OSHA'S FEASIBILITY POLICY: THE IMPLICATIONS OF THE "INFEASIBILITY" OF RESPIRATORS

In 1970, Congress enacted the Occupational Safety and Health Act[1] (OSH Act). As part of its comprehensive framework for promoting safe working conditions, the statute empowered the Occupational Safety and Health Administration (OSHA) to establish regulations on occupational exposure to hazardous materials. The Secretary of Labor is required to ensure "*to the extent feasible*, on the basis of the best available evidence, that *no employee* will suffer material impairment of health" from occupational exposure to toxic materials.[2] This authorization appears to be sweeping, and it was both applauded by those who hoped for a robust regulatory system that would prevent workers from being sickened by toxic chemicals[3] and met with dismay by those who feared draconian results.[4] However, "profound difficulties" soon became apparent.[5] Now, forty-six years later, hopes for a maximally protective system for regulating workplace chemical exposure have been disappointed.[6] How OSHA sets permissible levels of chemical exposure is, as this Note will show, one striking example of how the agency has fallen short of exercising its full authority to protect workers' health.

Feasibility standards are a feature of environmental, health, and safety laws.[7] Although some scholars have fiercely defended feasibility

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[1] Pub. L. No. 91-596, 84 Stat. 1590 (codified as amended at 29 U.S.C. §§ 651–678 (2012)).

[2] 29 U.S.C. § 655(b)(5) (emphasis added).

[3] *See, e.g.*, George H. Cohen, *The Occupational Safety and Health Act: A Labor Lawyer's Overview*, 33 OHIO ST. L.J. 788, 788–95 (1972) (describing the regulatory scheme set up by the OSH Act as "perhaps . . . the most profoundly far-reaching of all federal labor statutes[,] . . . go[ing] beyond the bounds of pure industrial relations, entering into the arena of progressive social reform 'to assure so far as possible every working man and woman in the nation safe and healthful working conditions,'" *id.* at 788–89 (quoting 29 U.S.C. § 651 (1970))).

[4] *See, e.g.*, Byron E. Calame, *Safety First: Job-Hazard Law Spurs Complaints from Firms on Cost of Safeguards*, WALL ST. J., Dec. 1, 1971, at 1 ("Almost everyone agrees the toughest problem for employers will come when the government gets around to setting precise limits on workers' exposure to thousands of dangerous chemicals and other substances.").

[5] Mark A. Rothstein, *OSHA After Ten Years: A Review and Some Proposed Reforms*, 34 VAND. L. REV. 71, 72 (1981).

[6] Between 1981 and 2010, OSHA promulgated only twenty-three health standards, and the average time OSHA took to develop and issue its health standards was over six years. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-12-330, WORKPLACE SAFETY AND HEALTH: MULTIPLE CHALLENGES LENGTHEN OSHA'S STANDARD SETTING 1, 9 (2012) [hereinafter GAO REPORT]. And most of the underlying "consensus standards" in which hundreds of OSHA limits are rooted are unchanged from the interim consensus standards the agency adopted in its first year of existence. *Id.* at 6.

[7] In addition to the OSH Act's mandate, environmental laws like the Clean Water Act and the Clean Air Act that call for implementation of the "best available technology" require a similar

standards,[8] others have criticized them for mandating irrational decisions. A primary criticism is that feasibility standards lead to inefficient overregulation.[9] More recently, Professors Jonathan Masur and Eric Posner have criticized the lack of a normative basis for the feasibility standard and warned that underregulation could result.[10]

But what has been missing from this discussion is a close study of how OSHA implements its feasibility standard.[11] This Note surveys the process by which OSHA has demonstrated that a permissible exposure limit (PEL) for a hazardous chemical is both economically and technologically feasible. *Economic feasibility* may appear to be more open-ended[12] and therefore a more important lever for standard-setting — indeed, the murkiness of its meaning has been amply discussed in the scholarly literature.[13] However, *technological feasibility* has set the limit on each of OSHA's recent significant health standards.[14] In determining the lowest exposure level that is technologically feasible, one might expect that the analysis would include the use of any technology that OSHA requires to achieve the PEL once it has been set. So OSHA's categorical exclusion of respirators — personal protective devices worn on the face to filter either airborne particles or

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analysis. *See, e.g.*, Bruce A. Ackerman & Richard B. Stewart, Comment, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1334–35 (1985).

[8] *See, e.g.*, SIDNEY A. SHAPIRO & ROBERT L. GLICKSMAN, RISK REGULATION AT RISK 61–65 (2003); Wendy E. Wagner, *The Triumph of Technology-Based Standards*, 2000 U. ILL. L. REV. 83, 92–107; Amy Sinden, Douglas A. Kysar & David M. Driesen, *Cost-Benefit Analysis: New Foundations on Shifting Sand*, 3 REG. & GOVERNANCE 48, 63–66 (2009) (book review).

[9] *See, e.g.*, Ackerman & Stewart, *supra* note 7, at 1333.

[10] Jonathan S. Masur & Eric A. Posner, *Against Feasibility Analysis*, 77 U. CHI. L. REV. 657, 661–62, 679–80, 697, 704 (2010) ("Underregulation occurs because feasibility analysis tolerates dangerous industrial practices if regulation would shut down plants." *Id.* at 704.).

[11] Masur and Posner took a step in this direction with a thorough analysis of OSHA's hexavalent chromium rule. *See id.* at 670–80. This Note builds upon their foundation by synthesizing information from that rule as well as three other significant health standards.

[12] Masur and Posner focused their criticism on OSHA's manner of conducting economic feasibility analysis, describing it as arbitrary and characterizing OSHA's economic feasibility analysis in industries that incur costs greater than the threshold test as "neither well reasoned nor well documented." *Id.* at 679.

[13] *See, e.g.*, Joseph E. Hadley, Jr. & Gerald L. Richman, *The Impact of* Benzene *and* Cotton Dust*: Restraints on the Regulation of Toxic Substances*, 34 ADMIN. L. REV. 59, 77 (1982); Howard A. Latin, *The Feasibility of Occupational Health Standards: An Essay on Legal Decisionmaking Under Uncertainty*, 78 NW. U. L. REV. 583, 588–89 (1983); Masur & Posner, *supra* note 10, at 661–62.

[14] This Note surveys four of the five significant OSHA chemical exposure rules of the past twenty years. The fifth standard, which is not discussed in detail, is OSHA's methylene chloride rule. *See* Occupational Exposure to Methylene Chloride, 62 Fed. Reg. 1494 (Jan. 10, 1997) (codified at 29 C.F.R. pts. 1910, 1915 & 1926 (2015)) [hereinafter Methylene Chloride]; GAO REPORT, *supra* note 6, at 11 fig.2. In that rule, OSHA determined only that the PEL it established was both economically and technologically feasible, Methylene Chloride, *supra*, at 1577, and that it did not have substantial evidence to demonstrate that any lower level was "feasible," *id.* at 1562.

chemicals from inhaled air[15] — from its technological feasibility analysis presents a puzzle. Either the way in which OSHA has interpreted technological feasibility is impermissible because it excludes from its technological feasibility analysis a technology that OSHA effectively admits is feasible, or OSHA has more discretion in interpreting what is feasible than is commonly realized.

