this exposure pathway—appears to be roughly one to two orders of magnitude, *i.e.*, ten to one hundred times, greater than the collective radiation dose resulting from the Three Mile Island (TMI) accident, which was on the order of 2,000 person-rem.

The collective dose from the Fukushima accident appears to be in the neighborhood of two orders of magnitude less than that from the Chernobyl accident. Similarly, the long term human health consequences of the nuclear disaster are one to two orders of magnitude less than the immediate non-nuclear consequences of the earthquake and tsunami. In sum, in terms of radiological consequences our preliminary estimate at this time is that the Fukushima disaster is two to three orders of magnitude worse than TMI (probably closer to two) and one to two orders of magnitude less than Chernobyl (probably closer to two). This preliminary comparison of Fukushima with TMI and Chernobyl may change as we learn more.

I hesitate to guess what the economic toll from Fukushima will be, and in any case it will be difficult to separate the economic consequences of the nuclear accident from the widespread devastation caused by the tsunami and earthquake. Nevertheless, one cost directly attributable to the accident will be the cost of replacement fossil power generation, which alone will cost several billion dollars per year. Other economic consequences will be global in reach and also far exceed the economic consequences of TMI. Beyond the yen and dollars, the human cost is, if anything, more severe. The widespread radioactive contamination has ripped farmers from their livelihoods and lands that in some cases have been in their families for generations. By any accounting, Fukushima is a nuclear disaster.

Japan continues to respond to this disaster in a forceful manner. Efforts to halt the spread of radioactive contamination and bring the reactors and spent fuel pools under control continue as we speak. On April 5, 2011, the Japan Atomic Energy Commission (JAEC) announced that "We are gravely concerned about this accident which can fundamentally undermine public trust in safety measures, not only in Japan but also in other countries." JAEC also indicated that it would suspend for the foreseeable future its deliberation process of new Framework for Nuclear Energy Policy which had been underway since last December. Some other leading economies are doing the same.

German Chancellor Angela Merkel announced a temporary shutdown of Germany's oldest plants and a three-month review period to run tests and reassess nuclear technology. Subsequently, on April 8, 2011, the German Association of Energy and Water Industries (BDEW), which represents about 1,800 utilities, approved the following statement: "The catastrophe at the Fukushima reactors marks a new era and the BDEW therefore calls for a swift and complete exit from using nuclear power." BDEW had been fully behind nuclear energy prior to the Fukushima disaster, and EON and RWE, two biggest operators of nuclear plants in Germany, opposed the BDEW Board decision. Nevertheless, some observers believe it is likely that that seven or eight of Germany's 17 reactors will never resume activity.

What does this nuclear disaster mean for the United States? Before addressing this question I offer some observations regarding the frequency of so-called "beyond the design basis" accidents.

Reassessing the frequency of partial core melt accidents

There have been enough partial core-melt accidents that we can ask whether the operational nuclear power plants throughout the world are safe enough as a group. As we see from Table 1, 12 nuclear power reactors have experienced fuel-damage or partial core-melt accidents: The Sodium Reactor Experiment (SRE), Stationary Low-Power Reactor No. 1 (SL-1), Enrico Fermi Reactor-1, Chapelcross-2, St. Laurent A-1 and A-2, Three Mile Island-2, Chernobyl-4, Greifswald-5 and Fukushima Daiichi-1, -2 and -3.

Eleven of these (all except SL-1) produced electricity and were connected to the grid during some period of their operation, and all are now permanently shut down. In assessing the historical core melt frequency among nuclear power reactors, the number

counted depends on how the issue is framed. SL-1 is excluded because it was an experimental reactor, and the design was abandoned after the accident. Although it was the first U.S. reactor to supply electricity to the grid, the SRE could be excluded because it was primarily a research reactor. Chapelcross-2 and St. Laurent A1 and A2 were dual use military reactors, producing plutonium for weapons and electricity for civilian use. From the data available to this author it is unclear whether any fuel actually melted in Greifswald-5. In five cases then, *i.e.*, SRE, Chapelcross-2, St. Laurent A1 and A2, and Greifswald-5, the fuel melt or damage did not result in immediate closure of the plant; rather the damage was repaired and the reactor was restarted.

Worldwide, there have been 137 nuclear power plants that have been shut down after becoming operational with a total generating capacity of about 40,000 MWe and 2,835 reactor-years of cumulative operation..[1] Thus, one in twelve [137/11 = 12.5] or fourteen [excluding SRE: 136/10 = 13.6] shut down power reactors experienced some form of fuel damage during their operation. Of the power reactors that have been shut down one in 23 [137/6 = 22.8] were shut down as a direct consequence of partial core melt accidents; one for every 500 reactor-years [2,835/6 = 472.5] of operation. Only about seven of eight giga-watts (GW) [40,000-5,250.5)/40,000 = 0.87≈ 7/8] of nuclear power plant capacity have been closed without experiences a fuel damage accident. One out of 13 GW [40,000/3,011 = 13.3] of nuclear power plant capacity have been closed as a direct result of a fuel melting accident.

Worldwide, there have been 582 nuclear power reactors that have operated approximately 14,400 reactor-years.[2] Thus, to date, the historical frequency of core-melt accidents is about one in 1,300 reactor-years [14,400/11 = 1,309], or excluding SRE, about one in 1,400 reactor-years.

Worldwide, there have been 115 Boiling Water Reactors (BWRs) that have operated approximately 3,100 reactor-years. Thus, to date, the historical frequency of core-melt accidents in BWRs is about one in 1,000 reactor-years [3,100/3 = 1,033].

Worldwide, there have been 49 BWRs with Mark 1 containments (the type at Fukushima) and 12 with Mark 2 containments. Five with Mark 1 containment (Millstone Unit 1 and Fukushima Daiichi Units 1-4) have been permanently shut down. These 61 BWRs have operated for 1,900 reactor-years to date. Thus, to date, the historical frequency of core-melt accidents in BWRs with Mark 1 and 2 containments is about one in 630 reactor-years [1,900/3 = 633].

In July 1985, the U.S. Nuclear Regulatory Commission's (NRC) Advisory Committee on Reactor Safeguards (ACRS) stated,[3]

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[1] This sum excludes the US reactors, SL-1, MI-1, PM-1, PM-2A, PM-3A, SM-1, SM-1A and Sturgis. The German KNK-I and KNK-II reactors are treated a one reactor.

[2] *Ibid.*

3 ACRS letter from D. A. Ward to N. J. Palladino, Subject: ACRS comments on proposed NRC safety goal evaluation report (17 July 1985); cited in David Okrent, "The Safety Goals of the Nuclear Regulatory Commission, *Science*, **236**, 296-300 (17 April 1987).

> We believe that the Commission should state that a mean core melt frequency of not more than 10^{-4} per reactor year [one in 10,000 reactor-years] is an NRC objective for all but a few, small, existing nuclear power plants, and that, keeping in mind the considerable uncertainties, prudence and judgment will tend to take priority over benefit-cost analysis in working toward this goal.

On August 4, 1986, the NRC published a final policy statement on safety goals, which said,[4]

> Severe core damage accidents can lead to more serious accidents with the potential for life-threatening offsite release of radiation, for evacuation of members of the public, and for contamination of public property. Apart from their health and safety consequences, severe core damage accidents can erode public confidence in the safety of nuclear power and can lead to further instability and unpredictability for the industry. In order to avoid these adverse consequences, the Commission intends to continue to pursue a regulatory program that has as its objective providing reasonable assurance, while giving appropriate consideration to the uncertainties involved, that a severe core damage accident will not occur at a U.S. nuclear power plant.

The NRC cites core-melt frequency estimates from probabilistic risk assessment (PRA) studies in the ranges from 2×10^{-5} to 1×10^{-4} event/reactor-year,[5] *i.e.*, from 1 to 5 per 10,000 reactor-years; and for Peach Bottom Unit 2, a GE BWR with Mark 1 containment, 1.202×10^{-5},[6] *i.e.*, 1 in 10,000 reactor-years.

Clearly, the historical frequency of core melt accidents worldwide does not measure up to the safety objectives of the NRC. On the whole the operational reactors worldwide are not sufficiently safe. If nuclear power is to have a long-term future greater attention must be given to the safety of current operational reactors worldwide. Older obsolete designs should be phased out rather than having their licenses extended. We should also revisit whether the newer reactor designs currently under construction worldwide and those on the drawing board are safe enough?

Implications for U.S. Nuclear Power Reactors

There are a host of concerns raised by the Fukushima nuclear disaster that bear directly on the safe operation and regulation of U.S. nuclear power reactors. While others will add to this list, our immediate concerns include:

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[4] Nuclear Regulatory Commission, *Federal Register* **51**, 28044 (4 August 1986); cited in David Okrent, "The Safety Goals of the Nuclear Regulatory Commission, *Science*, **236**, 296-300 (17 April 1987).

[5] http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0933/sec3/065r1.html

[6] http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0933/sec3/158r2.html

- Are old GE BWRs with poorly designed Mark 1 and Mark 2 containments and subsequent upgrades imposed by the NRC safe enough to continue operation or have their licenses extended?
- What additional improvements should be made to cope with hydrogen production in the event of fuel clad interaction with steam?
- What improvements must be made to extend the time reactors can cope with loss of off-site power?
- The NRC is overdue in requiring that spent fuel be removed from wet pools to hardened dry casks as soon as the spent fuel has cooled sufficiently to be passively cooled in air.
- Which reactor sites are located in areas that cannot be adequately evacuated?
- Which reactor stations impose an undue economic risk to the local, state or U.S. economy in the event of a partial core melt accident?
- Which U.S. reactors should be upgraded or phased out due to the risk of an earthquake, flooding or tornado that is beyond the design basis?
- Potential radiological accidents caused by earthquake or tsunami should be addressed in emergency response plans for US reactors.
- Nuclear plant owners/operators must assume a larger share of the financial risk in the event of a catastrophic nuclear accident. Should the Price Anderson Act (which defines the federal government's assumption of liability and economic burden in the event of catastrophic nuclear accident) be repealed or, at a minimum, significantly revised?
- What are the implications of predicted sea-level rise due to climate change on the safety of nuclear reactors near coasts?
- What are the implications of continued failure of the NRC to finalize and implement a fire protection rule?
- What changes should be implemented regarding radiation monitoring during routine plant operations and following an accident?
- And perhaps most importantly, what is the best process for addressing these concerns?

I now offer a few observations regarding several of these concerns, beginning with the process issue—the last question above.

What is the best process for addressing the concerns outlined above?
The NRC has initiated a two-pronged short and longer term review of U.S. nuclear power plant safety in the aftermath of the Fukushima disaster. In the interim the NRC maintains all of its licensed reactors are safe. This review is appropriate and we support this effort, but it is woefully inadequate to the larger task of ensuring nuclear safety given the grave concerns raised by the accident. Any review must be an open, transparent process that permits public participation and that creates public trust. It is not credible to expect the NRC staff to perform an unbiased review of its own past failings. An independent review by an unbiased committee is essential. We are under no illusions that the NRC review will lead to adoption of all the safety improvements that are needed.

Since it was created out of the old Atomic Energy Commission (AEC) in 1974, the NRC staff, like the previous AEC staff, has been largely captive of the industry it regulates. It is also equally true that the NRC staff is comprised of highly professional dedicated public servants. Moreover, no President has been willing to appoint, and no Senate willing to confirm, NRC commissioners without ensuring that the majority of commissioners are strongly supportive of the use of nuclear power. These two factors have resulted in the NRC taking actions that have placed the economic interest of the industry ahead of safety, and have over the years stripped public participants in the licensing process of adjudicatory rights they were previously afforded.

