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SIGNIFICANT RISK AND FEASIBILITY—A PARADIGM FOR INTERPRETING RECENT SUPREME COURT OSHA DECISIONS: *AMERICAN PETROLEUM & AMERICAN TEXTILE*

The Occupational Safety and Health Act of 1970 (the Act)¹ authorizes the Secretary of Labor to establish standards regulating workplace safety and health conditions.² While section 3(8) of the

¹ 29 U.S.C. §§ 651-678 (1976 & Supp. III 1979). Congress passed the Occupational Safety and Health Act in recognition of the "uneven, unbalanced, and incomplete" efforts of the private sector, the states and the federal government in reducing the incidence of job-related injury and illness. See 116 CONG. REC. 35,606 (1970), reprinted in SENATE COMM. ON LABOR AND PUBLIC WELFARE, LEGISLATIVE HISTORY OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, at 297 (1971) (statement submitted by Sen. Saxbe) [hereinafter cited as LEGIS. HIST.]. During hearings on the proposed legislation, it was established that 14,500 workers were killed and at least 2.2 million were disabled on the job annually, causing an annual loss of \$1.5 billion to industry and of \$8 billion to the gross national product. Moreover, the trend appeared to be worsening, especially in light of the ever-increasing use of new, potentially toxic substances. S. REP. NO. 91-1282, 91st Cong., 2d Sess. 2-5 (1970), reprinted in [1970] U.S. CODE CONG. & AD. NEWS 5177, 5177-81, and reprinted in LEGIS. HIST., *supra*, at 142-45. Hailed as a "safety bill of rights" for the nation's workers, Williams, *Foreward* to LEGIS. HIST., *supra*, at iii, the Act was envisioned as comprehensive legislation which would apply to all industries and rally a single national effort to improve workplace safety and health. 116 CONG. REC. 35,607 (1970), reprinted in LEGIS. HIST., *supra*, at 297. The Act applies to all employers engaged in business affecting interstate commerce, 29 U.S.C. § 652(3) (1976), excluding federal and state governments, *id.* § 652(5), imposing upon them a general duty to provide a working environment free from recognized hazards, *id.* § 654; see *National Realty & Constr. Co. v. OSHRC*, 489 F.2d 1257, 1261, 1265-67 (D.C. Cir. 1973) (construing the general duty clause). Additionally, the Act outlines an expansive, prevention-oriented plan including research, recordkeeping, employee training, and, most importantly, standard development and promulgation. See 29 U.S.C. § 651(b)(1)-(13) (1976); note 2 and accompanying text *infra*.

² See 29 U.S.C. § 655(a)-(c) (1976). The Act authorizes the Secretary to regulate workplace safety and health conditions by issuing either permanent or emergency temporary standards. *Florida Peach Growers Ass'n v. Department of Labor*, 489 F.2d 120, 124 (5th Cir. 1974); see 29 U.S.C. § 655(b), (c) (1976). The Act also provides for 2-year interim standard-setting authority, but this provision expired in April of 1973. 489 F.2d at 124 n.7; *Dry Color Mfrs. Ass'n v. Department of Labor*, 486 F.2d 98, 99 n.1 (3d Cir. 1973); see 29 U.S.C. § 655(a) (1976). Before issuing a permanent standard, the Occupational Safety and Health Administration (OSHA) must comply with certain rulemaking procedures similar to informal rulemaking pursuant to the Administrative Procedure Act, 5 U.S.C. § 553 (1976 & Supp. III 1979). 489 F.2d at 124; 486 F.2d at 101. For example, the proposed standard must be published in the Federal Register and interested persons must be given 30 days to submit written data or comments. 29 U.S.C. § 655(b)(2) (1976). The Secretary then has 60 days

