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AMERICA'S WORKFORCE NEEDS IN THE 21ST CENTURY

HEARING

BEFORE THE

SUBCOMMITTEE ON IMMIGRATION

OF THE

COMMITTEE ON THE JUDICIARY
UNITED STATES SENATE

ONE HUNDRED SIXTH CONGRESS

FIRST SESSION

ON

EXAMINING WORKFORCE NEEDS IN THE HIGH TECHNOLOGY INDUSTRY AND AT SMALLER COMPANIES, FOCUSING ON THE NEED FOR ADDITIONAL H–1B VISAS

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AMERICA'S WORKFORCE NEEDS IN THE 21ST CENTURY

THURSDAY, OCTOBER 21, 1999

U.S. SENATE,
SUBCOMMITTEE ON IMMIGRATION,
COMMITTEE ON THE JUDICIARY,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:26 p.m., in room SD–226, Dirksen Senate Office Building, Hon. Spencer Abraham (chairman of the subcommittee) presiding.

Also present: Senators Feinstein, Kennedy, and Schumer.

OPENING STATEMENT OF HON. SPENCER ABRAHAM, A U.S. SENATOR FROM THE STATE OF MICHIGAN

Senator ABRAHAM. We will come to order. I begin today with a brief apology on behalf of Senator Robb and myself. We were a little late getting here because there is a vote still being conducted on the floor, and so we apologize to everybody for our slightly late arrival. It is also my understanding that Senator Gramm, who was to have been part of the first panel to testify, along with Senator Robb, is engaged in, I believe, continuing conference on the banking reform legislation, so he will not be here today, but we will continue.

I will make an opening statement and then we will turn to Senator Robb. If we are joined, whenever we might be joined by other members of the subcommittee, we will turn to them for an opportunity to make statements if they wish, depending on where we are in the proceedings. So let me just begin.

The principal purpose of today's hearing is to examine workforce needs in the high tech area and at smaller companies. The impact of the current availability of skilled workers on entrepreneurs has received less attention than large firms in the discussion of H–1B visas for skilled professionals. The hearing will also address the need for additional H–1B visas and possible approaches to meeting that need.

Senator Gramm, I know, who, as I said, will not be able to be here today, still will be, I am sure, submitting written testimony to discuss a bill that he has introduced to address this problem, and Senator Robb, I believe, has legislation, as well, to address it in a slightly different format but will be here today to present his views accordingly.

This is not a new issue for our committee. In February 1998, the Senate Judiciary Committee, under the leadership of Chairman Hatch, held a hearing on high tech workforce issues that dem-

onstrated that many companies could not find enough qualified professionals to fill key roles. It also showed that foreign-born individuals companies hired on H–1B temporary visas typically created many additional jobs for Americans through their skills and their innovations.

Shortly after that hearing, with the cap on H–1B visas projected to be reached by June, I introduced the American Competitiveness Act, which raised the H–1B visa cap from the arbitrary 65,000 number selected in 1990 while also providing 10,000 scholarships for young Americans in high technology fields. In April of that year, that bill passed the Senate Judiciary Committee, and then in May, the legislation passed the full Senate by a 78 to 20 vote. Sometime thereafter, the House Judiciary Committee passed out a much different H–1B visa bill. A negotiation ensued, and in time, a House–Senate compromise was reached.

At that point, the White House raised several additional issues and threatened a veto. After several more weeks of negotiations, we were able to reach an agreement with the administration and the bill passed the House by over 150 votes. It was later signed into law as part of the ominous—ominous—— [Laughter.]

Senator ABRAHAM [continuing]. Omnibus appropriations bill. The delay caused by the White House objections unfortunately did set us back a bit, and it resulted in an extra 20,000 visas that were at least initially included in the House–Senate compromise from being available to employers in 1998, simply because the bill did not finish until after the beginning of the new fiscal year. That created, of course, an additional backlog for 1999.

The final legislation, which differed only somewhat from the initial bill, met objections that had been raised initially to increasing H–1B visas from the 65,000 cap. Some had argued that we needed to have money for training and educating U.S. workers, and as I indicated, the legislation did that. It created a $500 fee per visa, which means that today, every time an individual is hired on an H–1B visa, $500 goes to training U.S. workers and providing scholarships for up to 10,000 American students a year in science and technology.

In addition, since the bill's passage, we have seen Intel, Texas Instruments, and others in the private sector increase mentoring and other significant education programs, and we recently witnessed the $1 billion charitable donation from Microsoft Chairman Bill Gates to fund full scholarships in the science and technology fields.

At the time we passed the bill, others argued that tougher enforcement was needed, so that legislation dramatically increased fines, including a $35,000 penalty per violation, as well as a 3-year debarment if a company willfully underpays an H–1B visa holder and, in the course of which, replaces a U.S. worker. For the employers about which opponents had expressed the most concern, those employers with a high percentage of H–1B visas in their workforce, the bill added new layoff and recruitment attestations. In addition, the Labor Department was given the authority to initiate an investigation if it received credible evidence indicating a violation and received the approval of the Secretary of Labor to investigate.

Since the passage of the legislation, the case for maintaining an adequate supply of H–1B visas has only grown stronger. First, despite the H–1B cap having been raised to 115,000 in fiscal years 1999 and 2000, as well as to 107,500 in the year 2001, the increase has proven insufficient due to the tight labor market, increasing globalization, the rapid pace of the high tech sector, and the backlog of visas that developed from the prior year. With the cap reached by June this year, employers were again left wondering why government restrictions are causing them to shelve projects and drop plans to place key personnel overseas.

In addition, foreign countries are stepping up their own recruitment efforts, including a pitch by the Canadian government for U.S. high tech companies to move to Canada so as to avoid the problem of hitting the H–1B visa cap year after year. The CEO of Lucent Technologies stated this summer at a Capitol Hill technology forum that it has placed hundreds of engineers and other technical people in the United Kingdom in response to an insufficient supply of U.S.-based workers, keeping many related jobs from being created in America.

In addition, the INS has told Congressional committees that due to at least one significant systems error, it may have awarded more H–1B visas than the fiscal year 1999 statutory cap permitted. However, the INS also has been unable to rule out the possibility that other errors may have seriously shortchanged employers, leaving the actual number of visas issued in fiscal year 1999 uncertain absent a meticulous audit.

Finally, we have seen more studies and more individuals reach the same conclusion embodied in last year's legislation. A study by Joint Venture: Silicon Valley found that a lack of skilled workers is costing Silicon Valley companies $3 to $4 billion a year. A study by the Computer Technology Industry Association computed that a shortage of information technology professionals is costing the U.S. economy as a whole $105 billion a year.

In a study for the Public Policy Institute of California, University of California–Berkeley Professor Annalee Saxenian found that immigrants are a major source of job creation. Her research showed that Chinese and Indian immigrant entrepreneurs in Northern California alone were responsible for employing 58,000 people with annual sales of nearly $17 billion.

Perhaps most notably, Laura D'Andrea Tyson, who was our former chief economic advisor to the President, wrote recently in Business Week, "Conditions in the information technology sector indicate that it is time to raise the cap on H–1B visas yet again and to provide room for further increases as warranted. Silicon Valley's experience reveals that the results will be more jobs and higher incomes for both Americans and immigrant workers," she went on to say.

In closing, I would just like to note that although this hearing is in the Immigration subcommittee, I do not think anyone here thinks the issues we address today are solely immigration issues. Our long-term goal should be to make sure that American workers have the skills to fill the high-tech jobs of the future. In addition to the education and training measures included in last year's bill, this year, I introduced the New Millennium Classrooms Act to in-

crease the amount of computer technology donated to schools and to help our kids prepare for the high tech jobs of the future. There are other bills, I know, in both the House and Senate that similarly attempt to increase the focus on training and computer technologies. Indeed, currently, according to the Department of Education, the line to use a school computer is 5 times longer than it should be.

So I look at today's hearing more as an opportunity to get a gauge on where things stand. We will see. Senator Gramm, as I said, has a bill, Senator Robb a bill, and probably others will be offering various formula, but these are issues we need to deal with as well as to monitor, and we very much appreciate the witnesses who will be here a little bit later to testify from their perspectives and look forward to continuing to focus on these issues in the time ahead.

[The prepared statement of Senator Spencer Abraham follows:]

PREPARED STATEMENT OF SENATOR SPENCER ABRAHAM

"This issue is not new to this committee. In February 1998, the Senate Judiciary Committee, under the leadership of Chairman Hatch, held a hearing on high technology workforce issues that demonstrated that many companies could not find enough qualified professionals to fill key jobs. It also showed that the foreign-born individuals companies hired on H–1B temporary visas typically created many additional jobs for Americans through their skills and innovations.

"Shortly after that hearing, with the cap on H–1B visas projected to be reached by June, I introduced the American Competitiveness Act, which raised the H–1B visa cap from the arbitrary 65,000, number selected in 1990 while also providing 10,000 scholarships for young Americans in high technology fields.

"In April, that bill passed the Senate Judiciary Committee. And then in May the legislation passed the full Senate by a 78 to 20 vote.

"Sometime after that, the House Judiciary Committee passed out a much different H–1B visa bill. A negotiation ensued and in time a House–Senate compromise was reached

"At that point, the White House raised several additional issues and threatened a veto. After several more weeks of negotiations, I was able to reach an agreement with the Administration and the bill passed the House by over 150 votes and was later signed into law as part of the Omnibus Appropriations Bill. The delay caused by the White House objections prevented an extra 20,000 visas that were included in the House–Senate compromise from being available to employers in 1998, creating an additional backlog for 1999.

"The final legislation, which differed only somewhat from the initial bill, met objections that had been raised initially to increasing H–1B visas from the 65,000 cap. Some argued that we needed to have money for training and educating U.S. workers. The legislation added a $500 fee per visa, meaning that today every time an individual is hired on an H–1B visa $500 goes to training U.S. workers and providing scholarships for up to 10,000 U.S. students a year in science and technology.

"In addition, since the bill's passage we have seen Intel, Texas Instruments and others in the private sector increase mentoring and other significant education programs. And we recently witnessed a $1 billion charitable donation from Microsoft chairman Bill Gates to fund full scholarships in science and technology fields.

"Some argued that tougher enforcement was needed. So the legislation dramatically increased fines, including a $35,000 penalty per violation and a three-year debarment if a company willfully underpays an H–1B visa holder and (in the course of which) replaces a U.S. worker. For the employers about which opponents had expressed the most concern, those employers with a high percentage of H–1B's in their workforce, the bill added new layoff and recruitment attestations. In addition, the Labor Department was given the authority to initiate an investigation if it received credible evidence indicating a violation and received the approval of the Secretary of Labor to investigate.

"Since the passage of the legislation the case for maintaining an adequate supply of H–1B visas has grown stronger.

"First, despite the H–1B cap having been raised to 115,000 in fiscal year 1999 and 2000, and 107,500 in 2001, the increase has proven insufficient due to the tight

labor market, increasing globalization, the rapid pace of the high tech sector, and the backlog of visas that developed from the prior year. With the cap reached by June this year, employers were again left wondering why government restrictions are causing them to shelve projects and draw up plans to place key personnel overseas.

"Second, foreign countries are stepping up their own recruitment efforts, including a pitch by the Canadian government for U.S. high tech companies to move to Canada so as to avoid the problem of hitting the H–1B visa cap year after year here in America. The CEO of Lucent Technologies stated this summer at a Capitol Hill technology forum that it has placed hundreds of engineers and other technical people in the United Kingdom in response to an insufficient supply of U.S.-based workers—keeping many related jobs from being created in America.

"Third, the INS has told Congressional committees that due to at least one significant systems error it may have awarded more H–1B visas than the fiscal year 1999 statutory cap permitted. However, the INS also has been unable to rule out the possibility that other errors may have seriously shortchanged employers, leaving the actual number of visas issued in fiscal year 1999 uncertain absent a meticulous audit.

"As a solution, the Administration has proposed taking visas out of the fiscal year 2000 cap, which would only further exacerbate the expected shortfall for 2000. I also think it is of questionable legality. Even though political resistance has thus far prevented a higher H–1B cap, in light of these INS counting difficulties it seems clear that it's imprudent to set the H–1B cap too close to anticipated usage, since it engenders many problems for both employers and the U.S. government. This would appear to be a major benefit of Senator Gramm's bill.

"Finally, we have seen more studies and more individuals reach the same conclusion embodied in last year's legislation.

"A study by *Joint Venture: Silicon Valley* found that a lack of skilled workers is costing Silicon Valley companies $3 to $4 billion a year.

"A study by the Computer Technology Industry Association concluded that a shortage of information technology professionals is costing the U.S. economy as a whole $105 billion a year.

"In a study for the Public Policy Institute of California, U.C.–Berkeley Professor Annalee Saxenian found that immigrants are a major source of job creation. Her research showed that Chinese and Indian immigrant entrepreneurs in northern California alone were responsible for employing 58,000 people, with annual sales of nearly $17 billion.

"And most notably, Laura D'Andrea Tyson, former chief economic adviser to President Clinton, wrote recently in Business Week: "Conditions in the information technology sector indicate that it's time to raise the cap on H–1B visas yet again and to provide room for further increases as warranted Silicon Valley's experience reveals that the results will be more jobs and higher incomes for both Americans and immigrant workers."

"In closing, I'd like to note that although this hearing is in the immigration subcommittee, I don't think anyone here thinks the issues we address today are solely immigration issues. Our long term goal should be to make sure American workers have the skills to fill the high tech jobs *of the future.* In addition to the education and training measures included in last year's bill, this year I introduced the New Millennium Classrooms Act to increase the amount of computer technology donated to schools and to help our kids prepare for the high-tech jobs of the future. Currently, the line to use a school computer is five times longer than the Education Department says it should be.

"The New Millennium Classrooms Act will address this problem by increasing the deduction businesses can take for donating computers to schools.

"I look forward to today's testimony and the opportunity to explore all of these issues further."

Senator ABRAHAM. We have been joined since we began by Senator Feinstein, and I would like to turn to her at this point, if she has an opening statement to make, and then we will go to Senator Robb.

Senator FEINSTEIN. Thanks very much, Mr. Chairman. If I may, I would like to ask your consent to enter into the record a statement by the ranking member, Senator Leahy.

Senator ABRAHAM. Without objection.

[The prepared statement of Senator Leahy follows:]

PREPARED STATEMENT OF HON. PATRICK J. LEAHY, U.S. SENATOR FROM THE STATE OF VERMONT

I would like to thank the witnesses who have come here today and highlighted a serious problem, and thank Senator Abraham and Senator Kennedy for holding this hearing. Our high-tech industries have played a crucial role in driving our unprecedented economic progress, and I believe that we in Congress should act to help them meet their increasing needs for well-trained and highly skilled employees. That is why I am a proud cosponsor and strong supporter of Senator Robb's Helping Improve Technology Education and Competitiveness ("HITEC") Act. The bill will provide a needed boost to both the current high-tech work force and to science, math, and technical education in our schools.

The bill creates the T-visa, which would be available to companies looking to hire recent foreign graduates of U.S. master's and doctoral programs in mathematics, science, engineering or computer science. In other words, it will allow international students who gain advanced degrees in the United States to apply their American education to help American business. To be eligible, a company must provide total compensation of at least $60,000 a year to the graduate, and must also pay a $1,000 fee per visa. The fees paid by the companies would in turn be used to fund partnerships between schools and industry to improve science, math, and technology education in our grade schools and high schools.

Thus, while this bill addresses the current labor shortage by facilitating the hiring of additional foreign workers, it also takes a significant step toward ensuring that there will be no such labor shortage when our next generation of students finishes school. This approach is far better than simply increasing the number of H–1B visas, which is at best a stopgap solution.

Moreover, this bill also contains important protections for American workers. Employers must pay the T-visa holders the prevailing American wage for the tasks they are performing, and must give notice to their employees (or their bargaining unit, where one exists) before applying for a T-visa. In addition, employers cannot fire or lay off an American worker to hire T-visa holders, and also cannot hire them during a lockout or strike. Finally, the bill creates the T-visas for a five-year period. After that, we can reevaluate and see whether our employers still have needs that cannot be satisfied by the American workforce.

The HITEC Act offers the best and most comprehensive solution I have seen to the problems facing the high-tech industry. Indeed, it helps guarantee that our economy will continue to be strong, both now and in the future. I encourage all of my colleagues to support the bill and to work to make it law.

STATEMENT OF HON. DIANNE FEINSTEIN, A U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator FEINSTEIN. Mr. Chairman, I listened carefully to what you said. I thank you for holding the hearing. I think you are quite accurate in what you did say. We did raise the H–1B cap for 3 years. Last year, we doubled it, and apparently, that cap is already filled and the industry is back for an expansion. I would like particularly to welcome Senator Robb, the distinguished Senator from Virginia, who has a bill. I certainly have an open mind. I would like to read just a part of my statement, though.

Senator ABRAHAM. Please.

Senator FEINSTEIN. Our society has undergone a dramatic technical transformation. Indeed, information technology has influenced every aspect of our society, from telephone and banking services on to electronic commerce and education. Every day, Americans are becoming more and more connected to one another and to the global community through digital technology.

Given this fact, the demand for emerging digital technologies and highly skilled professionals to develop these technologies has exploded. Excluded the biotech industry, the high tech explosion experienced in the United States has created over 4.8 million jobs since 1993—that is extraordinary—and produced an industry unemployment rate of 1.4 percent.

In my State, California alone, this growth in technology has made the State number one in high tech employment by creating 784,151 jobs and comprising 61 percent of California's exports. That is how big it is. As a result, our Nation's economy has embarked on an unprecedented expansion.

Certainly, it is in our interest to ensure that these industries, which are located in the United States and help drive our economy, can continue to obtain qualified, highly skilled employees. I am interested in hearing the high tech industry's views on the adequacy of our current law to address these issues.

But at the same time, we must not lose sight of our country's long-term need to ensure that American workers, including minorities, women, and potentially displaced workers, are sufficiently educated, recruited, trained, and retrained to obtain or retain employment in the high tech industry. In California, and I have been since I have been on this committee now, which I guess have been 7 years, besieged by CEO's of high tech companies year after year. Our committee, the full Judiciary Committee, has held a hearing. I have heard first hand CEO's say, we cannot find educated Californians who can do these jobs. We advertise. The salaries are good. We have starting jobs that are paying $60,000, $70,000 a year.

I guess one of the things that I feel the strongest is that we must find a way to see that our young people are educated for this workforce, because not only is it the cutting edge workforce, but it is the workforce that is going to provide them with the jobs that enable them to buy the home and live the American dream. In my State, a high cost of living State, if you have a minimum wage job, if you have a job that is going to pay $29,000, $30,000, $32,000 a year, $35,000, even $40,000, you cannot buy a home. You cannot live and ever realize that dream.

So high tech really plays a very special role and the Bureau of Labor Statistics estimates that between 1994 and 2005, more than one million new computer scientists, engineers, systems analysts, and computer programmers will be required to fill these jobs in the United States. Now, that is an average of 95,000 new jobs each and every year. I hope the great portion of these will go to students educated in our schools, and I just throw out that challenge.

I know the problem. I know the deficit here. But I know the challenge we face, because unless we meet that challenge, what we are going to have in the California society is an increasing division between those who have and those who have not, those who can participate in the economy and those who cannot.

So I think and I hope that this hearing is more than just about, well, let us expand the cap, let us double the cap, we have got to have more foreign nationals because we cannot hire California students, into how we are going to prepare our youngsters for the future so that these companies can come in one day and say, yes, we are hiring local people and we are finding them to be excellent. Thank you very much.

Senator ABRAHAM. I want to thank you, Senator Feinstein. I also want to reiterate the point you are making. I share them completely. As I indicated in my statement, this is not the only place on Capitol Hill where we need to focus on this issue. I mean, it just

so happens that the immigration component of this brings a part of this before us, but I actually regret, I do not think I have seen some of the other committees who have jurisdiction over the workforce issues focus as much on it as we have tried to do here. Obviously, our oversight can only extend to a certain aspect of the problem.

I would also say one other thing before we turn to Senator Robb, which is that I have, I think, consistently indicated to the companies who have come to us with respect to the H–1B visa cap that while I think this is something we need to address, it is only, in my judgment, a short-term fix, because I do not really think that the possibility of having unlimited number of highly skilled immigrants coming to this country will exist for long, either. Other nations are not going to want to see their most talented people all come to the United States. They are going to want to develop their own industries, their own software, their own computer and high tech businesses, as well, and there are going to be a lot of inducements I think quite a few people will select, because they will be able to stay in their own home country.

I have always viewed this as being an interim solution that can only really help us for a short period of time, and then I think at that point, what we will see is that either we come up with the ways to encourage young people in this country to move in these directions and to train people in these directions or we are going to find that we start losing a lot of opportunities.

Senator FEINSTEIN. Would you allow me to comment?

Senator ABRAHAM. Sure. Please.

Senator FEINSTEIN. I think that is right. This is not to say that high tech, and I can only speak for my State, is not trying to be helpful, because they are. Company after company after company provide really major service to school districts with computers, with teacher training, trying to turn things around, after-school programs, internship programs, and the like. So I think the industry itself is aware of the dilemma. Of course, I think, in a way, what we need to—and one of the things I am interested in hearing from the high-tech people is the kind of engineer they need, where we fall short in our local curriculum that so many of these people have to be brought in from abroad.

Senator ABRAHAM. That is certainly part of it, and again, I would hope that some of the other committees with jurisdiction who have more of the workforce responsibilities will also start to look at this with some precision. I mean, I know they look at workforce issues in kind of a macro sense, but this is sort of more, as you indicated, a more micro focus, as well.

We have kept Senator Robb and our panel waiting for a while and we will, I am sure, have more comments to make as this goes on. I want to thank Senator Feinstein for participating today. She is one of the few members of the subcommittee who seems to make it to all of our hearings, which I appreciate, as opposed to the lonely conditions that usually ensue when I am up here.

Senator ABRAHAM. We will now turn to our first panel. We are joined by Senator Chuck Robb from the State of Virginia, who I know has a fair amount, maybe not quite as much high tech industry as Silicon Valley, although I do not know. From what I can tell,

the area around Northern Virginia here is quickly becoming a competitive alternative, and I know he has been very active on these issues.

We welcome you and we thank you for being here, Senator. We turn the floor over to you.

STATEMENT OF THE HON. CHARLES S. ROBB, A U.S. SENATOR FROM THE STATE OF VIRGINIA

Senator ROBB. Thank you, Mr. Chairman. I am delighted to be able to join both you and Senator Feinstein. I think you will find that the testimony that I am going to give is very much in sync with the words that have already been spoken. As a matter of fact, I was thinking some of the phraseology I was going to use is quite similar to some of the things that you have already said. But I join you in apologizing to others who may have been here earlier for the fact that we were delayed getting started with a vote.

I am delighted that you have held this hearing and I think that, as I say, the information that is going to be provided will be very useful to the other members of the subcommittee and other workforce-specific subcommittees in terms of dealing with this particular question.

This is really about the intersection of workforce and immigration issues, as you have already indicated, and I doubt that there is anyone in America who does not recognize that a really pretty radical change in our economy has come about as a result of the information technology explosion.

When I was Governor of Virginia in the early 1980's, we created a commission on science and technology so that we could determine how best to help Virginia companies bring new technology to the market and, to be perfectly honest, to attract additional businesses to locate in Virginia at the time that that technology appeared to be a burgeoning industry. There was a recognition that the explosion that was taking place in Silicon Valley was extremely important not only to Silicon Valley and the country, but to other areas that could take advantage of this technology explosion, as well.

One of the things that I did with this commission was to ask for a number of recommendations and they came back with 44 recommendations, one of which was to create a Center for Innovative Technology. You may have looked as you arrived from Dulles, and I know that until we have changed the slot and perimeter rule, all of at least our California Senators, if not our Michigan Senators, come and go through Dulles so that they can have a non-stop flight.

Right after you get on the Dulles access road or the Dulles toll road, depending upon which lanes you happen to be driving, if you look to the left, you will see a rather unusually shaped building. One of the recommendations of this task force was to create a Center for Innovative Technology, and although the actual building was finally approved and built after I left the Governor's office, I asked the group that was going to have that responsibility, the architects, I said, I would like to have a building that makes a statement. I was not quite certain how they would interpret that, and I think for any of you who have seen what appears to be a design architecture that might be upside down, at the very least, it makes

a statement and it does provide a focal point and creates a certain amount of discussion about the role of technology.

Let me say that these technological explosions, as I say, have occurred in many regions of the country, not just Silicon Valley and not just in this area that we used to refer to as the Dulles access road, and now the Dulles toll road since we have both roads. Our economy has grown. The number of quality jobs has increased, and a new and increasingly more important area of commerce has been born. While this growth has been occurring, Congress played a helping hand in terms of providing research funding and utilizing modern technology within the public sector.

For example, smart card technology has been used to streamline outdated administrative systems in the Department of Defense, and I should now recognize Route 128 around Boston with the arrival of the distinguished senior Senator from Massachusetts, and I will continue. We have used the Internet to put Congressional bills and votes online and establish home pages for almost every government agency. We passed the Telecommunications Act of 1996 that included what I view to be an extremely important provision, the e-rate to help ensure that every school and library has access to the Internet.

But as with any burgeoning industry, there are likely to be growing pains, and the most significant one that we see now is the shortage of skilled workers to fill the nearly 350,000 vacant information technology jobs in this country.

Prior to the passage last year of the H–1B legislation, Congress had recognized the problem but had failed to reach any consensus about how to begin to address the skilled workforce shortage. I certainly commend you, Mr. Chairman, for your particularly outstanding leadership in passing that legislation.

As you acknowledged then and many in the industry have acknowledged since, raising the caps on H–1B visas is a short-term solution to the critical labor shortages that this industry has been facing, and you have both reiterated that again today. The long-term challenge is to find ways to upgrade the skills of our existing workforce and to improve the quality of our education system so that the next generation has the skills needed to maintain our global dominance in the technology arena.

I am pleased that we were able to work together last year to include a provision in the legislation which will establish an industry-based, regional public-private partnership program to conduct training of U.S. workers. I understand that the Department of Labor has issued a request for proposals and I look forward to monitoring the Department's implementation of that portion of the H–1B legislation.

The effort last year, Mr. Chairman, was a good start to find a short-term solution. Unfortunately, it looks like the caps will again be reached early next year. With the start of the new fiscal year now, the new quota or the new increase takes effect, but there are projections that that cap will be reached or exceeded as early as the first of the next calendar year.

I see two main problems with continuing to just raise the caps on H–1B visas. The first is that it is an imprecise and short-term way of solving the high tech worker shortage. The H–1B visa cat-

egory is a general visa that applies to a wide range of workers. These visas can be granted to everyone from bakers to occupational therapists to computer programmers and fashion models. If we just increase the H–1B caps, we will not be targeting our specific need for high tech workers. Instead, we may end up inadvertently providing a supply of workers in other fields for which there may not be any shortage of labor at all.

The second problem with continuing to simply raise the H–1B cap is that it does not address the long-term education and training challenges that we face. In June, the Joint Economic Committee, which has already been referred to and on which I sit, convened a 3-day high technology summit to discuss the impact of technology on our Nation's economy. It was helpful in terms of confirming what most of us already suspected, that the advances in technology have accounted for half of our economic growth in the last 50 years and for a quarter of our real growth in recent years. We learned that the three fastest growing occupations in the United States are database administrators, computer engineers, and systems analysts. The number of people employed in these areas is expected to double by the year 2006.