On March 11, 2011, NRDC President Frances Beinecke wrote President Obama, requesting that "The administration should appoint a truly independent commission, similar to the Kemeny Commission that investigated the Three Mile Island accident in 1979, that can help to engender public confidence by thoroughly examining nuclear safety issues, including assessing the conclusions and proposed corrective actions arrived at by both the nuclear industry and the NRC in its '90-day safety review'." [full letter attached]. NRDC has received no response to this request from the Administration. The Administration appears to favor limiting the safety review to the NRC, no doubted recognizing that this is the "safer" course if one objective is to insulate future use of nuclear power in the United States from the potential implications of a genuinely independent review of the safety implications of Fukushima in which the public is invited to participate.

In this instance, we are seeking a truly independent, expert panel like the Kemeny Commission that reviewed the TMI accident. So if the Administration is unwilling to lead on this matter, we expect the Senate to insist on an independent, unbiased review.

Are the old GE BWRs with poorly designed Mark 1 and Mark 2 containments and subsequent upgrades imposed by the NRC safe enough to continue operation or have their licenses extended?

Before the Fukushima disaster I said—and I still believe—that a most important factor concerning the safety of a nuclear power reactor is establishment and presence of a culture of safety at the plant. On the whole the safety culture at U.S. nuclear plants has improved since the TMI accident. I am also on record saying that on this basis I believed the next major nuclear accident would more likely occur abroad, rather than in the United States. This turned out to be the case.

The Fukushima events have caused me to reassess my view as to the relative importance of safety cultures versus plant design. There are 23 operational U.S. GE-designed boiling water reactors (BWRs) with Mark 1 containments and the 8 operational U.S. BWRs with Mark 2 containments. The U.S. BWRs with Mark 1 containments are similar to Fukushima Daiichi Units 1-4, and the Mark 2 containments are similar to the Mark 1s. The design of the BWRs with Mark 1 containments by GE grew out of an effort to reduce construction costs by reducing the volume of the containment structure and rely more heavily on controlled venting of steam and radioactive contaminants in the event of reactor core fuel melting to prevent a larger disaster. This design was highly controversial

when it was proposed for licensing by the AEC, and has been subjected to review and subsequent upgrades required by the NRC.

My preliminary view is that the nuclear disaster at Fukushima illustrates the inherent design deficiencies in these 31 operational U.S. BWRs—a significant fraction of the 104 operational nuclear power reactors in the United States. In my opinion none are sufficiently safe despite upgrades that have been imposed by the NRC.

Others will argue that the BWR Mark 1 and 2s are safe noting that a) these U.S. reactors will not experience the same type of earthquake and tsunami as occurred on Japan, b) the NRC has a good handle on the magnitude and frequency of accident precursors, and c) upgrades to manage hydrogen releases in the event of a core-melt accident make controlled venting of steam and radioactive contaminates more acceptable. In other words, the claim is that it will not happen here, and if something comparable does happen we can cope with it. Still others will say that we should await a careful independent Kemeny-style review of the issues and not rush to judgment.

I do not think that the 31 older BWRs in the United States should be shut down forthwith. Rather, they should not have their licenses extended. The current course of safety review and reactor relicensing charted by the NRC and Department of Energy (DOE) is unacceptable. After a limited safety review, sometimes taking less than 18 months, the NRC has been routinely handing out 20 year license extensions, including license extensions to these older BWRs, *e.g.*, Vermont Yankee which received its license extension on March 21, 2011, as the events at Fukushima were unfolding. In addition, other older BWR units are undergoing, or are soon scheduled to undergo, thermal power uprates, which only compound the residual heat removal and radioactive gas venting problem in the event of a station blackout. Meanwhile, DOE is engaged in an R&D effort with industry to see if licenses can be extended beyond 60 years. On this course we could be saddled for years with inherently unsafe reactors—a potential commitment of more than one thousand reactor-years of operation using old reactor designs with inherent safety deficiencies.

In sum, the 20-year license extensions already granted to 20 U.S. operational BWRs with Mark 1 containments and the 3 extensions granted to BWRs with Mark 2 containments should be revisited and the their license extension periods should be shortened. Similarly, no 20 year license extension should be granted to the remaining three BWRs with Mark 1 containments and the five with Mark 2 containments, which have not yet received 20 year license extensions.

What improvements must be made to extend the time reactors can cope with loss of off-site power?

At Fukushima, in what is termed a "common mode failure," the tsunami took out both the off-site power and the backup diesel generators. The backup battery power was designed to last for eight hours. After battery power expired the operators could no longer maintain core cooling. At some U.S, reactors backup battery power is only designed to last four hours. Clearly, battery backup energy requirements should be increased from hours to

days, or other forms of portable on-site power generators must be stored out of harm's way and kept available for use in a crisis.

The NRC is overdue in requiring that spent fuel be removed from wet pools to hardened dry casks as soon as the spent fuel has cooled sufficiently to be passively cooled in air.

The Fukushima disaster provides further evidence that the safety of spent fuel storage would be improved if spent fuel were removed from wet pools to hardened dry casks as soon as the spent fuel has cooled sufficiently to be passively cooled in air. This was NRDC's position prior to Fukushima. In May 25, 2010, testimony before the Blue Ribbon Committee on America's Nuclear Future, we said, and we still believe:

> There is a need for a new spent power reactor fuel storage policy that ends the practice of dense compaction of spent fuel assemblies in wet pools, and moves spent fuel into interim hardened dry cask storage. Fuel pools were originally designed for temporary storage of a limited number of irradiated fuel assemblies in a low density, open frame configuration. Since it is going to be decades before there is a geologic repository, to improve the safety of wet storage of spent fuel we should bite the bullet and decide as a matter of policy to end the practice of dense compaction of spent fuel in wet pools. The Commission should recommend that the Nuclear Regulatory Commission (NRC) establish appropriate licensing criteria for this purpose.
>
> While dry cask storage of spent fuel at existing reactor sites is relatively safer than the operation of the reactors, dry cask storage can be made even safer by storing the dry casks in a hardened building such as the Ahaus Spent Fuel Storage Facility in Germany. The Commission should recommend that the Ahaus approach be adopted at most operational reactor sites and any new off-site interim spent fuel storage facility. The added security of such hardened enclosed storage is worth the small additional cost.
>
> NRDC believes it makes sense to provide for consolidated dry storage of spent fuel from permanently shut down reactors that are not at sites with reactors still operational. This would facilitate decommissioning of shut down reactor sites. NRDC is opposed to off-site consolidation of spent fuel from any reactors at sites where there are operational reactors, because a) it is unnecessary, b) it does not reduce significantly security risks at the reactor sites, c) it increases risks associated with transportation of spent fuel, and d) it reduces the pressure to obtain a geologic repository.

Which reactor sites are located in areas that cannot be adequately evacuated?

At Fukushima immediately following the earthquake and tsunami residents within 10 kilometers (km) (6.2 miles) were advised to evacuate by the Japanese National Industrial Safety Agency (NISA). By the next day, Saturday afternoon, NISA advised everyone within 20 km (12. 4 miles) to evacuated, and those between 20 and 30 km (12.4 to 18.6 miles) were advised to remain in their homes as shelter or voluntarily evacuate. Subsequently, the Japanese government considered extending the evacuation zone to 30

km. Also notably, shortly after the Fukushima accident began to unfold the NRC was so concerned regarding how the accident might progress that it recommended that U.S. citizens stay at least 50 miles away. Based on Japanese census data, we estimate that before evacuation there were 69,000 people within 20 km, 160,000 within 30 km, and 2 million within 50 miles of the Fukushima Daiichi reactor station. Let us examine how many people reside within the same distances from U.S. reactors.

There are 104 U.S. operational nuclear power plants at 65 generating stations at 64 sites in 63 counties. (Salem and Hope Creek Generating Stations are treated as a single site.) The NRC's planning zone for evacuation around a nuclear power plant is 10 miles. Using U.S. census data projected to 2010, my colleague, Dr. Matthew McKinzie, has estimated the number of people living with 10 miles, 20 km, 30 km and 50 miles of the 64 commercial nuclear sites in the United States. These data are reproduced in Table 2. As seen from this table, the number of people living near several U.S. operational nuclear power stations is quite large.

There are eight U.S. nuclear power plant sites where the population within 20 km is from 200,000 to 433,000—Indian Point, Three Mile Island, Limerick, Catawba, McGuire, St. Lucie, Turkey Point and Oyster Creek. At 30 of the 64 U.S. nuclear power plant sites the population within 20 km exceeds 69,000 people, *i.e.*, exceeds the population within 20 km of Fukushima Daiichi.

There are nine U.S. nuclear power plant sites where the population within 30 km ranges from 500,000 to 980,000—Indian Point, Limerick, McGuire, Catawba, Three Mile Island, San Onofre, Turkey Point and Shearon Harris. An addition 11 plants have populations between 300,000 and 500,000. At 31 of the 64 U.S. nuclear power plant sites the population within 30 km exceeds 160,000 people, *i.e.*, exceeds the population within 30 km of Fukushima Daiichi.

The Indian Point site has a whopping 17 million people within 50 miles, more than 5 percent of the entire U.S. population. There are six U.S. nuclear power stations where the population within 50 miles ranges from 5 million to 8.5 million—San Onofre, Limerick, Dresden, Peach Bottom, Salem/Hope Creek and Braidwood. An addition 18 plants have populations between 2 million and 10 million. At 25 of the 64 U.S. nuclear power plant sites the population within 50 miles exceeds 2 million, *i.e.*, exceeds the population within 50 miles of Fukushima Daiichi. Clearly, the NRC admonition to Americans in Japan could not be carried out at any of these sites.

Some of these reactors have recently been granted 20 year license renewals, *e.g.*, the two units at St. Lucie and the two units at Turkey Point. Indian Point Unit-2's license expires on 28 September 2013, and Unit 3's license expires on 12 December 2015. Entergy has applied for a 20 year license renewal for the two reactors. One might reasonably find it startling were the NRC to renew these licenses given what we now know. What is more surprising though is that the NRC is already on record saying the events at Fukushima will not affect ongoing license extension reviews!

Which U.S. reactors should be upgraded or phased out due to the risk of an earthquake, flooding, or tornado that is currently beyond the design basis?
The magnitude 9.0 earthquake and resulting tsunami that hit the Fukushima Daiichi reactors was very significantly larger than the design basis earthquake and tsunami for these reactors. This was also the case with respect to the Niigataken Chuetsu-oki earthquake that damaged the seven-unit Kashiwazaki Kariwa Nuclear Power Station on July 16, 2007. That quake too very significantly exceeded the design basis of the reactors. These events call into question the adequacy of the designs of several U.S. reactors in earthquake prone areas, most notably Diablo Canyon given that the U.S. Geological Survey (USGS) found a previously unknown fault along the central California coast, near the plant. As recently reported in the *Los Angeles Times*, California state Senator Sam Blakeslee (R-San Luis Obispo), who is testifying here today and who has a doctoral degree in earthquake science and whose district includes Diablo Canyon, claims the fault could be half a mile away, or a few hundred yards, or even under the reactors. The California Energy Commission has recommended a three-dimensional imaging study—a sort of geological CT scan—be conducted to determine the precise location of the Shoreline Fault and learn more about it, and the California Public Utilities Commission has also requested such a study. Because there may be similar surprises at other reactor sites the USGS should be directed to take a comprehensive assessment of the earthquake risk at all reactor sites, beginning with those in areas of known high seismic risk. These studies and assessments should be conducted before further reactor license extensions are granted and the results should be part of any relicensing review by the NRC.