Part I of this Note introduces the feasibility standard and its interpretation by the courts, with an emphasis on how practical constraints interact with that interpretation. Part II provides an overview of how OSHA defines technological feasibility in practice and surveys four OSHA health standards to discern how OSHA makes its feasibility determinations. Part III examines OSHA's implicit policy on respirators, asks whether that policy is lawful, and explores the implications for how much discretion OSHA is afforded in defining what is "feasible." The Note concludes with a suggestion for how OSHA might more systematically determine which technologies to include in its analysis of whether a PEL is technologically feasible.

I. "FEASIBLE" DEFINED

The language "to the extent feasible" was always intended to be a curb. The phrase was added to the original text of the bill that would become the OSH Act after Senator Peter Dominick expressed fear that the initial language of section 6(b)(5)[16] could permit a mandate that would "close every business in [the] nation."[17] But what does "to the extent feasible" mean?[18] It may be helpful to consider the constraints

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[15] *Respirator Trusted-Source Information*, CTRS. FOR DISEASE CONTROL & PREVENTION, http://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/respsource1quest1.html (last updated Aug. 2, 2011) [http://perma.cc/BVE3-ZW5H].

[16] Requiring the Secretary to set a standard "which most adequately assures, on the basis of the best available professional evidence, that no employee will suffer any impairment of health or functional capacity or diminished life expectancy." JOHN D. GRAHAM, LAURA C. GREEN & MARC J. ROBERTS, IN SEARCH OF SAFETY: CHEMICALS AND CANCER RISK 83 (1988) (quoting H.R. 16,785, 91st Cong. (1970)).

[17] *Id.* (quoting 116 CONG. REC. 36,530 (1970) (statement of Sen. Dominick)).

[18] Both commentators and courts have observed that "feasible" (like most legal formulations) is not a precise term. *See, e.g.*, *id.* at 98 ("Advocates of workers' rights . . . often recognize the need for OSHA . . . to consider feasibility. Unfortunately, the operational meaning of this word for the practice of standard setting is not obvious."); *see also, e.g.*, United Steelworkers v. Marshall, 647 F.2d 1189, 1263–64 (D.C. Cir. 1980) ("The conventional arts of statutory construction are of little help in understanding such scant language." *Id.* at 1264.). Even though "to the extent feasible" appears to indicate a clear cutoff — the Secretary is given a point up to which he must regulate, rather than a range — the Secretary has the discretion to determine which outcomes are feasible or infeasible, subject to deferential review by the courts. *See, e.g.*, Pub. Citizen Health Research Grp. v. U.S. Dep't of Labor, 557 F.3d 165, 176–77 (3d Cir. 2009). However, whether a standard is feasible depends on the cost we are willing to incur to achieve it. That inquiry requires a decision to be made about what costs to industry, and by extension to consumers and possibly to workers' wages themselves, are reasonable sacrifices in exchange for particular

on the standard's meaning in two steps: how the courts have interpreted it, and how practical limitations — in particular, factual uncertainty — have further limited its application.

A. Legal Interpretation

In *American Textile Manufacturers Institute, Inc. v. Donovan* (*Cotton Dust*),[19] the Supreme Court held that "feasible" in section 6(b)(5) of the OSH Act means "capable of being done."[20] Therefore, the Court determined, the OSH Act did not mandate cost-benefit analysis because "Congress itself defined the basic relationship between costs and benefits, by placing the 'benefit' of worker health above all other considerations save those making attainment of this 'benefit' unachievable."[21]

Lower courts have divided feasibility into two components: technological feasibility and economic feasibility.[22] To establish technological feasibility, the courts have required OSHA to demonstrate that the technology that could meet a standard is — as specified in *United Steelworkers v. Marshall* — "either already in use or has been conceived and is reasonably capable of experimental refinement and distribution within the standard's deadlines."[23] Thus, OSHA has interpretive discretion to deem a standard technologically feasible even if it mandates an exposure level not currently attained at any firm, so long as OSHA can point to existing or conceived-of technologies that are "likely to be capable of meeting the PEL and which . . . industries are generally capable of adopting."[24]

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health benefits. Although it could be argued that the essence of "feasible" is that it is set in the abstract, *see* David M. Driesen, *Two Cheers for Feasible Regulation: A Modest Response to Masur and Posner*, 35 HARV. ENVTL. L. REV. 313, 314 (2011), any meaning of "feasible" that OSHA could select makes an implicit judgment about what costs are worth incurring in order to meet the OSH Act's mandate. *Compare id.* (reducing excess risk is highly valued and prioritized — but not above the value of avoiding the near-shuttering of an industry), *with* Indus. Union Dep't v. Am. Petroleum Inst. (*Benzene*), 448 U.S. 607, 639 (1980) (argument advanced by industry representatives presumes that the value of reducing excess risk is not greater than any other benefit).

[19] 452 U.S. 490 (1981).

[20] *Id.* at 509.

[21] *Id.*

[22] This divide was first articulated in the context of setting a PEL in *American Iron & Steel Institute v. OSHA*, 577 F.2d 825, 832 (3d Cir. 1978) (citing AFL-CIO v. Brennan, 530 F.2d 109, 122 (3d Cir. 1975)), and elaborated on in *United Steelworkers v. Marshall*, 647 F.2d 1189, 1264 (D.C. Cir. 1980). *See also* Indus. Union Dep't v. Hodgson, 499 F.2d 467, 477–78 (D.C. Cir. 1974).

[23] *United Steelworkers*, 647 F.2d at 1272. In OSHA's restatement, "[a] standard is technologically feasible if the protective measures it requires already exist, can be brought into existence with available technology, or can be created with technology that can reasonably be expected to be developed." Methylene Chloride, *supra* note 14, at 1496 (citing *Cotton Dust*, 452 U.S. at 513 (1981)).

[24] *United Steelworkers*, 647 F.2d at 1266.

In the most expansive interpretation adopted by the courts, a standard is economically feasible "if it does not threaten 'massive dislocation' to, or imperil the existence of the industry."[25] However, "the practical question is whether the standard threatens the competitive stability of an industry."[26] Although OSHA is not "require[d] . . . to establish [a] standard's economic feasibility in a particular way,"[27] it "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."[28]

Moreover, the OSH Act requires OSHA to demonstrate feasibility by "substantial evidence."[29] Although courts reviewing OSHA standards consider the substantial evidence test a "rather generous constraint[],"[30] it is nonetheless "more stringent" than the arbitrary and capricious standard by which most other agency regulations are reviewed.[31] Though courts may excuse OSHA from the need to "prove with . . . certainty" a standard's feasibility,[32] OSHA still has the evidentiary burden of showing, on the basis of "credible sources of information," what the affected industry will be capable of in the future.[33]

B. Practical Limitations

Because OSHA must predict what will be feasible in the future, it must work with inherent factual uncertainty about whether new developments in the interim will make a lower PEL technologically feasible.[34] Even with already-existing technology, there is some uncertainty about whether the adoption of a PEL will be economically infeasible — what the actual economic impact of its adoption will be. Thus, which PEL is the *lowest feasible* is unknown, and the width of the range of concentrations in which that level possibly exists depends on how much information is available. Because OSHA has limited access to information, that range may be quite wide. OSHA's two sources of data for its feasibility analysis are worksite visits within industries that may be affected by a standard and surveys of those in-

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[25] *Id.* at 1265 (citations omitted) (quoting *Brennan*, 530 F.2d at 123). For discussion of how OSHA defines an industry, see Masur & Posner, *supra* note 10, at 688–91.