The other thing we heard from high tech CEO after CEO is that the real answer to our workforce shortages lies in the improvement of our elementary and secondary education system. This is not an easy task. Our students need more than just computers in their classrooms. They also need teachers who are well equipped, modern schools who can teach them strong technology skills. And our teachers need to be better trained to use technology, particularly innovative software as a tool to further their students' development of other basic schools. Teachers need help in learning how to use technology in the classroom and how to better integrate technology into their curriculum. School districts that are struggling just to get technology into the classroom also desperately need trained experts to help them maintain their systems.

For all these reasons, Mr. Chairman, I introduced the HITEC Act, or Helping Improve Technology and Competitiveness Act of 1999. It provides some short-term relief to companies who need highly skilled technology workers and it encourages long-term solutions by fostering partnerships between the private sector and local schools to improve technology education in elementary and secondary schools, much like the H–1B program that the chairman has already referred to.

For the short term, the HITEC Act creates a new category of visa, the T, or tech, visa, which is specifically aimed at foreign nationals with top skills in science and technology. Any international student who is a new graduate of a master's or doctoral program in mathematics, science, engineering, or computer science in this country would be eligible to obtain a T visa if they had a job offer with an annual compensation, total, not just salary, of $60,000 or more.

I targeted this group because the tremendous success of our high tech economy has made it increasingly difficult for universities to attract qualified candidates for master's and doctoral degrees in engineering and the sciences. With salaries high and stock options abundant, the majority of recent graduates in these fields opt to

enter the job market rather than pursue an advanced degree. Our universities, in turn, have looked overseas to find qualified students to fill these graduate programs, and as a result, 32 percent of high tech master's degrees and 45 percent of high tech Ph.D.'s are currently being awarded to foreign nationals.

With the tight tech labor market, this talent is in high demand and many American companies are making generous offers to these new graduates. But while they may want to stay, a limited number of H–1B visas forces many recent graduates to return to their own country, where they then compete against American businesses. I believe that the best and brightest products from our university system have a valuable role in our new economy.

Given that individuals with advanced degrees are needed to teach the next generation of tech professionals and continue the cutting-edge research that has made our economy the strongest in the world, we ought to do all that we can to hold on to our seed corn of our great minds. But Mr. Chairman, I do not believe that immigration, as you have suggested and Senator Feinstein has suggested and I know that Senator Kennedy believes, I do not believe that immigration is going to solve our long-term problems. These are problems that only education can solve.

The HITEC Act looks toward the future by levying a $1,000 fee on applications for the T visa. These fees would be directed toward the creation of public-private partnerships between schools and businesses that improve K through 12 math, science, and technology education, a basic format with which you are familiar. Funds from the T-visa program would be available through a competitive grant program on a one-to-one-to-one matching basis, with the other two-thirds provided equally by private industry and local public schools. To encourage public-private partnerships that better reach out to rural and disadvantaged areas, the government would increase its share of the matching in these areas to a two-to-one-to-one basis, covering 50 percent of the partnership cost.

Through these new alliances, the technology industry could provide direct training to teachers, support of schools, equipment, and networks, and supply both recent engineering graduates and more experienced tech workers who could serve as technology fellows to help teach math, science, and technology in our public schools.

One of the greatest hurdles we face is preparing our children for the kind of rigorous coursework required for today's high tech forces. We know that our public schools in many cases lack the resources and manpower to improve technology education. We know that we need better trained teachers and more technical support staff. And we certainly know that we need more role models for students, who frequently get discouraged by more advanced math and science courses and simply give up on these fields.

While the tech industry has begun to contribute equipment and services to improve education, more efforts are needed to connect willing businesses with schools to bring more innovation to our schools.

Mr. Chairman, technology changes very rapidly, so one of the very best ways to teach teachers and students the latest information and skills in high technology is simply to bring those who have the expertise into the schools themselves.

Finally, the High Tech Act would create a new high tech gold medal award to recognize technology companies who take an active role in improving our public schools. There are a number of businesses who are doing some fantastic things right now with our public schools and they simply ought to be commended for their efforts.

Mr. Chairman, there are many facets to the larger issue of how we as legislators can promote policies which support continued growth of our technology sector, but in terms of workforce issues, I believe the legislation that I have introduced with a number of cosponsors provides a good starting point to address both the short-term and long-term needs. It is not a panacea, but it is a proposal which I believe can be supported by a majority of our colleagues, given the overwhelming support of the legislation that you worked to pass last year.

Mr. Chairman, with that, I thank you very much for the opportunity to present this information to you today and I look forward to working with you and the other distinguished members of this committee and other committees with jurisdiction to solve a pressing problem and to resolve the shortage of some 350,000 unfilled vacancies today, over 20,000 of which are right in that burgeoning high tech corridor that both you and the distinguished Senator from California were kind enough to recognize in your opening statement.

With that, Mr. Chairman, I thank you for the privilege and I look forward to working with you.

Senator ABRAHAM. Senator Robb, we appreciate it and look forward to working with you and other colleagues with an interest in this area. I know you have other commitments here, so we will thank you again for being here and let you go into the next event on your schedule today. But we appreciate your participation very much.

Senator ROBB. Thank you, Mr. Chairman.

Senator ABRAHAM. We have been joined by our ranking member, Senator Kennedy, and I turn to him if he would like to make an opening statement at this time.

STATEMENT OF HON. EDWARD M. KENNEDY, A U.S. SENATOR FROM THE STATE OF MASSACHUSETTS

Senator KENNEDY. Thank you, Mr. Chairman, but I think, as you, Senator Feinstein, and others would understand, I remember when I first entered the U.S. Senate. In an area, say, of the South Shore of Massachusetts, if you worked for the Four Rivers Shipyard, your father worked there, your grandfather worked there, you had a high school diploma, and you had a very decent life. You may have even been able to buy a small little place on the Cape or off in the mountains. It was a satisfying, fulfilling kind of a life.

Now, everyone who enters the job market has seven different jobs, or will have at least seven different jobs. The skills which are required have expanded dramatically. We come from a part of the country, as my friend and colleague, Senator Feinstein, and yourself, Senator Abraham, where we are taking knowledge-based industries and basically hoping that we are going to take these various important breakthroughs that we are seeing in knowledge-based industries and use them actually in manufacturing so that

they will not go overseas, so that there will be manufacturers that will provide good jobs, good opportunities, and a good future.

If we expect to do that, you have to have highly-trained, highly-educated individuals to be able to do it, and that is what we are dealing with. We are distressed by the flow lines in terms of our own country about producing these individuals. We attempted in our bipartisan effort last year in terms of training programs to consolidate training programs and to be able to respond to many of those different challenges.

We have an immediate problem and a longer-term problem and I am looking forward today to hearing from some of the people who have thought about this to give us some guidance. I thank you for having this hearing. It is very important, and as always, you have brought some very thoughtful people that can help and guide us.

Senator ABRAHAM. Thank you very much. I do think one thing probably I suspect all of us up here would agree on is that we do not want to turn today's, or any of these events, to create the impression that there has not been a great deal of effort, and Senator Feinstein alluded to this, to try to train people on the part of the private sector and on the part of government and private sector partnerships. We have had a tremendous increase in the number of these jobs and we have filled an awful lot of them, obviously, with American workers, some who had the skills and some who were trained. But it is obvious from the statistics we already heard from Senator Robb and from Senator Feinstein that growth is running faster than the training programs so far can keep up.

I hope, as I said, Senator Kennedy, in my earlier comments, that this will not be the only subcommittee that focuses on this, because we only have a limited jurisdiction that really deals with only the immigration part of it. This really is something that other jurisdictions of the Senate really have to take a major role in, too, and we need to work together with them. Thank you for your participation.

At this point, we will invite the second panel to join us. We will put name tags up there so that people can sit accordingly. We are very pleased to have such a terrific panel of experts now to join us.

Senator FEINSTEIN. Mr. Chairman, while they are getting settled, may I just personally welcome Roberta Katz. She heads the Tech Net group in California, and it just so happens, I have worked very much with her predecessor, John Dorr, particularly on education issues. I want you to know that Tech Net has been really very responsive to trying to help and upgrade public education throughout the State, so I am looking forward to your testimony.

Ms. KATZ. Thank you, Senator.

Senator ABRAHAM. Thank you, Senator.

I will now introduce each of the panelists and then we will begin where we start.

First, we have Susan DeFife, who is the President and CEO of womenCONNECT, which is headquartered in McLean, Virginia. WomenCONNECT is considered the leading Internet site for professional women and women business owners.

We will next hear from Ms. Julie Holdren, who is President and CEO of the Alexandria, VA based Olympus Group, which develops business intelligence software for the Internet.

Next, we will hear from Mr. Robert D. Atkinson, who is the Director of the Technology and New Economy Project with the Progressive Policy Institute here in Washington, DC, and we welcome you.

Then we will turn to a friend of mine, as well, Roberta Katz who comes to us as the President and CEO now of the Technology Network—we met in your previous role at Netscape—from Palo Alto, CA.

Then we will hear from Mr. William Archey, who is the President and CEO of the American Electronics Association, which is the country's largest high tech trade association, with over 3,000 members, also an old friend. I remember you and I did a little visit to Northern California 4 years ago. I now hear lots of talk about members traveling to Silicon Valley to find out what is going on, and you were my guide on one of those trips myself when we first started talking about some of these issues.

I want to thank everybody for being here. We tend to be pretty informal at this subcommittee, but when we have a large panel, I do ask the panelists, if they would, to try to keep their opening statements, if possible, to about a 5-minute time frame. So we have this little clock system with orange lights indicating a minute to go and red lights indicating 5 minutes, but we are pretty generous in terms of flexibility. If at the end of that point there is a thought that needs to be finished, we will certainly be happy to do that.

I would also just mention that everybody's opening statement, if it is longer, will be included in the record, as well as any statements that other members of either the Judiciary Committee or the subcommittee want to submit subsequently.

We will begin with you. Thanks very much for being here, Ms. DeFife.

PANEL CONSISTING OF SUSAN WILLIAMS DeFIFE, PRESIDENT AND CHIEF EXECUTIVE OFFICER, WOMENCONNECT.COM, FAIRFAX, VA; JULIE HOLDREN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, OLYMPUS GROUP, ALEXANDRIA, VA; ROBERT D. ATKINSON, DIRECTOR, TECHNOLOGY AND NEW ECONOMY PROJECT, PROGRESSIVE POLICY INSTITUTE, WASHINGTON, DC; ROBERTA KATZ, CHIEF EXECUTIVE OFFICER, THE TECHNOLOGY NETWORK, PALO ALTO, CA; AND WILLIAM T. ARCHEY, PRESIDENT AND CHIEF EXECUTIVE OFFICER, AMERICAN ELECTRONICS ASSOCIATION, WASHINGTON, DC

STATEMENT OF SUSAN WILLIAMS DeFIFE

Ms. DEFIFE. Thank you, Senator Abraham, for inviting me today and for your leadership on this issue.

The H–1B issue is becoming critical to the future growth of the technology industry. I am here today on behalf of CAP Net and the greater Washington region. As you mentioned, I am CEO and founder of womenCONNECT.com, the leading Internet site for women in business, providing original daily content, interactive tools, online discussion groups, and e-commerce.

When I started the company in 1994, the Internet was not yet a part of most people's lives. The info.com industry in Northern

Virginia was in its infancy, and skilled technical workers or those who had the knowledge base to learn new technologies were fairly easy to come by.

In the past 5 years, the growth in the industry has exceeded even our own aggressive predictions. The Internet has become an integral part of people's everyday lives, changing the way we communicate, how we gather information, how we shop, and how we do business.

In Northern Virginia, you only have to drive from Tysons to Dulles to see the impact of the industry on our economy. You can see the size, the strength, and the wealth of the new technology companies in the many buildings cropping up. What many of us also see in those new buildings is an extraordinary increase in new jobs and the demand for more and more skilled workers to fill those positions. What you may not be familiar with is the fact that technology employment in the greater Washington region has surpassed Federal Government employment today.

From industry giants like AOL to emerging growth companies like womenCONNECT.com, the shortage of skilled workers has become one of the highest priority issues facing us. For companies like mine, with a smaller employee base—we have 25 employees—one unfilled tech position can severely impact our ability to grow.

Emerging companies are fueling the technology revolution and making significant contributions to the strong economy we now enjoy. Among them will be the next AOL or Amazon.com. We are the companies that are innovating and growing fast. At womenCONNECT, we have doubled in size each of the past 2 years and we expect to double again within the next 6 months.

There are many stories like ours out there. As investment capital flows into start-ups and puts them on a fast growth track, the demand for workers will continue to far exceed the supply, and the workforce shortage is not limited to our region. Similar concerns are expressed across the country.

What happens when companies like mine cannot find the workers we need? We have to delay projects, and in the Internet industry where change occurs daily and competitors are springing up all around us, waiting to execute on a project can be lethal.

Last year, we spent months recruiting for a systems administrator who has the critical role of ensuring our content is presented correctly and on time to our audience. We were fortunate to eventually find Noemi Nieto–Mendieta, a young woman from Mexico who is finishing coursework at a local university, and Noemi is here with me today. In order to hire her, we went through the H–1B application process, and then instead of filling that month-old vacancy, we waited again for an additional 4 months until the next fiscal year began and additional H–1B's became available.

Today, I have another tech position that has gone unfilled for 7 months, and not because of lack of interest in our company. We are one of the companies that people want to work for. We have a great reputation, we are viewed as a company with huge potential, and we offer the ever popular stock options as incentives.

What I cannot find are people with specific skills or the ability to obtain those skills as quickly as I need them. As we have entered into new partnerships with industry heavyweights such as

Lycos, CNN, CompuServe, and USA Today, we have had to carefully space those projects to ensure we can meet scheduled delivery dates and hold off on new projects until the appropriate staff people can come on board.

In order to fill vacant positions, the options for tech companies are not particularly attractive. We can limit our growth, but then we lose the ability to compete. We can steal employees from other companies, which makes none of us stronger and forces us to constantly look over our shoulders. Or in the case of larger companies I know, move operations offshore.

I fully understand the desire to provide jobs to American citizens, but in an economy where unemployment is at record lows, it is unrealistic to believe we can fill all of these new jobs being created within the technology industry with the workers we have.

I agree with the calls today and increasingly for increased educational programs. We should be developing new workers who can fully participate in the new economy and maintain our competitiveness. Many business leaders like me are willing to step up to fully participate and support those programs, but they are long-term solutions. In the short term, limiting our ability to recruit skilled workers from a larger labor pool around the world only limits the growth of emerging companies and ultimately slows the economy.

I hope Congress will give strong consideration to the importance of the H–1B program and support an increase in the annual cap on these visas. Thank you.

Senator ABRAHAM. Thank you very much.

[The prepared statement of Ms. DeFife follows:]

PREPARED STATEMENT OF SUSAN WILLIAMS DEFIFE

Thank you Senator Abraham for inviting me here today and for your leadership on the H–1B visa issue. It is an issue that is becoming critical to the future growth of the technology industry.

To give you a little background on my company, womenCONNECT.com is the leading Internet site for women in business—providing original daily content, interactive tools, online discussion groups and e-commerce. When I started the company in 1994, the Internet was not yet a part of most people's lives, the InfoComm industry in Northern Virginia was in its infancy, and skilled technical workers or those who had the knowledge base to learn new technologies were fairly easy to come by.

In the past five years, the growth in the industry has exceeded even our own aggressive predictions. The Internet has become an integral part of people's everyday lives changing how we communicate, how we gather information, how we shop, and how we do business. In Northern Virginia you only have to drive from Tysons to Dulles to see the impact of the industry on the economy. You can see the size, the strength, and the wealth of the new technology companies in the many buildings cropping up. Those new buildings also represent an extraordinary increase in new jobs and the demand for more and more skilled workers to fill those positions.

From industry giants like AOL to the emerging growth companies like womenCONNECT.com, the shortage of skilled workers has become one of the highest priority issues facing us. For emerging companies like mine with a smaller employee base—we have 25 employees—one unfilled tech position can severely impact our ability to grow.

These emerging companies are fueling the technology revolution and making significant contributions to the strong economy we now enjoy. Among them will be the next AOL or Amazon.com. We are the companies that are innovating and growing fast. At womenCONNECT.com we've doubled in size in each of the past two years and we expect to double again within the next six months. There are many stories like ours. As investment capital flows into start-ups and puts them on a fast growth track, the demand for workers will continue to far exceed the supply. And the workforce shortage isn't limited to our region. Similar concerns are expressed across the country.

What happens when companies like mine can't hire the workers we need? We have to delay projects and in the Internet industry where change occurs daily and competitors are springing up all around you, waiting to execute on a project can be lethal. Last year, we spent months recruiting for a systems administrator who has the critical role of ensuring our content is presented correctly and on time to our audience. We were fortunate to eventually find Noemi Nieto-Mendieta, a young woman from Mexico who was finishing coursework at a local university. (Noemi is with me today.) In order to hire her we went through the H–1B application process and then, instead of filling that months old vacancy, we waited again, for four more months until the next fiscal year began and additional H–1B's became available. Today, I have another tech position that has gone unfilled for 7 months—not because of lack of interest in the company. We are one of the companies that people want to work for. We have a great reputation, are viewed as a company with huge potential, and we offer stock options as incentives. What I can't find are people with the specific skills or the ability to obtain those skills as quickly as I need them. As we've entered into new partnerships with industry heavyweights such as Lycos, CNN, CompuServe, and USA Today we have had to carefully space those projects to ensure we can meet scheduled delivery dates and hold off on new projects until the appropriate staff people can come on board.

In order to fill these positions, the options for tech companies are not particularly attractive: we can limit our growth, but then we lose the ability to compete; we can "steal" employees from other companies, which makes none of us stronger and forces us to constantly look over our shoulders; or, in the case of larger companies I know, move operations off-shore.

I understand the desire to provide jobs to American citizens, but in an economy where unemployment is at record lows, it is unrealistic to believe we can fill all of the new jobs being created within the technology industry with the workers we have. I agree with those who call for increased educational programs. We should be developing new workers who can fully participate in the new economy and maintain our competitiveness. Many business leaders like me are willing to step up to fully participate and support those programs. But they are long-term solutions. In the short term, limiting our ability to recruit skilled workers from a larger labor pool around the world only limits the growth of emerging companies and ultimately slows the economy. I hope Congress will give strong consideration to the importance of the H–1B program and support an increase in the annual cap on these visas. Thank you.

Senator ABRAHAM. Ms. Holdren, thank you for being here.

STATEMENT OF JULIE HOLDREN

Ms. HOLDREN. Senator Abraham and members of the committee, on behalf of Olympus Group, I would like to thank you for allowing me to participate in today's hearing.

I am the founder, President, and CEO of the Olympus Group. Olympus Group is a fast-track, high tech company that delivers business intelligence solutions via the Internet. Olympus Group's next generation solutions enable businesses to both actively and passively deliver meaningful information to the appropriate end users, including employees, customers, and suppliers, over the Internet.

Our Nation's workforce needs for the next century is one of top concern to me. I am pleased your committee has chosen to delve further into this subject, which has tremendous implications for all Americans. While it is true that the United States is enjoying a record low unemployment and phenomenal economic expansion, if we do not concern ourselves with meeting the hiring needs of American employers, we will lose the benefits we are reaping today.

As technology continues to advance at a fast pace and the economy remains vigorous, companies such as mine will continue to have an unquenchable need for skilled IT workers. Many U.S. employers cannot find qualified workers for jobs that demand special-

ized education, such as engineering or computer science. It is not just technology companies that are hurt by the worker shortage. Almost any company in this Nation that hires IT workers in any capacity is feeling the pinch.

I am here to confirm, and shout from the hilltops, if necessary, that the serious shortage of skilled workers is, indeed, very real. My company currently employs over 70 people and has over 30 job openings. We have had these positions open for more than 120 days. Out of the 70 people that Olympus Group employs, we have five H–1B visa holders. Without the ability to hire a few key talented people from overseas, I would not be able to handle the current client workload. For every H–1B worker I employ, I am able to hire 10 more American workers.

That is the ironic part of this whole debate. H–1B visa holders who are employed by me actually create many new job opportunities for domestic workers. Several Olympus Group H–1B workers are currently training a team of Olympus employees on specific technology skill sets that will enable us to grow existing clients and add new clients. Without this type of strategic cross-training, I would not be able to continue to grow my company in a competitive manner.

Last year, Congress approved an increase in the number of H–1B visas for skilled foreign workers to come to the United States for temporary employment. Unfortunately, the new quota of visas was reached only 8 months into the year, leaving many employers to wait until the next fiscal year.

No one anticipated reaching the limit on H–1B visas before the end of the fiscal year. Now, the INS wants to cut the number of H–1B visas it will grant until fiscal year 2000 because officials at the agency claim they have approved more than the quota for fiscal year 1999.

The current employment immigration system is not working. Employers' hiring efforts are not only hampered by a serious shortage of American workers and a strict limit on the number of skilled foreign workers they can hire, but they also must deal with a government system that is in disarray. We cannot afford to come back year after year to address this national problem in a piecemeal fashion. Our economic and technological future is at risk.

As my company continues to grow, I expect I will need to hire an even larger percentage of H–1B workers if I cannot find the skilled applicants domestically. I hear the same concern day after day from my counterparts at other technology companies. No employer I know is without a worker shortage problem. It is both a blessing that U.S. employers and workers are simply worried about too many jobs in an economy that is growing quickly, as opposed to be concerned with high unemployment and slow economic growth.

The United States truly is the envy of the world, but we stand to lose this position if we do not take steps now to ensure that we shore up U.S. productivity by stocking our companies with qualified workers. Thank you.

Senator ABRAHAM. Thank you very much.

[The prepared statement of Ms. Holdren follows:]

PREPARED STATEMENT OF JULIE HOLDREN

Senator Abraham and members of the Committee, on behalf of Olympus Group, I want to thank you for allowing me to participate in today's hearing.

I am the Founder, President and CEO of Olympus Group, Inc. Olympus Group is a fast-track high technology company founded in 1995 and based in Alexandria, Virginia that specializes in internet based business intelligence solutions, Java application development and multimedia web design. Olympus Group's next generation solutions enable business to both actively and passively deliver meaningful information to the appropriate end users, including employees, customers, and suppliers over the Internet.

Our nation's workforce needs for the next century is of top concern to me. I am pleased your committee has chosen to delve further into this subject which has tremendous implications for all Americans. While it is true that the U.S. is enjoying record low unemployment and phenomenal economic expansion, if we don't concern ourselves with meeting the hiring needs of American employers, we will lose the benefits we are reaping today.

As technology continues to advance at a fast pace and the economy remains vigorous, companies such as mine will continue to have an unquenchable need for skilled IT workers. Many U.S. employers cannot find qualified workers for jobs that demand specialized education, such as engineering or computer science. It's not just technology companies that are hurt by the worker shortage. Almost any company in this nation that hires IT workers in any capacity is feeling the pinch.

I am here to confirm, and shout from the hilltops if necessary, that this serious shortage of skilled workers is indeed very real. My company currently employs over 70 people and has over 30 job openings. We have had these positions open for more than 120 days.

Out of the 70 people that Olympus Group employees we have 5 H–1B visa holders. Without the ability to hire a few key talented people from overseas I would not be able to handle the current client workload. For every H–1B worker I employ, I am able to hire ten more American workers. That's the ironic part of this whole debate. The H–1B visa holders who are employed by me actually create many new job opportunities for domestic workers.

Several Olympus Group H–1B workers are currently training a team of Olympus employees on specific technology skill sets that will enable us to grow existing clients and add new clients. Without this type of strategic cross training I would not be able to continue to grow my company in a competitive manner.

Last year, Congress approved an increase in the number of H–1B visas for skilled foreign workers to come into the U.S. for temporary employment. Unfortunately, the new quota of visas was reached only eight months into the year, leaving many employers to wait until the next fiscal year, which began just a few weeks ago. No one anticipated reaching the limit on H–1B visas before the end of the fiscal year. Now, the INS wants to cut the number of H–1B visas it will grant in fiscal year 2000 because officials at the agency claim they approved more than the quota in fiscal year 1999.

The current employment immigration system is not working. Employers' hiring efforts are not only hampered by a serious shortage of American workers and a strict limit on the number of skilled foreign workers they can hire, but they must also deal with a government system that is in disarray. We cannot afford to come back year after year to address this national problem in a piecemeal fashion. Our economic and technological future is at risk.

As my company continues to grow, I expect I will need to hire an even larger percentage of H–1B workers if I can't find skilled applicants domestically. I hear the same concern day after day from my counterparts at other technology companies. No employer I know is without a worker shortage problem.

It is a blessing that both U.S. employers and workers are simply worried about too many jobs and an economy that is growing quickly, as opposed to being concerned with high unemployment and slow economic growth. The U.S. truly is the envy of the world. But we stand to lose this position if we don't take steps now to ensure that we shore up U.S. productivity by stocking our companies with qualified workers.

Mr. Chairman, thank you for the opportunity to testify before your committee. I am prepared to answer any questions you may have.

Senator ABRAHAM. Before we turn to you, Mr. Atkinson and the rest of the panel, we have been joined by Senator Schumer and he is in the middle of the banking conference, I think. Despite enor-

mous bribes to keep him here as long as possible, I am going to let him go ahead.

STATEMENT OF HON. CHARLES E. SCHUMER, A U.S. SENATOR FROM THE STATE OF NEW YORK

Senator SCHUMER. I am a cosponsor of Mr. Robb's bill. I would ask unanimous consent that my statement be added to the record.

All I want to say is, for my folks in silicon alley, getting a way of finding new high tech workers is their number one legislative concern, barring anything else. Obviously, I would like if that our education system produces everybody here in America, but we have two choices. Either the businesses go overseas or we grow them here by allowing a proposal such as the one Senator Robb and I have put in. I hope we will seriously consider it.

I thank the committee for its indulgence and ask unanimous consent my statement be put in the record.

Senator ABRAHAM. Without objection, it will be.

Senator SCHUMER. I appreciate the opportunity to interrupt. We are over on the House side with the banking markup.

Senator ABRAHAM. I appreciate that you took the time to come over and participate, Senator. We appreciate it very much.

[The prepared statement of Senator Schumer follows:]

PREPARED STATEMENT OF SENATOR CHARLES E. SCHUMER

Mr. Chairman, I'd like to first thank you for holding a hearing on this vital and timely topic.

I think we can all agree that the fuel that propels our high tech industry and its many innovations is human capital. And we can all agree that our high tech economy is experiencing explosive growth.

But as this industry grows from a handful of firms to hundreds of them; from thousands of employees to tens of thousands of employees; from billions of dollars in industry-wide market capitalization to trillions of dollars—the pool of people skilled enough and schooled enough to keep this industry thriving is falling far short of demand.

The estimates are that there are currently 346,000 unfilled high tech jobs in the country, and that by 2006 the high tech sector will need upwards of 1.3 million new highly skilled employees.

This shortage of top-notch, high-tech talent, which I hear about all the time from members of New York's Silicon Alley, poses a serious problem for the high tech industry. And because the high tech industry is one of the main drivers of the long, steady, sustained economic boom in America—this also presents a major threat to our economy, and America's position as the dominant economy in the world.

The question then becomes what are the best and most effective legislative models for handling the shortage. Of course, answering that question requires us to understand the causes of the shortage.

I think there are mainly two: the speed with which the high tech industry develops and innovates, and the weaknesses in our education system.

