PRECEDENTIAL

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

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Nos. 06-1818 and 06-2604

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PUBLIC CITIZEN HEALTH RESEARCH GROUP;
THE UNITED STEEL, PAPER AND FORESTRY,
RUBBER, MANUFACTURING, ENERGY, ALLIED
INDUSTRIAL AND SERVICE WORKERS
INTERNATIONAL UNION,
Petitioners in No. 06-1818

v.

UNITED STATES DEPARTMENT OF LABOR,
OCCUPATIONAL SAFETY AND
HEALTH ADMINISTRATION,
Respondent

Aerospace Industries Association of America, Inc.,
Portland Cement Association**,
Surface Finishing Industry Council*,
Color Pigments Manufacturers Association, Inc.,
National Association of Manufacturers
and Specialty Industry of North America,
Intervenors

*(*Dismissed - See Court's Order dated 12/13/06)*
*(**Dismissed - See Court's Order dated 06/26/07)*

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

_____

EDISON ELECTRIC INSTITUTE,
Petitioner in No. 06-2604
v.

OCCUPATIONAL SAFETY AND
HEALTH ADMINISTRATION,
UNITED STATES DEPARTMENT OF LABOR,
Respondent

Aerospace Industries Association of America, Inc.,
Portland Cement Association**,
Surface Finishing Industry Council*,
Color Pigments Manufacturers Association, Inc.,
National Association of Manufacturers
and Specialty Industry of North America,
Intervenors

*(*Dismissed - See Court's Order dated 12/13/06)*
*(**Dismissed - See Court's Order dated 06/26/07)*

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Appeals from the United States Department of Labor
Occupational Safety & Health Administration
(Agency No. OSHA-1: H054A)

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Argued November 21, 2008

Before: SCIRICA, Chief Judge,
RENDELL, Circuit Judge,
and O'CONNOR, Retired Associate Justice,
U.S. Supreme Court*

(Filed February 23, 2009)

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* Honorable Sandra Day O'Connor, retired Associate Justice of the United States Supreme Court, sitting by designation.

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OPINION OF THE COURT

RENDELL, Circuit Judge.

Petitioners challenge a standard promulgated by the Occupational Safety and Health Administration ("OSHA") to regulate the occupational exposure of workers to hexavalent chromium ("Cr(VI)"), a toxic substance. Public Citizen Health

Research Group and the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Worker's International Union, (collectively "HRG") join in arguing that OSHA violated its statutory mandate in adopting a standard that under-regulates Cr(VI) exposure. The Edison Electric Institute ("EEI") separately argues that OSHA improperly adopted a standard that is over-inclusive of coal and nuclear electric power generating plants. For the reasons stated below, we will grant HRG's petition with regard to the employee exposure notification requirements of the standard. We will deny both petitions on all other grounds.

I. Background

Cr(VI) is a state of the metal chromium that generally results from man-made processes. Occupational Exposure to Hexavalent Chromium, 71 Fed. Reg. 10,100, 10,104 (Feb. 28, 2006). Compounds containing Cr(VI) can exist in mist, dust, or fume form, and have long been known to jeopardize the health of workers when inhaled, or upon contact with skin. Cr(VI) has been known to cause lung cancer, asthma, and damage to skin and the lining of the nasal passage. *Id.* at 10,108. Compounds containing Cr(VI) are used intentionally to perform metal electroplating, and in the production of chemical catalysts and pigments for textile dyes, paints, inks, glass, and plastics. Cr(VI) compounds are also encountered incidentally, for example as a by-product of certain welding processes, and as an impurity found in portland cement. *Id.* According to OSHA,

there are over 30 industry sectors in which workers may be exposed to Cr(VI). *Id.* at 10,246-55.

In 1971, OSHA adopted a permissible exposure limit ("PEL") of 52 micrograms of Cr(VI) per cubic meter, or 52 $\mu g/m^3$, which had been a recommended industry limit since 1943. *Id.* at 10,101-03. The early standard was established to protect nasal tissues from irritation and damage, but, over time, government and private organizations came to recognize Cr(VI) as a carcinogen. *Id.* at 10,103. In 1998, this Court denied a petition by the Oil, Chemical and Atomic Workers Union and Public Citizen's Health Research Group to compel OSHA to establish a lower PEL for Cr(VI). *Oil, Chem. & Atomic Workers Union v. OSHA*, 145 F.3d 120 (3d Cir. 1998). In 2002, however, this Court directed OSHA to "proceed expeditiously with its [Cr(VI)] rulemaking" after finding that OSHA's delay in promulgating a new standard had become unreasonable. *Pub. Citizen Health Research Group v. Chao*, 314 F.3d 143, 159 (3d Cir. 2002).

OSHA subsequently proposed a new Cr(VI) standard in 2004, and opened the matter for comment. The proposed rule contemplated reducing the PEL from 52 to 1 $\mu g/m^3$. Occupational Exposure to Hexavalent Chromium, 69 Fed. Reg. 59,306 (Oct. 4, 2004). After extensive comments and hearings, OSHA issued its final rule on February 28, 2006. 71 Fed. Reg. 10,100. Upon examining the health risks to workers, and the feasibility of implementing various PELs,

OSHA replaced the proposed 1 µg/m^3 PEL with a universal PEL of 5 µg/m^3. 71 Fed. Reg. 10,100-385. OSHA issued corrections to the final rule on June 23, 2006, and a minor amendment on October 30, 2006, reflecting a settlement agreement with various parties. 71 Fed. Reg. 36,008 (June 23, 2006); 71 Fed. Reg. 63,238 (Oct. 30, 2006).

HRG and EEI level a number of attacks on the methodology employed and conclusions reached by OSHA. We accordingly summarize OSHA's relevant methodology and findings as background for our decision.

A. Estimation of Health Risk

In adopting a new standard, OSHA must establish that workers face a significant risk of material harm. OSHA considered more than 40 studies of workers in order to assess the relationship between exposure to Cr(VI) and lung cancer. 71 Fed. Reg. 10,175. OSHA decided to base its risk analysis on the so-called "Gibb" and "Luippold" cohorts, which were both derived from studies of workers in chromate production facilities. *Id*. at 10,176, 10,220. According to OSHA,

> the Gibb cohort and the Luippold cohort, were found to be the strongest data sets for quantitative assessment . . . . Of the various studies, these two had the most extensive and best documented Cr(VI) exposures spanning three or four decades.

> Both cohort studies characterized observed and expected lung cancer mortality and reported a statistically significant positive association between lung cancer risk and cumulative Cr(VI) exposure.

Id. at 10,176.

OSHA found that a "linear relative risk model" best described the relationship between Cr(VI) exposure and lung cancer, whereby the exposure level over the course of a hypothetical 45-year career was directly correlated to the risk of cancer. *Id*. at 10,194. OSHA used the Gibb and Luippold cohorts to establish upper and lower estimates of cancer cases per 1000 workers, and tabulated the estimated cases for exposure levels ranging from 0.25 $\mu g/m^3$ to the pre-existing PEL of 52 $\mu g/m^3$. *Id*. at 10,195. According to the resulting table, exposure at 1 $\mu g/m^3$ would result in an estimated 2.1 to 9.1 cancer cases, exposure at 5 $\mu g/m^3$ would result in 10 to 45 cases, and exposure at the pre-existing PEL would result in 101 to 351 cases. *Id*.

Based in part on this information, OSHA concluded that "Cr(VI) causes 'material impairment of health or functional capacity' within the meaning of the OSH Act." *Id*. at 10,221. OSHA further determined that the cancer risk of 100 to 350 cases under exposure at the pre-existing 52 $\mu g/m^3$ PEL was "clearly significant." *Id*. at 10,224. OSHA also found that the

estimated 10 to 45 cases at a career exposure level of 5 µg/m^3, the PEL ultimately selected, would represent a substantial improvement, but the risk of impairment would remain "clearly significant." *Id.*

B. Feasibility Analysis

By law, OSHA is required to demonstrate both the "technological" and "economic" feasibility of a standard. After exploring the technological and economic feasibility of alternative Cr(VI) PELs, OSHA concluded that implementation of the proposed 1 µg/m^3 PEL would not be feasible. Although the agency recognized that a PEL of 5 µg/m^3 still presented significant health risks to workers, the agency found the higher level to be feasible, and adopted it as a universal PEL. A summary of OSHA's relevant technological and economic feasibility analyses follows.

1. Technological Feasibility

To assess technological feasibility, OSHA expressly applied the standard articulated by the Court of Appeals for the D.C. Circuit in *United Steelworkers of America, AFL-CIO-CLC v. Marshall*, 647 F.2d 1189 (D.C. Cir. 1980) ("*Lead*"). 71 Fed. Reg. 10,335. The *Lead* decision provides:

> [W]ithin the limits of the best available evidence, and subject to the court's search for substantial

> evidence, OSHA must prove a reasonable possibility that the typical firm will be able to develop and install engineering and work practice controls that can meet the PEL in most of its operations.

647 F.2d at 1272. OSHA explained that, in harmony with the *Lead* standard, it favored engineering and work practice controls to reduce the presence of toxins in the air over reliance on respirators.[1] OSHA explained its "long-held view" that extensive reliance on respirators to achieve a PEL should be avoided due to independent health, safety, and reliability problems that arise when workers are required to perform tasks with respirators. 71 Fed. Reg. 10,335.