[26] *United Steelworkers*, 647 F.2d at 1265.

[27] *Id.* at 1267 (quoting AFL-CIO v. Marshall, 617 F.2d 636, 673 n.228 (D.C. Cir. 1979)).

[28] *Id.* at 1272.

[29] 29 U.S.C. § 655(f) (2012).

[30] *United Steelworkers*, 647 F.2d at 1265; *see also Cotton Dust*, 452 U.S. 490, 522–23 (1981).

[31] GAO REPORT, *supra* note 6, at 18.

[32] *United Steelworkers*, 647 F.2d at 1266.

[33] *Id.* (quoting AFL-CIO v. Marshall, 617 F.2d 636, 658 (D.C. Cir. 1979)).

[34] *See* Latin, *supra* note 13, at 611–12.

dustries.[35] Both methods of gathering information are burdensome and make it impractical, even under the best circumstances, for OSHA to obtain full information within any reasonable timeframe.[36]

On the basis of this limited information, OSHA must exercise its judgment to pick a PEL whose feasibility may be demonstrated by substantial evidence. The only source of affirmative evidence available to OSHA is existing practices in the industry (gleaned from its site visits and surveys) and expert opinion based on those practices. These evidentiary limitations, in addition to inherent factual uncertainty, hinder OSHA's ability to require anything more ambitious than can be achieved through common industry practices.[37]

II. OSHA'S PRACTICE

How does OSHA itself give meaning to feasibility? This section will provide a general survey based on four recent OSHA health standards: cadmium, 1,3-butadiene, hexavalent chromium, and crystalline silica. Each health standard will then be considered individually in greater detail.

In practice, OSHA defines technological feasibility as what is achievable using work practice or engineering controls that are "commonly known, readily available and . . . currently used to some extent in the affected industries and processes."[38] Engineering controls — like ventilation systems or enclosures — are mechanical means of eliminating, containing, or diverting harmful contaminants at their source, thereby preventing them from entering the general workplace area without any intervention from workers themselves.[39] Work practice controls also prevent harmful substances from entering the general workplace area but, by contrast, rely on employee actions — for example, keeping lids on containers or using a HEPA vacuum instead of

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[35] GAO REPORT, *supra* note 6, at 14–15.

[36] *See id.*

[37] *See* Masur & Posner, *supra* note 10, at 691–92 ("Technological feasibility generally means technological availability." *Id.* at 691.).

[38] Occupational Exposure to Hexavalent Chromium, 71 Fed. Reg. 10,100, 10,256 (Feb. 28, 2006) (codified in scattered parts of 29 C.F.R.) [hereinafter Chromium]; *see also* Occupational Exposure to Respirable Crystalline Silica, 81 Fed. Reg. 16,286, 16,292 (Mar. 25, 2016) (codified at 29 C.F.R. pts. 1910, 1915 & 1926) [hereinafter Silica] ("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." (quoting *United Steelworkers*, 647 F.2d at 1272)). This definition's origin, in *United Steelworkers*, 647 F.2d at 1270, is discussed *infra* at section III.A, pp. 2248–53.

[39] Occupational Exposure to Lead, 43 Fed. Reg. 52,952, 52,989 (Nov. 14, 1978) (codified at 29 C.F.R. pt. 1910) [hereinafter Lead]; *see also* Am. Iron & Steel Inst. v. OSHA, 182 F.3d 1261, 1265 n.1 (11th Cir. 1999) (citing 29 C.F.R. § 1910.134(a)(1) (1999)).

dry sweeping.[40] After identifying all the industries that would be affected by a PEL and the available engineering and work practice controls, OSHA evaluates for each industry whether the PEL it sets may be achieved through the use of those specified control technologies.[41] If the PEL can be achieved "in most operations most of the time in the affected industries" by engineering or work practice controls,[42] OSHA considers it to be technologically feasible.[43] As the survey of OSHA health standards will make plain, this analysis excludes respirators as a technologically feasible means of attaining a lower PEL, and thus implicitly treats lower exposure levels attainable through respirator use as technologically infeasible. If the exposure level achievable through use of respirators were considered feasible, respirators would presumably have to be considered in this calculus too.

OSHA defines economic feasibility flexibly,[44] but it has a general threshold policy that if the costs of maintaining a PEL are less than 1% of revenues and less than 10% of profits, then that PEL is presumed to be economically feasible.[45] As with its technological feasibility analysis, for this economic feasibility screening analysis, OSHA considers each industry in turn and calculates how the costs of compliance for that industry relate to its revenues and profits.[46] After this initial screen, OSHA scrutinizes the industries that are most significantly affected, particularly if they fall above the threshold test. By evaluating price elasticity, historic fluctuations, and other factors,

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[40] *See, e.g.*, Lead, *supra* note 39, at 52,989 (lids on containers); Chromium, *supra* note 38, at 10,263 (HEPA vacuum).

[41] *See, e.g.*, Occupational Exposure to Cadmium, 57 Fed. Reg. 42,102, 42,299 (Sept. 14, 1992) (codified at 29 C.F.R. pts. 1910, 1915 & 1926) [hereinafter Cadmium]; Occupational Exposure to 1,3-Butadiene, 61 Fed. Reg. 56,746, 56,795 (Nov. 4, 1996) (codified at 29 C.F.R. pts. 1910, 1915 & 1926) [hereinafter 1,3-Butadiene]; Chromium, *supra* note 38, at 10,334–37; Silica, *supra* note 38, at 16,433.

[42] Silica, *supra* note 38, at 16,621.

[43] Generally, OSHA analyzes exposure levels by occupation or process within each industry affected by the rule. *See, e.g.*, Cadmium, *supra* note 41, at 42,214. However, OSHA allows exceptions to this way of grouping when the evidence shows that certain industries have "distinct high and low exposure clusters, especially from process to process within industries." *Id.* at 42,215. Reasoning that using the "most operations most of the time" test in such industries would either impose a "needlessly high" limit on the low exposure processes or an "unrealistically low" limit on the high exposure processes, OSHA may use its discretion to develop different control standards in different processes. *See id.*

[44] For an argument that OSHA's approach is so flexible as to be arbitrary, see Masur & Posner, *supra* note 10, at 693–97.

[45] *See* Silica, *supra* note 38, at 16,533.

[46] OSHA seeks to aggregate as many industries as possible under one standard for administrability. *See, e.g.*, Chromium, *supra* note 38, at 10,338 ("OSHA has not interpreted [section 6(b)(5)] to require setting multiple PELs based on the lowest level particular industries or operations could achieve. Because Congress did not speak to the precise issue in the statute, OSHA has authority to adopt the reasonable interpretation that it judges will best carry out the purposes of the Act." (citing Chevron U.S.A. Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837 (1984))).