We should therefore focus our legislative efforts on addressing both of these root problems, while still employing all the necessary safeguards to protect American workers.

That's why I recently joined Senator Robb to introduce the HITEC Act, which he has already outlined for us. The bill creates a new high-tech visa for foreign graduate students of science, engineering, math, and computer science who have job offers paying over $60,000.

Ideally, we'd want high tech jobs to go to Americans, but there is a shortage of U.S. workers qualified for many of these positions. Thus, we are not talking here about a choice between higher paid American workers and lower paid foreign workers—this is about filling jobs in companies that will fuel the growth of the American economy for the next century.

We should all recognize and acknowledge that one out of every five Silicon Valley high tech companies was founded by an immigrant; likewise, one out of every three

Silicon Valley engineers and one out of three Silicon Valley scientists is an immigrant.

The fact that these entrepreneurs, engineers and scientists are here rather than in their native India, Korea, France, Germany, Sweden, or Australia has made this country far and away the economic envy of the world. We should continue to allow the best and the brightest individuals to come here to benefit our companies, our consumers, and our country. That is one of the ways that we can remain strong and ahead of the curve in this very competitive new world we live in.

Importantly, the HITEC bill also begins to address the problems in our school system so that in the future we can get all the brainpower we need at home.

Now, this is just one way we can start dealing with these issues. There may be others, and I'm certainly open to suggestions. Moreover, it is my hope that in the future we will have the American workforce to tackle all of these jobs.

Let's face fact. We need to dramatically improve our education system. In a 21st century ideal economy where the success or failure of each individual depends more on the agility of their minds than the strength of their backs; where the success or failure of each country depends less on the fertility of its soil or the minerals in its mines than the intellectual prowess of its people—our schools are simply not good enough.

Our standards are too low. We are not attracting high quality individuals to the teaching profession. The curriculum often bares little resemblance to the world of work. And we are graduating students from high school and college who are ill-equipped to work at an Intel, a Sun, an Oracle, a Qwest or an AOL.

I believe that ultimately the right solution to the issues we are grappling with in this hearing will be best resolved by a comprehensive approach that addresses the needs of our schools, our students, our companies, and our workers. Again, Mr. Chairman, thank you for holding this hearing.

Senator ABRAHAM. We will now turn to you, Mr. Atkinson. Thank you very much for being here. We appreciate it.

STATEMENT OF ROBERT D. ATKINSON

Mr. ATKINSON. Thank you, Mr. Chairman, and other members of the committee. I want to just put this in a little bit of context by saying I think this is a central issue to U.S. economic growth in the next 15 to 20 years, but it is also a broader issue than just high tech workers. The skill shortage is really broader and really encompasses many, many industries, and it really speaks to a challenge of how we reshape our educational and training systems in this country.

But there is no doubt that this is an issue that is particularly relevant right now to the high tech community. According to the NSF statistics, in 1995, which is their latest statistics, the unemployment rate was 5.6 percent for the overall economy. It was 2.2 percent for scientists and engineers. It was only 1.7 percent for computer scientists, which is essentially no employment.

You see the same thing with job projections. A couple of people have alluded to this already. Jobs are expected to grow by 14 percent between 1996 and 2006, 44 percent for scientists and engineers and 100 percent for computer scientists. So that sector of the economy, because of its explosive growth, is the one facing critical skill shortages.

But I think what we need to do to really address that is we need to think about really a new bargain between government and industry to address these problems. In our view at PPI, to effectively address these new economy skill needs, companies can simply not rely on educational institutions to provide this for them, or even in the short run to rely solely on H–1B increases, however needed those might be, and you have already alluded to this. But rather, companies need to play a more central and sustained role in skill

development, but they cannot do that without government programs being reshaped to support that type of role, and I want to talk about a number of different programs that we think might play a key role in creating those kinds of partnerships.

I am not saying that companies have not done a lot, companies like Cisco with their training academy, the Novelle certified network engineer programs, the efforts of Microsoft and Boeing in the Pacific Northwest, the Massachusetts High Tech Council, but clearly, they can do more.

We found that in the 1990's, that actually corporate expenditures on training as a share of GDP have gone down, not up. Why is that? It is not because companies are not interested in this, but in our view, it is really two-fold. One is that the competitive environment is so stiff for companies now that it is hard for them to invest in those kind of public goods.

Second, and Susan DeFife alluded to this, the new economy and the high tech economy is really made up largely of small firms. In Research Triangle Park, for example, the average firm size is under 70 employees. It is very difficult for small firms on their own to invest in skill development without some kind of partnership arrangement.

So what do we need to do? I think, first of all, what we need to do is it is a mistake to think that the problem is only at, for example, K through 12, or only at college, or only in technical workers. I think we need really a three-fold approach. We need to think about systematically upgrading K through 12 for science and education. We need to think about upgrading the technical skills of the incumbent workforce. And finally, how do we get more scientists and engineers, whether through H–1B visas or other ways or through graduation.

I would like to just talk about nine recommendations very quickly. Some of these are being considered by this New Economy Task Force that PPI has formed that we are honored that Senator Kennedy is a member of and Senator Robb is also a member.

First of all, we need to boost K through 12 education levels, math and science education at the K through 12 level, and we have two thoughts on that. One, co-investing in math and science charter high schools or magnet high schools for disadvantaged communities—many of you may be aware of math and science high schools that have been developed. Northern Virginia has got a very excellent one, as well as some other communities. But by and large, those are really serving suburban upper-middle-class kids and we really need to extend that model, in our view, to disadvantaged areas, either in urban areas or in rural areas, and get those kinds of kids more interested and knowledgeable about science.

Two, to increase the number of teachers who are qualified. We have been talking about an idea of a forgivable loan for students who agree to major in math, science, or engineering, uphold a certain grade point average, and then agree to teach in an elementary or secondary school for at least 5 years.

Second, upgrading the skills of the workforce. One thing that the Federal Government could easily do and really we forget about it is the Federal Government being a significant employer in the economy, frankly, the Federal Government does very little to train

its information technology workers. It could play a much more sustained role in training information technology workers just for its own use, which would, therefore, expand the overall supply.

The second area to help with incumbent workers or technical trained workers, we strongly supported your efforts last year to create this regional skills alliance partnership idea. I think it is a great idea. Unfortunately, in our view, the Department of Labor really needs to—we are somewhat concerned with how the Department of Labor is really structuring that, that it is not industry or even industry and union led, it is more government led. We think that is a mistake. It needs to be industry led.

And finally, increasing the number of college graduates in math and science, graduates or people who are in this economy. Three ideas there. One is matching grants to State science/technology scholars programs. There are a number of States—only a handful—that have established new programs in the last few years, Pennsylvania and Maryland being the best cases, where they will provide a 3-year science or math or engineering scholarships to students to obtain a good grade point average and agree to work in the State either in an internship or some kind of arrangement with companies in the State. We need to expand those programs, and I think sort of a Federal carrot that gets States to do more there would be a way to do that.

Second, Paul Romer, a noted economist out at Stanford, has been talking a lot about this problem, and one of the, I think, most interesting recommendations he has made is a new approach to science fellowships. Most graduate students in math and science and engineering essentially work on Federal grants. They work on a very narrow area that their faculty mentor is interested in. We need to make sure that they are multi-disciplinary trained and also trained in areas that industry is involved in. Romer has proposed a new type of fellowship that would be oriented to students that would be matched with industry money. I think that is an excellent idea of how to get industry more involved in this.

Lastly, supporting what Senator Robb referred to, which is his bill and a companion bill in the House for this T visa, for essentially expanding the visas for foreign graduates of U.S. math, science, and engineering programs. Thank you very much.

[The prepared statement of Mr. Atkinson follows:]

PREPARED STATEMENT OF ROBERT D. ATKINSON, PH.D.

Mr. Chairman, Members of the Committee, I am Robert Atkinson, Director of the Progressive Policy Institute's Technology and New Economy Project. PPI is a think tank whose mission is to define and promote a new progressive politics for America in the 21st century. It is a pleasure to testify in front of you on the critical issue of America's workforce needs in the 21st century.

EDUCATION AND SKILLS ARE MORE IMPORTANT IN THE NEW ECONOMY

In the New Economy, skill requirements are increasing in many industries, not just the so-called high-tech industries. The percentage of workers who use computers at work has risen from 25 percent in 1984, to 46 percent in 1993, to 75 percent today. More than half of the new jobs created between 1984 and 2005 will require some education beyond high school.[1]

[1] Arnold E. Packer, et al., *Workforce 2000: Work and Workers for the 21st Century* (Indianapolis, Ind.: Hudson Institute, 1987).

The rise of new industries has also meant the rise of new jobs. Knowledge-based jobs (those requiring post-secondary, vocational, or higher education) have grown as a share of total employment. For example, there were fewer than 5,000 computer programmers in America in 1960; there are over 1.3 million today. Managerial and professional jobs have increased as a share of total employment from 22 percent in 1979 to 28.4 percent in 1995. Jobs in offices have grown from 30 percent of all jobs in 1960 to over 40 percent today.

Overall, there is an increasing realization across the nation that firms in a wide range of industries face serious difficulties hiring workers with needed skills. While estimates vary (as high as 200,000), there is a consensus that we face a shortage of workers with information technology skills. In 1995, when the national unemployment rate was 5.6 percent, the unemployment rate for scientists and engineers was 2.2 percent (1.7 percent for computer scientists)—a level most economists would term as frictional (i.e., workers between jobs).[2]

Finally, in the new knowledge economy, education and skills are increasingly becoming the ticket to upward mobility and increased earnings.

COMPANIES NEED TO DO MORE TO PROVIDE WORKERS WITH SKILLS

In the New Economy, technology companies cannot simply rely on government and educational institutions to provide the skilled workers they need. Rather, companies must play a more central and engaged role in skill development. But just as importantly, public policy must be re-structured to encourage and facilitate such partnerships.

To date, the technology industry has made efforts to train workers. For example, Cisco has established hundreds of training academies while Novel has created its certified network engineer programs. Microsoft and Boeing have invested in the Northwest Center for Emerging Technology at Bellevue Community College to develop a new IT training program. The Massachusetts Software Council has developed a program to train dislocated workers to be software programmers. In Washington, D.C., regional telecommunications firms donated computers and helped set up a program to train public high school students to be computer network administrators. The companies hire students who pass a standard certification exam for $25,000 to $30,000 a year.

But in spite of these efforts, more remains to be done to effectively address the high-tech worker skills shortage. There are a number of factors that have made it more difficult for companies to take active roles in high-tech skill development.

First, while employment stability in the old economy gave workers the opportunity to learn new skills on the job and move up within the company, increased competitive pressures coupled with reduced employment tenure make it harder for companies to justify training investments. Moreover, because workers are so mobile, it is difficult for individual employers to bear all the burden of training employees, whether new or incumbent workers, especially since the employee is likely to leave at some time to work for a competitor. This serves as a disincentive for individual firms to provide training without a concerted regional effort on the part of the entire industry.

This factor, coupled with increasingly competitive markets, is one reason why many larger companies that supported in-house, dedicated training programs in the 1960's and 1970's have eliminated those efforts. It's also why company training efforts have not kept pace with economic change. In 1995, American businesses spent $55 billion per year upgrading the skills of their employees, 20 percent more than a dozen years ago.[3] But the number of workers rose 24 percent, meaning that private-sector spending hasn't kept pace. Corporate training expenditures as a share of GDP have declined slightly since 1988, to about 0.7 percent of GDP in 1997. Considering that skills upgrading is far more important now than in the early 1980's, this shortfall is troubling. Finally, training is more prevalent among highly educated workers than other workers: 61 percent of college-educated workers participated in on-the-job training in 1991, compared to 22 percent of workers with a high school degree.[4]

Moreover, large firms spend almost three times more per employee on training than small firms, and since the New Economy is all about small and medium-sized firms, this poses a new policy challenge. For example, the average size of high tech firms in Research Triangle Park is under 70 employees. Most firms, but particularly

[2] National Science Foundation, *Science and Engineering Indicators, 1998,* p. A–106.

[3] Dr. Laurie J. Bassi, *Expenditures on Employer-Provided Training* (Alexandria, VA: American Society for Training and Development, July 1996).

[4] Progressive Policy Institute, *The New Economy Index,* (PPI: Washington, DC, 1998).

small and medium-sized enterprises (SME's), have limited capacity (financial, institutional, and informational) to engage in significant and sustained workforce development efforts. There are several reasons why. Managers and owners of most firms are simply too busy running their business to develop training systems, especially for new or dislocated workers. SME's often lack information on what kind of training their firms need and where to get it, and additionally, finding this information can be very time consuming. As a result, when confronted with a shortage of skilled workers, most firms try to hire workers from other companies.

When faced with persistent and significant shortages in skilled workers, the technology industry has looked to short-term assistance through the expansion of the H–1B visa program. During last year's deliberations on the H–1B visa program, PPI supported a temporary expansion of the cap. However, PPI also advocated not just "raising the cap," but also "filling the gap." In other words, PPI believes that while short-term expansion of high-tech visas is warranted, we need to also put in place moderate and longer-term policies to ensure that industry, government, and educational institutions work together to train Americans in these critical skill areas.

In short, we need a new social compact between the technology industry and government. If industry is to ask government to provide it short-term relief through increases in the number of visas for high-tech workers, it needs to make a strong and sustained commitment to invest money and effort to boost the skills of American workers so that they can also access these jobs. In turn, government must develop and fund policies and programs that work in partnership with industry.

POLICY RECOMMENDATIONS

To effectively train modern workers we need to foster industry/education/government partnerships at all levels of education. This requires making improvements in K–12 education, colleges and universities—including graduate education—and technical skills training, particularly among incumbent workers. As part of the 1998 American Workforce Competitiveness Act, Congress agreed to assign a portion of the fee companies pay to obtain an H–1B visa to a program to support industry-led training alliances run by the Department of Labor (DOL). Recently, DOL issued a solicitation to provide funding for such training alliances. The program, based in part on a PPI proposal,[5] was intended to stimulate the creation of industry-led, or industry- and union-led, training alliances. Unfortunately, the DOL plan does not require that the proposals be industry-led. Rather, they can be led by existing public training agencies and involve industry in only a peripheral manner. Moreover, DOL does not require matching funds from industry, as the legislative intent suggests. As a result, there is a significant risk that the program will simply duplicate existing public-sector programs, rather than provide a new opportunity for industry to take the lead in the development of skills training programs to address technical skills shortage areas. In PPI's view, having these programs be industry-led (or industry/union led) is critical to their success. Therefore, Congress should reauthorize this program to require that any applications be industry-led and that industry be required to provide at least some share of the overall funding.

(1) Math and Science Education at K–12 level

Student performance on verbal and reading skills has remained stagnant since the early 1980's while performance on math tests increased only modestly. As a result, as American students go through school, they fall further behind their foreign counterparts on math and science. The recent TIMSS report (the Third International Mathematics and Science Study) finds that between the 4th and 8th grades, U.S. students lost almost 40 points. In comparison, most other nations either lost only a few points, or as in cases such as Thailand and Singapore, gained significant ground. The result is that, while U.S. 4th graders scored among the top, 12th graders were among the lowest of all nations. Clearly, K–12 education needs to give students the math and science skills they need to succeed in the New Economy.

- *Co-invest in math, science, and technology charter high schools for disadvantaged communities.* In the last 15 years, states such as North Carolina and Illinois have established math and science magnet high schools. While these programs have proven effective in providing a solid education in math and science, the number of these high schools are limited, and they have generally not focused on disadvantaged students. If states are to encourage students—including minority students who have not traditionally gone into science and engineering

[5] Progressive Policy Institute, *Building New Skills for the New Economy,* (PPI: Washington, DC, 1998).

fields—they need to target their efforts. Congress should co-fund with states and industry math, science, and technology charter high schools that are focused on serving children from disadvantaged urban or rural communities. Entrance would be merit based, and as charter schools, they would have the flexibility they need to develop innovative curricula and work closely with industry partners.

- *Establish forgivable loans for students who major in math, science, or engineering and agree to teach math or science in elementary or secondary schools for at least 5 years.* Such forgivable loans would not only help reduce the shortage of qualified science and math teachers, it would also reduce the number of teachers teaching outside their fields, and increase the amount of science, math, and engineering bachelor's degrees awarded.

(2) Upgrade Technical Skills of the Workforce

Companies can fill many technical positions by training or retraining workers who are already out of the formal education system.

- *The federal government should take the lead in skills development and upgrading the skills of its workforce.* While some agencies such as the Department of Defense have out of necessity focused on training workers, most federal agencies have not. The federal government should partner with educational institutions to establish training and apprenticeship programs for technically skilled workers who would be eligible to work for the federal government.
- *Support-modify the Department of Labor's regional skills alliances (RSA's) program.* As part of the 1998 American Workforce Competitiveness Act, RSA's—independent, staffed collaborations among firms in an industry formed to identify common areas of skills shortages and develop and implement effective training solutions—would be supported, in part, for the first three years by federal funds. Companies would provide at least one-third of the costs of the alliances. Federal funds would be allocated through a competitive grant process administered by the Department of Commerce with consortia of firms as applicants.

(3) Increase the Number of College and Graduate Math, Science, and Engineering Graduates

As a share of the workforce, scientists and engineers increased moderately throughout the 1980's, and faster since 1993. But because jobs requiring science and engineering expertise are forecast to increase three times faster than other occupations between 1994 and 2005, the demand for scientists and engineers is expected to exceed supply by approximately 4 percent. Much of this increase has been driven by a rapidly growing demand for computer scientists and programmers, who increased as a share of all scientists and engineers from 23 percent in 1983 to 36 percent in 1997. According to the National Science Foundation, while total employment is expected to increase 14.4 percent between 1996 and 2006, the number of employed scientists and engineers is expected to increase 44 percent, with the number of computer engineers and support specialists doubling.

Foreign-born scientists and engineers are also becoming a larger and more valuable part of our economy. The numbers of immigrant scientists and engineers admitted with permanent visas to meet growing industry demand has doubled from 0.3 percent of the science and engineering workforce in 1988 to 0.6 percent in 1993 (the latest year available). Similarly, while only 1.3 percent of all Ph.D. scientists and engineers in the United States who have had a degree more than 25 years are foreign born, almost one-quarter (24.3 percent) of those who earned their degrees in the last 5 years are foreign born.

After falling in the mid-1980's, the number of people getting science and engineering degrees has grown as a share of the population to slightly more than in the mid 1980's. But given that science and engineering have become more important to the economy, the modest increase is not enough. Moreover, within certain areas there has been an absolute decline. Full-time enrollment in undergraduate engineering has declined from a high of 406,000 in 1983 to 317,700 in 1996, while graduate enrollment was essentially unchanged between 1987 and 1996.[6]

Foreign students, who remain a modest fraction of all science and engineering degree holders, are earning a significant and growing share of graduate degrees in some scientific and technical fields. For example, foreign students earned 35 percent of the master's degrees in computer science and 33 percent of those in engineering in 1993, up from 11 percent and 22 percent, respectively, in these fields in 1977.

[6] National Science Foundation, *Science and Engineering Indicators, 1998,* p. A–55.

- *Provide matching grants to state "SciTech Scholars" programs.* In response to declining graduation rates in technical fields, a number of states have established scholarship programs for students who major in science, math, or engineering; who maintain a high grade point average; and who agree to work in some capacity for a technology company in the state. For example, Pennsylvania provides a three-year science scholarship for students who maintain a B average and undertake an internship with a Pennsylvania technology company. Maryland has adopted a similar program. Federal matching funds could expand the scope of existing state programs and encourage more states to establish their own programs.
- *Establish a matching grant fellowship science and engineering graduate student fellowship program.* Currently, most science and engineering graduate students receiving financial support obtain it indirectly through federal research grants obtained by their faculties. However, as economist Paul Romer has pointed out, this system reduces the amount of inter-disciplinary and practical, real-world research and education that is undertaken. In order to increase both the number of Americans enrolled in science and engineering graduate programs and the amount of inter-disciplinary and industry-relevant graduate education, more graduate support should flow directly to students. The federal government could establish a matching grant fellowship program, paying half the costs, with industry and universities each picking up one-quarter of the costs.
- *Continue to support the NSF Computer Science, Engineering, And Mathematics Scholarships program.* Funded from fees on the H–1B visa, the CSEMS program provides scholarships to low-income, academically talented students who are working full-time toward associate, baccalaureate, or graduate degrees in computer science, computer technology, engineering, engineering technology, and mathematics. The scholarship provides up to $2,500 per student, per academic year. In the first year of the program, it granted approximately $21 million. The program should be continued.
- *Make it easier for foreign graduates of master's or doctoral science and engineering programs in the United States to stay in the United States.* A bill introduced by Senator Robb (D–VA), S. 1645, would establish a five year "T" visa (technology) for foreign graduates of master's or doctoral math, science, engineering, or computer science programs in the United States who receive a job with an annual total compensation of at least $60,000. The Act imposes a fee (between $500 and $1,000 per visa) on applications for the T-visa and provide funds to the National Institute of Standards and Technology to set up a competitive grant program with matching funds from industry to establish science and math educational K–12 partnerships. Similar legislation has been introduced in the U.S. House by Representative Zoe Lofgren (H.R. 2687). Because of the importance of engaging the technology industry in education and training efforts, the approach in the Robb bill has significant merit.

ATTACHMENT OF ROBERT D. ATKINSON

BUILDING NEW SKILLS FOR THE NEW ECONOMY—REGIONAL SKILLS ALLIANCES

The Problem

There is an increasing realization across the nation that firms in a wide range of industries face serious difficulties in hiring workers with needed skills, and that we need to do a better job of training and educating new entrants to the workforce and workers dislocated by economic change.

Many industries point to the lack of skilled workers as a critical factor limiting their competitiveness and growth. For example, the Information Technology Association of America recently concluded that there are approximately 190,000 unfilled information technology jobs in the United States today due to a shortage of qualified workers.[1] But it is not just high-tech firms. When asked "what are the main barriers firms face to expanding and becoming more competitive," companies across the country in different industries point to the difficulty in getting skilled workers. These shortages not only slow regional and national economic growth, they mean

[1] "Help Wanted: The IT Workforce Gap at the Dawn of a New Century," (Arlington, VA: Information Technology Association of America, 1997). See also "America's New Deficit: The Shortage of Information Technology Workers," (Washington, DC: U.S. Department of Commerce, Office of Technology Policy, 1997).

that hundreds of thousands of workers are not increasing their skills and standards of living.

While the current low unemployment rate contributes to this problem, its roots are more fundamental. In the New Economy, skill requirements are going up in many industries, even so-called low-tech industries. More than half of the new jobs created between 1984 and 2005 will require some education beyond high school.[2] The percentage of workers who use computers at work has risen from 25 percent to 46 percent between 1984 and 1993.[3] These changes are being felt around the nation. States such as Colorado, Maryland, Rhode Island, and Washington have all recently released reports highlighting the pressing need of employers for skilled workers. Today, to be competitive, firms are not only using more technology but are also reorganizing production processes in new ways, such as cellular production, use of teams, and other high performance work organization methods that require higher levels and new kinds of skills. For example, a recent survey of U.S. manufacturers found that in 81 percent of plants, production workers participate in empowered or self-directed teams. Marty Cohen, President of the Work in America Institute, states: "Thanks to e-mail, statistical process control, Just-In-Time, [* * *] and so forth, the need for production workers to master new technology is almost universal, whether they work on loading docks or in silicon clean rooms." And much of the needed knowledge is not firm-specific, but rather generic (related to math, communication, writing, and computing) and industry-specific (such as manufacturing methods).

There is increasing interest in addressing skills shortages. Several high-tech trade associations, in conjunction with the U.S. Department of Labor (DOL) and Department of Commerce (DOC), hosted a skills "summit" earlier this month in Berkeley, CA. President Clinton recently announced several proposals, including creation of a nationwide job bank and modest increases in funding for training programs.[4] The awareness of the problem and the interest in finding effective solutions is growing.

The Administration's proposal, while a useful start, is not enough. The problem cannot be solved at the federal level: solutions need to be regional, diverse, and industry-led. However, the federal government can and should play a catalytic role in bringing together the firms and other institutions that are critical to crafting effective solutions.

The Progressive Policy Institute (PPI) proposes that the federal government invest $40 to $60 million annually to support industry-led, regional skills alliances (RSA's). RSA's—independent, staffed collaborations among firms in an industry, and including educational institutions such as community colleges, formed to identify common areas of skills shortages and develop and implement effective training solutions—would be supported in part for the first three years by federal funds. Funds would be allocated through a competitive grant process administered by the DOC's Manufacturing Extension Partnership (MEP), with consortia of firms as applicants.

Why Existing Institutions Cannot Solve the Problem

According to the American Society for Training and Development, company spending on training has not kept up with the need. In 1995, American businesses spent $55 billion per year upgrading the skills of their employees, 20 percent more than a dozen years ago.[5] But the number of workers has risen 24 percent, meaning that private-sector spending hasn't kept pace. Considering that skills upgrading is far more important now than in the early 1980's, this shortfall is troubling.

Most firms, but particularly small and medium-sized enterprises (SME's), have limited capacity (financial, institutional, and informational) to engage in significant and sustained workforce development efforts. There are several reasons why. Managers and owners of most firms are simply too busy running their business to develop training systems, especially for new or dislocated workers. SME's often lack information on what kind of training their firms need and where to get it. And finding this information is very time consuming. As a result, when confronted with a shortage of skilled workers, most firms try to hire workers from other companies.

Moreover, because workers are so mobile, it is difficult for individual employers to bear all the burden of training employees, whether new or incumbent workers, especially since the employee is likely to leave at some time and go to work for a

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[2] Arnold E. Packer, et al., *Workforce 2000: Work and Workers for the 21st Century* (Indianapolis, Ind.: Hudson Institute, 1987).

[3] "Computer Use and Ownership: Level of Access and Use of Computers, 1984, 1989, 1993, Table A," (Washington, DC: U.S. Census Bureau, October 1993).

[4] Rajiv Chandrasekaran, "U.S. to Train Workers for Tech Jobs," *Washington Post,* (January 12, 1998), p. A1.

[5] Dr. Laurie J. Bassi, "Expenditures on Employer-Provided Training" (Alexandria, VA: American Society for Training and Development, July 1996).

competitor. In this case, not only does the firm "not realize an adequate return on the investment," it is actually at a disadvantage since it has spent money other firms have not, and has made its competitors stronger in the meantime. This serves as a disincentive for individual firms to provide training without a concerted effort on the part of the entire industry regionally. This factor, coupled with increasingly competitive markets, is one reason why many larger companies that supported in-house, dedicated training programs in the 1960's and 1970's have eliminated these efforts.

The skills shortage is also a problem for workers. Millions of American workers would like to upgrade their skills, but it is often difficult for government-run training programs to provide the kinds of skills that employees need. Dislocated workers (even a low unemployment economy has dislocated workers—approximately 1.4 million per year between 1993 and 1995[6]), young people coming out of high school, and workers making the transition from welfare to work may especially need the types of skills demanded by growing industries.

The educational system has not proven up to the task of providing technical training for workers. Many community colleges, and even four-year colleges, and universities, lack the resources to purchase up-to-date equipment (machines, computers, software) on which to train workers in relevant knowledge and skills. In addition, while some post-secondary training institutions (especially private ones) have reached out to industry and become more customer-focused, many more have not adequately responded to the changing skills needs of employers. The lack of partnerships with industry means that many educational institutions continue to train students for old economy jobs with old economy methods and equipment.