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[1]"'Engineering controls' employ mechanical means or process redesign to eliminate, contain, divert, dilute, or collect [toxin] emissions at their source." Occupational Exposure to Lead, 43 Fed. Reg. 52,952, 52,989 (Nov. 14, 1978). "'Work practice controls' . . . accomplish the same results as engineering controls, but rely upon employees to repeatedly perform certain activities in a specified manner so that airborne lead concentrations are eliminated or reduced," and include administrative controls, such as "moving the employee to a place of lower exposure or reducing his work hours." *Id.* at 52,989.

For technological feasibility purposes, OSHA chose to define employee exposure in terms of "application groups," or "groups of firms where employees are exposed to Cr(VI) when performing a particular function," rather than in terms of product-based industries. *Id.* at 10,226. OSHA justified this approach as follows:

> This methodology is appropriate to exposure to Cr(VI) where a widely used chemical like chromium may lead to exposures in many kinds of firms in many industries but the processes used, exposures generated, and controls needed to achieve compliance may be the same. For example, because a given type of welding produces Cr(VI) exposures that are essentially the same regardless of whether the welding occurs in a ship, or a construction site, as part of a manufacturing process, or as part of a repair process, it is appropriate to analyze such processes as a group.

Id. OSHA accordingly identified and analyzed dozens of application groups in which employees were exposed to Cr(VI). *Id.* at 10,228-44.

OSHA concluded that a PEL of 1 $\mu g/m^3$ was not technologically feasible based on several determinations. First, OSHA positively concluded that it was technologically

infeasible for the sectors of welding and aerospace painting to achieve a 1 μg/m^3 through engineering and work controls alone. OSHA, Final Economic and Regulatory Flexibility Analysis for OSHA's Final Standard for Occupational Exposure to Hexavalent Chromium, III-331, Feb. 23, 2006 ("FEA"). For welding, OSHA examined several types of welding processes employed in general industry, shipyards, and construction. *Id.* at III-332. OSHA found that two of the "most common" welding operations, shielded metal arc welding ("SMAW") on stainless steel, and stainless steel welding in confined and enclosed spaces, could not conform to a 1 μg/m^3 PEL by altering work processes or through engineering controls. *Id.* at III-333-36. Although OSHA recognized that the standard may be feasible for less common welding operations, "the fact that welding is not easily separated into high and low exposure operations render[ed] OSHA unable to conclude that the proposed PEL of 1 μg/m^3 is technologically feasible for any welding operations." *Id.* at III-336.

OSHA also determined that "approximately two thirds" of aerospace painting operations could not achieve the 1 μg/m^3 PEL with engineering or work practice controls. Although smaller parts could be painted in compliance with the PEL through use of enclosed and ventilated rooms, such treatment for larger parts and assemblies was impractical. Thus, the proposed PEL was "not generally feasible for aerospace painting." *Id.* at III-336-37.

While OSHA positively concluded that the proposed 1 µg/m^3 PEL was technologically infeasible for welding and aerospace painting operations, it also found that "the evidence in the record [wa]s insufficient" for it to conclude that the 1 µg/m^3 would be technologically feasible for four other industries with relatively few employees. *Id.* at III-338. For the three operations of chromate pigment production, chromium catalyst production, and chromium dye production, OSHA found a "lack of clear evidence" that it would be technologically feasible to install protective enclosures to avert widespread respirator use in order to achieve the proposed PEL. *Id.* at III-340. For hard chrome electroplating, OSHA found that the diversity of such operations, and the lack of evidence as to whether involved facilities could employ fume suppressants, left it "unable to conclude that the proposed PEL of 1 µg/m^3 would be technologically feasible for all hard chrome electroplating operations." *Id.* at III-341.

2. Economic Feasibility

OSHA analyzed economic feasibility by questioning whether a standard under consideration would eliminate or alter the competitive structure of an industry. 71 Fed. Reg. 10,301. OSHA determined that the proposed 1 µg/m^3 PEL was economically infeasible for electroplating job shops, which are businesses dedicated to providing electroplating services to others. OSHA concluded that these shops could not be expected to absorb the costs to comply with a 1 µg/m^3 standard. The

Agency found that compliance costs would "represent 2.7 percent of revenues and 65 percent of profits." *Id*. Under prior standards, OSHA had ensured that the most affected industries were not confronted with costs over 2 percent of revenues. *Id*. Also, OSHA found that the costs to electroplating job shops would not be significantly lower even if the shops were permitted to achieve the proposed 1 $\mu g/m^3$ PEL through use of respirators. *Id*. OSHA further found that the high costs of compliance would be similar across various types of plating shops. *Id*. On this analysis, OSHA concluded that the proposed 1 $\mu g/m^3$ PEL would "alter the competitive structure of the industry." *Id*. In comparison, OSHA determined that the industry could feasibly absorb the estimated compliance costs of 1.24 percent of revenues associated with a PEL of 5 $\mu g/m^3$. *Id*.

3. Overall Feasibility

In considering the proposed 1 $\mu g/m^3$ PEL, OSHA determined that the technological and economic infeasibility determinations discussed above affected "almost 56% of the total number of employees occupationally exposed to Cr(VI)." *Id*. at 10,246-54. OSHA calculated this figure using the following estimates of affected employees:

- 270,000 in welding
- 33,400 in electroplating job shops

- 8,300 in aerospace painting
- 469 in chromium pigment, catalyst, and dye production

Id. at 10,337. This totals 312,169 employees, or 55.9% of the estimated 558,431 employees exposed to Cr(VI). OSHA did not include employees in hard chrome electroplating in order to avoid double counting workers included in the job shop electroplating figure. *Id.* OSHA stated that it "did not receive data or recommendations regarding setting the PEL at any levels between 1 µg/m^3 and 5 µg/m^3,"[2] but found that a PEL of 5 µg/m^3 was technologically and economically feasible for "all industries." *Id.*

C. Application of a Uniform 5 µg/m^3 PEL

OSHA selected a universal PEL of 5 µg/m^3 that applies to all industries. *Id*. at 10,338. OSHA stated that it "has not interpreted [29 U.S.C. § 6(b)(5)] to require setting multiple PELs based on the lowest level particular industries or operations could achieve," and that, in the face of statutory silence, "OSHA has the authority to adopt the reasonable

[2]Likewise, neither petitioner points to any evidence, nor raises any argument, suggesting that OSHA should have considered other exposure limits. Thus, only OSHA's analyses of the 1 µg/m^3 and 5 µg/m^3 PELs are subject to our review.

interpretation that it judges will best carry out the purposes of the Act." *Id.*

Although OSHA recognized that "lower PELs might be achievable in some industries and operations," which would reduce risks to workers, it determined that "these benefits would be offset by the significant disadvantages of attempting to establish and apply multiple PELs for the diverse group of industries and operations covered by the standard." *Id.* OSHA supported this conclusion by stating that multiple PELs would place an "enormous evidentiary burden on OSHA to ascertain and establish the specific situations, if any, in which a lower PEL could be reached," causing delays in the implementation of health standards. *Id.*

Also, OSHA asserted, "the demanding burden of setting multiple PELs would be complicated by the difficulties inherent in precisely defining and clearly distinguishing between affected industries and operations." *Id.* The "definitional and line drawing problem is far less significant when OSHA uses a unit of industries and operations for analytical but not compliance purposes," because the "consequences of imprecise classifications" for compliance purposes "would become much more significant." *Id.* OSHA determined that the existing North American Industry Classification System ("NAICS") for categorizing businesses would not be appropriate for delineating multiple PELs because NAICS categorizes businesses by

primary activity, and sub-operations involving Cr(VI) would not necessarily be captured. *Id.*

OSHA also concluded that "disaggregation by operation has major practical disadvantages," in part because "many firms have exposures in two or more different categories." *Id.* Multiple PELs could therefore require single firms to achieve multiple standards in the same workplace, and possibly with the same employees. Employers would also have to monitor for multiple exposure levels in the same workplace, where the exposure of a particular employee might not be traceable to a single task. *Id.* OSHA determined that a single standard would make it easier for employers to understand and comply, and would simplify government enforcement. *Id.* at 10,338-39.

D. Resulting Regulations

The final rule applies the 5 $\mu g/m^3$ PEL through separate regulatory treatment for general industry, construction, and shipyards. *Id.* at 10,100. Only the distinctions pertaining to general industry, 29 C.F.R. § 1910.1026, and construction, § 1926.1126, are relevant to the instant petitions. The PEL pertains to "occupational exposures to [Cr(VI)] in all forms and compounds, except" for exposures governed by other government agencies, exposures to portland cement, or where employers are exempted by demonstrating that "a specific process, operation, or activity involving [Cr(VI)] cannot release dusts, fumes, or mists of [Cr(VI)] in concentrations above 0.5

$\mu g/m^3$ . . . under any expected conditions of use." 29 C.F.R. §§ 1910.1026(a)(4), 1926.1126(a)(4).