OSHA can reason that costs will be absorbed without a devastating impact.[47] For example, costs that would result in a fluctuation at the same order of magnitude as past fluctuations in the industry are likely to be considered feasible.[48]

OSHA often finds that certain "discrete operations" within particular industries experience much higher levels of exposure than the industry in general and would not be able to use engineering or work practice controls to attain a lower concentration of a hazardous substance.[49] For those processes, instead of setting the PEL for the entire industry high enough that even an outlier process can achieve it, OSHA sometimes designates a separate engineering control air limit (SECAL).[50] In doing so, OSHA explicitly recognizes that the SECAL, which is higher than the PEL, is the lowest exposure level that could feasibly be achieved in that process through engineering and work practice controls. Employers are obliged to attain the SECAL in the ambient air for those processes, and then supplement with respirators so that employees experience no higher exposure than the PEL.[51]

A. Cadmium

Cadmium has a "ubiquitous" industrial presence and is used in a wide range of applications.[52] Exposure occurs primarily through inhalation of either small particles from fumes or larger particles of dust.[53]

OSHA's health standard for cadmium, establishing a PEL of 5 micrograms per cubic meter ($\mu g/m^3$) for all cadmium compounds, was finalized in 1992. In the final rule, OSHA made the determination, based on its quantitative risk assessment, that the PEL should be set no higher than 5 $\mu g/m^3$.[54] At that PEL, OSHA estimated that there would be an excess lung cancer risk of between three and fifteen excess lung cancer deaths per 1000 workers (from forty-five years of occupational exposure) and between fourteen and twenty-three excess

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[47] In each of the four standards surveyed for this Note, OSHA did not consider any PEL that raised concerns about economic feasibility; technological feasibility set the lower limit for each standard.

[48] *See, e.g.*, Methylene Chloride, *supra* note 14, at 1568; Chromium, *supra* note 38, at 10,300.

[49] Chromium, *supra* note 38, at 10,347–48.

[50] *See, e.g.*, *id.*; Cadmium, *supra* note 41, at 42,390.

[51] Chromium, *supra* note 38, at 10,347.

[52] Cadmium, *supra* note 41, at 42,107, 42,210–11.

[53] *See id.* at 42,108.

[54] *Id.* at 42,209. OSHA's proposed rule had indicated a PEL of 1 $\mu g/m^3$ or, alternatively, 5 $\mu g/m^3$. *Id.* at 42,106. The previous PEL for cadmium had been 100 $\mu g/m^3$ for cadmium fumes and 200 $\mu g/m^3$ for cadmium dust. *Id.* at 42,104. The PEL discussed here applies to general industry, excluding construction, which is governed by a separate standard. *Id.* at 42,102.

cases of kidney dysfunction.[55] However, because of OSHA's feasibility analysis, it chose not to set the PEL any lower than 5 μg/m^3, despite the acknowledged significant risk remaining at that exposure limit.

OSHA asserted that the decision not to set an even lower PEL "involve[d] complex policy determinations that [drew] upon OSHA's experience and expertise and also reflect[ed] a delicate balancing of counterveiling [sic] factors."[56] OSHA's reasoning may be divided into two categories: arguments for why the risk assessment was an overestimate and hesitancy to require more respirators. For example, OSHA expected its ancillary requirements, such as medical surveillance of workers exposed to cadmium, would "substantially lower the risk of kidney dysfunction and the risk of cancer from the estimates in the risk assessment."[57] Although these effects were impossible to quantify, OSHA believed that they would "eliminate" the remaining significant risk.[58] Likewise, in order to leave itself a protective cushion, the industry was expected to achieve a mean exposure "considerably below" the PEL, likewise reducing the estimated risk.[59]

OSHA's reasoning about respirators proceeded as follows: OSHA had already "sever[ed]" the PEL from the high-exposure cadmium producing or processing industries so the majority of industries could be subject to the lower PEL.[60] The industries with particularly high cadmium exposures were subject to a higher SECAL of either 15 or 50 μg/m^3, the lowest levels OSHA found to be technologically feasible via engineering controls.[61] In those industries, workers were required to wear respirators to achieve the PEL. Thus, the chosen PEL would already "inevitably require[] a substantial number of employees to wear respirators full time."[62] OSHA was therefore "loathe to go further in this direction" by setting a lower PEL, because if it did, "large numbers of additional employees would have to wear respirators full time."[63] However, in the industries where OSHA did require respirator use, it decided that the "increased health risks associated with exposures to low levels of cadmium warrant[ed] the requirement for respiratory protection despite" the negative effects of respirator use, including decreased "comfort, ability to communicate, and productivi-

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[55] *Id.* at 42,199. At the previous PEL of 100 μg/m^3, OSHA estimated that there were 58–157 excess lung cancer deaths per 1000 workers, over forty-five years of occupational exposure, and more than 900 excess cases of kidney dysfunction. *Id.*

[56] *Id.* at 42,209.

[57] *Id.*

[58] *Id.*

[59] *Id.*

[60] *Id.*

[61] *Id.* at 42,209, 42,212.

[62] *Id.* at 42,209.

[63] *Id.*

ty."[64] Respirators, in other words, were not treated as technologically feasible, even as they were relied upon to meet specific needs.

OSHA's economic feasibility analysis motivated its decision to segregate certain industries so that they were subject to the SECAL-plus-respirators requirement.[65] If the expected compliance costs in an industry were high enough that it represented 20% or more of profits, OSHA shifted that industry to the SECAL strategy.[66] Technological feasibility, however, functioned as the limiting factor for the PEL: while OSHA adjusted its standard based on economic feasibility, it resisted setting a lower PEL based on its conclusion that no technologically feasible means of achieving it was available.

B. 1,3-Butadiene

1,3-Butadiene is a highly reactive gas used in the petrochemical industry as a building block for other products, such as synthetic rubber.[67] After the National Toxicology Program released an animal study in 1983 demonstrating that 1,3-butadiene causes cancer, OSHA announced plans to regulate occupational exposure to the chemical.[68] At the time, the PEL for 1,3-butadiene was 1000 parts per million (ppm).[69]

OSHA published its proposed rule, suggesting a PEL of 2 ppm, on August 10, 1990.[70] At that PEL, OSHA estimated that the risk of cancer over forty-five years of exposure was between 2.5 and 16.2 excess deaths per 1000 workers.[71] At 1 ppm, OSHA estimated that the risk dropped to between 1.3 and 8.1 excess deaths per 1000 workers.[72] Therefore, in its final rule, OSHA determined that the proposed PEL of 2 ppm would still pose a significant risk that could be substantially reduced by adopting the lower PEL of 1 ppm. Although OSHA acknowledged that the remaining risk at 1 ppm was still "clearly significant," it determined this to be the lowest technologically feasible level.[73] While OSHA settled on a lower PEL than what it had initially proposed, it did not set the PEL as low as experts and labor unions urged it to. Labor unions sought a PEL of 0.2 ppm, and National

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[64] *Id.* at 42,235.

[65] *Id.* The decision was also explained by the fact that these industries engage in some low-exposure processes and some high-exposure processes. Therefore, OSHA decided that its typical technological feasibility test (that the PEL can be met in "most operations most of the time") would not have led to good results. *Id.* at 42,215.

[66] *Id.* at 42,222–23.

[67] 1,3-Butadiene, *supra* note 41, at 56,750.

[68] *Id.* at 56,748.

[69] *Id.*

[70] *Id.* at 56,749.

[71] *Id.* at 56,794.