In some cases this may reflect a lack of entrepreneurial and innovative spirit in bureaucratic institutions. But there is a more fundamental issue: While colleges and universities, especially community colleges, may be able to establish partnerships with larger firms that have human resource departments, building partnerships and a two-way dialogue with small- and medium-sized firms has proven more difficult.

Finally, it has been difficult to use federally funded training programs for these kinds of industry-driven, innovative programs. Most federal training funds go to displaced and disadvantaged workers, not to incumbent workers. Yet, because of rigid and bureaucratic rules, it is difficult to use these federal funds to support effective industry-driven efforts, including some of the most successful and creative industry-community alliances training disadvantaged youth.[7] Moreover, even if the much-needed reforms of federal employment and training efforts are implemented, these efforts are largely focused on making it easier for workers to access training and reemployment services. To really address the skills issues in the New Economy, we need both—a more user-friendly employment and training system and an industry-driven skills effort based on firm alliances. Each complements the other.

The Solution: RSA's

It is becoming clear to many firms and training experts working in the trenches of the New American Economy that if we are going to begin to meaningfully address the skills problem, we have to motivate and assist companies in the same or similar industries to work collaboratively at the regional level to lead this process. As training expert Bill Nothdurft argues, "creating the workforce of the future requires partnerships and private industry leadership."[8]

Employers are most qualified to do this for several reasons. First, employers are the best positioned—often in partnership with others, such as community colleges—to identify the skills and knowledge needed for emerging jobs. Second, by letting employers lead, it is much easier to tie training directly to employment. And third, employers and industries facing skills shortages will be the ones to participate.

While employers need to take the lead, crafting effective solutions requires collaboration among firms. Because a skilled workforce benefits all firms in a region, a small handful of skills alliances have already been established, often with large firms and their employee unions. It has been more difficult for small- and medium-sized firms to band together to tackle educational and training needs. As a result, a critical task is helping firms build ongoing capacities to collaboratively address their own industries' workforce development issues.

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[6] DOL defines dislocated workers as workers who lose their jobs due to their plant closing down or moving, insufficient work for them to do, or their position being abolished. Source: U.S. Department of Labor, Employment and Training Administration.

[7] Peter Behr, "Job Training Success Story at Risk," *Washington Post,* (January 16, 1998), G1.

[8] William E. Nothdurft, "How to Produce Work-Ready Workers," *Across the Board,* (September 1990), pp. 47–52.

Collaborative solutions are more effective than going it alone. First, by working together, firms in the same or similar industries can pool resources (information, on-the-job training opportunities, equipment, curricula) that lower costs of training. Moreover, by supporting sector-based alliances (e.g., metal working, tourism, information technology), firms focus on building a regional training pool, rather than on "poaching" other firms in the industry to get workers.

Second, collaboration allows firms to develop joint solutions and communicate these to educational institutions. Without this ongoing collaboration, it is often very difficult for educational institutions to communicate effectively with industry and develop needed curricula. Moreover, alliances could serve as the intermediary between firms in an industry and the complex array of training programs and initiatives in any particular region.

Finally, solutions need to be regional. Too often Washington forgets that the economy runs through firms, institutions, and workers operating in locales and regions which are very diverse in their industrial structure, growth patterns, and institutional resources. At any one time, some regions may be booming and have the need for new workers, while others may not be growing and are struggling to address the needs of displaced workers. Some regions may be characterized by large firms that can address "infrastructure" needs related to skills, while many others may be populated by smaller firms. In addition, regions differ profoundly in terms of industrial mix. Many industries cluster regionally. In fact, regional industrial clusters are becoming more, not less, a feature of the New Economy—e.g., high-tech electronics and software in places like Silicon Valley, Boston, and Northern Virginia; plastics in Western Massachusetts; rubber in Akron; metal working in Pennsylvania; aerospace in Wichita; and financial services in Wilmington. All of these places have different needs and different problems.

The few collaborative training programs in place today act as powerful and innovative models of industry working together to address common skills shortages. Collaborative training is one reason why German firms invest more in training than U.S. firms do. There, a dense network of industry associations makes it much easier for firms, most of which are small, to jointly address training, with the German federal government contributing half the cost.[9] In the last several years, a small number of regional and industry-based training alliances in the United States have emerged, usually in partnership with state and local governments and technical colleges.

- As part of the Wisconsin Regional Training Partnership, a number of metal-working firms, in conjunction with the AFL–CIO, used an abandoned mill building to set up a teaching factory to train workers with needed skills. The workers learn directly on state-of-the-art manufacturing equipment.
- In Rhode Island, with help from the state's Human Resource Investment Council, plastics firms developed a skills alliance. Funds supported a part-time alliance coordinator who worked with firms to assess skills needs and develop curricula. In addition, a share of the funds went to establish a state-of-the-art polymer training laboratory at the local community college which trains workers in an apprenticeship program that guarantees jobs for graduates.
- In Wichita, a small federal grant, coupled with state and industry funds, helped 33 small aerospace supplier firms develop joint training curricula for new workers in partnership with the local community college.
- In Washington, D.C., regional telecommunications firms donated computers and helped set up a program to train public high school students to be computer network administrators. The companies hire students who pass a standard certification exam for $25,000 to $30,000 a year.[10]

While successful, these kinds of alliances are by far the exception rather than the rule.

Why a Federal Role?

There are several reasons why a limited but strategic federal role would be highly effective:

- The federal government already spends millions on training, but not as effectively as it could.
- Federal, state, and local governments have created a wide array of complicated and disjointed bureaucratic training programs. New initiatives are needed that empower customers and serve as models for service delivery integration.

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[9] Margaret Hilton, "Shared Training: Lessons from Germany," *Monthly Labor Review,* (March 1991).

[10] *Washington Post,* op. cit.

- While a small handful of these kinds of partnerships have emerged around the nation, there are documented difficulties in fostering this kind of collective action without some federal "glue" money. Widespread and timely deployment of these kinds of partnerships is simply not likely to happen without the incentives established by a federal initiative. This can help create successful models and templates that others can replicate across the nation.
- Because workers are mobile across regions and state borders, the federal government has an incentive to help new workers get an adequate education and skills to be employed in well-paid and rewarding jobs.
- Without some kind of support to create alliances, small firms just don't have the time or resources to collaborate with anybody on training, and over 99 percent of all businesses in the United States are small. In fact, almost all existing RSA's report that they would not have been able to get off the ground without an independent, staffed entity to operate the alliance.

How Regional Skills Alliances Would Work

PPI proposes that the federal government invest $40 to $60 million annually to support industry-led RSA's. Funds would be allocated through a competitive grant process, with consortia of firms as applicants. Federal support would be limited to three years, after which the efforts would be required to be self-supporting.

Successful applicants would be:

- *Consortia:* Alliances would have to have meaningful participation with a large number of firms, ideally at least 10 firms and/or employing at least 50 percent of the workers in that industry in the region.
- *Industry-led* (e.g., board of directors predominantly made up of industry, with state and local officials, educational leaders, and union officials also eligible as participants): Regional chapters of industry trade associations would be eligible to apply.
- *Sector-based:* The efforts would have to be organized around one or more industry sectors.
- *Alliances providing a 2-to-1 match for federal funds:* For every $1 in federal funds, state and/or local government would need to provide at least $1, and industry $1. Industry equipment donations to shared, off-site facilities (e.g., community colleges) would count as matching, while "in-kind" donations would not, but would be considered in ranking proposals.

How Many Alliances and What Level of Support?

Funds could be used to support alliance coordinator staff to work with firms to develop joint standards, curricula, apprenticeships, and other joint efforts. In addition, funds could be used to market the program, to purchase equipment on which to train workers, and to develop curricula. Alliances could also focus on other areas of joint concern, such as technology transfer or industrial modernization. Estimated costs for each alliance would be between $350,000 and $1 million per year, depending on the size of the area, the need, and the extent of effort by firms. Assuming that the federal government provides, at a maximum, one-third of the funds, $50 million would allow approximately 200 alliances to be established.

What Activities Would Qualify for Support?

Virtually all activities directly related to improving the skills of a region's workforce would qualify for support, including:

- Salaries and expenses to support a skills alliance manager;
- Joint assessment of industry training and skills needs;
- Development of skills standards benchmarked to advanced industry practices;
- Development of joint curriculum and training methods;
- Purchases or donations of equipment on which to train workers;
- Identification and development of training providers, and establishment of training programs;
- Development of apprenticeship and school-to-work programs;
- Development of training programs for dislocated workers;
- Initiatives to link technology and business modernization to skills upgrades; and
- Development of performance outcome measures.

Funding would not be allowed to subsidize workers wages (even training wages), could not be used for lobbying or political action, and could not be devoted to senior management development except possibly for skills development focused on team

building or employee involvement.[11] Alliances would also be required to report evaluation and outcome measures.

Administration

Because this is a skills and training effort it could be argued that DOL should administer the program nationally. However, because it is also an industry competitiveness effort, it may be more appropriate for DOC to administer it in partnership with DOL. The program could be run out of the Manufacturing Extension Partnership (MEP), an initiative at the National Institute of Standards and Technology (NIST), since NIST is already actively engaged in regional business modernization efforts around the nation. However, because the initiatives could support alliances in non-manufacturing sectors, and because these should be industry-led efforts, NIST should operate this program separate from, but linked to, the MEP.

Advantages of Regional Skills Alliances

Catalyzing the formation of RSA's has several advantages. These include:

- Engaging firms, particularly small- and medium-sized firms, more deeply in the issue of skills training and constructive interaction with educational institutions;
- Engaging public-sector educational providers (e.g., community colleges) more actively in on-going working relationships with groups of employers (i.e., encouraging them to be more responsive by creating the kinds of curricula needed by New Economy employers);
- Significantly increasing the scale of state and local training efforts, by moving away from a one-on-one approach toward engaging whole industries. (Workforce training in states is almost always one-on-one, customized training with individual firms); and
- Providing flexibility in the system to focus on a wide variety of training issues, including new workers, dislocated workers (e.g., Massachusetts Software Alliance), and welfare-to-work (e.g., Wisconsin Regional Training Partnership).

CONCLUSION

The transition underway to a more technological and skills-intensive economy has led to skills shortages in many industries and regions of the country. Yet, existing government-run training programs are not up to the task at hand. Effective solutions require collaboration between government and industry, and between firms in similar industries in the same region. Federal matching grants to industry to form skill alliances can be a catalyst to the formation of new, innovative, and flexible solutions.

Robert D. Atkinson is director of the Technology and Innovation Project at the Progressive Policy Institute.

Senator ABRAHAM. Mr. Atkinson, I thank you. You got a lot in in 5 minutes. I am not sure how you got it all in, but it was appreciated and I look forward to actually looking in more detail at it, because we appreciate your need to be succinct there. So thank you.

We welcome Ms. Katz. Thank you very much for coming out for this hearing. We appreciate it.

STATEMENT OF ROBERTA KATZ

Ms. KATZ. Thank you. It is a pleasure to be here. I very much appreciate the opportunity to testify on what we believe is one of the most important issues facing America's technology industry, which is the workforce needs of the 21st century. Tech Net very much appreciates this committee's recognition of the role of the technology sector in driving our Nation's growth and its focus on policies that support continued growth by addressing these workforce issues.

[11] PPI has proposed a similar non-discrimination rule that would treat firm expenses on training as taxable compensation unless the firm extends training to all its workers, just as health care coverage and retirement benefits are not taxable if all workers in a firm are eligible for them.

It is also a great pleasure to testify today before you, Mr. Chairman, for your leadership of technology policy is unparalleled. Your dedication to the development of fair and responsible business immigration policy has supported and protected our Nation's technological leadership, and the benefits of that leadership are enjoyed by all industries.

Employee talent is a defining feature of this new economy and a key to its tremendous growth. More and more, companies today derive their value from the ideas, the intellect, and the skills of their workforce. Yet today, we face a serious shortage in the number of skilled professionals necessary to support technology's continued growth. The number of graduates from American universities with computer science and engineering degrees declined significantly in the 1980's, and this trend has only recently reversed, largely due to the increased number of foreign students pursuing technical studies in the United States.

Yet demand for skilled employees in the technology industries continues to grow exponentially. Between 1996 and 2006, demand for database administrators, computer support specialists, and computer scientists is expected to increase 118 percent. Demand for computer engineers is expected to increase 109 percent. And demand for system analysts is expected to double.

Until our schools and universities are graduating sufficient numbers of technically trained American-born professionals, an efficient and effective business integration system must fill the workforce gap. From the standpoint of Tech Net's member companies, this is not an immigration issue. This is an issue that will affect our Nation's global competitiveness in the 21st century.

America's growing high technology industry has created hundreds of thousands of new high-paying jobs in the past decade. Studies have estimated that every additional skilled immigrant supports the creation of three to five new technology jobs for American employees, and I think that is also underscoring what previous witnesses have said. Every immigrant who comes with these skills creates a greater number of jobs for American employees.

Skilled immigrants also play a key role in supporting innovation in the high tech sector. Today, for example, nearly one-third of start-up companies in Silicon Valley are run by an Indian or Chinese immigrant. Intel and Sun Microsystems are two of the many Tech Net member companies whose early products were developed by foreign-born professionals. Today, those companies together employ nearly 100,000 workers. The contributions these companies have made to the American economy and quality of life are immeasurable.

Tech Net member companies utilize H–1B visas responsibly, relying upon H–1B employees only as necessary to fill a relatively small number of key positions. Companies hire skilled foreign-born employees when they offer a unique set of skills that cannot otherwise be found, in large part because our universities are not graduating sufficient numbers of American-born students who have the scientific or technical skills that companies demand.

As has been stated by Senator Robb, almost one-half of the advanced degrees in computer engineering, electrical, and electronic engineering awarded by American universities go to foreign nation-

als. To turn these highly-skilled scientists and engineers away after we have trained them in the United States, in essence, to encourage them to seek employment by foreign companies who may be our competitors, simply does not make sense.

The technology industry is working hard to close the workforce gap. Our Tech Net members are working at the K through 12 level, as Senator Feinstein pointed out, in partnership with universities and through in-house programs to train and retrain a skilled technology workforce. U.S. companies spend approximately $210 billion annually on the formal and informal training of their information technology workforce and provide an estimated $4 billion in support to schools at the K to 12, college, and university levels around the country. The technology companies are among the most generous of these corporate donors, according to the Conference Board.

Both large and small Tech Net member companies have developed educational programs to meet the workforce challenges that all technology companies are facing. These range from scholarships to in-house training programs. Tech Net also supported the provisions of the American Competitiveness and Workforce Improvement Act that ensure that a portion of the H–1B visa fees is used to support scholarships and technical skills training programs.

We understand that the INS is considering reducing the number of H–1B visas available in fiscal year 2000 to compensate for the issuance of visas possibly in excess of the fiscal year 1999 cap. We would urge the INS not to take such action, particularly given the uncertain data about the number of visas processed in 1999.

We also need to consider whether the business immigration programs are structured as efficiently as possible. Progress in increasing the H–1B visa cap will be undone by excessive processing delays and other inefficiencies. Companies which have a proven record of responsible reliance on the H–1B program should not be unnecessarily burdened or micromanaged by these excessive regulatory requirements.

In conclusion, I want to again express our appreciation for the leadership that this committee and the Congress have shown on these complex issues. I hope these thoughts are helpful and look forward to continuing a thoughtful examination of these important issues in the months ahead. Thank you.

Senator ABRAHAM. Thank you very much.

[The prepared statement of Ms. Katz follows:]

PREPARED STATEMENT OF ROBERTA KATZ

Mr. Chairman, Members of the Committee, thank you for the opportunity to testify today. I am Roberta Katz, Chief Executive Officer of the Technology Network, a network of senior executives of the nation's leading technology companies. Our members include chief executive officers and senior partners of companies in the fields of information technology, biotechnology, venture capital, investment banking and law. We are proud that our industries have played a leading role in the unparalleled growth of the United States economy in the past decade.

It is a pleasure to testify today on one of the most important issues facing America's technology industry: the workforce needs of the 21st century. The Technology Network appreciates this Committee's recognition of the role of the technology sector in driving our nation's remarkable economic expansion and its focus on policies that support continued growth by addressing these workforce issues. I am particularly pleased that Congress and industry, recognizing the technology workforce shortage, are examining the underlying business immigration issues, including the role of business immigration, the contribution of the technology industries to work-

force training and education and the workforce needs of the future. Addressing these workforce issues as we approach the 21st century is fundamental to supporting America's technology industries and the New Economy.

It is also a great pleasure to testify today before Chairman Spencer Abraham, whose leadership of technology policy is unparalleled. Mr. Chairman, your dedication to the development of fair and responsible business immigration policy has supported and protected our nation's technological leadership. The benefits of that leadership are enjoyed by all industries and all Americans.

THE GLOBAL ECONOMY DEMANDS AN EFFECTIVE BUSINESS IMMIGRATION POLICY

The American economy is undergoing a fundamental change as we approach the 21st century. This change is driven by technology and innovation and it has led to a revolution in the way we do business and live our lives.

Employee talent is a defining feature of this New Economy and a key to its tremendous growth. More and more, companies today derive their value from the ideas, the intellect and the skills of their workforce.

Yet today we face a growing workforce gap—a serious shortage in the number of skilled professionals necessary to support the technology industry's continued growth. The number of graduates from American universities with computer science and engineering degrees declined significantly in the 1980's. This trend has only recently reversed, largely due to the increased number of foreign students pursuing technical studies in the U.S. Yet, demand for skilled employees in the technology industries continues to grow exponentially. Between 1996 and 2006, demand for database administrators, computer support specialists, and computer scientists is expected to increase 118 percent, demand for computer engineers is expected to increase 109 percent and demand for system analysts is expected to double. Unless we take steps now to address this growing workforce gap, America's technological and economic leadership will be jeopardized.

A second defining feature of the New Economy is its global reach. In today's society, everything—products, capital, ideas—moves internationally and at Internet speed. At a keystroke, products are developed, markets are created, companies are launched. More than ever before, corporations must plan and compete on a global level. Those that fail to do so will lose market share, often to foreign competitors.

If the United States is to remain the world's technology leader, it is essential that American companies continue to have access to the most highly skilled employees. Until our schools and universities are graduating sufficient numbers of technically trained American-born professionals, an efficient and effective business immigration system must fill the workforce gap. As the global economy speeds up, business immigration policy must keep pace.

From the standpoint of TechNet's member companies, this is not an immigration issue, but a competitiveness issue. We need to separate these issues from the parameters of the immigration reform debate and understand this quite simply as an issue that will affect our nation's global competitiveness in the 2lst century.

BUSINESS IMMIGRATION SUPPORTS JOB CREATION AND INNOVATION

The valuable contribution of immigrants to America's economic growth is well known. The critical role of foreign-born engineers, computer programmers, managers and other skilled professionals to the growth and success of Silicon Valley companies is less understood. Employment-based immigrants who hold H–1B visas play a vital role in keeping the U.S. technology industry globally competitive.

America's growing high technology industry has created hundreds of thousands of new high-paying jobs in the past decade, becoming the single largest manufacturing employer in the United States. Studies have estimated that every additional skilled immigrant supports the creation of three to five new Silicon Valley jobs for American employees. By creating and managing technology companies, skilled immigrants have made a valuable contribution to U.S. job growth.

Skilled immigrants also play a key role in supporting innovation in the high tech sector. Today, for example, nearly one-third of start-up companies in Silicon Valley are run by an Indian or Chinese immigrant.

Intel and Sun Microsystems are two of the many TechNet member companies whose early products were developed by foreign-born professionals. Today, those companies together employ nearly 100,000 workers. The contributions these companies have made to the American economy and quality of life are immeasurable.

TECHNOLOGY COMPANIES UTILIZE BUSINESS IMMIGRATION PROGRAMS RESPONSIBLY

The extent to which American businesses rely on foreign-born professionals is also misunderstood. Foreign-born professionals, form a small but extremely important

percentage of the overall technology workforce. TechNet member companies Utilize H–1B visas responsibly, relying upon these employees as necessary to fill a relatively small number of key positions.

In general, technology companies rely on skilled foreign professionals in several ways:

First, companies hire skilled foreign-born employee's when they offer a unique set of skills that cannot otherwise be found. These skilled workers possess unique combinations of knowledge and experience or simply are the best in their fields. Access to these professionals is particularly critical today when our universities are not graduating sufficient numbers of American-born students who have the scientific or technical skills that companies demand. Business immigration, however, should always have a role in ensuring that America's technology industries have access to the most highly skilled professionals, wherever the source.

Second, a significant number of H–1B visas are granted to foreign-born students who have graduated from American universities. Almost one-half of the advanced degrees in computer engineering, electrical and electronic engineering awarded by American universities go to foreign nationals. America's universities are truly a magnet for the world's brightest minds. To turn these highly skilled scientists and engineers away after we have trained them in the United States—encouraging them to seek employment by foreign companies who may be our competitors—simply does not make sense.

And because American universities are sponsoring the most advanced technology research, these graduating students are not only brilliant researchers but also bring knowledge of the newest technologies to their employers.

Third, companies may hire skilled foreign professionals to help them build or strengthen their business in foreign markets. These professionals clearly offer valuable insight into language, culture and geographies that enable American companies to compete in foreign countries—increasingly important markets for American technology products and services.

Finally, a major use of foreign-born professionals is to fill skill shortages. As long as we face a workforce gap, this will remain a critical need of the technology industry.

THE TECHNOLOGY INDUSTRY SUPPORTS EDUCATION AND WORKFORCE TRAINING

The technology industry is working hard to close the workforce gap. Every TechNet member is concerned with the workforce needs of the 21st century. We all recognize that today's engineer will have seven careers before she retires and that, because technology changes overnight, lifelong learning is the key to competitiveness in the technology industries. To that end, our members are working at the K–12 level, in partnership with universities and through in-house programs to train and retrain a skilled technology workforce.

U.S. companies spend approximately $210 billion annually on the formal and informal training of their information technology workforce, and provide an estimated $4 billion in support to schools at the K–12, college and university levels around the country. The technology industries are among the most generous donors in the corporate world, according to data compiled by The Conference Board. In Silicon Valley, corporate contributions as a percentage of pretax profit are 17 percent higher than the median for all industries.

Both large and small TechNet member companies have developed programs to meet the workforce challenges that all technology companies are facing. These range from scholarships which are successfully encouraging minority students to pursue careers in engineering and computer science to in-house training programs that prepare current employees for the challenges of the future. Corporations also support K–12 education through the donation of dollars, technical resources and volunteers to nonprofit initiatives. We are in the process of cataloguing these efforts and look forward to sharing the experiences of our members with successful education and training programs.

Donations to education programs represent over 40 percent of all charitable activity by high tech companies. Some of the programs which are having an impact on science and technology education in American communities include Cisco Systems Networking Academies which currently enroll 17,000 students in all 50 states; Hewlett-Packard's Diversity in Education Scholarships which support engineering and computer science training for outstanding minority students; and the Microsoft Connected Learning Community program which provides grants to support technology access in disadvantaged communities.

TechNet supported the provisions of the American Competitiveness and Workforce Improvement Act that ensure that a portion of the H–1B visa fees are used to sup-

port scholarships and technical skills training programs. The technology industry is committed to continuing its high level of support for American education and worker training.

BUSINESS IMMIGRATION IN THE 21ST CENTURY

As we enter the next millennium, there are important issues that must be addressed to meet the workforce needs of the high technology industries.

First and foremost, we need to ensure sufficient supply of skilled technology professionals. The technology industry is committed to continuing its support for education and workforce training. Until America's schools and universities are graduating enough technically trained professionals, however, we must rely on skilled foreign professionals to fill the gap.

Next year, predictions are that the quota of H–1B visas may be used up before January 1, 2000. This will be due in part to a growing backlog of visas that stems from the period in 1998 when the quota was unavailable. It is estimated that between 40,000 and 60,000 H–1B petitions are pending at INS Service Centers. This rolling backlog has significantly reduced the effectiveness of the recent quota increases and must be addressed.

We understand also that the Immigration and Naturalization Service is considering reducing the number of H–1B visas available in fiscal year 2000 to compensate for the issuance of visas possibly in excess of the fiscal year 1999 cap. We would urge the INS not to take such action, particularly given the uncertain data about the number of visas processed in 1999. This controversial proposal also underscores the need for better data and predictability in these programs.

On behalf of TechNet's members, I want to express our appreciation to the members of the House and Senate, including Senator Phil Gramm, who have taken the proactive step of introducing H–1B visa legislation this year. We are encouraged by these efforts and hope that with the help of this Committee's leadership, we can pursue a bipartisan approach to these important issues in the months ahead.

Second, we need to consider whether the business immigration programs are structured as efficiently as possible. Progress in increasing the H–1B visa cap will be undone by excessive processing delays and inefficiencies in program administration. Delays in processing currently make it impossible for companies to plan or predict how long it will take to secure an H–1B visa. Policy makers should look carefully at how program management can be enhanced and consider potentially far reaching proposals to reform and improve these services. There is bipartisan support for restructuring and improving INS management and we hope that Congress will move expeditiously to address these reforms.

Further, as the provisions of the American Competitiveness and Workforce Improvement Act are implemented, policy makers should ensure that paperwork and regulatory requirements remain manageable. Companies which have a proven record of responsible reliance on the H–1B program should not be unnecessarily burdened or micromanaged by these requirements. It was certainly not congressional intent to hinder the ability of legitimate employers to utilize H–1B visas and we are very concerned with many aspects of the Department of Labor regulations in this area. Several TechNet member companies have submitted letters detailing concerns with these regulations.

CONCLUSION

This hearing is an important first step in addressing these urgent workforce issues. We hope that Congress will act on the pending proposals to address these issues early in 2000.

As we approach the 21st century, we simply cannot afford to let a lack of skilled workers jeopardize our nation's technological and economic leadership. The technology industry is continuing its efforts to build America's scientific and technically skilled workforce. As we do so, it is essential that have access to the scientists, engineers, managers and other skilled workers necessary to sustain our global competitiveness.

In conclusion, I want to again express our appreciation for the leadership that this Committee and the Congress have shown on these complex issues. I hope these thoughts are helpful and look forward to continuing a thoughtful examination of these important issues in the months ahead.

ATTACHMENT TO STATEMENT OF ROBERTA KATZ

TECHNET CEO TESTIFIES ABOUT AMERICAN COMPETITIVENESS

Highlights High Tech Giving for Education

Washington, D.C.—Technology Network (TechNet) Chief Executive Officer Roberta Katz testified today about maintaining American competitiveness in the 21st Century. During Senator Spencer Abraham's (R–MI) Immigration Subcommittee hearing, Katz highlighted the extensive efforts by high tech companies to improve education.

"If the United States is to remain the world's technology leader, it is essential that American companies continue to have access to the most highly skilled workers. Until our schools and universities graduate sufficient numbers of technically trained American-born professionals, an efficient and effective business immigration system must fill the workforce gap. As the global economy speeds up, business immigration policy must keep pace," said Roberta Katz, CEO of TechNet. "From the standpoint of TechNet's member companies, this is not an immigration issue, but a competitiveness issue. These issues need to be separated from the parameters of the immigration reform debate and understood as an issue that affects our nation's global competitiveness in the 21st century."

Katz highlighted the extensive efforts of industry to improve education. Cisco Systems, Compaq, Apple Computers, Intel, Microsoft, Nortel Networks, Sun Microsystems and 3Com give time and resources to bring technology to underserved areas.