Employers are required to use "engineering and work practice controls to reduce and maintain employee exposure to [Cr(VI)] to or below the PEL unless the employer can demonstrate that such controls are not feasible." *Id.* §§ 1910.1026(f)(1)(i), 1926.1126(e)(1)(i). Where further reductions are not feasible, employers must supplement the engineering and work practice controls with respiratory protection. *Id.* Also, if an "employer can demonstrate that a process or task does not result in any employee exposure to [Cr(VI)] above the PEL for 30 or more days per year," the employer may use respiratory protection in lieu of engineering and work practice controls to achieve the PEL. *Id.* §§ 1910.1026(f)(1)(ii), (g)(1)(iv), 1926.1126(e)(1)(i), (f)(1)(iv).

Employers are required to educate all affected employees about the contents of the controlling regulation, and about the applicable medical surveillance program. *Id.* §§ 1910.1026(l), 1926.1126(j). The regulations also establish an employee exposure "action level" of 2.5 $\mu g/m^3$, or one half of the PEL, at which employers are subject to heightened monitoring burdens. *Id.* §§ 1910.1026(b), (d)(2)(iii), 1926.1126(b), (d)(2)(iii).

Employers are also required to notify an employee when required monitoring procedures indicate that the employee was exposed to Cr(VI) levels in excess of the PEL. *Id.*

§§ 1910.1026(d)(4), 1926.1126(d)(4). This provision marks a change from the proposed rule, which would have required employers to notify employees of all monitoring results, regardless of the level of exposure detected. 69 Fed. Reg. 59,450-51.

The predominant difference between the general industry and construction regulations is that the general industry regulation has additional requirements for employers. First, employers subject to the general industry rules must establish defined and access-controlled "regulated areas" wherever "an employee's exposure to airborne concentrations of [Cr(VI)] is, or reasonably can be expected to be, in excess of the PEL." *Id.* § 1910.1026(e). Such employers must also comply with detailed "housekeeping" requirements for the removal and disposal of Cr(VI). § 1910.1026(j).

The general industry regulation also provides a special compliance requirement applicable only to the "painting of aircraft or large aircraft parts in the aerospace industry." *Id.* § 1910.1026(f)(1)(ii). For such activities, employers need only achieve Cr(VI) concentrations of 25 $\mu g/m^3$ through engineering and work practice controls, if feasible. *Id.* Respiratory protection may be used to achieve the PEL beyond that point. *Id.*

II. Jurisdiction

We have jurisdiction over the instant petitions pursuant to 29 U.S.C. § 655(f), which allows "[a]ny person who may be adversely affected by" an OSHA standard to "file a petition challenging the validity of such standard with the United States court of appeals for the circuit wherein such person resides or has a principal place of business." *Id.* HRG's petition was timely filed in this Court on behalf of member workers subject to Cr(VI) exposure. EEI's member businesses include coal and nuclear electric power generating facilities that are subject to the Cr(VI) standard, and its petition was transferred from the D.C. Circuit pursuant to a consolidation order by the Judicial Panel on Multidistrict Litigation pursuant to 28 U.S.C. § 2112(a)(3).

III. Review of OSHA Rulemaking

Under the Occupational Safety and Health Act of 1970 ("OSH Act"), as codified in 29 U.S.C. § 655, the Secretary of Labor is charged with promulgating occupational safety and health standards. The Secretary's rulemaking authority has been delegated to the head of OSHA, the Assistant Secretary for Occupational Safety and Health. 72 Fed. Reg. 31,160 (June 5, 2007); 67 Fed. Reg. 65,007 (Oct. 22, 2002). Section 655(b)(5) addresses rulemaking for toxic materials, and provides:

> The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents

> under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life.

29 U.S.C. § 655(b)(5). When OSHA promulgates a new standard, it must "include a statement of the reasons for such action, which shall be published in the Federal Register." *Id.* § 655(e).

Our review of an OSHA standard is limited and deferential. In executing its statutory mandate, the Agency must both find facts and make decisions that are ultimately legislative policy judgments. *Am. Iron and Steel Inst. v. OSHA*, 577 F.2d 825, 833-34 (3d Cir. 1978) ("*AISI*"). Our role in reviewing factual findings is expressly limited by the OSH Act, which provides that the"determinations of the Secretary shall be conclusive if supported by substantial evidence in the record considered as a whole." 29 U.S.C. § 655(f). Evidence is "substantial" when "an inference of the fact may be drawn reasonably." *AISI*, 577 F.2d at 831 (internal quotation marks omitted).

Our review of OSHA's legislative policy judgment is similarly restrained. We have recognized

> that because judicial review of legislative-like decisions inevitably runs the risk of becoming arbitrary supervision and revision of the Secretary's efforts to effectuate the legislative purposes in an area where various responses might each be legitimate in the sight of Congress, [a court should] remand only those provisions of [a] standard which le[ave] "nagging questions . . . as to the reason and rationale for the Secretary's particular choices."

AISI, 577 F.2d at 834 (quoting *Indus. Union Dep't, AFL-CIO v. Hodgson*, 499 F.2d 467, 488 (D.C. Cir. 1974); internal brackets removed). In applying these considerations to our review of a PEL for coke oven emissions, we concluded that the Secretary's

> ultimate determination of the appropriate exposure level is a legislative decision in the exercise of congressionally delegated powers. Even though we might have drawn different inferences from the information before the Secretary, his conclusion was reasonably drawn from the record and, therefore, it must be upheld.

Id. at 833. Accordingly, we will not disturb the Cr(VI) PEL, or

other policy determination in the instant standard, as long as we conclude that OSHA's decision was reasonably drawn from the record.

We have identified five separate inquiries to organize our review of standards under section 655(f):

> (1) determine whether the Secretary's notice of proposed rulemaking adequately informs interested persons of the action taken;
>
> (2) determine whether the Secretary's promulgation adequately sets forth reasons for his action;
>
> (3) determine whether the statement of reasons reflects consideration of factors relevant under the statute;
>
> (4) determine whether presently available alternatives were at least considered; and
>
> (5) determine whether substantial evidence in the record as a whole supports the Secretary's determination, if it is based in whole or in part on factual matters subject to evidentiary development.

AISI, 577 F.2d at 830. We have not labored through each inquiry in every case, but have limited our consideration to the particular issues raised by petitioners. *See*, *e.g*, *id*. at 830-41.

In promulgating a standard for toxic materials under section 655(b)(5), OSHA first bears the burden to demonstrate that there is a "significant risk" of material harm to workers in a workplace. *AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 655 (1980) ("*Benzene*") (plurality opinion). The Agency need not calculate risk with mathematical precision, nor does the substantial evidence standard require it to support a risk finding "with anything approaching scientific certainty." *Id*. at 655-56. Furthermore, the "best available evidence" requirement affords latitude, and "so long as they are supported by a body of reputable scientific thought, the Agency is free to use conservative assumptions in interpreting the data with respect to carcinogens, risking error on the side of overprotection rather than underprotection." *Id*. at 656.

Once OSHA demonstrates the existence of a significant risk, it must then satisfy the feasibility requirement of section 655(b)(5). This requires OSHA to demonstrate that the standard is both technologically and economically feasible. *AISI*, 577 F.2d at 832. While the OSH Act does not define feasibility, these inquiries are guided by prior decisions. As OSHA did in explaining the instant standard, numerous courts have relied on the careful and comprehensive review of OSHA's lead standard

in *United Steelworkers of America, AFL-CIO-CLC v. Marshall*, 647 F.2d 1189 (D.C. Cir. 1980) ("*Lead*").

The technological feasibility test articulated in *Lead* is particularly helpful because OSHA's lead and Cr(VI) standards follow a similar pattern with regard to the methods employers may use to control exposure to airborne toxins. As with the Cr(VI) standard, OSHA established a hierarchy of controls for lead exposure, preferring engineering controls first, then work practice controls, and finally personal protective equipment (primarily respirators). 43 Fed. Reg. 52,990. OSHA stated that "[r]espiratory protection is relegated to the bottom of the compliance priority list because it is an ineffective, unreliable, and unsafe method of reducing employee exposure." *Id.* Although respirators are generally a more economical alternative for employers, OSHA found that they do not eliminate the source of exposure, and also introduce independent occupational hazards, such as restrictions to vision, hearing, and mobility. *Id.* OSHA accordingly found respirators to be useful only on supplementary, interim, or short term bases. *Id.*

In an effort "to supply the systemic analysis" of technological feasibility that had previously been lacking, the Court of Appeals for the D.C. Circuit incorporated OSHA's compliance hierarchy into the following test:

> [W]ithin the limits of the best available evidence, and subject to the court's search for substantial

> evidence, OSHA must prove a reasonable possibility that the typical firm will be able to develop and install engineering and work practice controls that can meet the PEL in most of its operations . . . . The effect of such proof is to establish a presumption that industry can meet the PEL without relying on respirators . . . . Insufficient proof of technological feasibility for a few isolated operations within an industry, or even OSHA's concession that respirators will be necessary in a few such operations, will not undermine this general presumption in favor of feasibility.

Lead, 647 F.2d at 1272. The court stated that OSHA could satisfy its burden by pointing to available technologies, and to emergent technologies that were "reasonably capable of experimental refinement and distribution within the standard's deadlines." *Id.* In light of the D.C. Circuit's careful and comprehensive opinion, and the close parallels between OSHA's lead and Cr(VI) standards, we deem it appropriate to conduct our technological feasibility analysis in accordance with the *Lead* methodology.