Nuclear plant owners/operators must assume a larger share of the financial risk in the event of a catastrophic nuclear accident.
Congress should repeal, or at a minimum significantly revise the Price Anderson Act, which defines the federal government's assumption of liability and economic burden in the event of catastrophic nuclear accident, to increase the owner/operator share of the financial risk in the event of a catastrophic nuclear accident.

What changes should be implemented regarding radiation monitoring during routine plant operations and following an accident?
The radiation monitoring in Japan following the Fukushima accident was less than comprehensive and on at least one occasion was reported erroneously but corrected the next day. Here in the United States there have been criticisms regarding the failure of selected EPA monitors on the West Coast, failure to report readings taken with more sensitive instrumentation and failure to deploy some mobile radiation monitors. I do not have firsthand knowledge of these EPA monitoring issues and will not comment further on them. Rather, I wish to offer two recommendations.

First, the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), the international agency established to monitor for nuclear tests under the Comprehensive Test Ban, currently maintains 60 radionuclide particulate monitoring stations throughout the world. These stations monitor the air continuously, and thus provide extensive data on any radionuclides detected during a nuclear test or accident, including the Fukushima disaster and the data is transmitted daily to its member

states, including the United States. The U.S. government should take the necessary steps to promptly release to the public the data it receives from the CTBTO.

Second, the EPA and NRC should insure that continuous air monitoring data recorded by air monitors around nuclear power plants and by the national network of EPA stations are available to the public on the internet in real time. Today on the internet and you can check the weather at the beach by logging onto a web-cam, but if you live near a nuclear plant you cannot go on the internet to see what the air monitor is reading. The added cost of making these data available on the web in real time should be small. Some government officials may be reluctant to provide such data in real time for reasons related to quality control, but this seems a flimsy excuse. After all, the agency could post on the web which monitors it feels are not functioning or calibrated improperly.

Principal Conclusions

The historical frequency of core melt accidents worldwide does not measure up to the safety objectives of the NRC. On the whole the operational reactors worldwide are not sufficiently safe. Because of differences in the reactor safety cultures and the quality of regulatory oversight the next nuclear power plant disaster is more likely to occur abroad than in the United States. If nuclear power is to have a long term future greater attention should be given to current operational reactors. Older obsolete designs should be phased out rather than having their licenses extended. We should also revisit whether the newer reactor designs currently under construction worldwide and those on the drawing board are safe enough?

The administration should appoint a truly independent commission, similar to the Kemeny Commission that investigated the Three Mile Island accident in 1979, that can help to engender public confidence by thoroughly examining nuclear safety issues, including assessing the conclusions and proposed corrective actions arrived at by both the nuclear industry and the NRC in its "90-day safety review."

The 20-year license extensions already granted to 20 U.S. operational BWRs with Mark 1 containments and the 3 extensions granted to BWRs with Mark 2 containments should be revisited and the their license extension periods should be shortened. Similarly no 20 year license extension should be granted to the three BWRs with Mark 1 containments and the five with Mark 2 containments, which have not yet received 20 year license extensions.

The NRC is overdue in requiring that spent fuel be removed from wet pools to hardened dry casks as soon as the spent fuel has cooled sufficiently to be passively cooled in air. Dry cask storage should be made safer by storing the dry casks in a hardened building such as the Ahaus Spent Fuel Storage Facility in Germany. The Ahaus approach should be adopted at most operational reactor sites and any new off-site interim spent fuel storage facility.

In light of an improved scientific understanding of the full range of natural and man-made "beyond design basis" events that could strike 40 + year reactors, the risk of core melt followed by failure of containment should be stringently reevaluated for the two Indian Point units and all other existing reactors located in areas of high population

density. The feasibility of an adequately protective evacuation, under these revised conditions and extending beyond the current 10-mile radius for the emergency planning zone, should be explicitly reassessed in the context of the relicensing proceeding. The severity of the resulting radiological and other risks to life, property, and natural resources should inform NRC and state-level decisions regarding which units should be denied license or permit renewals, or have their existing license extensions shortened or revoked.

The USGS should be directed to take a comprehensive assessment of the earthquake risk at all reactor sites, beginning with those in areas of known high seismic risk. These studies and assessments should be conducted before further reactor license extensions are granted and the results should be part of any relicensing review by the NRC.

Potential radiological accidents caused by earthquake or tsunami should be addressed in emergency response plans for US reactors.

Congress should repeal, or at a minimum significantly revise the Price Anderson Act, which defines the federal government's assumption of liability and economic burden in the event of catastrophic nuclear accident, to increase the owner/operator share of the financial risk in the event of a catastrophic nuclear accident.

The U.S. government should take the necessary steps to promptly release to the public the data it receives from the CTBTO. The EPA and NRC should insure that continuous air monitoring data recorded by air monitors around nuclear power plants and by the national network of EPA stations are available to the public on the internet in real time.

Table 1. List of Nuclear Power Reactors That Have Experienced Fuel Melt or Failure.

1. **Sodium Reactor Experiment (SER)**
   Location: Santa Susana Field Laboratory, California, USA
   Reactor type: sodium-cooled graphite-moderated thermal power reactor
   Power: 20 MWt; 6.5 MWe
   History: initial criticality: April 25, 1957; first produced electricity July 1957; operated 2 years, partial core melt accident between 12 and 26 July 1959, resulting in melting of as much as one-third of the fuel; shutdown 26 July 1959 [It appears to have been operated for several days with its core partially melted.]; converted to HEU-Th fuel; second core operations began September 1960; permanently shutdown February 1964.

2. **Stationary Low-Power Reactor No. 1 (SL-1)**
   Location: National Reactor Testing Station (now Idaho National Laboratory)
   Reactor type: experimental, gas-cooled, water-moderated
   Power: 3.3 MWt; 300 kWe
   History: initial criticality March 1961; prompt criticality accident 3 January 1961; shut down May 1964

3. **Enrico Fermi Unit 1 Reactor**
   Location: Newport, Lagoona Beach, Frenchtown Township, Monroe County, Michigan, USA
   Reactor Type: Liquid Metal Fast Breeder Reactor (LMFBR)
   Power: 200 MWt; 65 MWe (gross); 61 MWe (net)
   History: initial criticality 23 August 1963; commercial operations began August 1966; partial fuel melt accident 5 October 1966, two of the 105 fuel assemblies melted, but no contamination was recorded outside the containment vessel; closed November 1972

4. **Chapelcross Unit 2 Nuclear Power Plant**
   Location: Annan, Dumfreshire, Scotland, United Kingdom
   Reactor Type: gas-cooled, graphite moderated; Magnox
   Power: originally 180 MWt, up-rated progressively to 265 MWt, originally 23 MWe (gross) progressively up-rated to 60 MWe (gross); 50 MWe (net)
   History: startup May 1959; while under evaluation for the commercial reactor program experienced a partial blockage in a single fuel channel May 1967, contamination was limited to one region of the core; shut down 29 June 2004

5. **Saint-Laurent A-1 Nuclear Power Plant**
   Location: St. Laurent-Nouan, Loir-et-Cher, Centre, France
   Reactor Type: gas-cooled, graphite moderated
   Power: 1570 MWt; 405 MWe (gross), 390 MWe (net)
   History: grid connection 14 March 1969; commercial operation June 1969; 50 kg of uranium began to melt 17 October 1969; permanently shut down 27 May 1992

6. **Saint-Laurent A-2 Nuclear Power Plant**
   Location: St. Laurent-Nouan, Loir-et-Cher, Centre, France
   Reactor Type: gas-cooled, graphite moderated
   Power: 1690 MWt; 465 MWe (gross) [uprated to 530 MWe (gross)], 450 MWe (net)

History: started November 1970; grid connection 9 August 1971; commercial operation November 1971; heat excursion causing some fuel melting 13 March 1980; permanently shut down 27 May 1992

7. **Three Mile Island Unit 2 Nuclear Power Plant**
   Location: Londonderry Township; Dauphine County, Pennsylvania, USA
   Reactor Type: Pressurized Water Reactor (PWR)
   Power: 2,568 MWt, 808 MWe (gross); 776 MWe (net)
   History: initial criticality December 1978; partial core melt accident March 1979; decommissioned 1979

8. **Chernobyl Unit 4 Nuclear Power Plant**
   Location: Pripyat, Ukraine SSR (now Ukraine)
   Reactor Type: RBMK-1000 (graphite-moderated water-cooled)
   Power: 3,200 MWt; 1,000 MWe (gross); 925 MWe (net)
   History: destroyed in full-core melt accident 26 April 1986

9. **Greifswald Unit 5 (KGR-5) Nuclear Power Plant**
   Location: Lubmin, GDR (now Germany)
   Reactor Type: VVER-440, Model V-230, Pressurized Water Reactor (PWR)
   Power: 1,375 MWt; 440 MWe (gross); 408 MWe (net)
   History: grid connection 24 April 1989; commercial operation 1 November 1989; near core melt with 10 fuel elements damaged 7 December 12975; permanent shutdown 24 November 1989

10. **Fukushima Daiichi Unit 1 Nuclear Power Plant**
    Location: Ohkuma, Fukushima Prefecture, Japan
    Reactor Type: Boiling Water Reactor (BWR), GE BWR/2, Mark 1 Containment
    Power: 1,380 MWt; 450 MWe (gross); 439 MWe (net)
    History: initial criticality 10 October 1970; grid connection 17 November 1970; commercial operation 26 March 1971; partial core meltdown following earthquake on 11 March 2011

11. **Fukushima Daiichi Unit 2 Nuclear Power Plant**
    Location: Ohkuma, Fukushima Prefecture, Japan
    Reactor Type: Boiling Water Reactor (BWR), TOS1 [GE BWR/4], Mark 1 Containment
    Power: 2,381 MWt; 794 MWe (gross); 760 MWe (net)
    History: initial criticality 10 May 1973; grid connection 24 December 1973; commercial operation 18 July 1974; partial core meltdown following earthquake on 11 March 2011

12. **Fukushima Daiichi Unit 3 Nuclear Power Plant**
    Location: Ohkuma, Fukushima Prefecture, Japan
    Reactor Type: Boiling Water Reactor (BWR), TOS1 [GE BWR/4], Mark 1 Containment
    Power: 2,381 MWt; 794 MWe (gross); 760 MWe (net)
    History: initial criticality 28 January 1978; grid connection 24 February 1978; commercial operation 12 October 1978; partial core meltdown following earthquake on 11 March 2011

Table 2. Population within 10 miles (mi), 20 kilometers (km) (12.4 mi), 30 km (18.6 mi) and 50 mi. of U.S. nuclear power stations and the Fukushima Daiichi Nuclear Power Station in Japan. [Calculated by Dr. Matthew McKinzie, NRDC Nuclear Program.]