According to the Conference Board, high tech companies direct more than 40 percent of their charitable contributions to education. These contributions are more than 34 percent higher than such contributions from all industries.

"High tech companies are rising to the challenge to improve K–12 education and ensure opportunities for all Americans working in the New Economy," said Roberta Katz.

During the hearing Katz thanked Senator Abraham for his work. "It is also a great pleasure to testify today before Chairman Spencer Abraham, whose leadership of technology policy is unparalleled. Mr. Chairman, your dedication to the development of fair and responsible business immigration policy has supported and protected our nation's technological leadership. The benefits of that leadership are enjoyed by all industries and all Americans."

Last year when H–1B visas were increased, TechNet worked to reenergize efforts to reach a compromise. Specifically, the organization engaged in a series of detailed, three-way negotiations between high-tech industry leaders, Congress, and the White House in an effort to reach common ground. At the end of the negotiations, when small issues still remained in dispute, dozens of TechNet executives called senior officials urging that a compromise be reached in a timely fashion. Senator Abraham was instrumental in finalizing the compromise.

TechNet is a national bipartisan political network. Its mission is to help its members build working relationships with national and state political leaders and pass federal and state laws that will help foster the New Economy. Its primary public policy priorities for 1999 are: to strengthen the nation's investment in basic research by enacting a permanent R&D tax credit and increasing federal funding for basic research, to protect current accounting rules for business combinations and stock options, and to improve K–12 education.

Senator ABRAHAM. Mr. Archey, welcome. Again, we are glad to have you here.

STATEMENT OF WILLIAM T. ARCHEY

Mr. ARCHEY. Thank you, Mr. Chairman. I would like to express AEA's thanks to you for your leadership on this issue and to Senator Feinstein and Senator Kennedy for their help and support on this issue over the last couple of years.

In my prepared statement, I sought to provide a quantitative base for the legitimacy of the concerns of this industry in terms of the shortage of jobs and in terms of what are some of the phenomenon taking place in the industry, and I just want to very quickly go over a handful of those.

Using government data that we used in our Cyber States report and our Cyber Nation report and our recent report on Cyber Education, this industry since the first quarter of 1984 has created 1.1 million net new jobs totaling 4.8 million. Interestingly, this industry is now the largest manufacturing employer in the United States, with two million employees.

I would also note that the average wage now in the industry is almost $54,000, 77 percent higher than the average private sector salary. By the way, that breaks down in some other interesting ways. For example, if you work in prepackaged software, the average salary yearly is about $81,000, and if you happen to work in the State of Washington, the average salary for a prepackaged software worker is $158,000 a year. I think the moral of that is, one, thank you, Microsoft, and number two is, may your son and daughter grow up and be a software engineer.

The other thing I think in terms of the employment, this is again Bureau of Labor Statistics 1998 data, the unemployment rate overall for all engineers is 1.6 percent, for computer programmers it is 1.4 percent, for computer scientists it is 1.2 percent. In no instance in terms of the high tech jobs—we classified six categories—is there any unemployment rate higher than 2.1 percent.

The point, I guess, I would make also in all of this has to do with—I am fascinated sometimes, although I think the controversy surrounding H–1B seems to be diminishing each year because I think the legitimacy of the case we make is being recognized. But I often think about the concept of George Orwell and language is everything and I am wondering if we called this the H–1B job program, if there would be any controversy at all, because that is, in fact, what it is.

Ms. Holdren made a very, very pungent point that the number of people coming in on an H–1B visa creates the intellectual property that, in turn, creates other jobs, and, indeed, creates wealth. This is really what this is about, and a lot of the other controversy tends to be, in my judgment, at the margin. The fundamental issue here is very talented technical people who get jobs in this industry tend to create enormous intellectual property which, in turn, creates an enormous number of jobs, and that is really what this is about. Yes, there are some complaints about other aspects, but I think that is it.

The other thing I would just note in terms of what Rob said, we have been taking a look at the whole issue of education. One of the things that is interesting is in the 1990's, 1990 to 1996—that is the latest data—their overall degrees from associate to doctorate have gone up by 16 percent. In the high tech industry, the degrees have declined by 5 percent. You would think that if the laws of supply and demand were operating, that more and more people would be taking those kinds of courses.

But then you look at educational performance in K through 12 in terms of our kids, particularly as compared to other kids in the rest of the world, and, for example, our kids do extremely well in math and science testing in the fourth grade. By the time they get to the 12th grade, they are 19th out of 21 countries in math and 16th out of 21 countries in science.

I would also note that not enough kids are taking it. Sometimes people think this is facetious, but I think if we want to really look at one overall thing that might help, you take a look at what tests are done with kids when it comes to particular professions and they draw caricatures. It is very interesting when you talk about engineering. The caricature is always somebody with coke-bottle glasses, clearly somebody who is terribly inept, and it has got an image that does not attract people, despite the fact that there is probably no more exciting place to work in the United States than in the high tech industry.

So my thought is, and I am going to be pursuing this next month, is what we need is Hollywood to get interested in a new program sit-com called "L.A. Geek," where it takes place actually in the workforce and shows how exciting this industry really is. And then, as an afterthought, by the way, you are going to be making somewhere between 80 and 100 percent more than somebody else in another industry. But I think there is an attitude issue here and a perception on the part of kids that we need to change.

And I think, lastly, I would just make this point. We are putting together a clearinghouse on high technology educational initiatives, to gather the data that is being asked by you and by many others on both, one, what is being spent, but two, the kinds of programs and whether they have succeeded or not so that we can seek to replicate those programs in lots of other parts of the country.

The point I would just make on this, and others have made this, this is an industry that disproportionately is contributing to educational reform and educational improvement. It is going to continue to do so. H–1B visa happens to be something that, until we can solve those larger problems, we must have it. Thank you very much.

Senator ABRAHAM. Mr. Archey, thank you very much.

[The prepared statement of Mr. Archey follows:]

PREPARED STATEMENT OF WILLIAM T. ARCHEY

Summary

America's high-tech industry is driving national economic growth. The industry employs 4.8 million workers in high-wage jobs, and is transforming the nation's economy by fundamentally changing the way Americans live and work.

This growth and prosperity has created a unique set of problems for the high-tech industry. Because of the rapid employment growth of the industry, it is becoming increasingly difficult to find highly skilled workers. Job growth and increasing salaries have not lead to an increased supply of workers. In fact, the opposite has occurred. The number of college graduates with high-tech degrees has declined by 5% since 1990. While the number of college graduates with high-tech degrees is declining, the number of foreign nationals with advanced high-tech degrees has increased. Test scores indicate that the nation's elementary and secondary schools are not adequately preparing students to study demanding technical fields such as engineering and mathematics. Degrees in these fields are in great demand by the high-tech industry.

While the supply of highly skilled workers is decreasing, demand for these individuals continues to increase. The Department of Labor estimates that by 2006 demand for database administrators, computer support specialists, and computer scientists is expected to increase 118% reaching 461,000. Demand for computer engineers is expected to jump 109% totaling 451,000, and demand for system analysts will double from 506,000 to more than 1 million. And the explosive growth of the internet continues to create demand for skilled employees.

The combination of these factors has led to a shortage of highly skilled workers. High-tech companies have used workers with H-1B visas as one means of meeting this shortage. Many of these individuals are graduates of U.S. colleges and universities, and possess the needed skills desired by high-tech companies. Opponents of this program have claimed that there is no shortage of skilled workers and that high-tech companies use these individuals to hold wages down. However, a close examination of the employment, wage, and educational trends indicates that this charge is simply not true.

A unique quality that sets America apart from the rest of the world is the openness of our immigration laws. Highly skilled individuals who want to work in our country are welcomed and allowed to contribute. Even if there were no shortage of highly skilled workers, the member companies of AEA would still support retaining the H-1B visa program. Access to the best and brightest workforce is one of the many strengths that sets our country apart from the rest of the world. But in more practical business terms, these highly skilled foreign nationals create the intellectual property here in the U.S., which in turn, translates into more jobs at extremely high wages for American workers. In other words, *the H-1B visa program creates high wage jobs for American workers.* America should welcome these talented people into our country and allow them to continue contributing to our nation's prosperity.

What follows is an analysis that lays out, using U.S. government statistics, the high-tech job shortage in the U.S. The testimony then demonstrates the greater importance of the H-1B visa program, given this shortage of high-skilled workers.

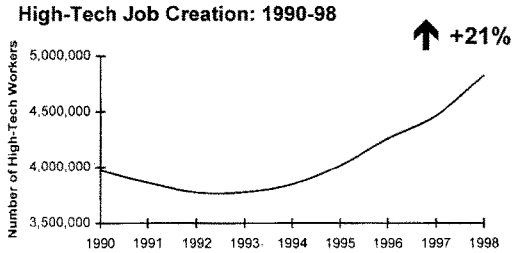
SUPPLY OF WORKERS DOES NOT EQUAL DEMAND

America's high-tech industry is driving national economic growth. The industry employs 4.8 million workers in high-wage jobs, and is transforming the nation's economy by fundamentally changing the way Americans live and work.

> The high-tech industry represented 6.4% of U.S. GDP in 1998 – up from 5.4% in 1990.

While high-tech is the engine driving the U.S. economy, a unique set of circumstances is threatening the ability of the industry to maintain its remarkable growth. Rapid employment growth and low unemployment, combined with increased demand for technical workers and fewer college graduates with high-tech degrees has created a shortage of highly skilled workers – the very workers that create the innovative products for the high-tech industry. Further complicating this situation is that access to a source of highly skilled workers – foreign nationals who graduate from American universities – is limited by the cap on H-1B visas. What follows is a detailed examination of the workforce trends facing the high-tech industry.

HIGH TECH = JOBS = ECONOMIC GROWTH



Source: U.S. Bureau of Labor Statistics

> Between 1994 and 1998, the high-tech industry created more than 1.1 million net new jobs, employing almost 5% of the private sector.

The high-tech industry has experienced rapid job growth since 1993. The high-tech industry added 852,000 net jobs to the U.S. economy since 1990, employing nearly 4.8 million electronics and information technology workers by 1998. The high-tech manufacturing industry has become the nation's single largest manufacturing employer with nearly 2 million workers.

While the job growth of the past five years is remarkable, these numbers become all the more amazing when placed in the context of actual employment growth in high-tech companies. Companies like Cisco, America Online, and Qualcomm were small start-up companies in 1990. Today, these companies employ thousands of workers and are leading technology innovators.

Job Growth in Select High-Tech Companies, 1990-1998

COMPANY	1990 Employment	1998 Employment	Job Creation	Job Growth
America Online	116	8,500	8,384	7,228%
Cisco Systems	254	22,000	21,746	8,561%
Dell	1,500	29,300	27,800	1,853%
Intuit	110	2,860	2,750	2,500%
Qualcomm	619	11,600	10,981	1,774%
Read-Rite	893	18,257	17,364	1,944%

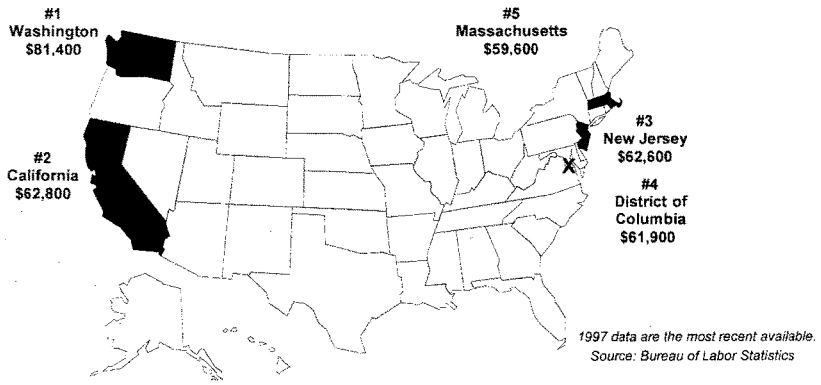
Source: Hoover's Online (www.hoovers.com) and Hoover's Guide to Computer Companies

HIGH-TECH JOBS = HIGHER WAGES

With rapid employment growth has come increasing wages. Employees of high-tech companies possess high levels of education and training. Commensurate with their high education and skill level, the average wage of U.S. high-tech worker grew 19% between 1990 and 1997. This compares to just 5% for the average private sector worker. **The 1997 high-tech average wage ($53,145) was 77% higher than the average U.S. private sector wage ($30,053).** High-tech workers in Washington State enjoy the highest average salary ($81,375).

Software employees in Washington State earned an average wage of *$158,000*.

TOP 5 HIGH-TECH WAGE STATES

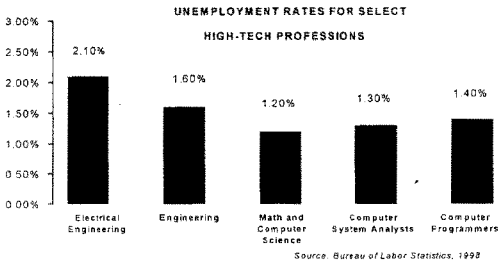


1997 data are the most recent available.
Source: Bureau of Labor Statistics

Since 1990 -- with few exceptions -- wages have increased for employees in almost every high-tech sector. The most dramatic increases have occurred for employees who manufacture computer storage devices (40% increase), prepackaged software employees (40%), employees of companies that manufacture calculating and accounting machines (30%), and manufacturing employees of computer peripherals (27%).

The semiconductor manufacturing industry paid its workers an average of $59,933 in 1997.

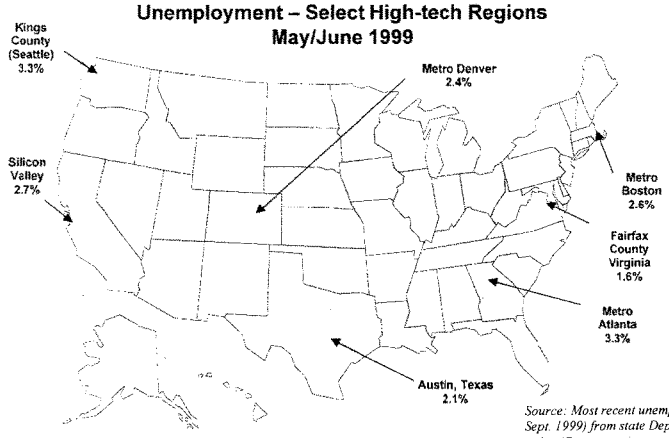
RAPID EMPLOYMENT GROWTH + INCREASING WAGES = LOW UNEMPLOYMENT



With rapid employment growth and increasing wages, unemployment, especially in professions in greatest demand by high-tech companies, is very low, under 2% in most cases. Such low unemployment figures call into question whether companies are avoiding hiring older workers.

Given the rapid employment growth of the past five years, in those regions of the country where the high-tech industry is concentrated, the predictable result has been very low unemployment. High-tech employment centers typically have an unemployment rate half the national average of 4.5%. Because of the low unemployment rates in these areas, the workforce shortage involves all workers, not just highly skilled workers.

Unemployment – Select High-tech Regions
May/June 1999



Source: Most recent unemployment figures (July-Sept. 1999) from state Departments of Labor/Commerce

DEMAND FOR HIGH-SKILLED WORKERS WILL CONTINUE

Clearly, the U.S. high tech creates high skilled, well-paying jobs. This trend is expected to continue through the next several years. In fact, the computer and office equipment industry is projected to be the fastest growing industry in the nation between 1996 and 2006, at an annual growth rate of nearly 15 %. The software and data processing services industry is projected to grow at 9.3 % annually and employment is expected to double from 1.2 million in 1996 to 2.5 million by 2006. An examination of occupational employment provides a different perspective with the same conclusions. The three fastest growing occupations over the next decade will be in the very rapidly growing computer and data processing services fields. The rapid advances in computer technology has increased demand for trained specialists like computer engineers, computer systems analysts, database administrators, and computer support specialists. The Bureau of Labor Statistics predicts that demand for these occupations will more than double by 2006.

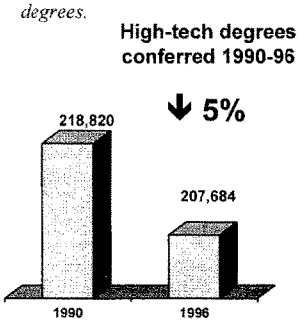
DEMAND CONTINUES INTO THE 21ST CENTURY
Occupational Employment Projections between 1996 and 2006

- Demand for database administrators, computer support specialists, and computer scientists is expected to increase 118% reaching 461,000.
- Demand for computer engineers is expected to jump 109% totaling 451,000.
- Demand for system analysts will double from 506,000 to more than 1 million.

Source: Bureau of Labor Statistics, Monthly Labor Review, November 1997

U.S. HIGH-TECH WORKERS – THE PIPELINE IS TRICKLING WHILE THE INDUSTRY EXPLODES

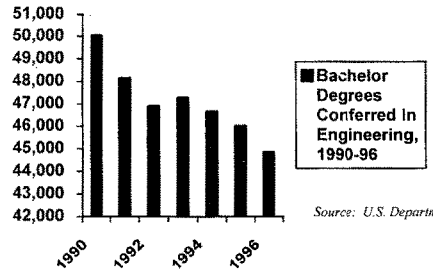
Given the rapid employment growth, increasing wages, low unemployment, and projected employment growth, it would follow that more students would be pursing degrees in demand by the high-tech industry, such as computer science and mathematics. Instead, the opposite is occurring. *Fewer students are graduating from U.S. universities and colleges with high-tech degrees.*



Source: U.S. Department of Education

AEA examined graduation rates using the most recent data available that tracks the number of high-tech degrees (defined as engineering, engineering technology, computer science, mathematics, business information systems, and physics) awarded every year from our nation's colleges and universities. The data show that the total number of graduates with high-tech degrees **dropped 5%** between 1990 and 1996. In specific degree fields, such as electrical engineering and computer sciences, the number of bachelor's degrees has dropped precipitously. Comparing these numbers against projected industry growth strongly suggests that if present trends continue, homegrown technical talent will not keep pace with the needs of the high-tech industry.

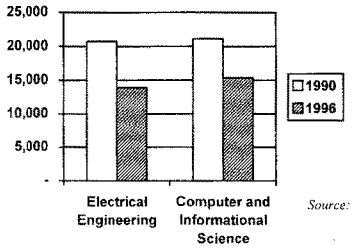
NUMBER OF U.S. ENGINEERS DECLINES



Between 1990 and 1996, the number of bachelor's degrees awarded in the engineering field **DECREASED 10%** from 50,053 to 44,878.

Source: U.S. Department of Education, Integrated Postsecondary Education Data System

SPECIFIC TECHNICAL DEGREES FALL SHARPLY



The number of bachelor's degrees in electrical engineering **DECREASED 33%** from 20,711 to 13,900 between 1990 and 1996.

The number of bachelor's degrees in computer and informational sciences **DECREASED 27%** from 21,108 to 15,324 between 1990 and 1996.

Source: U.S. Department of Education, Integrated Postsecondary Education Data System

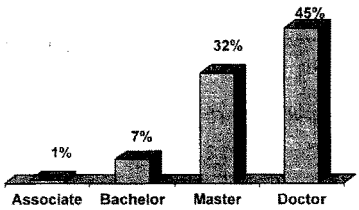
FOREIGN NATIONALS ARE A SIGNIFICANT PERCENTAGE OF HIGH-TECH GRADUATES FROM U.S. UNIVERSITIES

While the number of U.S. students receiving high-tech degrees is declining, large numbers of foreign nationals are earning high-tech degrees from American universities and colleges. Many of these individuals have the requisite education and skills to make a major contribution to the competitiveness of the U.S. high-technology industry in the global marketplace. Without sufficient H-1B visas, many of the skilled foreign nationals graduating from U.S. universities will not be able to obtain employment authorization. These individuals possess critical skills needed by the U.S. high-technology industry.

The charts below show that in the more advanced degrees (Master's and Ph.D.), the pool of available U.S. workers is severely limited. Preliminary data from 1997 and 1998 indicates that these numbers are growing. One of the biggest challenges facing the U.S. high-technology industry today is finding qualified American workers. Those with the best technical training are in greatest demand and many are foreign nationals.

MORE FOREIGN NATIONALS RECEIVE ADVANCED TECHNICAL DEGREES

Degrees Granted to Foreign Nationals

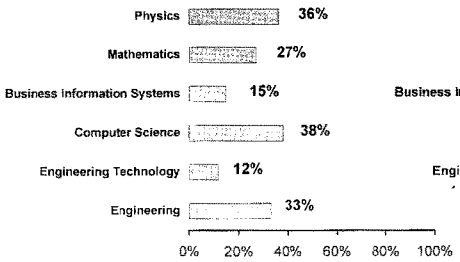


The American university system awards nearly half of all high-tech doctoral degrees to foreign nationals.

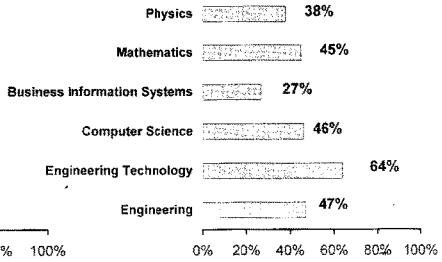
Source: U.S. Dept. of Education

When broken down by discipline, the number of foreign nationals receiving master's and doctoral degrees can reach upwards of two-thirds of the degrees awarded.

Master's Degrees Granted to Foreign Nationals



Doctoral Degrees Granted to Foreign Nationals



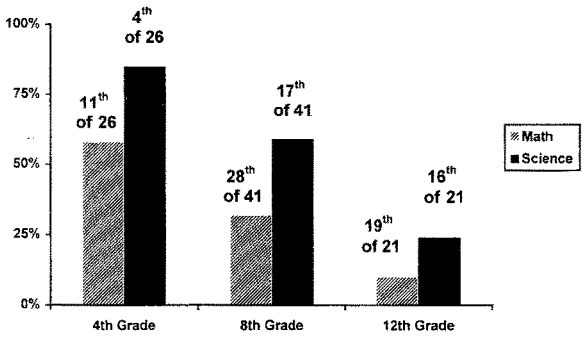
K-12 EDUCATION: NOT MEETING THE CHALLENGE

With fewer Americans earning high-tech degrees, the question is whether our nation's K-12 education system is adequately preparing students for the high-tech workforce. **The indicators suggest that our nation's elementary and secondary schools are not adequately preparing students for the technical workforce.**

Although all current projections anticipate tremendous growth and job creation in most high-tech sectors, the current labor pool of qualified workers is declining. With the number of graduates in key technology disciplines declining, will the K-12 education system prepare students for those high-tech degrees in demand?

If the test scores of K-12 students are an indication, the future does not look good. The performance of our elementary and high school students is disappointing when compared to the children of our foreign competitors.

K-12 Education International Key Findings
U.S. ranking as a Percentile When Compared With Other Countries.



Source: International Association for the Evaluation of Educational Achievement, Third International Mathematics and Science Study (TIMSS), 1994-95.

This is evident in the results in the Third International Math and Science Study (TIMSS), released in February 1998. TIMSS showed that U.S. twelfth graders scored 19th out of 21 countries in math and 16th out of 21 countries in science. The nation's elementary and secondary education systems simply are not doing an adequate job of preparing students in math and science skills necessary to compete in the workforce of the future.

THE WORKFORCE SHORTAGE: REAL AND CONTINUING TO GROW

Those who claim there is no shortage of highly skilled workers are not facing the facts of the current economy. Rapid employment growth and extremely low unemployment rates have combined with a declining number of graduates with high-tech degrees to cause a shortage of highly skilled workers. Since 1997, high-tech firms nationwide have been reporting a shortfall in the supply of technology workers. The numbers presented in this testimony confirm this anecdotal evidence. When the unemployment rate for computer systems analysts is 1.3% and 1.6% for engineers, it is hard to argue that there is no shortage of these highly skilled workers. The demand for these workers is not expected to slow anytime soon. The continued growth of the internet, ecommerce and software programming will drive further demand for highly skilled

workers. With the number of college graduates with high-tech degrees declining and the nation's elementary and secondary schools not providing an adequate education for the technical workforce, the shortage is not going to improve anytime soon. At some point, the demand for workers will outstrip supply. The resulting imbalance in the labor market will hamper the growth of the U.S. electronics and information technology industry, and will ultimately affect the entire U.S. economy.

H-1B VISAS: ONE ELEMENT OF THE WORKFORCE SHORTAGE SOLUTION

All these factors point to a growing problem faced by the high-technology industry – how to recruit and retain skilled workers. One solution used by high-tech companies to hire H-1B visa holders. The high-tech industry views the H-1B temporary worker program as vital to its continued success. H-1B visas offer the high-tech industry a competitive edge by allowing companies to hire the best and brightest workers from throughout the world. Even if there were no shortage of skilled workers, high-tech companies would continue to use the H-1B visa program to ensure access to talented individuals. For most companies, H-1B visa holders represent a small but significant part of their workforce. Given the current workforce shortage, it only makes sense that the H-1B visa program needs to be expanded once again.

AEA member companies do not view the H-1B visa program as the long-term solution to our nation's workforce needs. However, efforts to make the program more difficult to use or to impose more requirements on companies that use H-1B visas could result in companies setting up facilities in countries where there are available workers. AEA member companies comply with the requirements of the H-1B visa program. In fact, AEA supported the increased penalties for fraud contained in legislation to temporarily increase the number of H-1B visas. AEA fears that proposals to eliminate fraud from the H-1B visa program could end up imposing more filing requirements for companies that use the program properly. The INS already takes two months to process an H-1B visa application and more paperwork will not eliminate fraud, but only lengthen that process.

H-1B VISA LEGISLATION: PART OF THE SOLUTION

Last year, Congress enacted legislation (PL 105-277) that temporarily increased the cap on H-1B visas from 65,000 to 115,000 through FY 2000, and 107,500 in FY 2001. AEA supported this important legislation and commends Sen. Abraham for his leadership on this issue. Even though the cap on H-1B visas was increased last year, once again it was reached prior to the end of the fiscal year – on June 15. With an estimated 35,000 visas already approved for this fiscal year, the cap on H-1B visas may be reached as early as January 1, 2000. Once again, the cap on H-1B visas is preventing American companies from hiring the best and brightest workers from throughout the world.

Several bills have been introduced this year that address this issue. Senator Phil Gramm (R-TX) and Rep. David Dreier (R-CA) have introduced legislation supported by AEA (S. 1440/HR 2698) to increase the H-1B visa cap to 200,000 for the next three fiscal years. Rep. Zoe Lofgren (D-CA) and Sen. Charles Robb (D-VA) have introduced similar bills (HR 2687/S. 1645) to create a new visa category for high-tech workers. AEA believes the Lofgren bill offers a new, promising way to approach the issue of meeting the high-tech industry's demand for highly-skilled workers. While the Robb proposal contains the new "T" visa category, it unfortunately

imposes cumbersome new attestations on this new visa category. For that reason, AEA is unable to support Robb bill.

What all three proposals have in common is the creation of a mechanism to allow foreign nationals who graduate from American colleges and universities the ability to stay and work in for American companies. AEA believes that the common ground in all three proposals could serve as the starting point for discussing a legislative solution to the problems associated with the H-1B visa program. It makes no sense to educate foreign nationals in our universities and colleges, then send them home to create intellectual property. Instead, let our companies hire these individuals and let them create the intellectual property – and the jobs that flow from these creations – here in the U.S.