[72] *Id.*

[73] *Id.*

Institute for Occupational Safety and Health (NIOSH) recommended an even lower PEL of 6 parts per billion (ppb).[74] OSHA did not explain why it declined to adopt an even lower PEL, but it did note that a "March 1996 industry/labor agreement recommended" a PEL of 1 ppm and that it was "pleased that this group of interested parties have reached the same conclusion as the Agency in this regard."[75]

Despite the industrial significance of 1,3-butadiene, far fewer employees are exposed to it than to cadmium: approximately 9700, at the time of the rulemaking, compared to over 524,000.[76] OSHA's feasibility analysis was correspondingly more straightforward. In its technological feasibility analysis, OSHA found that "[w]ith few exceptions" employers would be able to achieve compliance with the 1 ppm PEL through the use of engineering and work practice controls in all five industry operations where exposure to 1,3-butadiene occurs, without resorting to respirators.[77] "The few exceptions [were] maintenance activities, such as vessel cleaning, which have traditionally often involved the use of respiratory protection."[78] Thus, OSHA stated that the rule was consistent with its "hierarchy of controls" policy, which "specifies that, in controlling exposures, engineering controls and work practices are to be used in preference to respiratory protective equipment."[79] Respirators are used "in emergencies; where engineering and work practice controls are not feasible, adequate, or have not yet been installed; or during intermittent, non-routine work operations."[80]

OSHA's economic feasibility analysis revealed that "compliance costs as a percentage of industry revenues never reach 1%; they range from less than 0.005% to 0.44% for establishments in all affected industries."[81] Its estimates of compliance costs as a percentage of profits likewise did not trigger further analysis, since they were lower than 10% in all affected industries.[82] Therefore, OSHA was able to conclude that the standard was "clearly" economically feasible: "Costs of this magnitude will not affect the viability even of marginal firms."[83]

C. Hexavalent Chromium

The hexavalent state of the metal chromium has a variety of industrial uses, including as a component of many pigments, in the produc-

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[74] *Id.* at 56,803.
[75] *Id.*
[76] *Id.* at 56,795; Cadmium, *supra* note 41, at 42,211.
[77] 1,3-Butadiene, *supra* note 41, at 56,795.
[78] *Id.*; *see also id.* at 56,810. For a discussion of respiratory protection, see *id.* at 56,814–15.
[79] *Id.* at 56,809.
[80] *Id.*
[81] *Id.* at 56,797.
[82] *See id.*
[83] *Id.* at 56,796.

tion of stainless steel, and in many plating applications.[84] As of 2006, over 558,000 workers were exposed to hexavalent chromium,[85] primarily through inhalation of mists, dusts, or fumes.[86] OSHA's original hexavalent chromium standard, adopted in 1971, set a PEL of 52 μg/m^3 and was established "to control irritation and damage to nasal tissues."[87] However, by the late 1980s, standards and regulatory organizations had recognized hexavalent chromium as a carcinogen.[88]

OSHA estimated that the lung cancer risk from forty-five years' exposure to hexavalent chromium at the existing 52 μg/m^3 PEL was 101 to 351 excess deaths per 1000 workers.[89] The 5 μg/m^3 PEL OSHA selected in its final rule was estimated to result in ten to forty-five excess deaths per 1000 workers, which OSHA acknowledged "is still clearly significant."[90] OSHA had proposed a more protective PEL of 1 μg/m^3, but it ultimately determined that 5 μg/m^3 was the lowest technologically feasible PEL "because [a 1 μg/m^3 PEL] cannot be achieved using engineering and work practice controls in a substantial number of industries and operations employing a large number of workers covered by the standard."[91] At the chosen 5 μg/m^3 PEL, 3.5% of exposed employees would be required to wear respirators, while at a 1 μg/m^3 PEL, 9.5% would have been required to wear respirators.[92]

OSHA found the PEL of 5 μg/m^3 to be "technologically feasible for most operations in all affected industries through the use of engineering and work practice controls."[93] An exception was made in the aerospace industry for jobs requiring the painting of aircraft or large aircraft parts: employers would only be required to use engineering and work practice controls to reduce ambient concentrations to 25 μg/m^3. Workers would then be required to wear respirators to further reduce their exposure to 5 μg/m^3.[94]

Applying its 1% of revenues, 10% of profits threshold policy, OSHA found that nine industries would experience costs greater than 1% of revenues and twenty-two industries would experience costs

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[84] Chromium, *supra* note 38, at 10,108.

[85] *Id.* at 10,262.

[86] *Id.* at 10,108.

[87] *Id.* at 10,102–03.

[88] *Id.* at 10,103.

[89] *Id.* at 10,175.

[90] *Id.* at 10,224. OSHA also admitted that the remaining excess risk under the new rule is higher than the remaining risk estimates for many other carcinogens regulated by OSHA. *See id.* at 10,225.

[91] *Id.* at 10,263. In particular, OSHA determined that the 1 μg/m^3 PEL would not have been feasible without widespread respirator use for welding, the largest affected industry. *Id.*

[92] *Id.* at 10,257–59.

[93] *Id.* at 10,256.

[94] *Id.*

greater than 10% of profits.[95] OSHA took a closer look at these industries and found that, in many of them, the high-exposure welding or plating operations that caused their costs to be so high were "extremely rare and unusual" and could certainly be dropped, since they were not part of the core business.[96] Only six of the industries were "dependent on [hexavalent chromium] applications" and required a more detailed economic analysis.[97] In the end, OSHA concluded that the standard would be economically feasible even in these six most impacted industries.[98] Once again, technological feasibility — based on an analysis that did not treat respirators as technologically feasible — determined how low the PEL would be set.

D. Crystalline Silica

OSHA's rule amending the PEL for crystalline silica was finalized in March 2016 and provides the most recent example of OSHA's approach to feasibility analysis. Crystalline silica exists in several forms; the most common in industrial applications are quartz and sand.[99] Workers in over thirty industries are exposed to crystalline silica by breathing in small particles of dust.[100] The inflammation and scarring of the lungs caused by this exposure in turn cause a particular disease, silicosis.[101] From reviewing an extensive health literature, OSHA also determined that there is "ample evidence" that occupational inhalation of silica particles increases the risk of lung cancer.[102] Based on these findings, OSHA established a new, lower PEL for respirable crystalline silica to replace the PEL that had been in place since 1971.[103] OSHA's detailed quantitative risk assessment concluded that worker exposure to respirable crystalline silica presents a significant risk and that the lower PEL would "substantially decrease[]" this risk.[104]

The new rule sets a PEL of 50 $\mu g/m^3$ across all affected industries, replacing the former system of having one PEL for "general industry" and another for construction and shipyards.[105] OSHA concluded that this PEL was technologically feasible for all twenty-four affected general industry sectors and the maritime industry, and technologically

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[95] *Id.* at 10,300.

[96] *Id.* These industries included performing arts and spectator sports, food services and drinking places, and gasoline stations. *Id.* at 10,300–01.

[97] *Id.* at 10,301–02.

[98] *See id.*

[99] Silica, *supra* note 38, at 16,298–99.

[100] *Id.* at 16,299, 16,305.

[101] *Id.* at 16,305.

[102] *Id.* at 16,302.

[103] *Id.* at 16,294.

[104] *Id.* at 16,399.

[105] *Id.* at 16,286, 16,294.

feasible in eleven of the fourteen affected activities in construction.[106] Thus, OSHA found the PEL to be technologically feasible: able to be achieved in most operations in the affected industries.