Nuclear Reactor Site Population	< 50 mi	< 30 km	<20 km	< 10 mi
Arkansas Nuclear One	300,875	85,118	56,562	46,665
Beaver Valley Power Station	3,136,087	386,818	195,304	115,185
Braidwood Generating Station	5,058,878	139,413	48,994	37,419
Browns Ferry Nuclear Plant	964,440	166,229	91,396	35,574
Brunswick Steam Electric Plant	447,204	125,455	41,134	28,098
Byron Generating Station	1,263,788	209,381	37,583	27,967
Callaway Nuclear Power Station	533,393	38,769	21,431	9,380
Calvert Cliffs Nuclear Power Station	3,265,942	133,018	66,815	35,732
Catawba Nuclear Station	2,583,890	842,304	336,079	216,684
Clinton Power Station	796,220	47,672	19,264	12,807
Columbia Nuclear Generating Station	440,870	122,151	24,473	4,212
Comanche Peak Steam Electric Station	1,763,739	68,039	46,026	33,584
Cook (Donald C.) Nuclear Power Station	1,229,031	129,972	83,371	52,335
Cooper Nuclear Station	158,357	15,900	7,930	3,688
Crystal River Nuclear Power Station	1,068,039	98,249	33,238	20,328
Davis-Besse Nuclear Power Station	1,765,945	77,506	22,855	15,540
Diablo Canyon Nuclear Power Plant	441,494	134,743	68,045	22,837
Dresden Generating Station	5,968,730	278,110	88,993	60,561
Duane Arnold Energy Center	663,337	222,916	186,729	112,515
Enrico Fermi Atomic Power Plant	4,921,862	318,112	137,964	90,230
Fort Calhoun Station	939,025	284,348	28,936	19,382
Grand Gulf Nuclear Station	323,731	21,270	11,734	8,412
H.B. Robinson Nuclear Power Station	892,571	82,207	39,719	32,483
Hatch (Edwin I.) Nuclear Power Station	419,726	50,951	19,186	10,129
Indian Point Nuclear Power Station	17,310,391	978,945	433,603	252,828
James A. FitzPatrick Nuclear Power Plant	884,703	89,086	42,727	31,722
Joseph M. Farley Nuclear Plant	422,000	83,846	18,344	11,357
Kewaunee Nuclear Power Station	766,265	70,032	21,655	10,025
La Salle County Generating Station	1,941,089	90,859	47,514	16,337
Limerick Generating Station	7,907,943	944,872	352,527	245,899
McGuire (W.B.) Nuclear Station	2,887,444	874,252	329,848	189,378
Millstone Nuclear Power Station	2,890,682	250,354	133,056	100,780
Monticello Nuclear Generating Plant	3,026,547	210,588	101,362	59,159
Nine Mile Point Nuclear Station	882,346	88,009	42,717	31,876
North Anna Nuclear Power Station	1,879,826	121,567	38,086	23,228
Oconee Nuclear Power Station	1,402,463	181,908	104,956	74,546

Oyster Creek Generating Station	4,346,015	369,541	204,833	122,628
Palisades Nuclear Power Station	1,344,455	102,087	44,726	31,298
Palo Verde Nuclear Power Station	2,127,628	40,433	6,058	3,798
Peach Bottom Atomic Power Station	5,406,288	350,043	81,614	46,202
Perry Nuclear Power Plant	2,270,346	248,902	125,073	82,525
Pilgrim Nuclear Station	4,536,218	237,115	104,292	65,881
Point Beach Nuclear Power Station	772,560	77,493	29,808	20,446
Prairie Island Nuclear Generating Plant	2,998,068	108,151	46,013	29,545
Quad Cities Generating Station	654,537	219,947	56,458	31,692
River Bend Station	950,101	103,067	39,648	23,979
Robert E. Ginna Nuclear Power Station	1,247,344	496,302	101,764	61,697
Salem and Hope Creek Generating Stations	5,348,293	392,762	79,003	42,125
San Onofre Nuclear Generating Station	8,509,157	600,809	159,101	85,877
Seabrook Nuclear Station	4,208,014	373,439	158,386	117,522
Sequoyah Nuclear Power Station	1,080,727	427,297	161,789	95,419
Shearon Harris Nuclear Power Plant	2,588,936	501,496	186,579	91,925
South Texas Project Electric Generating Station	265,091	31,633	11,854	2,224
St. Lucie Nuclear Power Station	1,194,373	376,216	265,315	182,511
Surry Nuclear Power Station	2,188,711	370,414	176,842	116,947
Susquehanna Steam Electric Station	1,744,486	277,445	100,719	53,197
Three Mile Island Generating Station	2,818,044	813,589	403,845	183,680
Turkey Point Power Station	3,426,334	579,857	251,892	156,705
Vermont Yankee Generating Station	1,418,842	126,257	46,010	34,447
Virgil C. Summer Nuclear Power Station	1,179,156	132,963	30,076	12,360
Vogtle (Alvin W.) Nuclear Power Station	721,893	36,853	10,158	5,171
Waterford Generating Station	2,005,593	332,637	113,956	87,231
Watts Bar Nuclear Power Station	1,173,601	92,982	29,569	19,971
Wolf Creek Generating Station	177,920	11,515	6,603	4,992
Fukushima Daiichi Nuclear Power Station	1,964,725	159,859	69,162	51,925

NATURAL RESOURCES DEFENSE COUNCIL

March 25, 2011

The Honorable Barack Obama
President of the United States
The White House
1600 Pennsylvania Ave. NW
Washington, DC 20500

Dear Mr. President:

I am writing on behalf of the members of the Natural Resources Defense Council to commend you for your response to the tragedy in Japan by providing assistance to the Japanese people and helping to address the ongoing threat at the Fukushima Daiichi Nuclear Power Station. Our thoughts and prayers are with you and the people of Japan. I am also writing because the severe accident at this power plant, involving a simultaneous loss of control over six nuclear units, demonstrates the grave risks posed by nuclear power, and how little we still know about anticipating and mitigating those risks. Therefore, we strongly endorse your call for a comprehensive review of nuclear reactor safety in the United States.

We further call on you to add an independent review of key safety issues, which we believe must then be followed by prompt implementation of necessary corrective actions to reduce the chance of any such nuclear incident occurring in the United States.

Your continued leadership is needed at this critical moment to move the nation to a safer energy future that will phase out reliance on older nuclear technology with known design weaknesses, responsibly manage and dispose of spent nuclear fuel, and reassess emergency preparedness requirements for all operating and planned nuclear power reactors in the United States. It is because of the need for a full vetting of these issues that we urge you to commission an independent inquiry which will help to ensure the adequacy of, and increase public confidence in, the measures to be taken in response to Japan's nuclear crisis and to promptly take corrective actions to further nuclear safety in the U.S.

The top priority for now remains assisting Japan in bringing its reactors under control, and providing resources and humanitarian relief to Japan for the radiological consequences of the accident and its aftermath. Yet we must also learn from this tragedy. Nuclear reactor siting, regulation, and licensing – for both the 104 operating nuclear power plants in the United States and any new plants that may be built – need to be thoroughly reviewed and reconsidered in light of the serious events at Fukushima. Of

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particular and urgent concern are the Boiling Water Reactors in the United States with Mark 1 and 2 containments, which are similar in design to the Fukushima units. Indeed, by building upon the lessons drawn from this national review, the U.S. could lead a renewed effort to work with other countries to integrate these findings into the safety strategies for their existing and future nuclear plants.

With that in mind, we recommend the following steps to address the safety of the nation's nuclear power plants:

1. The administration should appoint a truly independent commission, similar to the Kemeny Commission that investigated the Three Mile Island accident in 1979, that can help to engender public confidence by thoroughly examining nuclear safety issues, including assessing the conclusions and proposed corrective actions arrived at by both the nuclear industry and the NRC in its "90-day safety review".

2. The NRC should suspend the granting of nuclear power plant license renewals in high seismic hazard areas until the findings of the NRC's 90-day review are finalized and vetted by the independent commission.

3. The NRC should consider on a case-by-case basis the rescission of license renewals already granted for nuclear power plants located in high seismic hazard areas that were built to standards that no longer conform to our modern understanding of the full extent of the earthquake threat to the facility.

4. The NRC should direct the licensees of Boiling Water Reactors with elevated spent fuel storage pools to remove all spent fuel from wet pools as soon as it has cooled sufficiently to be stored in dry casks. We estimate that currently 60 thousand tons of spent fuel are stored nearby U.S. reactors, much of it in poorly protected and overloaded pools; and for 31 reactors these pools are located above and outside the containment, as they are at the Fukushima Daiichi plant.

5. The NRC should ensure that no emergency generator at a reactor is located where it is subject to flooding or other forms of potentially crippling damage.

We believe it is important that you now establish an independent commission to explore the root causes and consequences of the still unfolding disaster at Fukushima Daiichi in light of the renewed public concern regarding the serious hazards to public safety. This includes threats that may be triggered by so-called "beyond design basis" events–both natural and man-made–that could occur at U.S. nuclear power plants. Review of the implications of this disaster should not be limited to the NRC assessing the adequacy of its own previous rules and decisions. This would be problematic for any entity, but is particularly the case for the NRC, which has long been seen as a weak regulator with insufficient independence from the industry it oversees. Thus an independent commission can help objectively determine national and global ramifications for the siting and safe operation of nuclear power plants and provide a credible assessment of

the adequacy of what the NRC and the nuclear power industry will recommend as the appropriate responses to the accident.

We believe the best model is the Kemeny Commission, which was appointed by President Carter, chaired by the then President of Dartmouth College, and involved individuals with diverse opinions and backgrounds. Such a commission must be primarily comprised of independent experts and other knowledgeable, fair-minded persons of wide experience and good judgment whose current and future livelihoods do not depend on staying in the good graces of either the nuclear industry or the regulatory agency whose past and prospective courses of conduct will be under review. The commission should also hold public hearings, and hear from a wide range of witnesses and perspectives before reaching its own independent determination of the best path forward to improved nuclear safety.

The investigation should include but not be limited to the following issues:

- The causal factors in Japan's nuclear accident;
- Whether the design basis of existing and future designs should cover more severe accident precursors, including earthquakes, flooding and extended loss of off-site power;
- How such accidents can be anticipated and prevented in the future given similar U.S. reactor designs;
- The management of excess hydrogen produced by a loss of coolant and partial fuel melt in the core;
- The safety design and permissible loading limits of spent fuel storage pools;
- Provisions for supplying emergency backup power for longer periods of time;
- The adequacy of the nation's emergency preparedness for reactor accidents; and
- The implications of these findings for locating nuclear plants near large population centers, along seacoasts, and in areas at risk of being subjected to powerful earthquakes or other natural and man-made events, such as terrorism, tornadoes, and fires potentially capable of triggering a prolonged and potentially disastrous "station blackout" as occurred at the Fukushima Daichi plant.

While the situation at Fukushima remains dire and the full extent of the damage to life and property unknown, it is already clear that clinging to the status quo offers inadequate insurance against the occurrence of such a catastrophic nuclear event in the U.S. By taking these steps, your administration would help ensure that the lessons of this disaster can be used to strengthen the regulation of nuclear power generation in the U.S. and worldwide, and contribute to charting a rigorously careful path for the appropriate deployment of this technology in support of our nation's and the world's energy future.