AEA would also like any legislation dealing with the H-1B visa program to set a realistic cap based on demand for the program and additional visas be allocated to clear out the backlog in the program. The current backlog of H-1B visas – estimated to be 35,000 – was not addressed in the 1998 legislative changes. Increasing the cap without addressing the backlog is an incomplete solution to the H-1B visa cap issue.

AEA also supports addressing the "per country limit" issue in the context of H-1B visas. Current immigration law allows 140,000 employment-based immigrants per year. These visas are distributed among five preference categories. In 1952, Congress provided that all countries would be given identical quotas. In practice, this means that the Peoples Republic of China and India with a combined population of two billion have the same quotas as tiny countries like Nepal, Bhutan, and Monaco. In 1996, the employment-based categories for permanent residence started to backlog for persons born in India. By December 1997, employment based permanent immigrants from the Peoples Republic of China (PRC). The backlog is occurring, even though the overall cap of 140,000 is not being reached. Workers from China and India who use H-1B visas to await approval of their citizenship petition are getting caught in the backlog. Once their H-1B visa expires, they must be terminated or transferred overseas until a permanent visa becomes available. Addressing the "per country limit" would help decrease long-term usage of H-1B visas.

Finally, AEA also shares the concerns that have been raised regarding fraud in the H-1B visa program. Fraudulent use of H-1B visas harms those companies that use the program legally and are unable to obtain visas. One solution to this problem would be to create an expedited review of H-1B visa applications for companies that have a proven track record of complying with the program – a "Gold Star" program. Companies using the "Gold Star" program would free resources used to process visas and allow the Immigration and Naturalization Service (INS) to move resources towards enforcement against those companies suspected of abusing the H-1B visa program. AEA would also support increased penalties for companies that use the H-1B visa program in a fraudulent manner.

To summarize, AEA would like to see H-1B visa reform legislation that makes it easy to hire foreign nationals who graduate from American universities and colleges, realistically addresses the cap on H-1B visas and the backlog in the program, addresses the "per country" limit issue, creates an expedited review for companies that have a proven track record of compliance with the H-1B visa program, and increased penalties and enforcement to ensure the H-1B visa program is being used for its intended purposes.

THE LONG-TERM SOLUTION: IMPROVE EDUCATION AND TRAINING

The first and most important step is to continue to invest in the nation's current and future workforce. If the investment in the workforce pipeline does not continue, the problems we are facing today will only worsen. We will see slower technology development. Projects will be delayed due to the time it takes to bring unprepared workers up to higher performance levels. Predatory recruiting practices will continue.

Workforce characteristics, identified by AEA member companies, as critical to the success of high-tech companies are strong technical and analytic skills, communication skills, and teaming skills. Companies also have recognized that the supply chain of qualified workers is no longer just the K-12 level, the skilled workforce supply chain is K-Ph.D.

Recognizing this fact, AEA member companies are committing significant resources into improving education and training. For example, Intel Corporation spends more than $100 million per year in a variety of programs designed to improve the education and training of America's workforce. Hewlett-Packard donates $55 million per year to education. Texas Instruments is involved in numerous programs and partnerships across the country to improve K-12 math and science education. Many other AEA member companies partner with community colleges to ensure that there is a supply of well-trained workers.

> Intel Corporation spends more than $100 million per year on K-Ph.D. education

This is just a small sample of the resources high-tech companies are committing to improving workforce training and education. The high-tech industry is committed to continuing this high level of support. At the same time, the industry needs to maximize the productivity of the current workforce by encouraging life long learning and building incentives to keep the current workforce "work ready."

CONCLUSION

Factors such as rapid employment growth and low unemployment have combined with a declining number of college graduates and increasing number of foreign nationals with high-tech degrees to cause a shortage of highly skilled American workers. The numbers indicate that the shortage is real. If this shortage is not addressed, the ability of the high-tech industry to continue expanding and growing will be threatened. The long-term solution to this problem is to improve the nations education system and provide better training for workers already in the workplace. In the interim, foreign workers holding H-1B visas are helping to meet the workforce shortage needs of high-tech companies.

Senator ABRAHAM. I will turn to Senator Kennedy, if he has any questions for the panel. We will begin with you.

Senator KENNEDY. I thank you all very much for your testimony and the variety of different observations that were made about how we deal with the short term and then how we deal with the long term. I think it is pretty easy to understand what the short term is, perhaps, and less in terms of the long term.

As I see from the National Science Foundation, in the last 10 years, the number of science and engineering graduates has declined 17 percent nationally, and 37 percent in my own State of Massachusetts. So the economic indicators are going south.

One thing we have not talked about at all in the panel was what the pay rates are, what we are paying. Usually when we talk about supply and demand, we also talk about wages that are going up. Here, according to CRS figures from 1998 and 1999 for computer engineering—and this is the average salary of the bachelor degree candidates by major field of study and function—in 1998, it was $43,800 for computer engineering. In September, $49,045. Computer science, $41,900. In September, $49,000. Computer programming, $38,700, $40,839.

There is not a law student in Massachusetts that is graduating from any one of their schools that is not doing better than that, and we have got more lawyers than we possibly need. They have said that for a long time.

I could go down, but I do not want to because we are all on limited time, but this goes down, information science, $37,000 to $38,000; system analysis, $36,000 to $38,000. All of them have had a bleep of about $1,100 or $1,200, which is basically across the board, across the board in terms of every one of the professions—no jump, no hike there.

Furthermore, in terms of job function, software design and development, $43,400 to $45,500. Hardware design, $44,000 to $45,000. That is $1,000. Why are we finding out that in terms of at least the CRS and these kinds of studies, that with all this enormous demand, that all of you are being paralyzed in terms of the future of your companies, why in the world do we not see these things ratcheted up more?

A number of people are telling us that it is the law of supply and demand and they refuse to pay these increases of what the needs are, and would that not have some impact in terms of young people, if they suddenly saw the dramatic escalation their brothers and sisters are getting, that they have gone up from $36,000 to $45,000 to $60,000 to $100,000 over 2 or 3 years. Maybe someone down in those high schools sends them a message on this.

There was not one comment from any of you about pay, and there are people that believe that that is an issue. I would be glad to hear your comments. We are going to have a brief period of time.

Ms. DEFIFE. Senator, if I could address that issue. In companies like ours that are venture backed and where we are losing money on a fairly regular basis, we do a number of things to attract workers. Salary is obviously important, but one of the things we use is to increase the benefits and the package, basically, by the use of stock options. Oftentimes, what we do is make two offers, an offer of a higher salary level, less of stock, or a lower salary level and

greater number of options. I will tell you that, without fail, everyone who has walked into the company has taken a lower salary and a higher stock options package with the feeling that, long term, there is a lot of potential here, a lot of potential wealth.

I will also tell you that at the higher levels, the compensation is so great that you are talking a minimum of $60,000 and more likely in the $80,000 to $90,000 range to hire a senior technical officer, and that includes a very generous options package, as well.

Senator KENNEDY. There is not a graduate from Harvard Law School who is not going to get $100,000 next year, start off first year from law school.

Ms. DEFIFE. But they have no options.

Senator KENNEDY. You are talking about a highly competent, a highly trained person that is going to have a package of about $80,000. It really does surprise me. I understand about the stock. Nobody can look at what CEO's are being paid and not know what the stocks are and all the rest of it. But a lot of these are winners and losers. People understand that. You can talk about the stock. You are going to find, everybody can give a half-a-dozen different companies that have gone off the logs. They started out and they were only getting $30,000 and are worth over $1 million. At Microsoft, they keep throwing this back up.

But for what is happening out there in the average kind of smaller company, and I am just, quite frankly, kind of surprised that this is the level that is coming out. You take a fellow from a 2-year college and he gets a mechanic, advanced mechanics degree in that school, starting out with $47,000, $48,000 as a mechanic on a car, and you are talking about what is happening here.

I am just surprised that in terms of the totality of this, that it is not more, and I think it is going to happen. We will go through this in terms of the expansion of it, but I, for one, want to see what is happening out there and finding out what the companies are paying these people and what this thing is worth. I mean, if you are not paying it and want to get some people in here who are going to be cheaper workers on this kind of thing, that does not make a lot of sense as far as I am concerned.

I do not see why—part of it, we have to do. No one is more committed than I am in terms of K through 12, in terms of training and consolidating programs and all the rest of it. But we want to try and see what is being offered out there for people coming into the job market, too, rather than just saying, well, this is where we are and we have a lot more on it and it is going to take that.

This is another point. They talked about the decline in training programs. That is what they had all over Europe. They had all the decline programs. You mentioned, I think, $220 billion. How much of that goes to actually workers and how much goes to management?

Ms. KATZ. I do not have the background on that, but——

Senator KENNEDY. I will bet you the great percentage of it goes to the management part of it. If you do not have it, you can submit it.

Ms. KATZ. I will look into that.

Senator KENNEDY. If it is not, it will be one of the really important differences that we have had, where they have provided the

greatest percentage of the training programs are going to be for management rather than for continuing upward grade. There are others, there are exceptional companies and all the rest, but I am interested.

There is one other point. This is what was happening in Europe, not that this is the answer, but it is certainly one that you ought to consider. Instead, they had the requirements. Companies had the options that they could either have education programs and training programs available to everybody, everybody across the board, top and bottom suitable so that everybody moved up, or they paid an additional kind of contribution—call it a tax, whatever it is. They had their choice. They had their choice in it.

But what happened is they all went on for the training programs, all of them, and none of them cared about the—they made their best efforts to hold the workers, but they knew if the worker went out the door, they could bring another worker on in, and that worker was trained, too.

We have an incentive where if these companies, which the best companies do, go out and train, they lose them, they end up paying for it. You have financial disincentives for companies. I do not know whether you have any sense about how we deal with that, if we are going to have the private sector a partnership over a longer term.

Ms. KATZ. I do know that for technology companies, across the board, the number one issue is education because we cannot have an information age without people who do not know how to process information. Where our schools seem to be failing at is in basic skills that then translate into the ability to manipulate information. So for all of our companies, it is our number one issue.

Senator KENNEDY. Thank you very much.

Could I just ask, Mr. Atkinson, this is a very interesting book, and Massachusetts does reasonably well. I want to thank you very much. You worked for the Office of Technology Assessment, and one of the functions of the OTA was to guide the Congress about the impact of technology on legislation and also legislation on technology. This is one of the kinds of areas we are dealing in here, and we are always thirsty for information. We disbanded one of the enormous assets, and I had enormous respect for the personnel, and I know you were highly regarded.

Let me just ask you, Massachusetts does reasonably well, but we fall down in just three quick areas. One was in the education technology. We were 48th out of 50 States in online, without being partisan, Mr. Chairman, but under the Governor Wells period. Now, we are back to about 10th, and that is because of the private sector. We had Net Day and the private companies, software and so on, put $30 million and coordinated with schools. We got 350 miles of cable done by the union. It is the most extraordinary thing that I have seen as far as a partnership goes. So that figure might be a little different because that was done recently.

I wish you would just, if you could, tell me or supply it later, but we are 21st on IPO's, and what that means, and we are 18th on job churning. Could you just do it quickly, and I am finished, Mr. Chairman.

Mr. ATKINSON. IPO's—before you were alluding to the State New Economy Index that we just came out the end of July. It ranks all 50 States on how their economies are. The IPO measure is simply measuring the value of IPO's in a given year as a share of the gross State product. Massachusetts, as you say, does very well. In fact, they were the number one State in the country. But the IPO's, for some reason, they did not score as well on.

The churning, I think that is what you said——

Senator KENNEDY. Yes. What is churning?

Mr. ATKINSON. Churning is the amount of new jobs that are created, adding to jobs that are dead, that went out of business, the jobs that declined.

Senator KENNEDY. Is that sort of a replacement or something?

Mr. ATKINSON. It is whether the economy is just sort of stagnant, staying along, growing a little bit, or whether there is lots of dynamic activity. What was interesting is we found that actually States that had the most decline in terms of jobs going out of business had the fastest employment growth, which is counter-intuitive. One would assume, oh, if your companies are going out of business, you should not be growing. But we found that that was not the case, that States where the jobs were going out of business, for some reason—I think it was because older companies were going out of business and being replaced by new fast-growth companies and new fast-growth industries—that States that had that tended to grow faster.

Senator KENNEDY. And as all of you said, it is the combination of superb educational research facilities, the universities, and the private sector. We have had a very, very extraordinary experience with universities and the private sector, the NIST program, and SBI program for advanced research. It has just worked up there. We are all interested in seeing how we can do it in other parts of the country, too.

Thank you, Mr. Chairman.

Senator ABRAHAM. Thank you very much. Before we turn to Senator Feinstein, I just do want to clarify one point for the Senator from Massachusetts. I just want to draw your attention to clarify one point, which is that I graduated from the Harvard Law School 20 years ago and I am still only making about $100,000. [Laughter.]

I am not sure the upside potential is as great.

We will turn to Senator Feinstein for any questions here, but I did want to get that clarified.

Senator FEINSTEIN. Thank you. I just said to Senator Kennedy that in these rankings, Massachusetts is at number one and we are trying to change to hold harmless in the Title I program so that the money follows the children. See, Massachusetts through his chairmanship and his ranking always—they lose poor children, but they hold themselves harmless. The children come to California, but they do not get the money. So we have to——

Senator KENNEDY. Listen, you are talking to one of the big spenders. I am for doing it for both. [Laughter.]

Senator KENNEDY [continuing]. You cannot do enough for children in Title I.

Senator FEINSTEIN. Anyway——

Senator KENNEDY. I will support your amendment to increase it for all.

Senator FEINSTEIN. You will?

Senator KENNEDY. For all children.

Senator FEINSTEIN. You do not want me to get too specific here.

I was kind of captivated by something, and that was Mr. Atkinson's suggestion, because it kind of led to something, and that is if you are going to really encourage the so-called disadvantaged child to see a future in this industry, it has got to start very early on and that youngster has to believe they can be part of it.

Your concept of a scholarship program—I was wondering, just Ms. Katz and Mr. Archey, whether the private sector might be interested in doing something like that, setting up a scholarship program so that a disadvantaged youngster that you could begin very early on, and if they had the promise and the interest, commit to a scholarship for college so that they would then know if they carried this out, there was a future.

With many disadvantaged youngsters with respect to high tech, they do not see it being an environment that would ever be friendly or acceptable to them. They look at it as something from the Harvards and the Cal Techs and that kind of thing. I would like to know if you would ever be interested in that.

Ms. KATZ. Absolutely, and there are some companies and some individuals. I think the Gates Foundation has just made a large gift to promote that kind of a scholarship. There are—I believe Cisco—I think Rob mentioned that—has a program, and there is a great interest in more of those programs.

Senator FEINSTEIN. How big is the commitment, would you say?

Ms. KATZ. In the case of the Gates Foundation, I think it is in the billions, I believe.

Senator FEINSTEIN. I know that is a big one, but——

Ms. KATZ. Let me see. I have some statistics here. Cisco has an academy that currently enrolls 17,000 students. Hewlett–Packard has a program, Diversity in Education Scholarships, and it has been going on for a while very successfully, supporting engineering and computer science training for outstanding minority students. Then I have a reference to the Microsoft Connected Learning Community program, which provides grants to support technology access in disadvantaged communities. These are just some of the examples.

I think, as we get better organized to do this, the technology community, there is a great interest and there will be tremendous participation in these programs.

Senator FEINSTEIN. Just before you speak, Mr. Archey, I did not know that every H–1B visa produces three to five additional jobs.

Mr. ARCHEY. Yes.

Senator FEINSTEIN. There is also a dark side to that, which says we in this country cannot create someone that can produce three to five jobs. Therefore, we have got to go out and find the individual in another country and bring them in because that individual has the learning ability, has the basic skills, et cetera. Mr. Archey?

Mr. ARCHEY. I just would reinforce what Roberta said. A large number of our member companies—I do not have that data now, but hope to in a few months—in fact, are sponsoring scholarship

programs for disadvantaged and minorities and to get them to come into this industry.

The point that I would also make is, there is no industry in this country and perhaps ever that existed that is a greater meritocracy than this industry. You do not have to have the Harvard pedigree to succeed in this industry. You have to have very good ideas.

Now that the Senator is here, Senator Kennedy, I had a chairman of my board. It turned out he and I lived in Boston at the same time. I am a native of Massachusetts, but from Pittsfield, MA, where most people in Eastern Massachusetts think it is part of New York.

Senator KENNEDY. Not if you run for election, you do not. [Laughter.]

Mr. ARCHEY. But one of the points that I said to him is, what is the difference—he moved to Silicon Valley and I said to him, what is the difference between Boston and Silicon Valley? Oh, he says, that is real simple. In Silicon Valley, I have never had anybody ever ask me what school did I go to.

Senator FEINSTEIN. That is interesting.

Mr. ARCHEY. And he said, and number two is, not that you want to make it a habit, but you can fail out here and it is OK. You can still make it again.

I think that is the whole point about this industry. I was talking to somebody a couple of months ago who said, you know, now we are at the point with the availability of venture capital that if you have got a totally cockamamie idea, only five venture capital companies want to fund it.

So I think that to get those who are perhaps disadvantaged, I think that we have got to do more an industry because there is not anything that is more fascinating. As I said, merit is what matters. Your lineage and your pedigree is not of any great moment.

Senator FEINSTEIN. See, I just wonder if we could not really make some of this a national model out there and really attract industry capital in a big way and perhaps one day, when Senator Kennedy is back as chairman of the Education Committee——

Senator KENNEDY. We have kept this very friendly here today. [Laughter.]

Senator FEINSTEIN [continuing]. We could get a Federal share to it, and then you would really have a program, I think, that could boost youngsters into this industry. I think the idea of the meritocracy is really interesting. I mean, this could essentially really resolve a lot of problems in our society, so it is an exciting concept. Mr. Atkinson?

Mr. ATKINSON. I just wanted to completely reinforce what you said. I mean, I think if there is any message from the point I was trying to make, it was that we are not going to solve this problem simply by industry alone or by government alone. We need to really build that partnership together.

Senator FEINSTEIN. Right, maybe have some kind of a matching program. For every dollar one puts in, the other puts in a dollar, and then you can make it national and can really make a dent in this needy population.

Ms. KATZ. Well, and we also need to make sure that the schools, even for our youngest children, are teaching math and science in a way that makes them exciting and compelling.

Senator FEINSTEIN. Yes. But you see, the disadvantaged child, I have worked a lot with them. Math and science are not the thing that really appeal. They see it as a dead-end street. So the real need is to show the excitement in it and what the future can bring. So that would mean there would have to be something in addition to just scholarship, but some program in schools that could put youngsters into the program so that they would get a taste of it, and if they had the aptitude and the willingness, it could be a lifetime pursuit.

Ms. KATZ. And Hewlett–Packard does do that. They bring students in every summer to work at the company as the kids get to high school age. It is a very successful program.

Senator FEINSTEIN. Do you have to wait for high school age to do it, because I think it is too late then, by and large. The youngster is formed.

Ms. KATZ. I think what they do is they participate in the training of certain of these kids and then as they progress in the program and then they become of an age where they really can come to work every day, that is what happens.

Senator FEINSTEIN. Thank you. Thanks, Mr. Chairman.

Ms. DEFIFE. Senator, could I add some things? There are some innovative programs going on here, as well. Through the Potomac Conference, we brought business leaders and education and government leaders together, and superintendents of the area school districts are meeting with business to figure out what we can do, first of all, to figure out what kind of curriculum might help to develop these jobs and provide the support, as well. AOL has really taken the lead on developing a pilot curriculum in the schools that, hopefully, we can use around the country as an example of how we can help train some of these workers. We are also——

Senator FEINSTEIN. That would be really terrific.

Ms. DEFIFE. It is a fabulous program.

Senator FEINSTEIN. Then children, if we can find a way to get them a little computer at home, that they practice on the AOL program or something.

Ms. DEFIFE. And it is designed to capture their imagination, as you had mentioned, putting it as part of the curriculum, capturing their imagination on the technology end. CapNet is also doing a digital divide tour with the Congressional Black Caucus also to discuss these issues, because we are well aware that they are there, and trying to provide our help as much as we can.

If I could add one thing, I do think one of the things we need to reach out to in addition to the disadvantaged is to take a look at the issue of young girls and women. They are not taking advantage of the technology in the schools, and the reduction in the number of women going into technical fields is alarming to me. We cannot afford to ignore 50 percent of our workforce as we are talking about developing new workers.

Senator FEINSTEIN. Thank you.

Senator KENNEDY. Just on that, in 1976, we had a special program through the National Science Foundation for women and mi-

norities in the sciences, and that thing has just sort of limped along and they have never really been able to get a handle on it. I think now, actually, it is disappearing. I could not agree with you more.

We have taken too much time, but I would be glad if we could have our staffs visit with you or talk with us about which companies you know are doing the best in terms of the training programs and education, if you could let us know. I would be glad—with our colleagues here or with others—to try and get the people over there from the Labor Department, as well. We passed a decent bill this last year to try and eliminate an awful lot of these targeted programs, to have them more consolidated, and see what the possibilities are, I mean, the intersects on some of these things.

I will submit that as a question and then be in touch with you and see if we can get our colleagues to try and do something. Thank you very much.

Senator ABRAHAM. Thank you. Let me say, I have a few things to add. First of all, we will request that our subcommittee be retitled the Subcommittee on Immigration and Workforce Development.

Senator FEINSTEIN. Yes, that is good.

Senator ABRAHAM. We obviously are trying to encroach on somebody's turf who is going to get mad at me, probably by tomorrow, but——

Senator FEINSTEIN. Do not worry about it.

Senator KENNEDY. It is my turf on the Labor Committee, and I am glad to——

Senator ABRAHAM. Senator DeWine and you can work with us here. In fact, we probably should do maybe a joint hearing on this at some point.

I just wanted to put a couple other sort of comments into play here in response. Mr. Atkinson, you mentioned the notion, I think, of trying to work on a program to try to get teachers or people who would become teachers to commit to science and math and so on. If we moved in that direction, I would say, or States moved in that direction, certainly—this is going to be an anecdote-filled commentary by me, but one of the things I had an interesting experience with was just a year ago or so with Governor Keating of Oklahoma.

I do not know if you can shed any light on this issue beyond Oklahoma, but we were talking about the H–1B program, the problems, and he said, look, we have got them in Oklahoma, too. We need this increase. I thought, this is not the State that you would automatically think of. Part of my problem in Oklahoma, he said, is that in Oklahoma City—I think it was in Oklahoma City—he said, the oldest math teacher in the entire school system is 27 years old. That is because what is happening is the teachers are being hired. I assume—I am just seeing a lot of nodding of heads here—that math teachers are being hired by the private sector in high tech-related industries because the scarcity problem is forcing——

Senator FEINSTEIN. The best teachers end up in high tech. Every "Teacher of the Year" in California ends up leaving and going into high tech.

Senator ABRAHAM. I am trying to get toward the point here that it is a bigger problem. The education side of this strikes me as a lot more complicated than simply a money issue or a training issue or whatever, because I think the scarcity issue is taking people who could train folks, train our children to move in these skill areas. They are leaving. So a lesser, maybe a lesser focus exists.

I will say this. Our two girls started first grade this year, and in the school system, which is a fairly affluent school system that they attend, they have got a program for kindergartners, for first graders, and I do not know if it goes into second grade, of a special class on science one morning a week from 8 to 9 a.m. that is not taught by the school system but it is done through the PTA.

They had exactly enough help and support to do this for, I think it was nine children, and our girls, because of a little glitch in terms of the form getting in, were numbers 10 and 11, and so they were not going to get to participate because the PTA could only handle nine slots. Now, this is, as I say, a fairly affluent school system. Fortunately, my wife then got on the phone and literally recruited seven other children so that they could get another set of nine, which would justify having another section of this.

But that is it. That is the science training, and it happens not because of anything going on in the school system. So it really is another example of kind of the problems we confront, school systems with a lot of resources but not, at least at that age, focusing enough on science, so that this has got to happen on a separate track.

I wanted to ask a question that gets more back to not necessarily either Senator Gramm or Senator Robb's bill, but just the general issue of the H–1B needs and so on, at least the short-term issue that we have got to confront in this subcommittee. Ms. DeFife, you indicated that companies are moving offshore. I take it that is something that you have some personal familiarity with, and I suspect some of the others. We hear that. That is not just sort of a threat, that is happening, is that correct?

Ms. DEFIFE. That is correct. For our company, it is not, but I know a number of CEO's who have said, it is easier for me, it is more economically feasible, because I cannot find the workers here, to move. India is one that I am very familiar with a number of companies moving to.

Senator ABRAHAM. Ms. Katz, in your experience——

Ms. KATZ. The same phenomenon is happening with some West Coast companies.

Senator ABRAHAM. Mr. Archey?

Mr. ARCHEY. I think that is true. I would also, though, amend that to say that for most of our CEO's, they would rather expand here. I mean, there is not any question about that. That is really, if not the course of last resort, it is pretty damn close to it, of moving it offshore.

Senator ABRAHAM. The issue that we dealt with in the last go-around on this H–1B debate that was linked, in a way, was the notion also that, somehow, the perception existed that somehow it is cheaper and easier to find somebody overseas to come and work for you than it is just to hire. I mean, it is not a case that American

companies are for some reason benefitted by going elsewhere to find talent, when if the talent was here, it would be hired.

But this gets me to the question, I know in Senator Robb's bill, the sort of T visa concept, it is my understanding, and he did not specifically get into the numbers, but that we would be talking in the range of 8,000 to 10,000, maybe, per year, who would fit the parameters, that is, who would graduate with the kind of degree we are talking about, as well as the salary we are talking about.

I would ask all of you to comment on whether you think, at least in the short term, and by that, I guess I would say maybe over the next 5 years, whether if we were to revert back to the 65,000 number of H–1B visas but have this T visa program, whether you feel this is adequate in terms of the numbers, because that is sort of where we will be in a little more than a year.

Ms. DEFIFE. I know of one company that has 30,000 technical vacancies right now, so I can tell you that would not even come close.

Senator ABRAHAM. Thank you.

Ms. HOLDREN. It definitely would not come close. It is alarming.

Mr. ATKINSON. I would agree.

Ms. KATZ. I would also agree. I think it addresses an important aspect of it, but the problem is bigger than that.

Mr. ARCHEY. I think that is right. I think the problem is much bigger than that. You know, I think, Senator, there is one thing that ought to be considered. We are looking at 45 percent of all doctoral degrees in high technology that are now being given to foreign nationals, and that is only up to 1996 data. That is the last data the Department of Education has got. I think that number is going to be higher than 50 percent when you get up to 1999.

It strikes me, and I say this not flippantly at all, that when somebody who is a foreign national gets a doctoral degree in high technology and science, math, engineering, that along with the diploma, they ought to get a green card, because it is highly likely that that individual has also gotten some public support, through some form of fellowship or scholarship.

The thing that I do not understand is why would the U.S. policy want to encourage that individual to leave this country, and this individual right now is at the cutting edge of his field. Engineers will tell you, there is nobody more current in the field than somebody who is just coming out of a doctoral program. And then have them go back to whatever country, that just does not make sense.

Senator ABRAHAM. I have to say, that was actually the next point I was going to comment on, was that one of the things about Senator Robb's proposal, as I understood it today, that had an appeal to me is that it begins to look at that issue of people who are already coming here and part of the country for obviously their educational training and maybe some may have an H–1B as part of it in some way, but the idea that we are training folks to work for competitors does not make a lot of sense. But the notion of limiting it to only the people who would hit a certain income or salary level would bring the numbers down. That was my concern. And as I say, I have heard the number is 8,000 or 10,000, which seems to me to not maybe get there. But that is another issue that needs to be examined, Mr. Archey. I agree with you on that.