In the operations where the PEL was determined not to be feasible even if workers were to use the recommended engineering and work practice controls, OSHA permits employers to supplement those controls with respirators.[107] At an alternative PEL of 25 μg/m^3, which was considered in the proposed rule, OSHA found that respirators would be required in enough industries that it would not be technologically feasible,[108] even though a reduction to the lower exposure would yield additional health benefits.[109]

Turning to economic feasibility, OSHA estimated the compliance costs of the proposed rule for each affected industry sector and compared them with industry revenues and profits for its screening analysis. Industries "with unusually high costs as a percentage of revenues or profits were further analyzed."[110] However, OSHA concluded that all industries faced annualized costs from the final rule that fell "below the threshold level that could threaten [their] economic viability."[111] Thus, as with the earlier rules, a technological feasibility analysis that did not consider respirators to be technologically feasible set the PEL for crystalline silica.

III. QUESTIONING TECHNOLOGICAL FEASIBILITY: THE RESPIRATOR POLICY

As the survey in Part II demonstrates, technological feasibility served as the limiting factor in each of OSHA's recent health rules. Therefore, the quality of OSHA's technological feasibility analysis dictates whether these standards are maximally protective or, alternatively, are systematically leaving OSHA's mandate unfulfilled.

A. OSHA's Policy on Respirators and Technological Feasibility

As described above, OSHA defines technologically feasible as what may be maintained "in most operations most of the time in the affected

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[106] *Id.* at 16,455 tbl.VII-8, 16,457, 16,459 tbl.VII-9.

[107] *Id.* at 16,621.

[108] Occupational Exposure to Respirable Crystalline Silica, 78 Fed. Reg. 56,274, 56,355 (proposed Sept. 12, 2013) (noting that although a level of 25 μg/m^3 had already been achieved in several industries, "to use respiratory protection would have to be required in most operations and most of the time"); Silica, *supra* note 38, at 16,625.

[109] Silica, *supra* note 38, at 16,623 tbl.VII-33, 16,624 tbl.VII-34.

[110] *Id.* at 16,652.

[111] *Id.* at 16,546.

industries" by engineering or work practice controls.[112] Exposure levels that may be achieved by respirator use, however, are not considered to be technologically feasible — if they were, they would be considered in the technological feasibility analysis. In other words, OSHA has an implicit general policy of considering respirators *infeasible*. As support for this respirator infeasibility policy, OSHA cites *United Steelworkers v. Marshall*, which stated a pre-enforcement test for the technological feasibility of a PEL: "[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."[113]

To understand the meaning of this formulation, it is important to consider its context. The *United Steelworkers* test was an attempt to dispel confusion about what feasibility showing OSHA was required to make in a pre-enforcement industry challenge to a new standard, given the agency's longstanding "hierarchy of controls" policy, which requires that "employers install and implement all feasible engineering and work practice controls before respirators may be used."[114] Respirators are used "in emergencies; where engineering and work practice controls are not feasible, adequate, or have not been installed; or during intermittent, non-routine work operations."[115]

In *United Steelworkers*, Judge J. Skelly Wright addressed consolidated challenges from both labor union and industry interests to "virtually every aspect of [OSHA's] lead standard and the massive rulemaking from which it emerged"[116] in an opinion over one-hundred pages long. The above-quoted articulation of the technological feasibility test occurs within the opinion's response to an industry argument that "OSHA must prove the [technological] feasibility of the PEL for all workplaces in all industries" in a preenforcement challenge.[117] This argument assumed that OSHA's lead policy "absolutely prohib-

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[112] *Id.* at 16,621; *see supra* p. 2241.

[113] United Steelworkers v. Marshall, 647 F.2d 1189, 1272 (D.C. Cir. 1980); Silica, *supra* note 38, at 16,292.

[114] Silica, *supra* note 38, at 16,293; *see also* 1,3-Butadiene, *supra* note 41, at 56,809.

[115] 1,3-Butadiene, *supra* note 41, at 56,809. For a discussion of the "Hierarchy-of-Controls Policy," see *American Iron & Steel Institute v. OSHA*, 182 F.3d 1261, 1265 (11th Cir. 1999), which described the policy as a "preference for engineering controls over respirators; in effect, it allowed respirators only '[w]hen effective engineering controls are not feasible, or while they are being instituted,'" *id.* (alteration in original) (footnote omitted) (quoting AM. NAT'L STANDARDS INST., PRACTICES FOR RESPIRATORY PROTECTION, STANDARD Z88.2-1969). This policy was memorialized in OSHA's Respiratory Protection Rule in 1998. *See* Respiratory Protection, 63 Fed. Reg. 1152 (Jan. 8, 1998) (codified at 29 C.F.R. pts. 1910, 1926).

[116] *United Steelworkers*, 647 F.2d at 1202.

[117] *Id.* at 1271; *see id.* at 1270–72.

it[ed] employers from relying on respirators to meet the PEL."[118] The court concluded that the industry's assumption about the prohibition of respirators was incorrect. If particular employers could show that, despite efforts to do so, they were unable to achieve the PEL through engineering and work practice controls alone, they would be allowed to use respirators as well.[119] Therefore, prior to enforcement of the rule, the court would not hold OSHA to a "stringent test of feasibility."[120] Instead, in a preenforcement challenge to an OSHA toxic substance standard, OSHA (as the proponent of the rule) had the burden of establishing a presumption that the PEL could be achieved through engineering and work practice controls by demonstrating its feasibility in *most* industries.[121] Thus, the "test" incorporated and restated OSHA's respirator infeasibility policy, which was not at issue in the case.

OSHA maintains that the test in *United Steelworkers* is the legal test for technological feasibility,[122] and subsequent courts have unhesitatingly applied this framework.[123] But the *United Steelworkers* articulation is not a test for technological feasibility that is derived from the organic statute itself. Nor does it purport to be. Indeed, earlier in the opinion, *United Steelworkers* even provided a legal test for technological feasibility that did not incorporate OSHA's policy: "OSHA's duty is to show that modern technology has at least conceived some industrial strategies or devices which are likely to be capable of meeting the PEL and which the industries are generally capable of adopting."[124] Respirators, as technology, could be included in this test.

Is the general exclusion of respirators a legitimate policy choice? OSHA surely has discretion in its determination of which technologies are feasible ways to achieve a PEL. Hypothetically, tying a clear plastic bag over one's head might completely prevent exposure to toxic chemicals during an occupational procedure. However, no one could fault OSHA for finding this "technological" solution infeasible: it would present a serious risk of asphyxiation and require running out of the room every minute to remove the bag and take some deep breaths. Effectively, OSHA asserts that a respirator falls in the same category of infeasible technological options.

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[118] *Id.* at 1271.

[119] *Id.* at 1273.

[120] *Id.* at 1271.

[121] *Id.* at 1272.

[122] *See, e.g.*, Silica, *supra* note 38, at 16,292–93 ("[C]ourts view the legal standard for proving technological feasibility as incorporating the hierarchy . . . ." *Id.* at 16,293.); *see also* Chromium, *supra* note 38, at 10,102.

[123] *See, e.g.*, Pub. Citizen Health Research Grp. v. U.S. Dep't of Labor, 557 F.3d 165, 179 (3d Cir. 2009).

[124] *United Steelworkers*, 647 F.2d at 1266.