The court in *Lead* also distilled a comprehensive review of economic feasibility considerations into a concise standard:

> [A]s for economic feasibility, OSHA must construct a reasonable estimate of compliance costs and demonstrate a reasonable likelihood that these costs will not threaten the existence or competitive structure of an industry, even if it does portend disaster for some marginal firms.

Id. at 1272. We join our sister courts of appeals in applying this methodology. *See, e.g.*, *Color Pigments Mfrs. Ass'n, Inc. v. OSHA*, 16 F.3d 1157, 1163 (11th Cir. 1994); *Nat'l Grain & Feed Ass'n, Inc. v. OSHA*, 903 F.2d 308, 311 (5th Cir. 1990); *Forging Indus. Ass'n v. Sec'y of Labor*, 773 F.2d 1436, 1453 (4th Cir. 1985). We note that the Supreme Court has conclusively ruled that economic feasibility does not involve a cost-benefit analysis. *Am. Textile Mfrs. Inst., Inc. v. Donovan*, 452 U.S. 490, 513 (1981).

IV. HRG's Arguments

HRG contends that, contrary to the OSH Act, past practice, and prior judicial decisions, OSHA promulgated a Cr(VI) standard that is insufficiently protective of workers. HRG does not challenge OSHA's risk determinations, but argues: (1) OSHA's determination that a 1 $\mu g/m^3$ is infeasible was factually and legally inadequate; (2) OSHA's decision to implement a uniform 5 $\mu g/m^3$ PEL for all industries is not supported by substantial evidence, and departs from judicial and Agency precedent; and (3) OSHA's decisions to set the

monitoring "action level" at one half of the PEL, and to only require employee notification of detected exposures exceeding the PEL, were arbitrary and unexplained. For the reasons stated below, we will deny HRG's petition except with regard to OSHA's decision to set the employee notification requirement at the PEL.

A. Infeasibility of 1 μg/m^3 PEL

As discussed above, OSHA concluded that the proposed PEL of 1 μg/m^3 was infeasible because the Agency could not prove feasibility in workplaces employing nearly 56% of the workers exposed to Cr(VI), or 312,169 out of 558,431 workers. To conduct its analysis, OSHA categorized workers by application groups, defined by common tasks, rather than industries defined by end products. OSHA affirmatively concluded that a 1 μg/m^3 PEL was technologically infeasible in welding and aerospace painting, accounting for 270,000 and 8,300 workers respectively. Furthermore, OSHA concluded that it could not meet its burden to prove that the standard was technologically feasible for the 469 workers in chromium pigment, catalyst, and dye production. Finally, OSHA determined that it would be economically infeasible for electroplating job shops, employing 33,400 workers, to comply with a 1 μg/m^3 PEL. HRG challenges OSHA's determinations

for each of these workplace categories.[3]

1. Welding

With regard to welding, HRG argues that the finding of infeasibility was flawed on two grounds. First, HRG challenges OSHA's use of application groups, instead of industries, to delineate groups of workers. HRG argues that OSHA must demonstrate that a typical firm will be able to comply with a PEL in most of its operations most of the time, and, since welding describes a single operation within a firm, rather than a type of firm defined by an industry, OSHA did not conduct an appropriate analysis.

We disagree. As an initial matter, nothing in 29 U.S.C. § 655(b)(5) requires OSHA to analyze employee groups by industry, nor does the term "industry" even appear. In the face of this statutory silence, HRG presents no argument as to why the Agency's choice of methodology to implement the statute

[3]HRG also challenges OSHA's conclusion that a 1 $\mu g/m^3$ PEL was infeasible in hard chrome electroplating operations. In order to avoid the potential double counting of workers in electroplating job shops, OSHA did not count hard chrome electroplating workers in its overall feasibility assessment. 71 Fed. Reg. 10,337. Thus, OSHA's feasibility findings with regard to these operations are immaterial to the overall feasibility determination.

should not be afforded deference under *Chevron, U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 843-44 (1984). We also note that OSHA has employed the application group methodology in prior standards. *See* Occupational Exposure to Methylene Chloride, 62 Fed. Reg. 1,494, 1,564 (Jan. 10, 1997). OSHA explained that the application group "methodology is appropriate to exposure to Cr(VI) where a widely used chemical like chromium may lead to exposures in many kinds of firms in many industries but the processes used, exposures generated, and controls needed to achieve compliance may be the same." 71 Fed. Reg. 10,226. The Agency specifically stated that "a given type of welding produces Cr(VI) exposures that are essentially the same . . . [and] it is appropriate to analyze such processes as a group." *Id.* In light of OSHA's stated reasons for utilizing the application group methodology, we will not substitute another.

Also, we find that the application group methodology is consistent with *Lead*. OSHA determined that technology did not exist that would permit certain welding operations to achieve exposure levels of 1 $\mu g/m^3$ without reliance on respirators. An employer would thus be unable to achieve the PEL in those operations, regardless of whether the operations constituted all or a portion of the employer's business. HRG would apparently have us require OSHA to research all operations of all employers with Cr(VI) exposure, including operations that do not involve Cr(VI), to determine whether a typical firm could meet the PEL in most of its operations. Such an interpretation

would severely hinder OSHA's ability to regulate exposure to common toxins, a result that would appear to run afoul of HRG's own interests. Furthermore, in a review of the lead standard that followed its *Lead* decision, the D.C. Circuit upheld a technological feasibility determination by OSHA that considered only the specific operations in leaded steel production that caused exposure to airborne lead. *Am. Iron & Steel Inst. v. OSHA*, 939 F.2d 975, 983-86 (D.C. Cir. 1991). We accordingly conclude that it was appropriate for OSHA to consider only those operations involving Cr(VI) exposure in assessing the technological feasibility of the proposed 1 $\mu g/m^3$ PEL.

HRG also argues that the technological infeasibility determination with regard to welding was not supported by substantial evidence because the record demonstrates that most welding operations could comply with the 1 $\mu g/m^3$ most of the time without respirators. OSHA's feasibility concerns regarding welding focused on the common practices of stainless steel shielded metal arc welding ("SMAW"), and stainless steel welding in confined spaces. HRG points to evidence in the record that "only" 22.3% of all stainless steel welders, and 29% of SMAW welders, would require respirators to meet a 1 $\mu g/m^3$ PEL. *See* FEA at ES-34; 71 Fed. Reg. 10,335. HRG contends that the record therefore demonstrates that the 1 $\mu g/m^3$ PEL is feasible for all welding operations.

HRG's argument is flawed for at least two reasons. First,

HRG asserts a novel rule for technological feasibility that has never been applied by OSHA, nor recognized in any court. HRG twists the *Lead* methodology, and would have us require OSHA to find a PEL to be technologically feasible so long as a majority of a typical employer's workers performing an operation would not have to wear respirators. If this were the rule, no employer would be required to further remove toxins from the air, or further limit employee presence in contaminated air, so long as exposure could be kept at or below a PEL with 49% of the employees wearing respirators.

Neither the *Lead* decision nor logic support HRG's position. In crafting its feasibility rule in *Lead*, the D.C. Circuit accepted OSHA's hierarchy of compliance controls and simply incorporated them into a manageable standard of proof. This hierarchy, the same one at issue here, strongly disfavors respirators as "an ineffective, unreliable, and unsafe method of reducing employee exposure," and generally restricts their use to supplementary, interim or short term purposes. 43 Fed. Reg. 52,990; *see Lead*, 647 F.2d at 1205 n.12 ("This key provision of the lead standard is based on OSHA's view that respirators are an inferior and inadequate means of protecting workers."). Nothing in *Lead*, nor in any case reviewing an airborne toxin standard, can be read to support a technological feasibility rule that would effectively encourage the routine and

widespread use of respirators to comply with a PEL.[4] In fact, HRG's support for such a rule is surprising since the purpose of OSHA's hierarchy is to drive employers to use more effective means than respirators to protect workers from toxins.

Second, OSHA amply explained why compliance problems in stainless steel SMAW and enclosed space welding operations rendered a 1 $\mu g/m^3$ PEL technologically infeasible for welding generally. OSHA stated:

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[4]In reply, HRG points to *Building and Construction Trades Department v. Brock*, 838 F.2d 1258 (D.C. Cir. 1988), and *ASARCO, Inc. v. OSHA*, 746 F.2d 483 (9th Cir. 1984), to support its assertion that OSHA is bound to conclude a PEL is feasible as long as firms can meet the PEL without respirators in most operations, most of the time. This reliance is misplaced. In *Building and Construction*, the D.C. Circuit upheld an asbestos PEL in which more than 90% of the affected workforce would not be regularly required to wear respirators. 838 F.2d at 1268. In *ASARCO*, the Ninth Circuit upheld an arsenic standard in which 11 of 16 smelters at issue could achieve the PEL with "with engineering and work practices and only very limited use of respirators," and the remaining four could comply with "limited to moderate" respirator use. 746 F.2d at 496-97 (internal quotation marks omitted). In neither case did OSHA depart from its strong disfavor of respirators, nor did either court constrain OSHA's discretion with regard to technological feasibility.