I do think it is important to acknowledge for the record the concern that I think Ms. DeFife mentioned with respect—although you did talk about some of the compensation issues, I believe, in your remarks. But I do think that there is a lot of sort of upside potential. It is kind of hard, and Senator Kennedy had to leave and I do not want to get too much into his statement without him here, but I do think the average salary for people in a certain area, to compare the average graduate with a mechanical engineering degree to a Harvard Law School graduate may not be quite the same as comparing them to the average law school graduate, where I think the number—I know, because of relatives, the numbers are not necessarily always the same as they are coming out of Harvard.

But, also, the upside investments that people make. I mean, not everybody that was in that list is somebody who has gone to 3 years of post-graduate education. I think if you compared people with post-graduate training of 3 years at an Ivy League school in these other areas and what their starting salaries are, I suspect they might be a little closer to the Harvard salary.

But all of that said, I do think we need to note that there is a pretty significant distinction between compensation and salary and some of the other inducements and incentives that people are, I think, not only inclined to want to do, because they want to kind of take a little bit of the risk, but also that, in fact, has become so well known as the way in the high tech area that so many have profited that that becomes pretty appealing.

The only other point I guess I would make on the general front is this, too. I think it is inevitable that in a program like H–1B, that there will be somebody, somewhere, who mishandles it, whether intentionally or unintentionally, brings somebody in, and you referenced fashion models. I am still waiting to have a hearing with the fashion model H–1B holders just for purposes of drawing attention to these hearings. With all due respect to all of you, if we brought in H–1B fashion models, we would have more cameras, I am sure, here. [Laughter.]

But nonetheless, it is also the case that a lot of the high tech uses of these visas is extraordinarily specific in nature. I had the opportunity to meet, it was, I guess, some people that Microsoft had under their H–1B program, because when we were dealing with the H–1B bill, there were a lot of questions about who these were.

For instance, one of the people was somebody who was basically adapting the operating system to Arabic and he was from Jordan. I cannot imagine there is an unemployed person in America who could do this thing, but he could. The notion that you had to get somebody like that—now, that may be a little too specific, but still, I was struck that virtually every one of the people I met, of the five or six who were brought here for that meeting, were doing things that you just did not have—the notion that there is an immediately available alternative is just simply wrong.

I just throw that out. I mean, you employ people on the H–1B program. Would you like to comment on the replaceability of those people in terms of the workforce here and your ability to find folks who could today, not in 5 years or 10 when hopefully we can do something, do that work?

Ms. DEFIFE. Well, it is interesting. I do not even have jobs that are that specific to doing something that I know I definitely could not find an American to do. There are not enough people to fill all of the jobs. I have been unable to find a single qualified employee for the one vacancy that has been open for 7 months, whether they are on an H–1B or not. So I can assure you that it is not something that is easy to do, it is not something that is taking jobs away from Americans, and it is not something that is so specialized.

Senator ABRAHAM. Seven months and no one qualified, either H–1B or non–H–1B.

Ms. DEFIFE. Correct.

Senator ABRAHAM. Ms. Holdren?

Ms. HOLDREN. I was actually excited to hear that Susan brought her network administrator in, because that is a position I have had open for 6 months, so I am experiencing much of the same.

Senator ABRAHAM. I want to just thank the panel. We appreciate very much your participation. This is a set of issues, and as you can see, that is rapidly going to expand beyond immigration. I am glad we had a chance to go beyond immigration because I tried in my efforts to increase the H–1B program to make it very clear that I see this, as many of you do, as not something that is an immigration-only issue by any means. I think as a country, we are very challenged here to try to find ways to address this in the long term.

The statistics on American children's academic performance are ones that really are quite staggering. Something is clearly happening between grade school and the middle of high school. One only has to have either their own children in these age categories or know kids in these categories to know that the interest in technology is extraordinarily great, and yet, for some reason, we are not very successful, whether it is in a cultural sense or it is in an academic sense or whatever, to convince folks that in addition to recreational uses, there are actually very lucrative employment possibilities.

I want to talk some more about the things that Mr. Atkinson has mentioned, and learn more about the things he has brought to us as ideas here, but there is a disconnect, and I see it even in friends of mine, family members. There still is a certain cultural distinction between what are perceived to be professions and things that are not.

In Michigan, we have people in the auto industry, I mean, in large numbers now, who are in one way or another in high tech jobs but they are theoretically blue collar employees. I think sometimes there is a failure to understand that there is a lot more remuneration for tool and die makers doing those kinds of things than there are for people who go out and get professional degrees in fields where there is a surplus of workers. So we do have these challenges.

I appreciate all five of you participating today to help us to get a little bit more information on the record about it. Hopefully, our colleagues will show a similar interest to the ones who were here today in trying to move forward.

Mr. Archey, do you want to comment?

Mr. ARCHEY. Just on one point, because it really kind of bugs me, which is the issue of the companies are trying to use H–1B to get

workers on the cheap. I am not saying that there are not some instances of that happening, but the companies that Roberta and I represent, I can tell you, one CEO said to me a couple of weeks ago, he said, those folks in Washington, they do not really believe that, do they, that we are going to do this on the cheap? He said, do they not understand that somebody who is getting a bachelor's degree from Stanford truly knows what the prevailing wage is? I just wanted to make that point, because that is one that—maybe it can be directed at a very small number, but it is a fundamentally wrong assertion.

Senator ABRAHAM. I appreciate your making the point. I tried to allude to it a few minutes ago. The fact is, obviously, why would you go through all of this trouble? We tried to toughen up the laws. We tried to increase the punishments. We have tried to create, for companies that may fit a certain profile, a certain amount of additional requirements for them to go through as a way to address it. I just do not accept it, either.

There are bad actors in every sector of the economy, and I am sure there might be somebody who is trying to do something, and we hear stories from time to time, but this is a case where I think sometimes people who for other reasons do not want something to move forward have raised these kinds of excuses.

But I think it is a good point for you to make, and if anybody else has a closing point, I would be glad to entertain it, and if not, I, again, want to thank you all, as well as our audience, for the hearing. I think it was very productive.

We are adjourned.

[Whereupon, at 4:14 p.m., the subcommittee was adjourned.]

APPENDIX

ADDITIONAL SUBMISSIONS FOR THE RECORD

PREPARED STATEMENT OF HON. PHIL GRAMM, U.S. SENATOR FROM THE STATE OF TEXAS

Mr. Chairman, thank you for the opportunity to provide the subcommittee with my views on an issue of such importance to the people of Texas, and to our entire nation. With record low unemployment and a nationwide shortage of highly skilled workers, many U.S. high technology companies have been forced to slow their expansion, or cancel projects, and may be forced to move their operations overseas because of an inability to find qualified individuals to fill job vacancies. We will achieve our full economic potential only if we ensure that such companies can find and hire the people whose unique qualifications and specialized skills are critical to America's future success.

On July 27, 1999, I introduced the "New Workers for Economic Growth Act" (S. 1440) to increase the number of available H–1B temporary work visas used by U.S. companies to recruit and hire foreign workers of exceptional skill, particularly in high technology fields. It is cosponsored not only by you, but also by Senators Trent Lott, Mitch McConnell and Sam Brownback. This bill will ensure that, the U.S. economic expansion will not be impeded by a lack of skilled workers.

Last year, the Congress temporarily increased the number of annual H–1B visas from 65,000 to 115,000 for fiscal years 1999 and 2000, and to 107,500 in 2001. The number of H–1B visas is scheduled to drop back to 65,000 for fiscal year 2002 and subsequent years. As you know, Mr. Chairman, our "New Workers for Economic Growth Act" will increase the H–1B visa cap to 200,000 for fiscal years 2000, 2001 and 2002. By the end of that period, we will have the data we need to make an informed decision on the number of such visas required beyond 2002. The bill retains the language of current law which protects qualified U.S. workers from being displaced by H–1B visa holders.

According to a recent study by the American Electronics Association, Texas has the fastest growing high technology industry in the country and is second only to California in the number of high technology workers. This legislation would ensure that these companies have access to highly skilled, specialized workers, in order that such businesses can continue to grow and prosper, and in doing so, create jobs and opportunity for U.S. workers.

Additionally, our bill expands work opportunities for America's retired senior citizens by removing the financial penalty which is now imposed on those who choose to continue to work while receiving Social Security and whose wages exceed specified levels. The Social Security earnings test robs senior citizens of their money, their dignity, and their right to work, and it robs our nation of their talent and wisdom.

Mr. Chairman, I believe that our legislation represents a fair and effective way to address a critical need in our Nation's economy. I appreciate the committee's attention to this important issue and look forward to working with you in an effort to secure enactment of our proposal.

PREPARED STATEMENT OF THE AMERICAN FEDERATION OF LABOR—CONGRESS OF INDUSTRIAL ORGANIZATIONS

The AFL–CIO expresses is appreciation for the opportunity to file written testimony comment to the October 21, 1999 Subcommittee on Immigration hearing on

"America's, Workforce Needs in the 21st Century." Of one thing we are absolutely clear: H–1B workers are not the answer to any perceived information technology skills shortage in either the long or short-term. By focusing attention on this dubious solution, we divert precious time and energy from ensuring that U.S. workers and their children are given a fair opportunity to attain necessary jobs skills, and to be fairly considered for jobs that currently are available.

Congress cannot continue to determine H–1B policy on the basis of unfounded reports of skills shortages. When subject to an objective analysis rather than self-serving anecdotes, the arguments made by the information technology industry fail to prove its case of the existence of a worker shortage. Rather than utilize recruitment methods that may attract U.S. workers to their companies, information technology companies have embarked on a multi-year quest for an unlimited supply of H–1B workers.

The information technology industry, other industries, must contend with a tight job market during these times of low unemployment. The usual response of an employer to a tight job market is to raise wages, and offer better benefits and working conditions to workers, both current and prospective. However, data from the Bureau of Labor Statistics show that real median weekly high technology wages were actually less in 1998 than in 1995, while wages for other mangers and professionals rose during that same time, illustrated on chart 1. Likewise, recent computer science graduates have not seen their initial wages increase, although they are said to be the objects of fierce bidding wars waged by employers eager to fill vacant positions. Economic history has shown us time and again that increased employment and steeply rising wages characterize a tight labor market. This is not the case for high technology industry. The prevalence of H–1B workers in the information technology industry must be considered a factor in the depression of information technology wages.

The Bureau of Labor Statistics figures shown on chart 1 indicate that the real issue here is not the availability of U.S. Workers or a skills shortage, but one of manipulation of the H–1B program by employers in order to hold wages down. In the August 30, 1999 edition of U.S. News and World Report, Roger Coker, Texas Instrument's director of staffing in the U.S. listed the pursuit of H–1B workers in addition to other anti-worker devices, such as the use of contingent labor, to "fight labor cost creep." Congress must ascertain the real motivations behind the employers' push for H–1B workers.

Employment practices of the high technology industry have not served to retain or recruit workers. The industry also continues to layoff workers at an alarming and steady pace. Since January 1, high technology companies have laid-off over 63,000 workers. As early as June, 1998, Computerworld magazine was predicting a "bloodbath" of unemployed programmers after the Year 2000 problems are addressed. This is hardly the behavior one would expect from an industry strapped for workers.

The report of the Virginia Commission on Information Technology stated that many of the vacancies listed by Virginia high technology companies could be filled but for the fact that the employer had "over-credentialed" the requisite qualifications, eliminating many job applicants capable of performing the job duties. This same "over-credentialing" is apparent in the push for workers with advanced degrees in mathematics, computer science and engineering. Although the high tech industry says that the jobs they need to fill with H–1B workers require advanced degrees, the Department of Labor states that the majority of H–1B Labor Condition Applications filed for computer positions are for programmers, not higher level occupations. Alleged shortages are exacerbated when employers are permitted to post job qualifications that are not related to openings, but are manipulated to exclude most potential U.S. applicants.

There is not enough information regarding the effect of expanding the H–1B program on U.S. workers. Last year members from both parties agreed that we did not know enough about the high tech worker skills shortage, or the effects of bringing in an additional 142,000 H–1B workers over the course of three years on the U.S. workforce. The American Competitiveness and Workforce Improvement Act of 1998 directed the National Academy of Science (NAS) to file reports on the alleged high technology worker shortage, and on allegations of age discrimination in the high technology industry. The NAS currently is in the process of gathering information through regional hearings and the solicitation of views from interested parties, and will submit a report to Congress in the Fall. Likewise, the 1998 legislation directed the Immigration and Naturalization Service (INS) to report information on H–1B workers, their employers and occupations by October 2000. While INS has stated that it will not make interim reports, the agency did announce last month that it overcertified upwards of 20,000 H–1B visa petitions. We know nothing more from the INS about the H–1B program other than the fact that the agency managed to

provide business with an extra 20,000 or more H–1B workers. The Department of State continues to investigate allegations of H–1B visa fraud at its consular offices. Accurate information is necessary to administer the H–1B program and to plan for the program's future. Increasing the number of H–1B workers without the interaction necessary to craft a meaningful, fair, and workable solution will ultimately shortchange U.S. workers. Congress should wait until the NAS, INS and the General Accounting Office submit reports on the H–1B program and its impacts on U.S. workers before considering another increase of the H–1B cap.

It is also too early to judge the effectiveness of worker protections and enhanced DOL enforcement abilities. Not one U.S. worker has been protected from displacement or failure to select for a job because DOL has not published regulations to implement the protections. Neither do we know if the enhanced DOL enforcement role goes far enough to protect workers. Fair treatment of U.S. workers should be given the same priority as industry's demands for H–1B workers.

Preparing for future workforce needs must include training opportunities for U.S. workers, access to education and fair consideration for jobs. Some members of Congress and the information technology industry have favored improving K–12 math, science and computer skills, while failing to promote training programs that would enable the parents of school children to work in the information technology industry right now. The best thing that can be done for American children is to give their parents the opportunity to get a good, secure well-paying job. With that foundation, parents can provide computers for their own children, contribute their time and tax dollars to improve curriculum in the public schools and send those well-educated children to college. Enrollment in computer science programs have increased in recent years, and Department of Education statistics project that at graduation rates of over 1 million annually, U.S. colleges and universities will be more than able to fill the new jobs of the future. Opportunity also means that once hired, the employer has the obligation to facilitate the attainment of skills by their own incumbent workers to meet future needs of the industry.

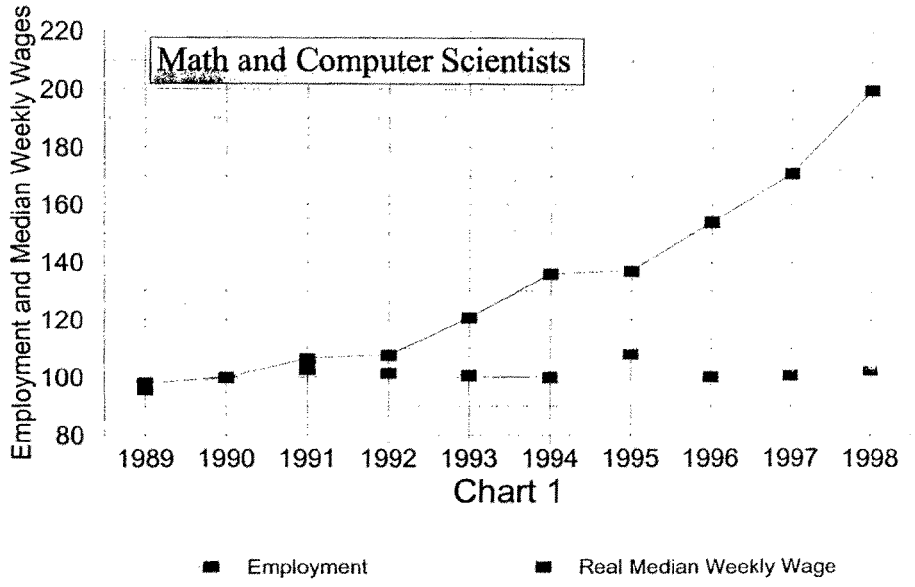
Allegations of age, gender and race discrimination in the information technology industry must be investigated and remedied. Disturbing allegations of age discrimination persist in the information technology industry, but have not been addressed with a thorough investigation or aggressive enforcement of laws prohibiting such discrimination. U.S. Census Bureau data shows that information technology workers over the age of 40 are 5 times more likely to be unemployed than other workers in that same age group. Discrimination against older workers has caused many information technology workers to leave the industry at a time when retention of talent is essential. The information technology industry's desire to wrap itself in the trappings of youth should not translate into discrimination against older workers based on stereotypes. More importantly, age discrimination is a violation of the nation's civil rights laws, and offensive to public policy.

Currently African American and Latino representation in the information technology workforce is 3.7 percent and 8.4 percent respectively. Many technology jobs are being filled by H–1B workers, while there is a labor pool of more than 300,000 African Americans and Latinos with engineering and scientific qualifications. A recent report by the Public Policy Institute of California noted that a 1991 survey of Asian information technology professionals in Silicon Valley found that two-thirds of those employed in the private sector believed that race was a factor in their failure to advance, and that the belief increased significantly with the age of the worker. The information technology industry must fully utilize the assets of all U.S. workers before looking to temporary foreign workers as a solution to personnel shortages.

Information technology industry representatives often cite the success of immigrant entrepreneurs, and link that success to the creation of jobs. However, these entrepreneurs are immigrants, not temporary foreign workers who are beholden to their H–1B employer/sponsor for not only their current job, but the opportunity to be sponsored for permanent immigration. These temporary workers cannot leave for a better job, or start their own business no matter how good their idea. The statement of an H–1B worker quoted in the November 1, 1999 edition of Computerworld best describes their predicament. "I'm in a situation where I'm at a disadvantage," said the worker. "I'm on H–1B. I don't have much bargaining power. In a sense, everyone on H–1B is in the same boat." The issues the AFL–CIO, worker advocates and concerned members of Congress have raised will not be addressed by granting the information technology or any other industry, a blank check for as many H–1B workers as they desire. It is time for policy makers to take a long, hard look at the H–1B program with all of its reported failings and abuses, and the behavior of the information technology industry in exploiting the program to the detriment of both

U.S. and foreign temporary workers, and to craft solutions that fairly serve the interests of both workers and industry.

Despite Fast Growth in Employment, Weekly Wages Have Barely Increased



Source: Bureau of Labor Statistics, Employment and Earnings, January, Various Years.

PREPARED STATEMENT OF THE AMERICAN OCCUPATIONAL THERAPY ASSOCIATION

The American Occupational Therapy Association (AOTA) appreciates the opportunity to submit a statement to the Subcommittee on Immigration of the Senate Judiciary Committee addressing the recruitment and employment of internationally-educated workers in the United States. We would like to offer our perspective on the policies that should be considered when making changes to employment-based visa programs, particularly the H–1B visa program. Internationally-educated occupational therapists have made up a significant percentage of H–1B visa recipients.

While the hearing today is intended to explore the workforce needs of the hi-tech industry to determine whether a substantial increase in the number of H–1B visas issued annually is warranted, other professions, including several health care professions are impacted by these changes. *We urge the Subcommittee to consider the impact any changes to the H–1B program will have on the health care industry.*

The AOTA is the nationally recognized professional association for over 60,000 occupational therapists and occupational therapy assistants. These individuals work with people experiencing health problems such as stroke, spinal cord, injuries, cancer, congenital conditions, developmental problems, and mental illness, in a wide range of practice settings including hospitals, nursing facilities, home health agencies, outpatient rehabilitation clinics, psychiatric facilities and school systems.

In general, policies directed at reform of employment-based immigration programs, including existing temporary workforce programs, should take into consideration the marketplace and other government action (budget reductions) which are likely to impact demand for services and the domestic workforce. Policies should be consistent with overall goals of meeting urgent but temporary business responsibilities and should strike a balance between American business needs to remain competitive by having access to skilled foreign workers, while also protecting American workers against abuses by employers who seek to replace domestic workers with lower-paid foreign workers. Internationally-educated workers should be appropriately trained and prepared to work in the U.S. Laws and regulations governing the recruitment of internationally-educated workers should recognize the need to evaluate the responsibilities of all parties involved including those of employers, recruitment agencies and credentialing organizations. This should take into account the need to identify both employment and preparation responsibilities involved in placing non-immigrant temporary workers in the U.S.

VISA PROGRAM POLICY SHOULD BE RESPONSIVE TO SUPPLY/DEMAND TRENDS

The U.S. Commission on Immigration Reform has identified the occupational and physical therapy fields as having among the highest numbers of nonimmigrant temporary workers in the U.S. on H–1B visas, second only to computer programmers.

In the 1980's a significant shortage and maldistribution of occupational therapy (OT) practitioners in the U.S. became evident. In response, the number of domestic education programs in the accreditation process has nearly doubled to 121 OT professional level programs and 157 technical level programs. This represents 24,409 individuals currently in U.S. schools or in clinical fieldwork placements who will be looking for work opportunities, or a 38 percent increase over the existing OT workforce of approximately 65,882 for 1998.

The anticipated supply of occupational therapists and occupational therapy assistants by 2005 approximately will equal the Bureau of Labor Statistics (BLS) employment forecasts for that year, *even if the marketplace is presumed to have no affect at all* in determining the future requirements for OT practitioners. Moreover, if the capacity of the OT education system increases more rapidly, the supply of practitioners by 2005 may be even larger than anticipated. BLS projections released in December, 1997 for the labor force for the period 1996–2006 estimates that occupational therapy employment will increase by 66 percent to 95,000, while occupational therapy assistant employment will grow by 69 percent to 26,000. A recent workforce study commissioned by AOTA suggests that these numbers may be too high, and questions the assumptions used by the BLS in describing the future direction of the health services industry and whether BLS estimates reflect some of the market-driven changes affecting different segments of the health care industry.

International recruiters also responded to the shortage of OT practitioners by markedly increasing their recruitment of internationally-trained OT practitioners. The percentage of newly certified OT's who are foreign graduates had risen from 3 percent in 1985 to over 20 percent in 1995. In 1997, this percentage fell to 14 percent in large part due to new English language proficiency requirements now required by the National Board for Certification in Occupational Therapy (NBCOT).

The AOTA believes that the shortage/maldistribution issue must now be viewed in the context of a rapidly evolving marketplace for health care services where consoli-

dation and integration are changing the demand equation for therapy services. Although uncertainty exists as to the pace, scope and ultimate impact of marketplace changes on the occupational therapy workforce, it is reasonable to assume that growth in demand for OT services will not continue as it has in recent years.

Changes to government-funded health care programs will have a significant impact on OT services. Medicaid and Medicare are the principal public purchasers of occupational therapy services, and spending for services for people with disabilities under these programs has risen rapidly in recent years. However, both Medicare and Medicaid are taking steps to gain more control over future spending for services provided to beneficiaries and recipients. Expanded payment reforms and greater use of managed care by these programs will have a major impact on the future demand for, and delivery of, occupational therapy and other rehabilitative services. Under the Balanced Budget Act (BBA) of 1997 many of these structural changes to the delivery of health care for both Medicare and Medicaid patients, as well as significant budget cuts in rehabilitative care under the Medicare program, were realized. For example, one of many provisions in the BBA affecting access to rehabilitative services places a limit on outpatient therapy, including occupational therapy. The limit—which is applied without regard to medical necessity—restricts Medicare coverage of occupational therapy to $1,500 per year per patient in most health care settings. This will have a significant impact on the utilization of therapy services under the Medicare program.

Private purchasers are also aggressively moving to restructure their approaches to health care delivery and finance by selectively contracting with networks of providers to control costs. Reports from AOTA members around the country indicate that greater market penetration of managed care in the private sector has led to more stringent management of the utilization of occupational therapy services. School districts, state governments and the federal government are all under increasingly severe budgetary and personnel constraints that will shape the future size and composition of the occupational therapy workforce.

About 27 percent of 1,000 AOTA members who responded to a survey regarding job status reported that they had lost jobs since January 1, 1999. Of these, about 21 percent had been laid off and 6 percent said that they had been forced to leave their employer due to severe cutbacks in pay, loss of contracts, or decrease in hours worked. The survey also indicated that many OT practitioners who have not lost jobs have had their hours reduced involuntarily, their pay cut, productivity quotas imposed or increased, or their status changed from salaried to per diem. Large rehabilitation employers such as NovaCare, Vencor, Sun Health and Mariner are mired in severe financial problems and have laid-off employees and taken other cost cutting measures. The results indicate that practitioners in long-term care, skilled nursing and home health settings are facing profound changes in their work status, their paychecks, and their ability to find appropriate work.

BALANCE COMPETITION WITH ASSURING OPPORTUNITIES FOR DOMESTIC-TRAINED WORKERS

As these changes in the marketplace are likely to impact the demand for services, policies should be examined to determine whether the processes in place to receive approvals for H–1B job openings are sufficient. Currently the H–1B visa program provides little incentive to employers to commit themselves to developing a domestic workforce. In fact, the current design of the H–1B program seems to be encouraging the building of businesses, which are dependent on the labor of foreign workers. Employers should be required to determine the availability of qualified U.S. workers before hiring H–1B workers, and to provide notice to potential domestic workers of job openings. Lay offs and replacements of domestic workers should be illegal under the law. Recruiting and training domestic workers should be a priority and policies should encourage employers to commit themselves to developing a domestic workforce rather than encouraging the building of businesses that are dependent on the labor of foreign workers. In the case of health care, training priorities would be particularly effective if directed at the maldistribution problems of health professionals.

Until recently, applications for therapy jobs outranked all other professions under the Department of Labor's attestation process. Most of these applications are coming from contractors/recruitment companies. Of the job openings certified by the Department of Labor in 1997, 25.9 percent or 103,097 were for therapists, second only to computer-related jobs at 44.4 percent or 177,034. Similarly, the business section of the *Washington Times* reported (October 13, 1998) that of the top 100 companies that sponsor the highest numbers of H–1B visa recipients, 25.9 percent are for therapists compared to 44.4 percent for hi-tech workers.

The Department of Labor reports of 14 enforcement cases involving employers of H–1B therapists, nearly all of which were recruitment companies, finding violations in prevailing wages in the amount of $2 million for nearly 400 temporary foreign therapists. In one case involving a contractor in the business of recruiting therapists from Poland primarily for jobs in Texas, the contractor paid its therapists $500 per month when the prevailing rate was $2,800 per month. The case resulted in the company paying more than $460,000 in back wages to 54 therapists. In another case, a contracting firm that supplies Philippine therapists to medical centers in 21 states was ordered to pay almost $1 million in back wages and $143,000 in civil penalties.

THE AMERICAN COMPETITIVENESS AND WORKFORCE IMPROVEMENT ACT OF 1998 (ACWIA) DOES NOT PROVIDE SUFFICIENT SAFEGUARDS

While AOTA supports the implementation of additional attestation requirements for employers to ensure better protections for workers, an issue addressed in ACWIA, we regret that the law does not extend these protections to all workers potentially effected by the H–1B visas program. The law only applies these protections to a small number of H–1B dependent employers. This is particularly troubling considering that the law also substantially increases the number of visas over the next three years to more than 60 percent, and the hi-tech industry is already requesting Congress to consider additional significant increases to over 200,000 visas annually.