Act dictates that such standards should ensure "conditions . . . reasonably necessary or appropriate" to provide a safe working environment,³ section 6(b)(5) mandates that, in regulating toxic substances, the Secretary must adopt the standard "which most adequately assures, to the extent feasible . . . that no employee will suffer material impairment of health."⁴ Controversy has arisen over the proper interpretation of these two sections and their effect on the Secretary's authority to regulate toxic substances.⁵ The Su-

in which to issue the standard. *Id.* § 655(b)(4). Emergency temporary standards, however, are effective upon publication in the Federal Register, without resort to rulemaking procedures, upon a showing that employees are subject to grave danger from toxic substance exposure. *Id.* § 655(c)(1). Because of the possibility of circumventing the procedural safeguards intended to precede standard setting, the authority to issue emergency temporary standards is limited to exigent circumstances. 489 F.2d at 130 & n.16; 486 F.2d at 104 & n.9a. See generally 29 C.F.R. §§ 1911-.18 (1981); M. ROTHSTEIN, OCCUPATIONAL SAFETY AND HEALTH LAW 40-66 (1978).

³ See 29 U.S.C. § 652(8) (1976).

⁴ See *id.* § 655(b)(5). Section 655(b)(5) provides in part:

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. . . . In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and the experience gained under this and other health and safety laws.

Id.

⁵ Compare *American Petroleum Inst. v. OSHA*, 581 F.2d 493, 501-05 (5th Cir. 1978), *aff'd on other grounds sub nom. Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. 607 (1980) (plurality opinion) (section 3(8) requires performance of cost-benefit analysis in setting permanent standards) with *AFL-CIO v. Marshall*, 617 F.2d 636, 662-66, 676-77 (D.C. Cir. 1979), *aff'd in part and vacated in part sub nom. American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. 2478 (1981) (section 6(b)(5) governs standard setting and does not permit cost-benefit balancing) and *United Steelworkers v. Marshall*, 647 F.2d 1189, 1263-64 n.102 (D.C. Cir. 1980) (citing 617 F.2d at 662-66) (cost-benefit analysis would contravene the congressional goal of protecting worker health and safety within the limits of economic possibility). In *Industrial Union Dep't v. Hodgson*, 499 F.2d 467 (D.C. Cir. 1974), the Circuit Court of Appeals for the District of Columbia first interpreted the feasibility language of section 6(b)(5) to include consideration of economic factors in standard setting. *Id.* at 477. The court made clear, however, that the economic impact of a proposed standard is not determinative of its feasibility. See *id.* at 477-78. The Third Circuit also adopted this reasoning. See *American Iron & Steel Inst. v. OSHA*, 577 F.2d 825, 835-37 (3d Cir. 1978); *AFL-CIO v. Brennan*, 530 F.2d 109, 122-23 (3d Cir. 1975). Defining the extent to which cost properly may be considered, the District of Columbia court later expressly rejected the applicability of cost-benefit analysis to the standard-setting process. See 617 F.2d at 662-66, 676-77. Analogizing the Act to the Consumer Safety Act, however, the Fifth Circuit held that the Act does require the performance of cost-benefit analysis. 581 F.2d at 501-05; see

preme Court twice has addressed this issue. In *Industrial Union Department v. American Petroleum Institute*,⁶ the Court promoted section 3(8) to a threshold requirement pursuant to which the Secretary must find that a risk is significant before he may promulgate any standard regulating such risk.⁷ Recently, however, in *American Textile Manufacturers Institute, Inc. v. Donovan*,⁸ the Court held that section 6(b)(5) controls the regulation of toxic substances once the threshold significant risk test has been satisfied and, moreover, that such section sanctions the imposition of regulations calling for the taking of all steps feasible in order to reduce exposures to toxic substances.⁹

In *American Petroleum*, the Court reviewed the validity of a standard, promulgated under section 6(b)(5), which lowered the permissible level of employee exposure to benzene.¹⁰ When establishing the standard, the Occupational Safety and Health Administration (OSHA)¹¹ interpreted the section as requiring the standard to be set either at the level which eliminates the risk or at the lowest feasible level.¹² Finding that there was no safe level of benzene exposure, OSHA set the standard at the lowest level it considered technologically and economically achievable by the affected

Texas Indep. Ginners Ass'n v. Marshall, 630 F.2d 398, 411 (5th Cir. 1980).