> Welders are not generally assigned to a particular welding process. Instead, welders frequently perform different types of welding on different types of metals in different environments — sometimes even during the same shift. [citing comments from industry] For example, a welder may spend part of his shift performing a task for which exposures cannot be reduced below the PEL, e.g., SMAW on stainless steel in a confined space, and other parts of his shift performing welding tasks for which exposures may be below 1 $\mu g/m^3$.

FEA at III-336. Furthermore, "workers performing different welding tasks often work next to one another," rendering it "impractical to separate employees on an operation by operation basis." *Id*. Accordingly,

> Although a PEL of 1 $\mu g/m^3$ may be technologically feasible for some less common welding processes, the fact that welding is not easily separated into high and low exposure operations renders OSHA unable to conclude that the proposed PEL of 1 $\mu g/m^3$ is technologically feasible for any welding operations.

Id.

Thus, OSHA's conclusion that a PEL of 1 $\mu g/m^3$ was technologically infeasible for welding operations is supported by substantial evidence, was adequately explained, and also comports with both past practice and prior decisions.

2. Aerospace Painting

HRG argues that OSHA's conclusion that a 1 $\mu g/m^3$ PEL would be infeasible for aerospace painting was flawed for two reasons. First, HRG again challenges the use of application groups, asserting that the technological feasibility analysis was improper because aerospace painting is an operation rather than an industry. This argument fails for the same reasons discussed above.

HRG's second argument is particularly confusing and equally unavailing. OSHA found that the painting of whole aircraft or large aerospace structures, activities comprising approximately two thirds of aerospace painting, could not be conducted in compliance with either a 1 $\mu g/m^3$ PEL or a 5 $\mu g/m^3$ PEL without reliance on respirators. FEA at III-337. OSHA accordingly built an exception into the final rule, whereby employers engaged in these activities need only achieve airborne Cr(VI) concentrations of 25 $\mu g/m^3$ through engineering and work practice controls, and could rely on respirators to further reduce exposure to the 5 $\mu g/m^3$ PEL. 29 C.F.R. § 1910.1026(f)(1)(ii).

HRG does not dispute OSHA's conclusion that a majority of aerospace painting operations cannot achieve either a 1µg/m^3 PELor a 5µg/m^3 PEL through engineering and work practice controls. Neither does HRG challenge OSHA's explanation for the aerospace painting exception. Instead, HRG argues that, because OSHA found it acceptable for one third of the workers in aerospace painting to wear respirators in order to comply with a 5µg/m^3 PEL, the Agency was required to explain why more widespread respirator use would not have been acceptable to support a 1µg/m^3 PEL.

This argument is illogical. OSHA carved out an aerospace painting exception from its general rule disfavoring respirators, a rule adopted for the benefit of workers, in order to institute a lower uniform PEL of 5µg/m^3. In exercising its discretion to make this exception, OSHA had no obligation to explain why it did not accept a *greater* deviation from the rule. Since HRG offers nothing to challenge the adequacy of OSHA's decision as explained in the record and written into the final rule, HRG's argument pertaining to aerospace painting must fail.

3. Pigment, Catalyst, and Dye Production

HRG also challenges OSHA's conclusion that the Agency could not prove the technological feasibility of a 1 µg/m^3 PEL in the chromium pigment, catalyst, and dye production industries, industries that together accounted for only

469 workers in the feasibility analysis. OSHA identified enclosures which, when combined with ventilation systems, could generally achieve Cr(VI) exposures of 1µg/m^3 or less. 71 Fed. Reg. 10,337. However, OSHA pointed to industry evidence that the ventilation systems could cause "significant and intolerable" product loss by extracting the fine powders that contained Cr(VI). *Id.* OSHA also pointed to evidence that some plants, especially older facilities, would not be able to physically accommodate enclosures. *Id.* OSHA estimated that 44% or more of the workers in these industries would require respirators to achieve 1µg/m^3 concentrations, and accordingly concluded that it could not meet its burden to prove the technological feasibility of a PEL set at that level. *Id.*

HRG argues that OSHA's analysis of these three industries was flawed because, in considering whether existing plants could physically accommodate available technology, the Agency improperly incorporated an economic consideration into the technological analysis. Even if we were to conclude that technological feasibility requires OSHA to accept that employers may be forced to alter or abandon their physical plants, OSHA also found that ventilation systems could cause intolerable product loss. This concern squarely involved the suitability of available technology. Moreover, the 469 employees at issue were a minute portion of the 312,169 employees in operations where a 1µg/m^3 PEL was not deemed feasible, and their exclusion from consideration would have been immaterial. We therefore will not disturb OSHA's

technological feasibility analysis as it pertains to the chromium pigment, catalyst, and dye production industries.

4. Electroplating Job Shops

HRG argues that OSHA's determination that a 1µg/m^3 PEL was economically infeasible for the electroplating job shop industry was neither supported by substantial evidence nor adequately explained. Electroplating job shops are facilities that perform electroplating services for other persons or businesses. As discussed above, OSHA reached its infeasibility determination upon finding and explaining that costs of compliance would amount to 2.7 percent of revenues and 65 percent of profits, and that costs of compliance would be similar across various types of plating shops. On this analysis, OSHA concluded that the proposed 1 µg/m^3 PEL would "alter the competitive structure of the industry." 71 Fed. Reg. 10,301.

HRG bases its argument on part of a single statement by OSHA that the costs of compliance "might not be passed forward, particularly by older and less profitable segments of the industry." *Id.* at 10,301-02. HRG asserts that this statement derives from improper speculation that some marginal firms might suffer, and economic feasibility allows that certain marginal firms might fail.

HRG paints an incomplete picture of OSHA's economic analysis. OSHA determined that the estimated costs to job shop

electroplaters of 2.7% of revenues was more than the Agency had deemed economically feasible under previous health standards, and was well in excess of the sector's average annual nominal price increase of 1.6%. FEA at V-94. OSHA also determined that it would be unable to mitigate costs through longer phase-in times or a greater reliance on respirators, techniques that had been used in the past to address economic difficulties where costs might otherwise have been in excess of 2% of revenues. *Id*. OSHA further found that the costs for compliance would be approximately equal across different types of job shops. Factoring in these costs, OSHA stated that "a price increase that would assure continued profitability for the *entire* industry would require almost tripling the annual nominal price increase." *Id*. (emphasis added). It is clear from the record that OSHA considered and explained how costs would affect the job shop electroplating industry as a whole, and was within its discretion to conclude that a 1 $\mu g/m^3$ PEL would alter the competitive structure of the industry.

B. Uniform PEL

HRG argues that the uniform PEL of 5 $\mu g/m^3$ must be set aside on two grounds. First, HRG claims that evidence in the record demonstrates that the feasibility problems of a 1$\mu g/m^3$ PEL noted by OSHA, even if correct, only affect a minority of all exposed workers, and the lower PEL should therefore have been selected. According to HRG, at most only 107,380 of the 558,431 exposed employees worked in operations where the

lower PEL is infeasible, counting 67,000 workers performing stainless steel SMAW welding, 3,921 in aerospace painting, 2,590 in hard chrome electroplating, 33,400 in electroplating job shops, and 469 workers in pigment, catalyst, and dye production. To the contrary, OSHA concluded that 312,169 employees worked in operations where the lower PEL was not deemed feasible: 270,000 in welding, 33,400 in electroplating job shops, 8,300 in aerospace painting, and 469 in pigment, catalyst, and dye production.

Welding accounts for a dispositive difference of 203,000 workers between the opposing figures. HRG contends that only stainless steel SMAW welders should be included in the number. As discussed above, OSHA explained and sufficiently supported its conclusion that a 1µg/m^3 PEL is infeasible for *all* welding operations because welding is not readily segregated into high and low exposure operations. 71 Fed. Reg. 10,336; FEA at III-337. HRG offers no explanation to justify its lower figure for aerospace painters, and does not explain why it did not include workers engaged in enclosed space welding.

Second, HRG contends that the selection of a uniform PEL for all industries, where many industries can accommodate a lower PEL, is contrary to law and past practice. HRG points to OSHA's final lead standard, which HRG claims implemented different PELs to accommodate different technological feasibility findings in certain industries. HRG claims that the lead standard incorporates a 50 µg/m^3 PEL for large foundries,

and a 75 µg/m^3 PEL for smaller foundries and the brass and bronze ingot industry. HRG argues that OSHA should have accordingly adopted separate PELs to achieve the lowest exposures feasible for each industry or operation.

HRG mischaracterizes the lead standard and OSHA's past practice. It is true that, based on feasibility concerns, OSHA made special allowances in amendments to the lead standard for small foundries and the brass and bronze ingot industries. 55 Fed. Reg. 3,146 (Jan. 30, 1990); 60 Fed. Reg. 52,856 (Oct. 11, 1995). However, these allowances only pertain to the time for compliance, and to the exposure level the industries were required to meet through engineering and work process controls alone. 29 C.F.R. § 1910.1025(e). The standard expressly provides that "[w]here engineering and work practice controls do not reduce employee exposure at or below the 50 µg/m^3 [PEL], the employer shall supplement these controls with respirators . . . ." *Id.* § 1910.1025(e)(2). Thus, all employers are subject to a single, universal PEL of 50 µg/m^3. *Id.* § 1910.1025(c). We fail to see how the respirator exceptions OSHA made in the lead standard are any different functionally from the exceptions the Agency made for aerospace painting in the instant Cr(VI) standard. *See* 29 C.F.R. § 1910.1026(f)(1)(ii).