Sincerely,

Frances Beinecke

Frances Beinecke

President

cc: The Honorable Nancy Sutley, Chair of the White House Council on Environmental Quality
The Honorable John Holdren, Assistant to the President for Science and Technology
The Honorable Heather Zichal, Deputy Assistant to the President for Energy and Climate Change Policy
The Honorable Steven Chu, Secretary of Energy
The Honorable Lisa Jackson, Administrator of the Environmental Protection Agency
The Honorable Gregory Jaczko, Chairman of the Nuclear Regulatory Commission

THE COLLECTIVE EFFECTIVE DOSE RESULTING FROM RADIATION EMITTED DURING THE FIRST WEEKS OF THE FUKUSHIMA DAIICHI NUCLEAR ACCIDENT

Matthew McKinzie, Ph.D. and Thomas B. Cochran, Ph.D., Natural Resources Defense Council

April 10, 2011

The Magnitude 9.0 earthquake off Japan's Pacific Coast, which was the initiating event for accidents at four of the six reactors at the Fukushima Daiichi nuclear power plant, occurred at 14:46 local time on March 11th. At 15:41 a tsunami hit the plant and a station blackout ensued. A reconstruction of the accident progression by Areva[1] posited that the final option for cooling the reactors – the reactor core isolation pumps – failed just hours later in Unit 1 (at 16:36), failed in the early morning of March 13th in Unit 3 (at 02:44), and failed early in the afternoon of March 14th in Unit 2 (at 13:25). Radiological releases spiked beginning on March 15th and in the Areva analysis are attributed to the venting of the reactor pressure vessels, explosion in Unit 2, and – significantly – explosion and fire in Unit 4. Fuel had been discharged from the Unit 4 reactor core to the adjacent spent fuel pool on November 30, 2010, raising the possibility of a core melt "on fresh air."

The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has posted hourly dose rates by prefecture[2] on its website. We do not currently know the geographic coordinates of these radiation monitoring sites. The English language versions of the hourly dose rate measurements by prefecture begin in table form at 17:00 on March 16th, and hourly dose rates are provided as charts[3] beginning at 00:00 on March 14th. We first extracted the early data from these charts point by point using image processing software, and these extracted points were subsequently normalized to tabular data beginning at 17:00 on March 15th from the MEXT Japanese language website provided to us by Professor Tadahiro Katsuta of Tokyo's Meiji University. Hourly dose rates were not provided by MEXT for Fukushima Prefecture, nor for Miyagi Prefecture to the north of the Fukushima Daiichi until after 17:00 on March 15th. We used the available hourly dose rate measurements by prefecture to calculate a collective effective dose for nine prefectures near the damaged Fukushima Daiichi plant, including Tokyo, as shown in the Figure 1 map.

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[1] Alan Hanson, Stanford University Center for International Security and Cooperation (CISAC) Visiting Scholar, and Executive Vice President, Technologies and Used Fuel Management of AREVA NC Inc., March 21, 2011 CISAC Seminar: "The Nuclear Crisis in Japan," http://iis-db.stanford.edu/evnts/6615/March21_JapanSeminar.pdf.

[2] http://www.mext.go.jp/english/radioactivity_level/detail/1304080.htm.

[3] http://www.mext.go.jp/english/radioactivity_level/detail/1303986.htm.

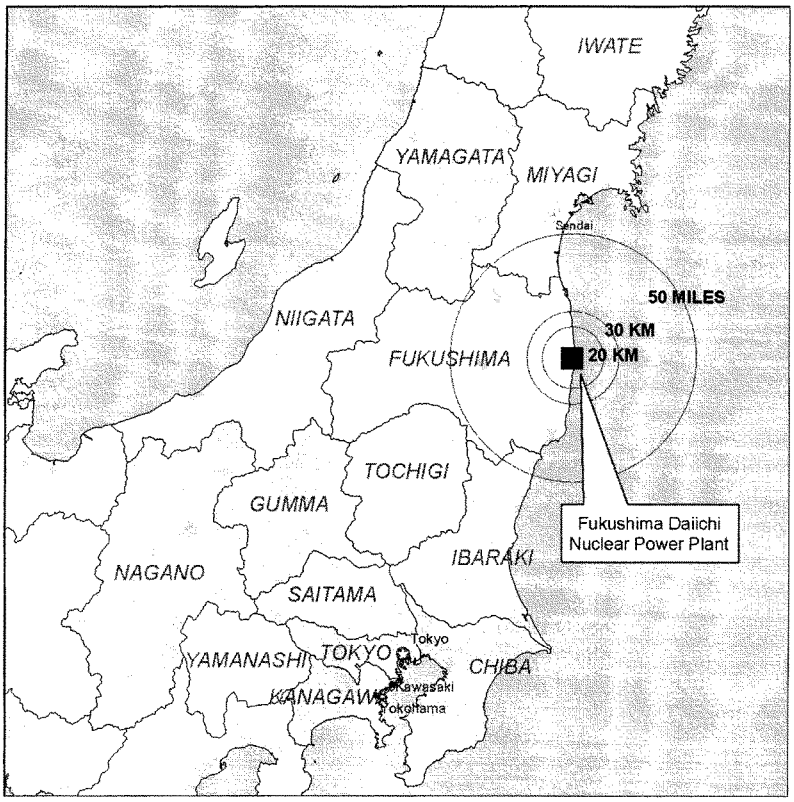

Figure 1: Hourly dose rates from MEXT for the nine prefectures highlighted in this map were used to calculate an effective collective dose over the population for radiation exposure during the first weeks of the accident. Japan prefecture (Ken and To) boundary polygon data were obtained from Harvard University.[4]

In radiation protection, the effective dose takes into account any non-uniformity of exposure and can be used to calculate the risks of cancer. The collective effective dose is the effective dose summed over the exposed population. Units of measure for collective effective dose are person-siverts, or in the older units, person-rems (1 person-rem is equal to 0.01 person-sieverts. The cancer and genetic risks for a given radiation exposure may be very small for an individual if the radiation exposure is small, but when a small exposure occurs over a large population, health effects can be expected on a statistical basis.

[4] http://www.fas.harvard.edu/~chgis/japan/datasets.html: citation for original data given as the United Nations Environment Programme (UNEP).

In Figure 2, the dose rates for Ibaraki and Tokyo prefectures are plotted by hour for a three-week time interval. Ibaraki Prefecture borders Fukuhima Prefecture, and the center of Ibaraki Prefecture is located about 130 kilometers (81 miles) southwest of the reactor accident site. Tokyo is located about 250 kilometers (155 miles) also southwest of Fukushima Daiichi. The fact that these two prefectures are in the same direction from Fukushima Daiichi, with Tokyo more distant, makes it likely that the radiation readings in Tokyo should be similar but smaller than for Ibaraki Prefecture as can be seen in Figure 2.

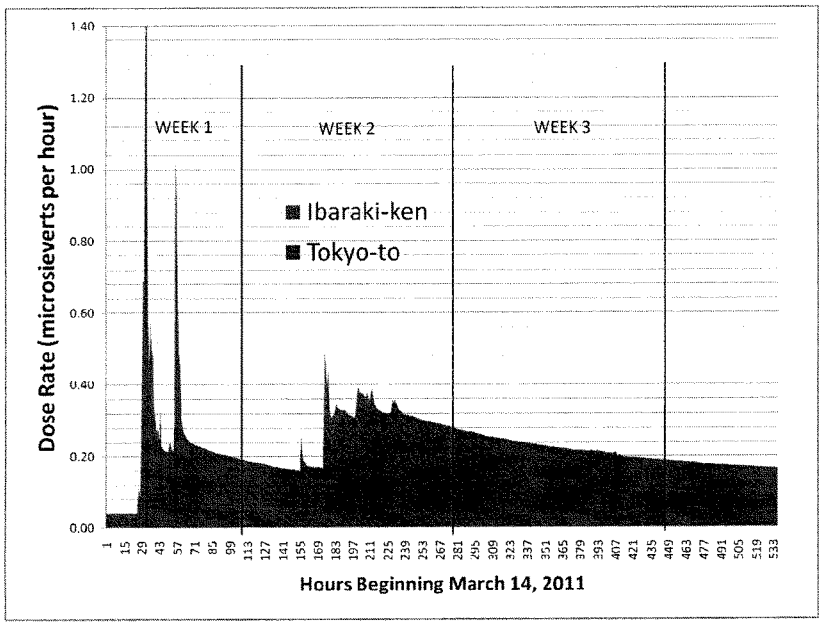

Figure 2: Hourly dose rates for Ibaraki and Tokyo Prefectures, data from MEXT.

Radiation dose rates in these nine prefectures does not just depend on proximity to the Fukushima Daiichi plant, but also depends on the prevailing winds and weather events over the course of the accident progression. Figure 3 charts the hourly dose rate in Tochigi Prefecture and Yamagata Prefecture, which both border Fukushima Prefecture. Not only is the dose rate in Yamagata lower overall than in Tochigi, but the radiation from the first prominent spikes on March 15th did not register in Yamagata Prefecture until almost a day later than it did in Ibaraki, Tochigi or Tokyo Prefectures. This disparity in dose rate depending on the direction of a prefecture from Fukushima is even more evident in Figure 4, where dose rates in Niigata Prefecture which borders Fukushima Prefecture to the west don't appear to rise above background levels, but dose rates are higher in Kanagawa Prefecture south of Tokyo, and the radiation spikes are apparent. Figures 5 and 6 contrast the dose rates in Saitama and Chiba Prefectures, and Gumma and Nagano Prefectures, respectively.

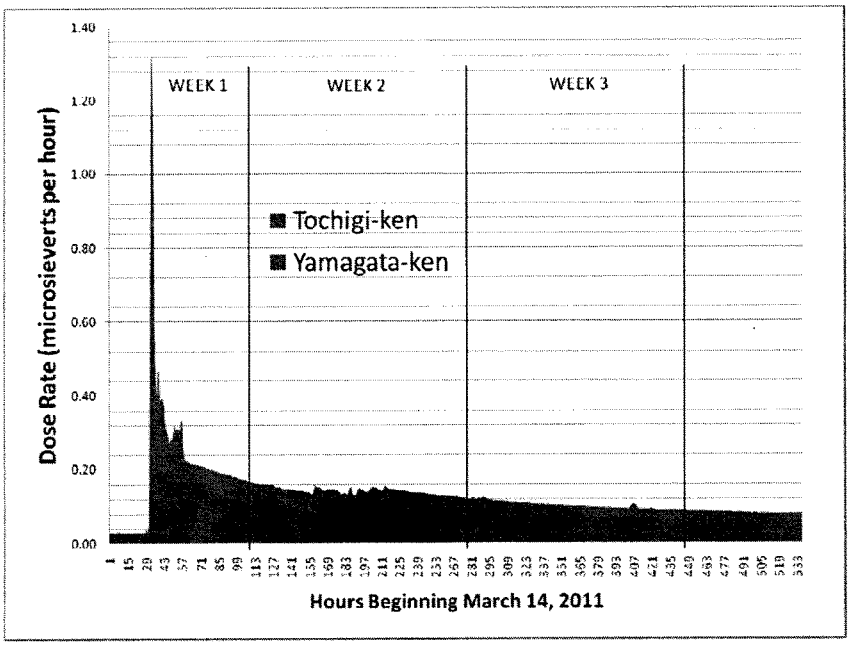

Figure 3: Hourly dose rates for Tochigi and Yamagata Prefectures, data from MEXT.