⁶ 448 U.S. 607 (1980) (plurality opinion), *aff'g sub nom.* American Petroleum Inst. v. OSHA, 581 F.2d 493 (5th Cir. 1978).

⁷ 448 U.S. at 642.

⁸ 101 S. Ct. 2478 (1981), *aff'g in part and vacating in part* 617 F.2d 636 (D.C. Cir. 1979).

⁹ 101 S. Ct. at 2491-92.

¹⁰ 448 U.S. 607, 611 (1980). Benzene is a toxic substance, which if inhaled is believed to cause various blood disorders, including leukemia. *Id.* at 616-19. Although all persons are exposed to small quantities of benzene vapors present in the ambient air, workers in industries which use benzene, such as the chemical processing, rubber manufacturing and petroleum refining industries, regularly are exposed to higher concentrations. *Id.* at 615-16. Interestingly, service station attendants, one of the largest groups of workers exposed to heightened levels of benzene as a result of their employment, specifically were excepted from protection under the benzene standard. *Id.* at 616 n.6, 628. The first nationwide regulation of benzene occurred in 1969 when the American National Standards Institute established a national consensus standard setting the maximum permissible exposure limit to benzene at 10 parts per million (ppm). *Id.* at 617. This standard was adopted as an interim standard when the Act was passed. *Id.* at 617 & n.7; *see note 2 supra*. The proposed benzene standard would have lowered the permissible exposure level from 10 ppm to 1 ppm. 448 U.S. at 623.

¹¹ The Occupational Safety and Health Administration is the agency established within the Department of Labor to administer the Act. 448 U.S. 607, 613 n.2 (1980).

¹² *Id.* at 637 & n.42 (1980).

industries.¹³ The standard was challenged immediately on the ground that OSHA had not shown it to be reasonably necessary or appropriate in accordance with section 3(8).¹⁴ Moreover, it was argued that the "reasonably necessary or appropriate" language requires that the anticipated benefits of the standard justify the estimated compliance cost as shown by the performance of cost-benefit analysis.¹⁵ The Fifth Circuit Court of Appeals adopted this reasoning and invalidated the standard.¹⁶ The Supreme Court affirmed, not on the basis of cost-benefit analysis, but rather, under a newly fabricated test: significant risk.¹⁷

Writing for a plurality of the Court,¹⁸ Justice Stevens reiter-

¹³ *Id.* OSHA interpreted the feasibility language of section 6(b)(5) as mandating the adoption of a standard "technologically achievable at a cost that would not impair the viability of the industries subject to the regulation." *Id.* at 639. Thus, OSHA considered both technological and economic factors in concluding that the proposed 1 ppm benzene standard was feasible within the meaning of section 6(b)(5). *Id.* at 637.

¹⁴ *Id.* at 638. OSHA had dismissed section 3(8)'s "reasonably necessary or appropriate" language, which provides the general definition for the phrase "occupational safety and health standard," as having no legal significance, or, in the alternative, as imposing only a minimum requirement of rationality upon the promulgation of standards under section 6(b)(5). *Id.* at 639.

¹⁵ *Id.* The industries which challenged the validity of the proposed benzene standard interpreted section 3(8) as imposing substantive restraints on OSHA's authority to regulate toxic substances, and as mandating the performance of cost-benefit analysis. *Id.*

¹⁶ *American Petroleum Inst. v. OSHA*, 581 F.2d 493 (5th Cir. 1978), *aff'd sub nom. Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. 607 (1981). In upholding the industries' interpretation of section 3(8), the court of appeals approved their reliance on an earlier Fifth Circuit decision construing similar language in the Consumer Safety Act as requiring cost-benefit analysis. 581 F.2d at 501; see *Aqua Slide 'N' Dive Corp. v. Consumer Prod. Safety Comm'n*, 569 F.2d 831, 839-40 (5th Cir. 1978). Notably, analogy to the Consumer Safety Act was later criticized on the ground that the statute also uses the phrase "unreasonable risk," traditionally indicative of a balancing of factors, accompanied by a clear indication in its legislative history that such balancing was intended. See *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. 2478, 2491 n.30 (1981); *AFL-CIO v. Marshall*, 617 F.2d 636, 663 n.159 (D.C. Cir. 1979).