In fact, uniform PELs for the control of occupational exposure to airborne toxins have been the rule in OSHA standards. *E.g.* 29 C.F.R. §§ 1910.1001(c) (asbestos); 1910.1017(c) (vinyl chloride); 1910.1018(c) (inorganic arsenic);

1910.1028 (benzene); 1910.1048(c) (formaldehyde); 1910.1051(c) (1,3-butadiene); 1910.1052(c) (methylene chloride). As it had similarly done in other standards, the Agency recently explained that it set the PEL for methylene chloride at the "lowest level for which OSHA c[ould] currently document feasibility across the affected application groups and industries." 62 Fed. Reg. 1,575 (Nov. 22, 2006). HRG provides no argument explaining why the Agency's longstanding interpretation of its responsibilities under section 655(b)(5) should not be afforded *Chevron* deference. Nor does HRG point to a single case in which a court invalidated a uniform PEL on grounds that certain industries could comply with a more restrictive standard.[5]

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[5]HRG argues that two cases, *Building and Construction Trades Deptartment, AFL CIO v. Brock*, 838 F.2d 1258 (D.C. Cir. 1988), and *Industrial Union Deptartment, AFL CIO v. Hodgson*, 499 F.2d 467 (D.C. Cir. 1974), impose a burden on OSHA to explain why it is adopting a uniform PEL when significant risk could be feasibly be eliminated in certain industries. *Hodgson* merely states that OSHA is "authorized" to structure standards according to "the compliance capabilities of various industries." 499 F.2d at 480 n.31. *Brock* stands only for the proposition that an enforcement efficiency justification in support of uniform regulatory treatment "seems to completely disappear" when the subcategory at issue consisted of "93 percent of affected workers." 838 F.2d at 1273. Moreover, even if OSHA had some special burden of explanation, HRG fails to demonstrate why the Agency's asserted reasons for

OSHA's decision to select a uniform exposure limit is a legislative policy decision that we will uphold as long as it was reasonably drawn from the record. *See AISI*, 577 F.2d at 833. OSHA acknowledges that a lower PEL was feasible for certain industries representing a minority of exposed workers. However, the Agency provided ample reasons for selecting a uniform standard. OSHA explained that multiple PELs would create an "enormous evidentiary burden," and associated implementation delays, in order for the Agency to define the precise situations under which employers would be required to meet a lower PEL.[6] 71 Fed. Reg. 10,338. OSHA further explained that multiple PELs would create compliance and enforcement problems because many workplaces, and even individual workers, are subject to multiple categories of Cr(VI) exposure. This would make it "virtually impossible to distinguish exposures from one source versus the other." *Id.*

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adopting a uniform PEL were factually unsupported or legally inadequate.

[6]HRG argues that OSHA's existing feasibility analysis already contains the information necessary to identify which activities should be subject to a lower PEL. However, OSHA explained that the "definitional and line drawing problem is far less significant when OSHA uses a unit of industries and operations for analytical but not compliance purposes," because the "consequences of imprecise classifications" for compliance purposes "would become much more significant." 71 Fed. Reg. 10,338.

OSHA concluded that "a uniform PEL will ultimately make the standard more effective by" facilitating employer understanding and compliance, and enhancing OSHA's ability "to provide clear guidance to the regulated community and identify non-compliant conditions." *Id.*

In light of OSHA's stated reasons for adopting a uniform PEL, and the Agency's similar practice in prior standards, we conclude that OSHA's decision was reasonably drawn from the record. While HRG may provide reasons to disagree with OSHA, it provides no grounds upon which we could conclude that the agency operated outside of its discretion in implementing section 655(b)(5).

C. Action Level

HRG argues that OSHA did not adequately explain why it set the "action level", the level that triggers additional monitoring and surveillance obligations, at one half of the PEL. *See* 29 C.F.R. §§ 1910.1026(b), (d)(2)(iii), 1926.1126(b), (d)(2)(iii). HRG argues that this action level was unjustified given the significant risks to employee health that remain at both the PEL and one half of the PEL. HRG points to no case in which a court invalidated the action level of a previous standard.

OSHA explained that, given the variable nature of Cr(VI) concentrations in workplaces, the action level is a tool that "provides increased assurance that employees will not be

exposed to Cr(VI) at levels above the PEL on days when no exposure measurements are made in the workplace." 71 Fed. Reg. 10,331. By setting the level at one half of the PEL, the action level also "effectively encourages employers, where feasible, to reduce exposures below the action level to avoid the added costs of required compliance with provisions triggered by the action level." *Id.* at 10,332. Set as it is, OSHA explained that the action level provides a "very real and necessary further reduction in risk beyond that provided by the PEL alone." *Id.* OSHA adopted this practice in the Cr(VI) standard after "successful experience with an action level of one-half the PEL in other standards." *Id.* at 10,331. *See, e.g.*, 29 C.F.R. §§ 1910.18 (inorganic arsenic); 1910.1047 (ethylene oxide); 1910.1028 (benzene); 1910.1052 (methylene chloride). OSHA pointed to numerous comments on the proposed rule, from industry and labor, submitted in support of its selected action level. 71 Fed. Reg. 10,331.

Much like the selection of an exposure level, selection of an action level is primarily a legislative policy decision that we will uphold so long as it was reasonably drawn from the record. *See AISI*, 577 F.2d at 833. To the extent the decision may have relied on factual findings, we will not disturb those findings as long as they are supported by substantial evidence. 29 U.S.C. § 655(f). OSHA has no statutory obligation to implement action levels, but has developed the concept as a means to promulgate more effective standards. As OSHA explained, one reason for implementing the action level was to provide confidence that

day-to-day exposures do not exceed the PEL. The action level is also intended to encourage employers to reduce employee exposure below the PEL where possible. As for setting the level at one-half of the PEL, OSHA explained that it followed a practice it had found successful in prior standards, and identified diverse comments in the record supporting its approach.

We conclude that it is eminently reasonable for OSHA to base a tool for PEL compliance on the PEL, and that the past experience and positive comments cited by OSHA provide substantial evidence in support of the chosen action level. We will accordingly not disturb the Agency's decision.

D. Employee Notification Level

The Cr(VI) standard requires an employer to notify an employee whenever monitoring results indicate that the employee was exposed to Cr(VI) levels in excess of the 5 $\mu g/m^3$ PEL. 29 C.F.R. §§ 1910.1026(d)(4), 1926.1126(d)(4). The proposed rule would have required an employer to notify an employee of all monitoring results. 69 Fed. Reg. 59,450-51. HRG argues that OSHA's decision not to adopt the proposed rule and, instead, to set the notification level at the PEL is arbitrary and unexplained.

OSHA argues that the notification trigger complies precisely with a statutory requirement for employers to notify employees of exposure to toxins "at levels which exceed those

prescribed by an applicable [OSHA] standard." 29 U.S.C. § 657(c)(3). OSHA also contends that its general record access standard provides all employees the right to access their records, thus permitting them to discover monitoring results on their own. *See* 29 C.F.R. § 1910.1020(e)(1)(i) ("Whenever an employee . . . requests access to a record, the employer shall assure that access is provided in a reasonable time, place, and manner."). OSHA further argues that it opened the notification issue up to comment, and that the final rule was more protective than the proposed rule because the final rule expanded the monitoring requirements to include shipyards and construction. Finally, OSHA asserts that the Cr(VI) standard requires all employers to educate affected employees about the risks of Cr(VI) exposure. *See* 29 C.F.R. 1910.1020.

While all of these arguments may be true, they are beside the point. OSHA does not deny that the final Cr(VI) standard departed significantly from the notification requirement of the proposed standard, or that *every* prior standard that required monitoring also required the employers to notify their employees of *all monitoring results*. *E.g.*, 29 C.F.R. §§ 1910.1001(d)(7)(i) (asbestos); 1910.1017(n) (vinyl chloride); 1910.1018(e)(5)(i) (inorganic arsenic); 1910.1025(d)(8)(i) (lead). While we recognize that OSHA operates with substantial discretion in promulgating standards, rules, and decisions, the Agency must always include a statement of its reasons for any such action in the Federal Register. 29 U.S.C. § 655(e). We are particularly curious as to OSHA's reasons for setting the notification level

at the PEL, since the Agency does not deny that this decision departs from both its proposed rule and its past practice.