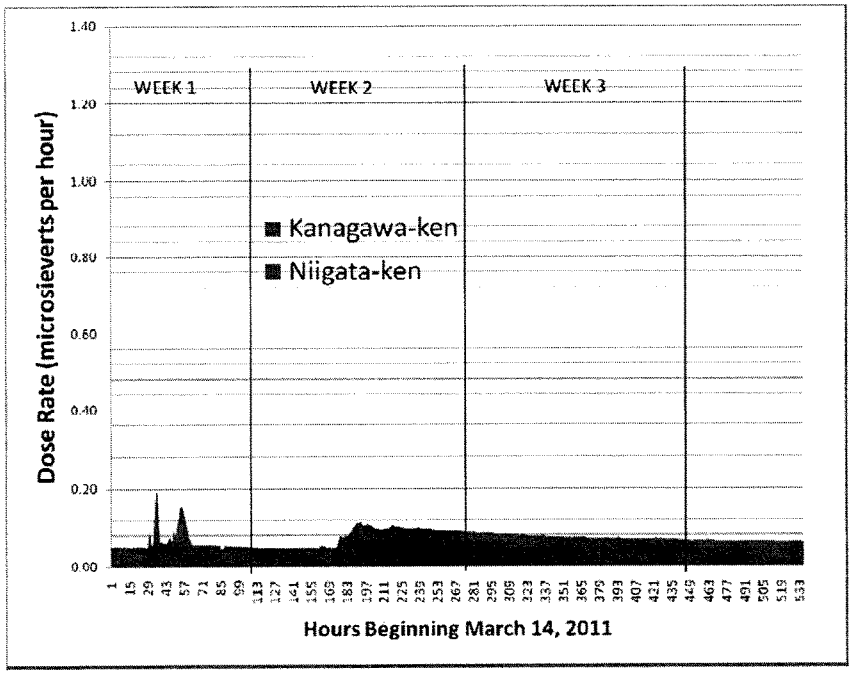

Figure 4: Hourly dose rates for Kanagawa and Niigata Prefectures, data from MEXT.

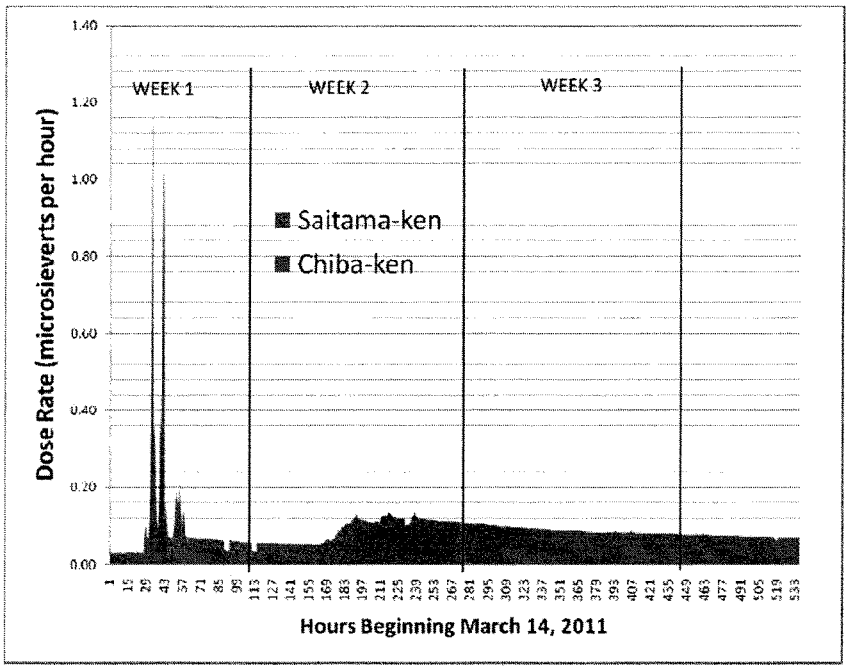

Figure 5: Hourly dose rates for Saitama and Chiba Prefectures, data from MEXT.

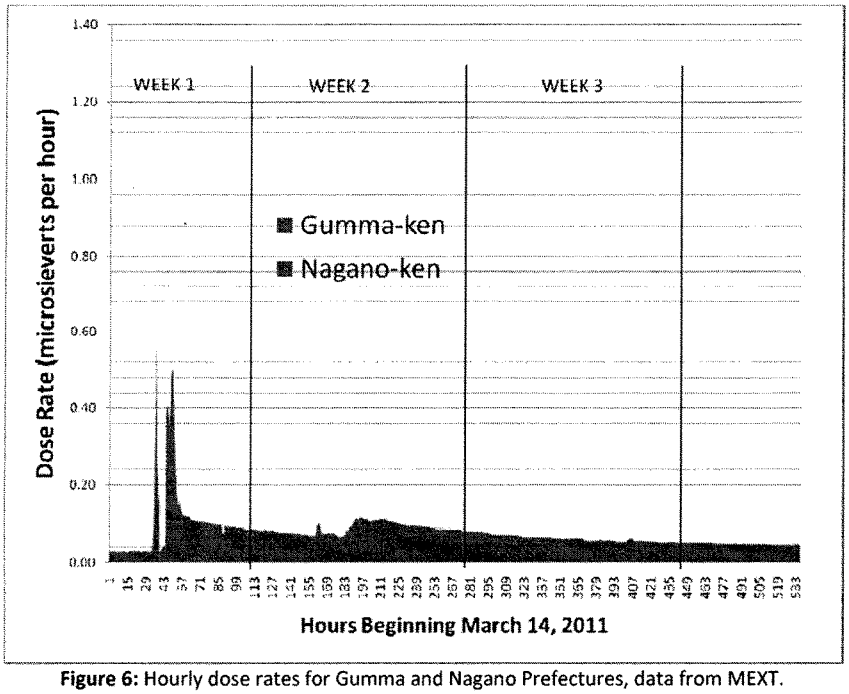

Figure 6: Hourly dose rates for Gumma and Nagano Prefectures, data from MEXT.

In order to calculate the excess collective effective dose caused by the accident, it is necessary to subtract a background radiation signal to measure health effects from the excess radiation produced by the events at Fukushima Daiichi. Ranges for background radiation levels were published by MEXT for each prefecture along with the hourly dose data, described as the "Usual Value Band." Figure 7 shows the average dose rates across eleven prefectures for March 14th and March 15th, and contrasts these dose rates with the background range provided by the Japanese government. For this analysis, we have therefore subtracted the average dose rate for March 14th as a background level in order to calculate the collective effective dose from radiation emitted during the accident.

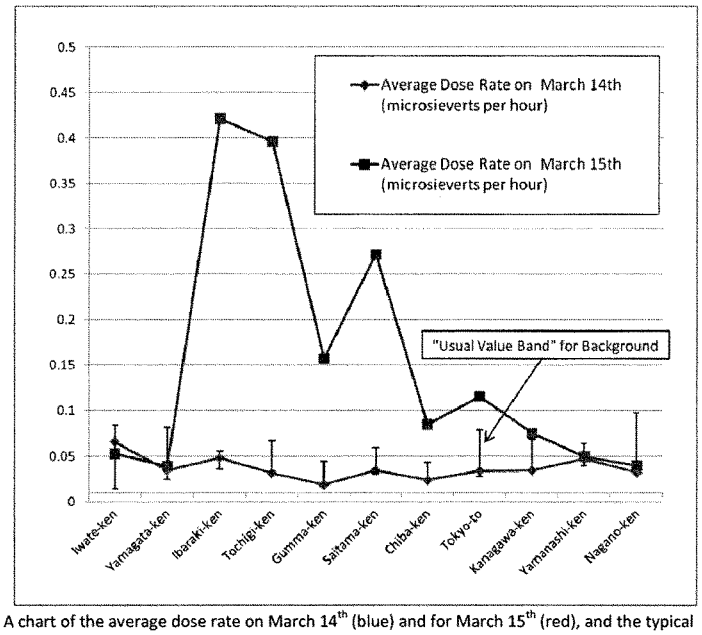

Figure 7: A chart of the average dose rate on March 14th (blue) and for March 15th (red), and the typical background ranges (black bars) for eleven Japanese prefectures near Fukushima Daiichi: all units are micro-sieverts per hour.

Hourly dose rates for the time period March 14th through April 5th were summed for nine prefectures and subtracted from background, as shown in Table 1. We obtained population data for Japan prefectures from the Japan Ministry of Internal Affairs and Communications, Statistics Bureau[5] for the year 2010. These populations were multiplied by total doses less background to calculate the collective effective dose by prefecture, as shown below in Table 2. The BIER VII Phase 2[6] best estimates were used

[5] http://www.stat.go.jp/english/data/chiri/map/index.htm.
[6] http://www.nap.edu/openbook.php?isbn=030909156X.

to estimate expected excess cancers and excess cancer deaths as a function of exposure to the radiation released from Fukushima Daiichi. These excess cases are compared with expected incidence of cancer and cancer deaths absent this exposure. The BEIR VII risk estimates are for a U.S. population of all ages. We do not have comparable risk estimates for a Japanese population, but the differences would be insignificant compared to other uncertainties.

Table 1: Hourly dose rates by prefecture were integrated over approximately 533 hours of data: from March 14, 2011 until April 5, 2011. Background dose rates for each prefecture were taken as the average dose rates on March 14, 2011 and are shown in the first column of data. Fukushima-ken and Miyagi-ken were excluded because of incomplete data released so far by the Japanese government. Iwate-ken, Niigata-ken and Yamanashi-ken measurements showed only a background signal.

JAPANESE PREFECTURE	BACKGROUND DOSE RATE (REM PER HOUR)	BACKGROUND DOSE (REM)	TOTAL DOSE (REM)	TOTAL DOSE LESS BACKGROUND DOSE (REM)
Yamagata-ken	3.447E-06	1.851E-03	3.511E-02	3.325E-02
Ibaraki-ken	4.821E-06	2.589E-03	1.270E-01	1.244E-01
Tochigi-ken	3.192E-06	1.714E-03	7.279E-02	7.107E-02
Gumma-ken	1.875E-06	9.993E-04	4.170E-02	4.070E-02
Saitama-ken	3.478E-06	1.826E-03	4.825E-02	4.643E-02
Chiba-ken	2.391E-06	1.284E-03	3.585E-02	3.456E-02
Tokyo-to	3.434E-06	1.844E-03	5.092E-02	4.908E-02
Kanagawa-ken	3.447E-06	1.844E-03	3.782E-02	3.598E-02
Nagano-ken	3.218E-06	1.728E-03	2.890E-02	2.717E-02

Table 2: Census population figures, collective dose and statistical cancers and cancer deaths calculated for radiation exposure above background over nine prefectures, from March 14, 2011 until April 5, 2011.