But OSHA has never explained why respirators, in conjunction with available engineering and work practice controls, should be excluded from the analysis of whether a PEL is technologically feasible. Indeed, with the possible exception of the new silica rule,[125] all of OSHA's reasoning about the drawbacks of respirators is offered in support of its hierarchy-of-controls policy, not its respirator infeasibility policy.[126] These drawbacks are that respirators may "create additional hazards by interfering with vision, hearing, and mobility," "plac[e] stress on . . . breathing," are difficult to fit for "female employees or employees with unusual facial configurations," and "inappropriate[ly]" shift the primary burden of compliance from the employer to the employee.[127]

Perhaps for some jobs it is true that wearing a respirator would be as infeasible a control as wearing a plastic bag. But the *general infeasibility* of respirator use for meeting a PEL — respirators' categorical exclusion from OSHA's technological feasibility analysis — appears belied by the fact that OSHA frequently includes respirator use in its standards, either temporarily for the years in which companies are installing engineering controls or permanently for particular industries that must use respirators to reach the established PEL. For example:

- In the cadmium rule, OSHA set the PEL at a level that "inevitably required a substantial number of employees to wear respirators full time."[128] Although OSHA did this with "serious reservations," it "on balance, [had] decided that the risks of not requiring some protection for employees from airborne cadmium levels above 5 $\mu g/m^3$ are more serious than those attaching to full time respirator use."[129]
- In the 1,3-butadiene rule, OSHA stated that employers must "provide respiratory protection to supplement engineering controls where such controls are not feasible, are insufficient to meet the PELs, are necessary for short infrequent jobs, or in emergencies,"[130] and required respirators for certain maintenance activi-

[125] OSHA's new crystalline silica rule does take an unprecedented step by stating that the reasons for respirators' place in the hierarchy-of-controls policy are also reasons "for limiting the use of respirators," Silica, *supra* note 38, at 16,293. Even so, OSHA does not explain why respirators are categorically excluded from the analysis of whether a PEL is technologically feasible.

[126] The court in *Public Citizen* quoted these arguments in support of the respirator infeasibility policy, 557 F.3d at 176–77 (quoting Lead, *supra* note 39, at 52,990), but in fact OSHA's statement that respirators are "an ineffective, unreliable, and unsafe method of reducing employee exposure" was its explanation for why respiratory protection is at the "bottom of the compliance priority list," and so should not be relied on without other controls, not why respirators are a generally infeasible means of preventing exposure. Lead, *supra* note 39, at 52,990.

[127] Lead, *supra* note 39, at 52,990; *see also* Silica, *supra* note 38, at 16,782.

[128] Cadmium, *supra* note 41, at 42,209.

[129] *Id.*

[130] 1,3-Butadiene, *supra* note 41, at 56,795.

ties "which have traditionally often involved the use of respiratory protection."[131]

- In the hexavalent chromium rule, OSHA found that "supplemental use of respirators may still be necessary" in some stainless steel welding operations,[132] and that when painting aircraft or large aircraft parts in the aerospace industry, employers are only required to maintain ambient exposure at 25 μg/m^3 and "must then supplement those engineering controls with respiratory protection to achieve the PEL."[133]
- In the silica rule, OSHA determined that "where the new PEL is not technologically feasible, even when workers use recommended engineering and work practice controls, employers can supplement controls with respirators to achieve exposure levels at or below the new PEL."[134]
- Finally, OSHA's general respiratory protection rule requires that "[a] respirator shall be provided to each employee when such equipment is necessary to protect the health of such employee."[135]

Respirator use is, as OSHA has put it, "relegated to the bottom of the compliance priority list because it is an ineffective, unreliable, and unsafe method of reducing employee exposure,"[136] but *it is still on the list*. A truly infeasible option would not be on the compliance priority list at all and would not be mandated in standards.

Only one case has addressed the absence of respirators from the technological feasibility determination. In 2009, the Third Circuit in *Public Citizen Health Research Group v. U.S. Department of Labor*[137] rejected a challenge to OSHA's technological feasibility policy's exclusion of respirators, but it did so based on the idea that OSHA restricts respirator use to "supplementary, interim or short term purposes."[138] The above catalog of OSHA's health rules including respirators raises doubts about whether that characterization is accurate. OSHA attempts to set the PEL at a level that will require only a "few" types of jobs to use respirators in addition to engineering and work practice

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[131] *Id.*

[132] Chromium, *supra* note 38, at 10,263. OSHA went on to minimize this requirement of respirators: "However, respirator use in those circumstances will not be extensive and does not undermine OSHA's finding that the PEL of 5 μg/m^3 is technologically feasible." *Id.*

[133] *Id.* at 10,101.

[134] Silica, *supra* note 38, at 16,652. For a table specifying which tasks require respiratory protection, see *id.* at 16,877 tbl.1.

[135] 29 C.F.R. § 1910.134(a)(2) (2015).

[136] Lead, *supra* note 39, at 52,990.

[137] 557 F.3d 165 (3d Cir. 2009).

[138] *Id.* at 179.

controls to achieve compliance.[139] However, in those operations, respirator use is neither interim nor short term.

B. If Respirators Are "Feasible"

If respirators are unambiguously a feasible technological option, at least in some circumstances, it follows that they must be included in the technological feasibility analysis for any health standard where they are a feasible way of reducing exposure. OSHA and the courts seem to have morphed OSHA's reasons for making respirators a least-preferable option — an option to be used after engineering and work practice controls have already been implemented — into a justification for considering the lower exposure levels achievable with respirators technologically infeasible. It may be that respirators are infeasible for some jobs. But OSHA has a duty, assuming economic feasibility and remaining significant risk, to set PELs at the lowest level technologically feasible, which must include levels achievable with respirators when they are feasible. Because OSHA standards do call for the use of respirators for many activities, in combination with other controls that reduce ambient concentrations as much as possible, OSHA clearly regards respirators as feasible in at least some situations.

Note that inclusion of respirators in the technological feasibility analysis would not undermine OSHA's hierarchy-of-controls policy[140]: OSHA could still, as now, require use of engineering and work practice controls to achieve as low an ambient exposure level as possible. In addition to saving lives by requiring lower exposure rates, incorporating respirators into setting the lowest technologically feasible level would have the benefit of incentivizing improved technology. Employers might demand more effective and user-friendly respirators as well as improved engineering controls, which might be able to achieve the PEL without the hurdles of ensuring respirator compliance.

C. If Respirators Are Not "Feasible"

The only alternative is that OSHA has much more discretion in determining the meaning of "feasible" than its plain meaning, endorsed by the *Cotton Dust* Court,[141] suggests. That is to say: OSHA has permissibly found that respirators, a technological control it sometimes endorses, are nonetheless legitimately excluded from the analysis of whether a PEL is technologically feasible. This raises a question about the interpretation of the OSH Act: what may OSHA consider in deciding whether a particular technology is "feasible"? It does not

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[139] *See, e.g.*, Silica, *supra* note 38, at 16,652.
[140] *Cf. id.* at 16,293.
[141] *See supra* p. 2238.

merely mean available, since respirators are available. Of course, it is desirable that OSHA's feasibility determination may include consideration of whether a technology has other risks associated with it and how reliable the technology is. Thus, OSHA's reasoning that respirators hamper vision, impair breathing, and are difficult to fit correctly could be relevant to its feasibility determination. But one reason OSHA excludes respirators is not clearly relevant in this way: OSHA's preference against putting the burden of protection on employees.[142] If this preference itself is a permissible reason for finding a technology not "feasible," OSHA's feasibility definition has incorporated policy considerations and balancing that *Cotton Dust* seems not to allow.[143]

No court has been presented with the question of whether OSHA's respirator infeasibility policy is supported by substantial evidence and neither arbitrary nor capricious. The *Public Citizen* court dodged the question and accepted OSHA's arguments for the hierarchy-of-controls policy as a substitute for arguments that respirators are infeasible. This question is worth revisiting, particularly since respirator technology has no doubt improved in the thirty-six years since 1980. It is time for either OSHA or a court to take a step back from *United Steelworkers* and ask whether the exclusion of respirators from technological feasibility analysis is permissible. Answering this question will require a determination of OSHA's discretion to stretch the meaning of feasibility. Is *Cotton Dust* still good law? Or may OSHA consider factors other than those related to the plain meaning of the word in determining what is "feasible"?