In its brief and at oral argument, OSHA failed to point us to a statement in the record justifying the altered notification requirement, or attempt to explain the agency's reasoning. While we find extensive discussion in the Federal Register regarding the methods employers may use to measure exposure, and a discussion of the notification requirement in its final form, we find no explanation for why OSHA replaced the proposed notification requirement. *See* 71 Fed. Reg. 10,339-43. OSHA accordingly failed to provide a statement of reasons for its actions as required by section 655(e), and we will accordingly grant HRG's petition on this ground.[7]

V. EEI's Arguments

EEI challenges the applicability of the Cr(VI) standard to employees performing maintenance and repair work in coal and nuclear electric utility power plants. These employees may be

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[7]OSHA cites *National Grain and Feed Ass'n v. OSHA*, 866 F.2d 717 (5th Cir. 1989), for the proposition that HRG bears the burden to demonstrate that any rule alteration it proposes would have "more than a *de minimis* benefit for . . . worker safety." *Id.* at 737. Since we do not here consider an alternative provision, but rather conclude that OSHA failed to adequately explain its actions, we find *National Grain* to be inapplicable.

exposed to Cr(VI) through contact with "fly ash" in coal plants, or through welding in either coal or nuclear plants, during occasional periods of maintenance and repair. EEI argues: (1) OSHA impermissibly relied on medical data from other industries to establish the toxicity of Cr(VI) compounds in electric plants; (2) OSHA's decision not to exempt electric plants from the Cr(VI) standard is not supported by substantial evidence; (3) OSHA's conclusion that the Cr(VI) standard is feasible for coal and nuclear electric plants is not supported by substantial evidence; and (4) the standard is arbitrary and capricious because OSHA failed to address conflicts with other regulatory requirements. For the reasons stated below, we will deny EEI's petition on all grounds.

A. Toxicity of Cr(VI) Compounds in Electric Power Plants

EEI challenges OSHA's reliance on the Gibb and Luippold cohorts, studies drawn from the chromate production industry, to establish the toxicity of the Cr(VI) compounds found in electric power plants. EEI points to portions of a statement by Dr. Herman Gibb, of the Gibb study, suggesting that the relative toxicity of different forms of Cr(VI) compounds encountered in different industries may vary. (*See* Ex. 47-8, Post-Hearing Comments From Herman Gibb on the Proposed Hexavalent Chromium Rule, Mar. 21, 2005 ("Gibb Comments")). EEI also points to two cases, *Texas Independent Ginners Ass'n v. Marshall*, 630 F.2d 398, 403 (5th Cir. 1980),

and *Color Pigments Manufacturer's Ass'n, Inc. v. OSHA*, 16 F.3d 1157 (11th Cir. 1994), to support its assertion that evidence of health risks in one industry may not be relied on to establish health risks in a second industry. EEI identifies no evidence, in the record or otherwise, suggesting that Cr(VI) compounds encountered in electric power plants are any less carcinogenic than Cr(VI) compounds encountered in chromate production.

In reaching a conclusion as to the existence of significant risk, OSHA need not calculate risk with mathematical precision, nor does the substantial evidence standard require the Agency to support its risk determination "with anything approaching scientific certainty." *Benzene*, 448 U.S. at 655-56. Under the "best available evidence" standard, "so long as they are supported by a body of reputable scientific thought, the Agency is free to use conservative assumptions in interpreting the data with respect to carcinogens, risking error on the side of overprotection rather than underprotection." *Id.* at 656.

During rulemaking, OSHA considered arguments that risk estimates derived from Cr(VI) compounds found in the chromate production industry were not applicable to other industries. 71 Fed. Reg. 10,334. However, OSHA ultimately determined that "all Cr(VI) compounds" are carcinogenic, and that the risk estimates derived from the Gibb and Luippold cohorts were "reasonably representative of the risks expected from equivalent exposures to different Cr(VI) compounds in other industries." *Id.* During rulemaking, the Agency

specifically asked for Dr. Gibb's opinion on this precise matter through a post-hearing question. Dr. Gibb's response, taken in its entirety, provides no support for EEI's position:

> Should the exposure response observed in the chromium chemical production worker studies be restricted to setting a PEL only for the chemical production industry?
>
> Answer: It is conceivable that differences in exposure (e.g. practical size, nature of the aerosol, etc) between some industries (e.g. steel, aerospace, lead chromate pigment production) and the chromium chemical production industry could lead to differences in cancer risk, *but the available data are inadequate to evaluate whether such differences exist* . . . . It is unlikely that adequate studies of all industries affected by this proposed rule will ever be conducted. In the absence of more definitive information regarding specific industries, it is prudent to regard exposure to any hexavalent chromium compound as presenting an excess lung cancer risk and that *the exposure response observed in the chromium chemicals production industry should apply to other industries with occupational exposure to hexavalent chromium*.

(Gibb Comments at 5 (emphasis added).)

In explaining its final risk determinations regarding Cr(VI), OSHA stated that "the Gibb cohort and the Luippold cohort, were found to be the strongest data sets for quantitative assessment" because, in part, the "two had the most extensive and best documented Cr(VI) exposures spanning three or four decades." 71 Fed. Reg. 10,176. Dr. Gibb's comments bolster OSHA's conclusion that the Agency based its health risk determination on the "best quantitative estimates of excess lifetime lung cancer risks" available. *Id.* at 10,220. To the extent that OSHA's reliance on these estimates might conceivably have been conservative, *Benzene* permits the Agency to risk error on the side of overprotection. Since Dr. Gibb expressly recommended that OSHA rely on the chromate production studies to establish the toxicity of Cr(VI) compounds generally, his testimony is of no help to EEI.

EEI's reliance on *Color Pigments* and *Texas Independent* is also misplaced. EEI points to portions of both cases in which the relevant issue was not the inherent toxicity of certain compounds, but the *amounts* of known toxins encountered in different industries. There is no dispute here that different operations naturally generate different concentrations of Cr(VI). The Cr(VI) standard accounts for these differences by requiring all employers to comply with a uniform exposure limit.

In *Texas Independent*, the cotton dust standard at issue did not establish an exposure limit or require employers to limit cotton dust emissions. *See Texas Independent*, 630 F.2d at 403. OSHA did not measure exposure levels in the cotton gin industry, but sought to impose medical surveillance requirements on that industry on the basis of negative health effects observed in cotton textile manufacturing processes. *Id.* at 409. The court determined that OSHA's risk assessment lacked substantial evidence because the concentration of cotton dust in cotton gin operations was "substantially lower" than the concentrations encountered in cotton manufacturing. *Id.* at 409. Thus, the disputed issue was the *amount* of occupational exposure to a particular substance in disparate industries, not the *toxicity* of the substance itself.

Color Pigments is similarly inapplicable. OSHA's technological feasibility analysis for the cadmium standard at issue was based upon the extent to which employers could reduce toxin concentrations below an initial exposure level. 16 F.3d at 1162-63. Proper calculation of the initial exposure level in a given industry was therefore "vital." *Id.* at 1163. OSHA established the initial exposure level in the chemical mixer industry by using data captured from the dry color formulator industry. *Id.* at 1162. The court ruled that this methodology was inadequate because OSHA failed to account for variables between the industries that would affect the *amount* of cadmium to which employees were exposed. *Id.* Thus, the disputed issue was again the level of exposure to a

toxic substance in disparate industries, not the toxicity of the substance itself.

EEI identifies no case in which a court faulted OSHA for using medical data derived from one industry to establish the toxicity of a substance generally. In fact, in another portion of the *Color Pigments* decision, the Eleventh Circuit rejected an argument that mirrors the one made here by EEI. The cadmium pigment industry argued that OSHA should have excluded it from the cadmium standard because exposure to cadmium pigment was allegedly "less toxic and carcinogenic[] than other forms of cadmium." Id. at 1161. The court disagreed:

> Given the absence of definiteness on the issue, the volume of evidence that points at least implicitly to the dangers of cadmium pigments, and the serious potential health risks present if cadmium exposure is as great in pigment form as in other compounds, we believe that OSHA was justified in choosing to include cadmium pigments in the PEL, despite the existence of an equally rational alternative.

Id. EEI's argument is no more availing.

OSHA's conclusion that health risk data derived from the chromate production industry was sufficient to establish the toxicity of Cr(VI) compounds generally is supported by the best

available evidence and by substantial evidence. We will therefore not disturb the Agency's decision.

B. Exemption for Electric Power Plants

EEI also argues that, even assuming that Cr(VI) compounds encountered in electric plants are carcinogenic, the concentrations of such compounds in electric plants are so low as to warrant a general exemption from the standard. OSHA denied EEI's request for such an exemption during rulemaking. 71 Fed. Reg. 10,330-31. EEI argues that the amount of Cr(VI) contained in "fly ash," a residue of coal combustion encountered during the maintenance and repair of boilers in coal-fired electric plants, results in exposure levels that are below the Agency's exemption level. *See* FEA at II-24. Because this argument does not pertain to welding, the only identified source of Cr(VI) exposure in nuclear plants, and an additional source in coal-fired plants, we consider the exemption argument to be limited in scope to fly ash encountered in coal-fired plants.

EEI points to a statement by OSHA indicating that the Cr(VI) content found in samples of fly ash provided to the Agency demonstrated that the worker exposure to Cr(VI) would be "well below 0.5 $\mu g/m^3$." FEA at III-362. Under the final Cr(VI) standard, any employer, including an employer operating an electric power plant, may be granted an exemption by demonstrating with "objective data" that "a specific process, operation, or activity involving [Cr(VI)] cannot release dusts,

fumes, or mists of [Cr(VI)] in concentrations above 0.5 µg/m^3 . . . under any expected conditions of use." 29 C.F.R. §§ 1910.1026(a)(4), 1926.1126(a)(4). EEI argues that exposures to fly ash should have been completely exempted from the standard during rulemaking under this same standard, just as exposures to portland cement were exempted in the final rule. *See id.* § 1910.1026(a)(3).