BUSINESS PRACTICES SHOULD ENSURE A WELL TRAINED WORKFORCE

Internationally-educated health care practitioners should have sufficient education and clinical preparation to work in U.S. health care settings/programs, including a minimum level of field-based experience in their field prior to coming to the U.S. In addition to appropriate education, clinical training and work experience, the individual should be appropriately prepared in oral and written language skills, cultural differences, and reporting, documentation and other management requirements of U.S. health care systems. These skills are particularly critical in an industry that works with a vulnerable patient population. The majority of consumers seeking occupational therapy services are doing so incident to serious injury or illness, or other physical, medical or psychological problems that result in disabilities. Because of the complexity of the population served by occupational therapy practitioners, it is especially important to regulate members of this profession in a manner that assures the highest level of protection for those populations who are extremely vulnerable, frail and often have multiple problems.

The increase in internationally-educated therapists working in the U.S. has focused attention on issues and business practices associated with recruitment and placement practices that frequently adversely affect the well-being of therapists recruited to the U.S. to work. Among the problems cited were instances of insufficient preparation and training to work in U.S. health programs, inappropriate written language skills for meeting the demands of reporting requirements of Medicare and insurance companies' documentation requirements, lack of prior cultural orientation preparation for working particularly in rural areas, and lack of access to professional resources to adequately prepare for the national examination.

Many of the suggestions offered to improve the process center on the activities of recruitment companies and include ensuring that therapists are working with reputable recruiting/contract firms and that they understand the terms of their contracts and their rights and responsibilities under state practice laws as well as federal immigration and labor laws. Requiring therapists to meet all certification requirements prior to receiving a visa has been recommended. Currently many states allow OT's to practice for up to 6 months without a license. The AOTA is troubled by anecdotal reports that some firms are moving therapists from state to state to avoid meeting license requirements. Also, anecdotal reports of recruitment companies "parking" foreign therapists have also been described. In these situations, companies keep foreign therapists in a holding pattern between jobs with employers while not paying them any salary. Under H–1B rules, foreign workers are required to receive pay on a continuous basis.

AOTA URGES CONSIDERATION OF THE HEALTH INDUSTRY WHEN INCREASING H–1B VISAS

The AOTA urges the members of the Subcommittee to consider refinements to the current H–1B temporary worker program that take into consideration the changing marketplace, that are more consistent with the overall goals of this program to meet urgent but temporary business responsibilities, that ensures a well-educated and prepared foreign-trained workforce and that carefully scrutinizes the responsibilities of all parties involved in the recruitment of foreign workers.

Above all, AOTA asks the Members of the Subcommittee to consider the impact of a substantial increase in H–1B visas on all industries affected—including the health care industry (approximately 17 health care professions qualify for H–1B visas). *Should the Subcommittee recommend an increase in these visas, we request that these additional visas be directed only to those industries with demonstrated shortages.*

During the negotiations on ACWIA during the 105th Congress, the House and Senate conference committee agreed to limit the number of visas directed to the health professions to a level that more appropriately corresponded to the health care marketplace. However, the White House, among other issues, asked Congress to eliminate this amendment claiming it violated the GATT agreement. AOTA did not agree, but the law was passed without this amendment, so all categories of H–1B professions fall under the new increases in visas.

On behalf of our members, we thank you for the opportunity to address these concerns and we look forward to working with the Subcommittee on employment-based and related immigration issues.

PREPARED STATEMENT OF JOHN WILLIAM TEMPLETON, CO-CONVENOR, COALITION FOR FAIR EMPLOYMENT IN SILICON VALLEY

Chairman Abraham, Senator Kennedy and Subcommittee Members: I'd like to begin by posing a question. Could you count to one thousand?

Do you believe that most Americans could count to eight hundred?

If you lived in a subdivision that was one thousand parcels wide by eight hundred parcels long, could you locate your house?

Of course, to find your address, you would go down a certain number of house and then perhaps across a few more.

More than 250 million Americans perform that task every day.

And that is the same basic skill that computer programmers perform. They describe the behavior of a computer screen that is 1,000 pixels wide by 800 pixels deep. A program tells each pixel what to do, choosing from two options.

I'm not a programmer, but the author of a computer language with whom I'm writing a technical book, just liberated me from the gnawing feeling that there was a super race of people out there somewhere who could program computers.

I'd like to share that same sense of liberation with you in the hope that you would realize that the non-immigrant visa is perhaps the biggest fraud perpetrated on the Congress of the United States in many years. Behind the fog of how difficult it must be to program a computer, you've been convinced to undo the protections of the immigration system and abdicate your constitutional responsibility to control access to this country to a few overseas contractors. More than eight of ten Americans, when asked if they would approve of a law like the H–1B program, think it is a ridiculous idea. Most are not aware that you actually put this provision into law. They certainly don't know that the government actually allowed more H–1B visas in the country than the law provided or that 60 percent of the applicants are of questionable qualifications.

African–Americans, Latinos and Native Americans are painfully aware of how Congress warped the labor marketplace with this corrupt program. Approximately 770,000 of those groups currently work in information technology throughout the economy, according to the Bureau of Labor Statistics. But fewer than 18,000 work in high technology federal contractors.

Let's examine why this has warped the working of the free market. There are 125,000 African–Americans and 54,000 Latinos who are systems analysts. There are also 166,000 of those two groups who are engineers. In addition, there are 39,000 African–Americans and 30,000 Latinos who are programmers.

Interestingly enough, the Bureau of Labor Statistics lists programmers not as a professional occupation, but as a technical profession.

The employees we've just listed total 414,000.

According to the Institute of Electrical and Electronic Engineers, only 7,349 members of those groups received bachelors degrees in engineering in 1997–1998. Only 1,700 received masters in engineering and only 205 received doctorates in engineering.

Go back five years, the comparable numbers are 5,657; 1,324 and 103.

Clearly, those numbers are not sufficient to produce more than 400,000 high tech workers. Let's look at some real life examples. Two weeks ago, the Byte Back program in the nation's capital held a graduation for a class of 20 interns, all older persons being retrained in high tech skills. I watched one woman of about 50 years

of age describe having spent the previous 10 years as a cook. After one years internship, she is now a database administrator.

One of my co-convenors in the Coalition is Jacqueline S. Anderson, who began working with Bank of America 18 years ago as a teller. Last year, we celebrated her graduation from a masters of business administration program at Golden Gate University. At the time, she had two small kids and had been receiving welfare. Since banking became increasingly technology intensive during that period, she began going to night school in mathematics. Five years before she finished her bachelors degree, she was already working for the bank as a technology troubleshooter, writing the customer account and call center software and leading teams of programmers to integrate merged banks. When the bank itself was acquired, her skills were highly coveted by the new owners. They got rid of the CEO and promoted her.

People like Jackie have an organization called Black Data Processing Associates that holds programming classes for high school students each Saturday. The chapters around the country have a programming competition each August.

People who have risen up through the ranks have a tendency to reach back and bring along others.

Let's look at another example, Jennifer Wellington, an instructional technologist at San Francisco State University who operates its high tech learning lab. She gained her technical training in the U.S. Army Signal Corps. I met her when she wired the technical pavilion of 30 computers at the Juneteenth celebration in San Francisco for Microsoft. Interestingly enough, no one from Microsoft offered her a job, though.

That is another source of talent which the normal functioning of the free market would tap. There are currently 422,977 African–Americans and 161,611 Latinos in the U.S. military. That's 600,000 young people who somehow have mastered the math and science to operate the most advanced technology. There are more than 167,000 black female veterans like Wellington and 770,000 black male veterans under the age of 44—almost one million people who have placed their lives on the line for this country.

The kind of free market they fought for would value their skills and aptitude.

The Department of Defense has had to step up its recruiting, get involved in K–12 education, increase scholarship assistance and continuing education. That demand has increasingly benefited the groups that have been excluded.

In a free market, the same thing would happen in high technology.

Congress has created a situation where only three Silicon Valley companies fund scholarships through the National Action Council on Minorities in Engineering which provides 700 scholarships yearly on a budget of $5 million; where only four companies are corporate sponsors of the Silicon Valley chapter of the National Society of Black Engineers, where more than 1,200 of 1,500 firms do not file EEO–1 or VET–100 forms with the Joint Reporting Committee, where a national laboratory just told an African–American receiving a Ph.D in physics this year that it had no places available and last year told a black female Rhodes Scholar in physics the same thing, where the number of African–Americans and Native Americans at federal contractors in Northern California high tech firms actually declined from 1996 to 1997.

That's why this program violates the equal protection clause of the 14th Amendment. It denies those workers the opportunity to work in the high-paying jobs created by taxpayer funded research and allows a group of wealthy campaign contributors to flout the laws that other employers have to abide by.

The impact in lost wages is $350 million per year for blacks, Latinos and Native Americans in Northern California. The impact over the next 20 years will be $3 trillion in lost income and entrepreneurship—that's 15 times the impact of residential segregation over the past 50 years. In Oakland, Micheal Fields, a former military veteran who rose to be president of Oracle USA without benefit of a college degree, has invested in a startup company called Via Novus, which has doubled in the past year and plans to hire 300 employees in the next year by hiring from places like the local community college district and area universities. If they can find these workers, why not the larger high tech companies.

The San Jose airport has a curfew of 11 p.m. No one can land a plane there past that point. Oracle Chairman Larry Ellison has landed his plane after the curfew numerous times. The same attitude permeates companies like Oracle on this H–1B program. They think they're above the law.

I'm having to cancel a trip to Cote D'Ivoire to a World Bank conference on educational technology for my software business in November because I can't get a passport renewed by then. But an H–1B can get approved into the country in seven

days, by fax, with no confirmation of the supposed qualifications. Do you think that is not an invitation to fraud?

NEWS RELEASE OF THE AMERICAN BUSINESS FOR LEGAL IMMIGRATION

EMPLOYERS TO CONGRESS: FIX H–1B VISA PROGRAM SO WE CAN HIRE WORKERS WE NEED

WASHINGTON, D.C., Oct. 21, 1999—Declaring that the annual cap on H–1B visas may be reached as early as January of next year, the American Business for Legal Reform coalition (ABLI) and more than 90 companies and associations today sent letters to members of the House, Senate and the Administration urging them to start work now on finding a bipartisan solution to the problem. A hearing on the program was held today by the Immigration Subcommittee of the Senate Judiciary Committee, chaired by Sen. Spencer Abraham (R–MI).

"The U.S. must not allow the baseless H–1B visa quota to cripple our ability to compete in the global economy," the letter said. "Creative solutions which do not burden employers with unproductive paperwork and fees are needed now."

According to the letter, at least 35,000 visas already have been issued in fiscal year 2000, and the quota may be reached by January 1. H–1B visa petitions filed after April 1999 were not processed in this fiscal year, causing projects to be pushed back or moved abroad and jobs to be delayed.

"The inability to obtain H–1B visas for skilled professionals impacts all U.S. industries. We are losing our edge in attracting skilled professionals to countries like Canada, the United Kingdom, Ireland and others which have streamlined their visa systems to attract skilled workers," the letter concluded. "The employer community appreciates the attention Congress has paid to this issue, and the legislation that has been introduced to alleviate this burden. We urge you to work with your colleagues to find a bipartisan solution and move a bill through the committee process *before* we reach the fiscal year 2000 quota."

American Business for Legal Immigration is a coalition of business associations and companies concerned about legal, employment-based immigration. ABLI believes foreign business personnel are vital to maintaining U.S. competitiveness in the global marketplace. Our laws should recognize the significant contributions made by legal immigrants to the vitality of the U.S. economy.

NEWS RELEASE OF THE AMERICAN OCCUPATIONAL THERAPY ASSOCIATION, INC.

EMPLOYMENT TRENDS CALL FOR CHANGE IN IMMIGRATION WORKFORCE POLICIES

Bethesda, MD The American Occupational Therapy Association is submitting testimony today to the Subcommittee on Immigration of the Senate Judiciary Committee requesting that workplace visa policies be amended to consider changes in the marketplace that seriously affect health care professionals participating in the H–1B visa program. Senator Phil Gramm (R–TX), together with Senate Majority Leader Trent Lott (R–MS) and Senator Mitch McConnell (R–KY), are pushing legislation to raise the number of visas to 200,000 from its current ceiling of 115,000.

Traditionally, the occupational and physical therapy fields have had the highest numbers of nonimmigrant temporary workers in the United States on H–1B visas, second only to computer programmers—the target of this new push to raise the number of visas. But in the months since the Balanced Budget Act of 1997 took effect, there has been a significant drop in the amount of therapy that is ordered and paid for through government sponsored programs such as Medicare. At the very least, supply now equals demand in most settings. An increase in the number of available H–1B visas could make it more difficult for U.S. OT practitioners to find employment.

AOTA believes workplace visa program policies that affect the supply of health care practitioners must find a balance between reduced reimbursement and need of Americans for good quality care. In its testimony, AOTA stated that "policies should strike a balance between the needs of American business to remain competitive * * * while protecting American workers against abuses by employers seeking to replace domestic workers with lower paid foreign workers."

AOTA contends that the current design of the H–1B program may encourage the development of businesses that are dependent on the low-cost labor of foreign-trained workers. The association would like employers to be required to determine the availability of qualified U.S. workers before hiring H–1B workers.

"The Balanced Budget Act and greater use of managed care by Medicaid and Medicare, the principal public purchasers of OT services, have decreased the demand for occupational therapy and other rehabilitation services," notes AOTA Associate Executive Director Fred Somers. "Resulting employment cutbacks have been exacerbated by major healthcare providers who were not positioned to effectively deal with these reimbursement changes."

AOTA is the nationally recognized professional association for over 60,000 occupational therapists and occupational therapy assistants. These individuals work with people experiencing health problems such as stroke, spinal cord, injuries, cancer, congenital conditions, developmental problems, and mental illness, in a wide range of practice settings including hospitals, nursing facilities, home health agencies, outpatient rehabilitation clinics, psychiatric facilities and schools.

NEWS RELEASE OF THE NATIONAL ASSOCIATION OF MANUFACTURERS

NAM CALLS ON CONGRESS TO STEP UP EFFORTS TO FIND BIPARTISAN SOLUTION TO H–1B VISA CRISIS

Inability to Hire Skilled Workers Impacts Broad Range of Companies

WASHINGTON, D.C., Oct. 21, 1999—Noting that some 35,000 H–1B visas have already been issued since the beginning of October, the National Association of Manufacturers today called on Congress to find a "bipartisan, innovative and fair way to enable U.S. companies to hire the personnel they need to maintain their competitive edge."

"Arbitrary caps and quotas that are not based on the realities of today's global economy are stifling our ability to compete and could threaten our economic vitality," said Sandy Boyd, the NAM's assistant vice president for human resources policy. "Congress needs to take the lead in finding a sensible solution, sooner rather than later.

"Already, we are losing ground to other countries in key areas because their companies have access to professionals with highly specialized math and science skills when, very often, American companies don't. We simply can't afford to wait to streamline our visa process, which often leads to delayed projects, lost business opportunities and limited job creation.

"Crafting a balanced and creative solution to our H–1B visa problems now could be one of the most important things Congress does for American economic growth and prosperity," Boyd concluded.

The National Association of Manufacturers—"18 million people who make things in America"—is the nation's largest and oldest multi-industry trade association. The NAM represents 14,000 members (including 10,000 small and mid-sized companies) and 350 member associations serving manufacturers and employees in every industrial sector and all 50 states. Headquartered in Washington, D.C., the NAM has 11 additional offices across the country.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS, INC.,
UNITED STATES OF AMERICA,
Washington, DC, October 20, 1999.

The Hon. WILLIAM JEFFERSON CLINTON,
President of the United States,
1600 Pennsylvania Ave.,
Washington, DC.

DEAR MR. PRESIDENT: As you know, the Immigration and Naturalization Service has announced that it issued at least 20,000 unauthorized H–1B non-immigrant visas in fiscal year 1999. Since it would require an Act of Congress to create such a large number of visas, resolving the problems created by this error pose several unattractive options.

First, the INS could simply proceed as if these unauthorized visas were not issued in fiscal year 1999, but rather under the total authorized by Congress for fiscal year 2000. In effect, these temporary non-immigrant workers would simply have been hired several months early.

But lobbyists for the affected industries, notably information technology, and their allies in Congress have argued that this approach, however sensible, would somehow "penalize" industry by counting the 20,000 unauthorized visas for fiscal year 1999 in the 115,000 authorized for fiscal year 2000. Obviously, if the INS does not have authority to reduce the total for fiscal year 2000, it did not have the authority

to increase the total for fiscal year 1999; the agency cannot simply create visas whenever it loses count. Which leaves a second option.

The law may mandate the INS to revoke all H–1B visas issued in fiscal year 1999 beyond the 115,000 specifically authorized by the Congress. That would force the INS to require all of these new hires to re-apply for H–1B visas to be issued under the fiscal year 2000 ceiling. This approach would follow the letter of the law, but it may be particularly difficult to implement in light of the INS' evident difficulties.

It seems likely that no matter which approach the Administration follows, there will be litigation. If the unauthorized visas arc revoked, some employers and H–1B visa holders may sue. And if the INS does not issue the 115,000 visas authorized by Congress for fiscal year 2000 during fiscal year 2000, employers who seek H–1B visas for new hires when the available visas run out next year are also likely to sue.

As President of the IEEE–USA, the career services and public policy arm of the 225,000 U.S. members of the Institute of Electrical and Electronics Engineers worldwide, may I make a suggestion that might—just might—avoid a needless mess?

Green cards, not guest worker visas, are the answer.

As you know, the IEEE–USA opposed last year's increase in the H–1B visa ceiling from its permanent level of 65,000 to a temporary level of 115,000 for several sound reasons. But one of the most telling is simply that, for all the talk about shortages of skilled workers and high demand for H–1B guestworker visas, in every year since the Immigration Act of 1990 nearly tripled the available number to 140,000, we have fallen far short of using all of these permanent employment-based visas. For example, in fiscal year 1998 (the most recent year for which official figures are available), the INS reported just 77,000 of the 140,000 were issued.

Mr. President, you are justly proud of your record as "pro-immigration—and pro-immigrant." Many observers note that most H–1B visa holders intend to remain in the United States as permanent immigrants, and it makes no sense that they are here on temporary, NON-immigrant visas.

Surely we can devise a better system for skilled immigration than the current combination of the H–1B fiasco and the utterly failed bureaucratic paper chase of labor certification. Since every year 50,000 to 60,000 permanent employment-based visas remain unused, and since most H–1B workers want to be permanent immigrants, the most fair way to resolve industry's concerns that it not be penalized for the INS error would be to use those unused employment-based visas.

There are unacceptably long delays, which are getting even worse, to get green cards from the INS. But the fact is, it is labor certification itself that causes the real failure of employment-based immigration both to protect U.S, workers and to provide industry with the skilled immigrants which they need.

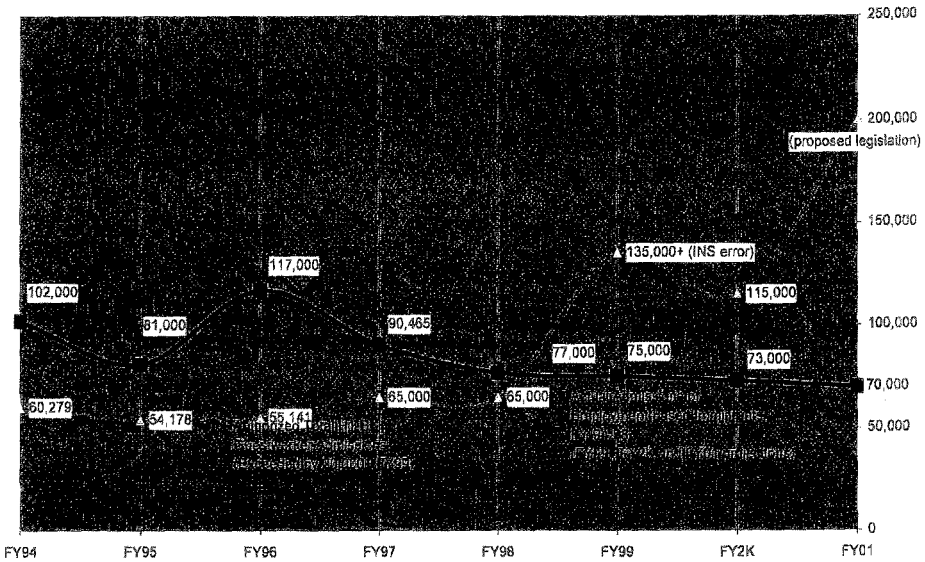
We are ready to work with your administration, and the Congress, to develop and implement a better way to allow industry to hire the skilled workers they need, promptly: as immigrants, not guest workers.

Green cards, not guest workers. That is the solution, Mr. President.

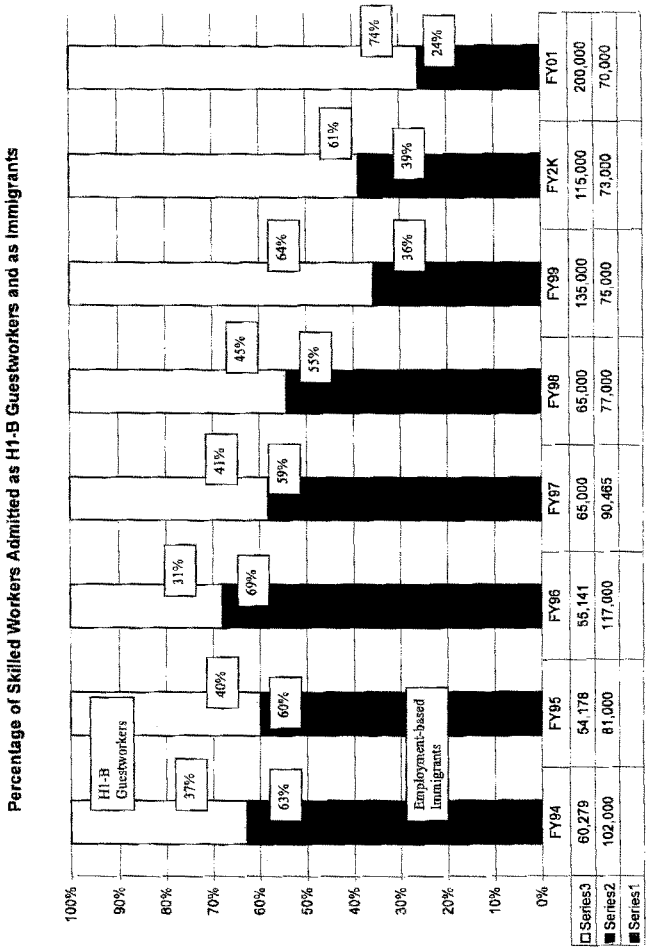
Sincerely,

PAUL J. KOSTEK,
President, IEEE–USA.

Comparison of Increase in H1-B guestworkers and Decline in Employment-based Immigration



Sources: INS, State Department, IEEE-USA projections


Percentage of Skilled Workers Admitted as H1-B Guestworkers and as Immigrants
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
H1-B Guestworkers
Employment-based Immigrants
37%
63%
40%
60%
31%
69%
41%
59%
45%
55%
64%
36%
61%
39%
74%
24%
FY94
FY95
FY96
FY97
FY98
FY99
FY2K
FY01
Series3
Series2
Series1
60,279
102,000
54,178
81,000
55,141
117,000
65,000
90,465
65,000
77,000
135,000
75,000
115,000
73,000
200,000
70,000

ABLI American Business for Legal Immigration

October 20, 1999

[Identical letter sent to full Senate, House, and Administration]

The Honorable Trent Lott
United States Senate
487 Senate Russell Office Building
Washington, DC 20510

Dear Senator Lott:

Imagine finding a bright, motivated person to fill a key position on your staff. Now imagine being told that you cannot hire this person for ten months because an arbitrary and artificial quota on key staffers has been filled for this year. This is what happens to U.S. employers with the H-1B visa quota.

Although the H-1B visa limit was increased last year, continued economic growth and increasing demand for skilled workers caused the quota to be filled before the end of the year. Petitions filed after April 1999 were not adjudicated under the FY99 quota. This meant that new college graduates could not begin their jobs in the United States, professors could not teach fall semester classes, and projects were moved abroad when key members of a team could not enter the United States.

The FY00 H-1B quota may be gone as soon as January 1, 2000. At least 35,000 visas have already been issued in FY00. The inability to obtain H-1B visas for skilled professionals impacts all U.S. industries. We are losing our edge in attracting skilled professionals to Canada, the United Kingdom, Ireland and other countries which have streamlined their visa systems to attract skilled workers. The U.S. must not allow this baseless quota to cripple our ability to compete in the global economy.

The employer community appreciates the attention Congress has paid to this issue and the legislation introduced by Senators Gramm (S. 1440), Robb (S. 1645) and McCain and Representatives Dreier (H.R. 2698) and Lofgren (H.R. 2687) to alleviate this burden. Creative solutions, which do not burden employers with unproductive paperwork and fees, are needed now. We urge you to work with your colleagues to find a bipartisan solution and move a bill through the committee process before we reach the FY00 quota.

We stand ready to work with you to find a sensible solution to this problem. If you have any questions or need additional information, please contact ABLI co-chairs Jenny Verdery at (202) 626-4380 or Sandy Boyd at (202) 637-3133.

Sincerely,

A. T. Cross
Algomod Technologies Corporation
American Council on International Personnel
American Dehydrated Foods, Inc.
American Electronics Association
American Immigration Lawyers Association
Armstrong World Industries
Atmel Corporation
Bayer Corporation
Bechtel Group, Inc.
BFGoodrich Company
Bioanalytical Systems, Inc.
Bridgestone/Firestone, Inc.
CapNet
Caterpillar, Inc.
ChannelLock, Inc.

ABLI American Business for Legal Immigration

Cisco Systems, Inc.
Clips & Clamps Industries
College & University Personnel Association
Compaq Computer Corporation
Computer & Communications Industry Association
Computing Technology Industry Association
Conquest Systems
Coors Brewing Co.
Crane & Co., Inc.
DaimlerChrysler Corporation
DBT Online, Inc.
Dell Computer Corporation
Detroit Diesel Corporation
Eastman Kodak Company
Eaton Corporation
Edge Biosystems, Inc.
EDS
Employers Association of Western Massachusetts
Glassmaster Co.
Goodyear Tire & Rubber Co.
Guidant Corporation
Harris Corporation
Hewlett-Packard
Hillenbrand Industries
Honeywell
Hosiery Association
Illuminet
Information Technology Association of America
Ingersoll-Rand Co.
Integrated Computer Management
Intel Corporation
International Paper
JDS Uniphase
Keane, Inc.
Lam Research Corporation
Lucent Technologies
Mahle, Inc.
Mastech Corporation
Microlog Corporation
Microsoft
Motorola
Nalco Chemical Co.
National Association of Manufacturers
NCR Corporation
Oracle Corporation
Otsuka America Pharmaceutical Inc.
P&H Plating Co., Inc.
Pelton Company
Perfection Spring & Stamping
Photocircuits Corporation
PPG Industries, Inc.
PriceWaterhouse Coopers
Quality Information Systems
RadioWave.com
Real Time Enterprises, Inc.
Sabre, Inc.
Small Business Survival Committee
Society for Human Resource Management
Software Information Industry Association
Sun Microsystems, Inc.
Technology Training Tax Credit Coalition
TESCO Engineering, Inc.
Texas Instruments
TMW Systems, Inc.
TREEV, Inc.
TRW, Inc.
Turner WSD
U.S. Chamber of Commerce
U.S. Farathane Corporation
UNOVA, Inc.
West Milton Precision Machine & Tool, Inc.
Western Digital
Yuasa, Inc.
Zero Zone, Inc.

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