A related open question is what effect, if any, *Entergy Corp. v. Riverkeeper, Inc.*[144] had on the scope of OSHA's discretion in interpreting "to the extent feasible." In *Entergy*, the Supreme Court held that when determining the "best available technology" under the Clean Water Act, the EPA may consider the costs of the technology.[145] Writing for the Court, Justice Scalia remarked that *Cotton Dust* did not indicate otherwise because that case had held only that OSHA was not *required* to consider costs when determining whether a PEL was "fea-

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[142] Note that all of these reasons were in fact offered for respirators' place on the hierarchy of controls, but have been accepted by courts as reasons for leaving respirators out of the feasibility analysis. This reason exemplifies the difference between the hierarchy of controls and feasibility, since OSHA's preference against requiring workers to take self-protective action supports its preference for engineering controls over work practice controls but does not exclude work practice controls from the technological feasibility determination. *See* Lead, *supra* note 39, at 52,990.

[143] OSHA's reasoning in the new silica rule introduces another possibility: because "conditions for effective respirator use are difficult to achieve," Silica, *supra* note 38, at 16,782, OSHA can credibly argue that its preference against putting the burden of protection on employees expresses only an empirical determination particular to respirators, not a philosophy about which party should bear the burden of protection.

[144] 556 U.S. 208 (2009).

[145] *See id.* at 218, 226.

sible."[146] Justice Scalia did not explicitly denounce *Cotton Dust*, but he did leave out an important detail. The *Cotton Dust* Court held that OSHA is not required to consider costs because it concluded that OSHA *is* required to set the PEL as low as is feasible.[147] The *Cotton Dust* Court's holding relied on the fact that "to the extent feasible" meant that Congress had spoken clearly to the issue, so the case could be resolved at *Chevron* Step One. But *Entergy* suggests that the current Court might view the question in a different light. Perhaps OSHA may consider costs in deciding what technologies are feasible. And perhaps OSHA may also consider other factors, such as whether the technology is implemented by workers or installed by the company.

D. Summary

Regardless of how these questions are resolved, OSHA's respirator infeasibility policy illuminates a serious flaw with the OSH Act's "to the extent feasible" standard. Either OSHA has been able to exclude a feasible technological control from its feasibility analysis for decades without judicial scrutiny of that choice, or OSHA's feasibility standard provides it with much more freedom than OSHA or many commentators recognize.[148] Whichever description we accept, the result is that OSHA has used the uncertain meaning of the word "feasible" and the courts' rightful reluctance to second-guess specialized and technical determinations to avoid setting lower, more worker-protective PELs.

IV. CONCLUSION

This Note has sought to demonstrate that for many years OSHA, with the acceptance of the courts, has cloaked a policy preference in the guise of what is "technologically feasible." This observation suggests that the technological feasibility standard does not achieve what it sets out to do: provide maximal protection to worker health. As a result, perhaps OSHA would be better off with a defined rule of decision. A clearer way to decide whether a particular technological control is *feasible* would be to quantitatively weigh the risks associated with using it against the risks associated with the higher level of exposure from not using it — a "risk-risk" rule. Presently, OSHA has provided no specific justification for why it does not include respirator use

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[146] *See id.* at 223.

[147] *Cotton Dust*, 452 U.S. 490, 509 (1981) ("Congress itself defined the basic relationship between costs and benefits, by placing the 'benefit' of worker health above all other considerations save those making attainment of this 'benefit' unachievable. Any standard based on a balancing of costs and benefits by the Secretary that strikes a different balance than that struck by Congress would be inconsistent with the command set forth in § 6(b)(5).").

[148] For OSHA's expressed opinion on the discretion within the feasibility standard, see Silica, *supra* note 38, at 16,292.

as a supplement to available engineering and work practice controls in ascertaining the limit of technological feasibility. With a "risk-risk" rule for what technologies are feasible, respirators would be included in the feasibility determination if the expected benefits from respirator use (lower exposures, leading to more deaths averted) would exceed the expected health-related drawbacks of respirator use (risk from reduced visibility and risk from difficulty breathing).[149]

Beyond the issue of OSHA's respirator policy, there are more fundamental problems that keep the "to the extent feasible" standard from being realized. Specifically, the factual uncertainty involved in feasibility determinations indicates that maximally protective standards are unlikely to be adopted. Chances are very high that the *true* lowest feasible level will be lower than the level the agency can show is feasible by substantial evidence. And if the agency lacks such evidence, any challenger (likely a union) will also be unable to provide enough evidence that the agency did not pick the lowest feasible level. As a result, the agency's task is reduced to showing by substantial evidence that a standard is "feasible" — not that it is the *extent* of feasibility.[150]

This Note's analysis has centered on practical concerns about OSHA's policy choices on technological feasibility and how much interpretive discretion is embedded in the "to the extent feasible" standard. But the broader issue of how OSHA can make the best decisions within this statutory constraint should not be swept aside. A recognition that the problems with OSHA's standard go beyond the details of determining what is technologically feasible could provide an impetus for a new interpretation of the statute or even amendment of the OSH Act itself.

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[149] For example, the silica rule predicted substantial incremental net benefits from setting the PEL at 25 μg/m^3, compared to the proposed PEL of 50 μg/m^3: over $1.1 billion, including prevention of an additional 295 silica-related fatalities and 122 silicosis cases annually. Silica, *supra* note 38, at 16,624 tbl.VII-34. But because achieving compliance with the PEL of 25 μg/m^3 would require substantial respirator use, *see id.* at 16,625, OSHA rejected the more protective PEL. Nowhere, though, did OSHA calculate the health costs from increased respirator use so that they could be compared to the health costs from choosing the less protective PEL.

Similarly, the hexavalent chromium rule rejected as technologically infeasible a PEL of 1 μg/m^3 because it would have required 9.5% of exposed employees to use respirators. Chromium, *supra* note 38, at 10,256, 10,259 tbl.VIII-3. However, the chosen PEL of 5 μg/m^3 requires 3.5% of exposed employees to use respirators, *id.*, and the decision that 3.5% respirator use is feasible while 9.5% respirator use is infeasible is never explained. Had OSHA calculated the respirator-use rate at which the health costs of respirator use cancel out the additional fatalities averted, its choice of cutoff could have been understandable, at least in theory.

[150] *See* United Steelworkers v. Marshall, 647 F.2d 1189, 1308–10 (D.C. Cir. 1980) (noting, in dismissing the union's argument that the PEL was not set low enough, that "in examining the feasibility of [the standard] [the court] found it necessary to exercise considerable deference to the agency to uphold some of its [feasibility] conclusions" and that the court "cannot find much merit in the charge that OSHA acted . . . without substantial evidence in refusing to find a still more stringent PEL technologically and economically practical," *id.* at 1309).