OSHA asserts, and the record demonstrates, that the Agency only received nine samples of fly ash from EEI during rulemaking, despite there being more than 1,000 coal-fired electric plants in operation. Furthermore, EEI did not fully identify the types of coal involved, or where the samples originated. While the samples provided did indicate that exposures from fly ash would be low, OSHA explained that there was insufficient evidence "to establish that *all* coal ash from *all* sources will *necessarily* have comparable Cr(VI) content [to the exempted portland cement]." 71 Fed. Reg. 10,330-31 (emphasis added).[8] This was in contrast to comprehensive data pertaining to portland cement, which demonstrated that employee exposures would be below 0.3 µg/m^3. *Id.* at 10,328.

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[8]In fact, one of the nine samples provided by EEI had a Cr(VI) content of 45 micrograms per gram of fly ash. FEA at III-361. In its brief, OSHA states that this translates to an inhalation exposure level of 0.675 µg/m^3, above the exemption level of 0.5 µg/m^3.

In this argument, EEI does not deny that Cr(VI) is toxic, and that Cr(VI) is present in fly ash. The sole issue is whether the evidence of Cr(VI) concentration levels in the record required the Agency to exempt all fly ash exposure in coal-fired electric plants from the standard. OSHA is required to promulgate protective standards on the basis of the best available evidence. The Agency rejected EEI's requested exemption upon finding that the available evidence was insufficient to demonstrate that employee exposure to Cr(VI) from fly ash would be sufficiently and uniformly low. OSHA's determination that there was an insufficient basis for exemption is supported by substantial evidence in the record indicating that EEI only provided OSHA with nine samples of ash during rulemaking that were incompletely labeled. To the extent this decision involved legislative policy decisions on the part of the Agency, we find it to be reasonably drawn from the record. We will therefore not disturb the OSHA's decision to deny a general exemption for fly ash exposures in coal-fired electric power plants.

C. Feasibility of the Standard for Electric Power Plants

EEI argues that OSHA failed to prove that the Cr(VI) standard is economically and technologically feasible for coal and nuclear electric utility power plants. First, EEI argues that OSHA failed to prove economic feasibility because it did not show that the costs of compliance would be reasonably related to the benefits to be derived from employee protection. This

argument is predicated on a clear misstatement of law. EEI relies on a concurring opinion by Justice Powell in *Industrial Union Department, AFL-CIO v. American Petroleum Institute*, 448 U.S. 607 (1980), in which he argued for a proportionality requirement. *Id.* at 663. The Court squarely rejected Justice Powell's position the next year in *American Textile Manufacturer's Institute, Inc. v. Donovan*, 452 U.S. 490 (1981), after reasoning that a "cost-benefit analysis on the issuance of § 6(b)(5) standards would eviscerate the 'to the extent feasible' requirement." *Id.* at 513. We therefore reject EEI's argument with regard to economic feasibility.[9]

Second, EEI devotes just over a page in its brief to argue that OSHA made no findings regarding the technological feasibility of the Cr(VI) standard in electric power generation plants. However, the record demonstrates that, for the purposes of assessing feasibility, OSHA included electric utilities within

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[9]In its reply brief, EEI adds an additional argument that OSHA's cost estimates for welding were not appropriately tailored to the electric utility industry. During hearings, OSHA specifically asked EEI to supply additional information to support its asserted cost figures, but EEI does not deny that it never complied. Furthermore, EEI offers no argument or evidence that, under the correct standard for economic feasibility, the costs of compliance would have threatened the existence or altered the competitive structure of the electric utility industry.

the welding applications group. FEA at II-24. EEI points to no evidence indicating that welding in electric utilities differs substantially from welding generally, but, in its reply brief, EEI attacks the application group methodology generally. As we discussed above in considering HRG's similar argument, OSHA acted within its discretion to assess feasibility through use of application groups. We will therefore not disturb OSHA's findings with regard to the feasibility of the Cr(VI) standard in the electric utility industry.

D. Relationship of the Cr(VI) Standard to Other Regulations

EEI argues that OSHA failed to harmonize the Cr(VI) standard with regulatory requirements of the Nuclear Regulatory Commission ("NRC"), and OSHA's own arsenic standard as it applies to fly ash.

With regard to workers in nuclear plants, EEI points to 10 C.F.R. § 20.1101(b), which requires employers subject to NRC licenses to "use, to the extent practical, procedures and engineering controls based on sound radiation protection principles to achieve operational doses . . . that are as low as is reasonably achievable (ALARA)." *Id.* EEI contends that the controls required to comply with the new Cr(VI) standard would risk increasing the time workers spend in radioactive areas, particularly through use of respirators, and the total number of employees exposed to radiation. However, the record

demonstrates that OSHA entered into an agreement with the NRC in 1988, which delineates jurisdiction regarding occupational safety and health at nuclear power plants. Memorandum of Understanding Between the U.S. NRC and OSHA, Oct. 21, 1988 ("MOU"). By the terms of the MOU, OSHA has jurisdiction to regulate "[p]lant conditions which result in occupational risk, but do not affect the safety of licensed radioactive materials," conditions which might include "exposure to toxic nonradioactive materials and other industrial hazards in the workplace." *Id.* Moreover, a regulatory guide published by the NRC expressly provides that "if an NRC licensee is using respiratory protection to protect workers against nonradiological hazards, the OSHA requirements apply." NRC Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection, Rev. 1, Oct. 1999. Thus, we conclude that the Cr(VI) standard is fully compatible with NRC's ALARA requirement.

With regard to coal-fired power plants, EEI argues that OSHA failed to rectify the Cr(VI) standard with its existing standard for inorganic arsenic, another toxin present in coal fly ash. EEI points to language in the preamble of the arsenic standard by which OSHA responded to EEI's argument that coal plants should be exempt because exposure from cleaning boilers is "intermittent." Occupational Exposure to Inorganic Arsenic, 48 Fed. Reg. 1,864, 1,895 (Jan. 14, 1983). OSHA found no basis to exclude the plants from the standard, but stated "[i]f it is a maintenance operation with intermittent exposures, the

arsenic standard indicates that a good respirator program with sign posting, training, and hygiene facilities . . . may be an appropriate control strategy. If exposures are continuous, additional control strategies would be appropriate." *Id*. at 1985.

EEI contends that, by this language, OSHA excluded coal power plants from the arsenic standard's requirement to maintain regulated areas and to comply with certain housekeeping standards. *See* 29 C.F.R. §§ 1910.1018(f), (g). In view of OSHA's alleged past practice regarding toxins in fly ash, EEI contends that it was therefore inexplicable and arbitrary for the Agency to include maintenance and repair activities in electric plants in the general industry provisions of the Cr(VI) standard. EEI contends that the construction provisions of the Cr(VI) standard, which do not include regulated area and housekeeping requirements, would have been more appropriate.

OSHA flatly denies that the arsenic regulations contain any exemption for electric utilities with regard to maintenance and repair work. We note that both the arsenic standard and the general industry provisions of the Cr(VI) standard contain virtually identical requirements for regulated areas and housekeeping. *Compare* 29 C.F.R. §§ 1910.1018(f), (g) *with* §§ 1910.1026(e), (j). Nothing in the text of the arsenic regulations indicates that electric utilities are subject to an exemption, and we find EEI's reliance on the language in the preamble to be unconvincing.

Moreover, even if electric plants were required to do more to control fly ash under the Cr(VI) standard, EEI identifies no legal basis for this Court to disturb a standard merely because two disparately regulated toxins happen to exist in a single substance found in a workplace. Each standard was written to mitigate the risks of a different hazardous substance, and we fail to see why it would be at all improper for OSHA to expect an employer to comply with the more restrictive standard.

VI. Remedy

Because we conclude that OSHA failed to provide a statement of its reasons for setting the employee exposure notification level at the PEL, we must select an appropriate remedy. Where, as here, the only identified defect in a standard is the lack of an adequate statement of reasons, the appropriate course of action is to remand the matter to OSHA for further consideration and explanation, without disturbing the rule itself. *AFL-CIO v. Brennan*, 530 F.2d 109, 124 (3d Cir. 1975); *see also Int'l Union, United Mine Workers of Am. v. Federal Mine Safety and Health Admin.* 920 F.2d 960, 966 (D.C. Cir. 1990) ("We have commonly remanded without vacating an agency's rule or order where the failure lay in lack of reasoned decisionmaking."). We will accordingly remand the matter to OSHA for further consideration and explanation, consistent with this opinion. Given the length of time that has passed in finalizing the rule before us, and the need for certainty, we expect that OSHA will act expeditiously in either providing an

explanation for its chosen notification requirements, or taking such further action as may be appropriate.

VII. Conclusion

For the reasons stated above, we will GRANT HRG's petition for review with regard to the employee notification requirements of the Cr(VI) standard, and REMAND the matter to OSHA for further consideration. We will DENY HRG's petition for review on all other grounds. We will DENY EEI's petition for review on all grounds.

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