JAPANESE PREFECTURE	2010 PREFECTURE CENSUS POPULATION	COLLECTIVE DOSE (PERSON-REM)	EXCESS CANCER CASES	CANCER CASES ABSENT EXPOSURE	EXCESS CANCER DEATHS	CANCER DEATHS ABSENT EXPOSURE
Yamagata-ken	1,168,789	1,939	2.2	489,839.5	1.1	238,666.7
Ibaraki-ken	2,968,865	30,019	34.1	1,244,251.3	17.1	606,242.2
Tochigi-ken	2,007,014	11,169	12.7	841,139.6	6.4	409,832.3
Gumma-ken	2,008,170	6,367	7.2	841,624.0	3.6	410,068.3
Saitama-ken	7,194,957	21,580	24.5	3,015,406.5	12.3	1,469,210.2
Chiba-ken	6,217,119	14,304	16.2	2,605,594.6	8.2	1,269,535.7
Tokyo-to	13,161,751	42,752	48.5	5,516,089.8	24.4	2,687,629.6
Kanagawa-ken	9,049,500	17,537	19.9	3,792,645.5	10.0	1,847,907.9
Nagano-ken	2,152,736	2,500	2.8	902,211.7	1.4	439,588.7
Total	**45,928,901**	**148,167**	**168.2**	**19,248,802**	**84.4**	**9,378,681.6**

There are several factors that make our current estimate of collective effective dose from the Fukushima accident highly uncertain. First, we did not include a sheltering factor. Staying indoors will significantly reduce a person's dose from ionizing radiation in the environment, which is the principal of the Cold War fallout shelter. Some measurements published by the Japanese government illustrate this fact. On March 16th at 8:16 AM local time, at a point 60 kilometers northwest of the Fukushima Daiichi plant, radiation readings were recorded as 18.0 micro-sieverts per hour outdoors and 1.5 micro-sieverts per hour indoors.[7] Secondly, media reports indicate that people have been voluntarily leaving Tokyo, and the earthquake and tsunami have resulted in displaced persons in some of these prefectures. The 2010 Japanese census data does not likely represent the actual populations in these prefectures during the radiation exposures.

Factors that could contribute to an increase in the collective effective dose over what we have calculated are the contributions of other radiation exposure pathways – ingestion of contaminated water and food, and inhalation of radioactive particles. And as noted above, the analysis does not include Fukushima and Miyagi Prefectures due to lack of continuous radiation monitoring data available to us at this time. Importantly the accident is still ongoing, so there will be a contribution to the collective effective dose from exposures after April 5, 2011. Finally, these calculations are for a single value of dose rate across an entire prefecture – weather, topography and other factors will likely have produced areas with greater or lesser dose rates than MEXT reported for the entire prefectures.

We may compare this value of collective effective dose with that of the Pennsylvania's 1979 Three-Mile Island partial core meltdown and the Ukraine's 1986 Chernobyl reactor explosion and fire. Given uncertainties in our estimate, we find the collective dose from external exposure to date—and consequentially excess cancers that are projected to result from this exposure pathway—appears to be roughly one to two orders of magnitude, i.e., ten to one hundred times, greater than the collective radiation dose resulting from the Three Mile Island (TMI) accident, which was on the order of 2,000 person-rem. The collective dose from the Fukushima accident appears to be in the neighborhood of two orders of magnitude less than that from the Chernobyl accident, which is estimated to have been 25.5 million person-rem[8]. In the aftermath of the accident at Fukushima Daiichi, extensive dose reconstructions will certainly be undertaken that will include better data on radiation levels, weather, other exposure pathways, and population distribution, as was done for Three-Mile Island and continues today for Chernobyl.

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[7] MEXT, "Readings at Monitoring Post out of 20 Km Zone of Fukushima Dai-ichi NPP, As of 20:00 March 16, 2011," at: http://www.mext.go.jp/component/english/__icsFiles/afieldfile/2011/03/20/1303972_1620.pdf.
[8] http://www.unscear.org/unscear/en/chernobyl.html.

Senator CARPER. Thanks so much for your testimony. As I said earlier, the entire statement will be made part of the record.

I am going to telegraph a pitch and let you know what my last question is going to be to the panel. Basically I am going to ask each of you to give us a just a really good takeaway, a really good takeaway, not just for Chairman Boxer and myself and Senators Inhofe and Barrasso, but just really one good takeaway from each of you from this hearing for our committee, please. So just be thinking about that.

In the meantime, let me ask a first question of Secretary Schiliro, and that would be, after seeing the devastation in Japan, are you concerned with our State, with Delaware's emergency planning process? Could anything be improved? To follow onto that, do you feel our plan is flexible enough to be changed if you saw a need to expand beyond the 10-mile evacuation plan?

Mr. SCHILIRO. Thank you, Senator. We have a very robust group in Delaware and it truly is a team effort. The ability of DEMA to incorporate all of our partners from the law enforcement and public safety communities, both State and our Federal partners, I think is very robust.

Certainly I think the lesson that we need to learn is what can we take away from the events in Japan that would allow us to evolve that plan? Because it truly is a living document and certainly something that we need to understand.

As has been stated, the 10-mile EPZ is something that we do practice for and plan for. However, I do think the plan is flexible enough, and certainly in the power of the Governor, that in the event that the circumstances go beyond that 10 miles, that we certainly could react to. We do, as has been stated, plan for that in terms of hurricane evacuations. So, it is adaptable.

I think, as was stated earlier, what the 10-mile zone allows us to do is to really give that early warning and to really just start to begin from that. But there is no doubt in my mind, based upon the people that we have in Delaware, that if we needed to expand it, we certainly could and would do that. So, I feel very comfortable with that.

Senator CARPER. All right. Thank you.

Let me follow that one with a question of Mr. Sommerhoff and perhaps of Secretary Schiliro as well. The question is, many of the families in Japan have been away from their homes for I guess close to a month or so. In your emergency planning, is it explained to people being asked to evacuate that it could be not just for a couple of hours or a couple of days? It could be, in this case, for over a month for a lot of the folks in Japan, and I guess the clock is still running there.

But do we have long-term emergency housing that can accommodate people for these kinds of extended periods of time?

Mr. SOMMERHOFF. One of the things we try to do as we, when we educate the public and certainly practice these drills and exercises, is we have an emergency reception center concept. The idea with the emergency reception center is to have a place, at least temporarily, for people to seek shelter and emergency services from local government.

From there, we are also looking at some offsite reception centers, some more long-term sheltering capability. Then we would be looking at Federal resources coming in, as well as aids from the nuclear industry through American nuclear insurers and others, to provide more resources for those long-term housing needs and those types of opportunities.

But all of those things that you mentioned in terms of both human and health services type things, as well as the housing issues and the mass care issues, all that is provided and explained to folks in terms of education, as well as the resources at the reception center concept.

Senator CARPER. OK. Mr. Schiliro, Secretary Schiliro, anything you want to add to that?

Mr. SCHILIRO. Just one quick note, Senator. As you know, we have had occasion, unfortunately, to stand up, primarily through the Red Cross short-term shelters, one in the event of certain snowstorms that we have recently had and weather-related events, and generally that works very well.

But obviously in the event that we needed longer term, the primary responsibility would be for the public safety and, if that were the case, I am confident that through our Federal partners and other related resources we would be able to accomplish that.

Senator CARPER. All right, thank you.

A question, if I could, of Mr. Pardee. This is a question relating to alert systems. In Secretary Schiliro's written statement, he stated that within, he said within 15 minutes of a radiological emergency, PSE&G must send an alert to Delaware's emergency response team. Do you know if that is a requirement that is established by the Nuclear Regulatory Commission?

Mr. PARDEE. Yes, Mr. Chairman. The Nuclear Regulatory Commission has very strict reporting guidelines that are applicable to all nuclear stations in the United States that ensure timely reporting of events as they are unfolding and regular periodic updates to make sure, as further information is acquired by the station, that that information is shared with State and Federal officials for the purposes of making quick protective action recommendations and mustering resources to assist.

Senator CARPER. OK. During an emergency, how does a company communicate with the NRC and with local governments?

Mr. PARDEE. We have emergency response facilities both local to the site and remote from the site, our emergency operating facilities. Those facilities all have dedicated communication links between the Nuclear Regulatory Commission op centers and on a State-by-State basis. They are emergency operating centers. These are dedicated phone lines, they have back-ups in the form of satellite, radio or cellular communications and such. So, there are multiple communications links in which to share the information I described.

Senator CARPER. Did you say earlier that you had spent some time in Japan?

Mr. PARDEE. I have. I have been to both Fukushima Daiichi and the Kashiwazaki-Kariwa station that suffered an earthquake about 3 years ago. In that case, I went about 2 weeks after that earthquake hit.

Senator CARPER. A member of my staff, I think it might have been Laura Haynes, I think, said to me earlier today, suggested that the NRC has the ability to monitor control rooms, maybe of all the nuclear power plants in the United States. I do not know if that is true, but if you know, and the second, like a followup, whether that is true or not, do the folks in Japan have a similar kind of capability?

Mr. PARDEE. We in the United States all have something called the Emergency Response Data System which is a provision to provide technical data to the NRC Emergency Operations Center and other interested parties. I am not strictly familiar with what exists within the Japanese regulatory protocol, but I do know that information flow seems to be much more greatly challenged than I would ever expect it to be here in the United States.

Senator CARPER. OK. Thanks.

I am going to ask a question of Secretary Schiliro and then I am going to ask Dr. Cochran and Mr. Boyd and Mr. Pardee to followup on this. But here is the question of Secretary Schiliro. In your written testimony, I think you stated approximately 41,000 Delawareans live within 10 miles of PSE&G's Salem/Hope Creek facilities. Is that about right?

Mr. SCHILIRO. That is correct, Senator.

Senator CARPER. All right. If there was a full evacuation of that 10-mile radius because of an emergency at the PSE&G facilities, how long do you think it would take to conduct that full evacuation?

Mr. SCHILIRO. Our modeling, Senator, depending on the time of the day and the time of the year, anywhere between three and 6 hours.

Senator CARPER. Three and 6 hours. All right. Again, if I could, of Dr. Cochran and Charles Pardee and Mr. Boyd, if a nuclear power plant in this country faced a full blackout, faced a full blackout, similar to what we have seen at the Fukushima facility, in your opinion, would we have a few days before we might see the fuel rods degrade and therefore see harmful radiation levels?

I am going to say that one again. I will just say it again. If a nuclear power plant in this country faced a full blackout similar to what we have seen at the Fukushima facility, in your opinion, would we have a few days before we might see the fuel rods degrade and therefore witness harmful radiation levels?

Mr. COCHRAN. I do not believe so if you include within that full blackout the loss of emergency power generation at the site. For example, you have both batteries and diesel generator backup systems. Diesel generators failed in Japan because of the tsunami. If they failed in the United States, you then can rely on, and they also relied upon, battery power. At some reactors the batteries are only designed for 4 hours, it is my understanding.

Senator CARPER. Do we have any idea if those batteries can be recharged? I just drove one of those new Chevrolet Volts yesterday and the Chevrolet Volt, as you may know, the battery provides, constantly provides, the force, if you will, for the wheels to move. Whether the engine, if the engine is running, the engine does not run, turn the wheels. It powers the battery so the battery can be charged constantly.

Any idea if these batteries at the nuclear power plants can be charged or recharged while they are drawing down electricity? Does anybody know?

Mr. PARDEE. Yes they can, Mr. Chairman.

Senator CARPER. OK. Thanks.

Mr. PARDEE. We have to have the requisite equipment available, but they can be recharged. They are big automobile batteries. Very big automobile batteries.

Senator CARPER. I bet they are. Thanks. OK. Doctor, go ahead and finish your response now.

Dr. COCHRAN. Well, in order to recharge them, you have to have a source of power. Your original premise was that you lost power, that you had a station blackout, so you would not be able to charge them under those circumstances.

I think you have touched on one of several very important issues that need to be addressed as a consequence of this disaster. In my judgment, the most important thing you need to do is address how this process should be undertaken. We support the NRC's review. We support the industry's review. But we do not feel that is adequate.

We should rely solely on the NRC to review its own previous failures, and we therefore believe that you need something akin to a Kemeny Commission that you had following the TMI accident, similar to the Blue Ribbon Commission you had following the BP oil spill.

There are people in the industry, people in the Government, who do not want to have an independent review because they see that it might threaten their future course of actions.

Senator CARPER. All right. Thank you. May I ask, if I could, Mr. Boyd and Mr. Pardee to respond as well to this question. Mr. Boyd?

Mr. BOYD. Thank you, Senator. I know, and I just checked with my good Senator here, that Diablo Canyon has a real problem with regard to evacuation of, you heard the very small numbers of people. But there is incredibly limited access. So, the number we have is about 15 hours to evacuate the area because, and that assumes the overpasses have not collapsed on the freeway and that assumes it leaves one of the only two escape routes available.

At SONGS, it is a little different with 7 million people. I do not have the estimate on the top of my head but it, while we have significant freeway systems there, it is still a very substantial period of time that has been modeled over and over again and I can get you that information.

Additional comments on the second question because it relates to the evacuation issue. Both of our plants have 8 hour battery backup capability. Diablo Canyon's backup generators are fairly high up on the hillside so it would take a very significant tsunami to impact them. But, nonetheless, we are in discussions now as a result of what happened in Japan with both utilities about the whole question of station blackout.

The SONGS generators are right at the plant which is right on the beach although, hopefully, a less earthquake prone area. But nonetheless, they have the advantage of the entire Marine Corp across the street, Camp Pendleton, and arrangements have been

made for backup generation, portable generators and what have you, in the event of some kind of problem there.

Diablo Canyon does not have that luxury and we have been talking about helicoptering in batteries and what have you in the event there is a serious problem there.

Senator CARPER. All right. Thank you. One last word, if you would, Mr. Pardee, on this question, please.

Mr. PARDEE. Yes, sir. For the first question regarding evacuation times, our times also vary, station dependent, time of day, time of year, seasonal varieties, but somewhere on the order of four to 10 hours is representative of our stations as well.

To your question about our ability to forestall fuel damage for a number of days per station blackout, I do not believe that we would have fuel damage, although I do not mean to trivialize the amount of work that would be required on the part of the operators to create that result.

But we do have, even in the event of depleting batteries, we have procedures here in the United States for manual operation of our emergency pumps that would require no battery power for operation or measurement instrumentation. In other instances, we have temporary or portable battery supplies, such as carts with batteries on them, that would allow us to operate the equipment necessary to keep the core from being damaged. This equipment and these procedures are pre-staged. We train on them. We have formal qualification programs on them.

I am positive that we will learn things out of the Japanese event that will make us better. We are already starting to investigate how we can extend the lives of our batteries and such. I am sure we will have to look harder at spent fuel pools and their ability to withstand sustained loss of AC electrical power. But the direct answer to your question is, I would not anticipate fuel damage after 48 hours.

Senator CARPER. OK. Thanks very much.

Let me go back to the pitch I telegraphed earlier and that is to ask each of you if you could share with us one takeaway before you go back. I will just start, if I could, with, I will start with Senator Blakeslee. If you would not mind responding, that would be great.

Mr. BLAKESLEE. Thank you, Senator. I appreciate the opportunity.

We have 104 reactors in the Nation and the NRC has identified there are only two plants that are in the highest seismic potential category and both of them happen to be coastal plants. But only one of them has a recently identified fault of significant proportions in very close proximity.

My concern in listening to Commissioner Jaczko's comments in response to Senator Boxer's questioning was that, although he is looking at procedures in a 90-day and a 6-month window, I heard nothing that identified the unique needs of these two plants, and the one plant in particular, which have these direct analogies to the threat faced in Japan through the 2007 and 2011 earthquakes.

So I would again, the one take away I hope we can walk away with is that for these two facilities in California, we upgrade our relicensing procedures to formally include seismic safety criteria

and standards that directly relate to earthquake hazard in our process.

Senator CARPER. All right. Thank you, Senator. Thanks so much for being with us today.

Mr. Boyd, please.

Mr. BOYD. The Senator took my first item but I knew he might so I have got a couple of others noted here. I will mention one of them, and that is the spent fuel pool safety issue that has been discussed today. The re-racking of the spent fuel pools into high density and the slow speed with which these pools are being emptied in order to put materials into dry cask storage is a serious concern to us, particularly in the high seismic activity areas, again, like California's two plants.

Senator CARPER. All right. Thank you, sir. Secretary Schiliro?

Mr. SCHILIRO. Yes, thank you, Senator. In my mind, and as you know, Senator, our obligation is for the safety of the people of Delaware. But what to me is paramount is that we learn from the events in Japan from the standpoint of their reaction and the emergency response that they had. We need to learn the lessons from that. That information needs to be transparent. It also needs to be shared with the State and local counterparts, the people that would actually be forced to respond to this kind of event.

So, what I hope is that once the lessons are learned, and once that information is gotten, that there be system to share that with us so that we can change and develop our plans to meet that. If that does not occur, then to me, that would be the greatest tragedy.

So, I would hope that as the NRC and the other Federal agencies get that that it be shared and that we learn from that. Thank you.

Senator CARPER. All right. Good. Thanks so much for joining us today.

Mr. Sommerhoff.

Mr. SOMMERHOFF. Senator, thank you. Our protective action decisionmaking, it is based on plant conditions and it is based on the conditions on the ground. From that, we start making our implementation for protective actions for the public.

We are always looking first, when we look at issues that are going to require evacuation, and evacuation is not always the protective action that we are going to implement, it might be sheltering in place, but we will look at those people who are in close proximity to the plant initially and then we are also going to look at those vulnerable populations, those difficult to move populations.

I cannot think of a situation where we would just say, everybody within 10 miles evacuate now. It does not happen like that. It happens in phases. That is how we conduct evacuations for all types of hazards, including hurricanes and other types of hazards.

So, I just wanted to make sure that this was this understanding that the way we do implement evacuation protective actions, it is not everybody evacuate at once. I do believe the 10-mile Emergency Planning Zone is the appropriate planning standard for us.

We have always considered that there could be implementation of protective actions outside that 10-mile zone. We have never thought that, based on environmental conditions or conditions at the plant that somehow radiation would stop at 10 miles and just fall to the ground. We always have considered that we would have

to move outside that 10 miles and implement actions outside to address the public there.

So, I just wanted to make sure that that understanding was known.

Senator CARPER. Good. Thanks. Thanks so much. Mr. Pardee, one good takeaway.

Mr. PARDEE. Yes. Thank you again for the opportunity. For my takeaways, I would simply say that we understand the concern on the part of the committee and the general public, the public at large.

We are committed to open, transparent and proactive communications regarding our current State and what changes we are implementing based on the lessons learned from the events in Japan and that we share the objective of the committee to protect the public health and safety. We will do that through concerted operations and by profitably learning from the lessons learned and taking actions to improve our safety posture.

Senator CARPER. All right. Thanks. Thanks so much.

Dr. Cochran, you have the last word, please.

Mr. COCHRAN. Mr. Chairman, on page 5 of my written statement, I gave you just over a dozen take-home lessons.

Senator CARPER. Cheaper by the dozen?

Mr. COCHRAN. I would hesitate to choose one or even several as more important than others. But, let us take the spent fuel issue. We are 50 years into this industry and we do not have a geologic repository. We need to start getting that spent fuel in hardened, safe, dry cask storage and we ought to do it at the reactor sites as well as any interim site.

Then there is the issue of these BWRs. We have old reactor designs out there. One-third of the U.S. fleet. The issue that you should be thinking about is whether we have in place a process that ensures that those reactors get relicensed over and over again and we try to patch up their design deficiencies, or are we going to get the clunkers off the street? We ought to have a process that retires these old, obsolete designs and replaces them with better technology.

Senator CARPER. All right. Thanks. Thanks for those closing thoughts.

Before I thank you all and send you on your way, I just want to go back to something that Chairman Boxer said earlier in the hearing. She was asking our second panel, Chairman Jaczko and Administrator Jackson, she asked what is the worst that can happen? I think that is paraphrasing her, but she asked what is the worst that can happen?

I said, a few minutes after that, I said maybe the worst thing that could happen was on the heels of this terrible tragedy where the folks of Miyagi, which as I may have said earlier and as Secretary Schiliro knows, is our sister State to the State of Delaware, the Miyagi Prefecture, I have been there before and feel a real sense of empathy and compassion for the folks there.

But maybe the worst thing that could happen, at least for us here, would be for all this pain and suffering to have occurred in Japan and for us not to have learned anything from it. Or maybe

for us to have learned from it but not to have done enough about it, not to have acted on the lessons that we have learned.

There is a responsibility, I think, for all of us, not just on this committee, not just in the Congress, not just in the industry, not just at the NRC, but there is a responsibility for all of us to work together to make sure that we fully implement the lessons that we learn and that we remain vigilant until we have done that.

I will close with the words I use often in this room and that is, everything I do I know I could do better. I think that is true for all of us and it remains true of the nuclear industry. We just need to remain eternally vigilant, eternally vigilant. I am encouraged today that that is our intent and we need to make sure that that is not only our intent, but it is actually what occurs.

With that having been said, I thank you again for joining us here today and for providing your input. We look forward to working with you in this ongoing dialog. Thank you so much.

With that, this hearing is adjourned.

[Whereupon, at 5:40 p.m. the committee was adjourned.]

[Additional statement submitted for the record follows:]

444 South 16th Street Mall
Omaha NE 68102-2247

W. Gary Gates
President & CEO

April 12, 2011

Dear Senator Johanns:

I am writing in support of nuclear power. I understand that the EPW Committee and the Subcommittee on Clean Air and Nuclear Safety will be holding a hearing today. As the president and CEO of Omaha Public Power District, which owns and operates a nuclear facility, and as the current chair of the Nuclear Energy Institute Board of Directors, I can assure you that nuclear power is safe.

As you may know, nuclear facilities undergo extensive evaluations on their components and other equipment. And, through rigorous training of plant workers and increased communication and cooperation between nuclear plants and federal, state and local regulating bodies, the U.S. nuclear industry keeps the nation's 104 nuclear plants safe for their communities and the environment.

Nuclear power plants are protected by multiple back-up safety systems, robust physical defenses and plant security forces with rigorous training, and with more than 50 years of experience, our nation's nuclear power plants are among the safest and most secure industrial facilities in the United States. Last year, 93 percent of those key back-up safety systems at nuclear plants met or exceeded their availability goals. Additionally, in 2010, nuclear plants posted a low industrial accident rate with 0.1 industrial accidents per 200,000 workers.

Furthermore, the training for U.S. nuclear plant operators is intense. Operators are equipped and trained to manage severe and plant-centered events similar to those experienced at the Fukushima nuclear power plant in Japan. In fact, nuclear plant workers spend one week out of every six on training. We have made significant improvements to the physical structures at our facilities and in how we manage our emergency preparedness and response capability.

I relay these statistics to help you understand that I have every confidence in the safety of U.S. nuclear plants. I also sit on the boards of the Institute of Nuclear Power Operators and the World Association of Power Operators. Together, along with the Nuclear Regulatory Commission, these institutions extensively regulate and monitor the nuclear industry. As an industry, we have already committed to review all plants to verify their ability to maintain safety even in the face of severe, adverse events. Additionally, as an industry, we will take lessons learned from the Japan situation and apply them accordingly.

Please feel free to call me if you have any questions or concerns about nuclear power and public safety. The top priority at all nuclear plants is to protect the safety of the public. That's been the hallmark of the nuclear power industry, and that will never change.

Sincerely,

W. Gary Gates
President and CEO
Omaha Public Power District