¹⁷ *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. 607, 630-40 (1980) (plurality opinion). The Court upheld the industry contention that section 3(8) imposes substantive restrictions on the setting of all standards under the Act, including those regulating toxic substances pursuant to section 6(b)(5). The Court found that the threshold substantive restriction contemplates the showing of a "significant" risk of disease. *Id.* at 639-40. Absent a finding of significant risk in the instant case, the Court declined to address whether section 3(8) imposes the additional requirement of performance of cost-benefit analysis. *Id.*; see notes 20-22 and accompanying text *infra*.

¹⁸ Chief Justice Burger and Justice Stewart joined in an opinion authored by Justice Stevens. The plurality invalidated the standard on the ground that it had not been predicated upon a finding that the existing permissible exposure limit of 10 ppm presented a significant risk of material harm to employees. 448 U.S. at 630-40. Justice Powell wrote a separate opinion in which he concurred on the significant risk issue. *Id.* at 664-65 (Powell,

ated the court of appeals' holding that section 3(8) applies to all permanent standards issued under the Act, including those regulating toxic substances.¹⁹ The plurality reasoned that the requirements of section 3(8) are incorporated by reference into section 6(b)(5), since this section is "just one species of the genus of standards" defined in section 3(8).²⁰ The Court, however, interpreted section 3(8) as limiting OSHA's regulatory authority to situations which present a significant risk of harm.²¹ Since OSHA had not made a threshold finding that exposure at existing permissible levels presented such a risk, the Court affirmed the order setting the standard aside.²² In a dissenting opinion, four Justices²³ looked to the Act's legislative history and concluded that section 3(8) placed no limit on section 6(b)(5)'s broad mandate to adopt the most protective standard feasible.²⁴

J., concurring in part and in the judgment). Justice Powell further opined, however, that in addition to the significant risk requirement, section 3(8) also requires a determination whether a standard's economic effects bear a reasonable relation to its anticipated benefits. *Id.* at 667 (Powell, J., concurring in part and in the judgment). Justice Rehnquist concurred in the judgment on the broader ground that the language of section 6(b)(5) is unconstitutionally vague, providing virtually no guidelines for the setting of standards regulating toxic substances. *Id.* at 671-88 (Rehnquist, J., concurring). Indeed, Justice Rehnquist stated that he would invalidate the feasibility language of section 6(b)(5) as an impermissible delegation of legislative authority to an administrative agency. *Id.* (Rehnquist, J., concurring).

¹⁹ *Id.* at 642.

²⁰ *Id.* The plurality reasoned that the provisions of section 3(8) are incorporated into section 6(b)(5) since the latter section uses the word "standard" without indicating any exception from the general definition found in section 3(8). *Id.* The dissent considered the feasibility language of section 6(b)(5) to be such a qualification of the general definition and argued that the plurality's interpretation rendered the feasibility language superfluous. *Id.* at 709 (Marshall, J., dissenting). The plurality responded to this argument by noting that section 3(8)'s "reasonably necessary and appropriate" requirement determines the need for regulation, at which point the feasibility language would dictate adoption of the most stringent regulation feasible. *Id.* at 643 n.48. Moreover, the plurality found its interpretation supported by the requirement in section 6(b)(5) that standards be directed to "'toxic materials' and 'harmful physical agents'" and not to chemicals and other substances generally, thus indicating the need to find some heightened degree of risk. *Id.* at 643 (footnote omitted).

²¹ *Id.* at 642. In construing section 3(8) to require a finding of significant risk as a predicate for standard setting, the plurality relied upon the fact that workers normally are exposed to a certain degree of risk when they engage in nonwork-related activities, such as driving a car or breathing polluted air, and that these activities are not considered "unsafe." *Id.* The plurality further noted that the significant risk requirement would serve to ensure that those standards which were promulgated would result in significant benefits. *Id.* at 644.

²² *Id.* at 662.

²³ Justice Marshall wrote the dissenting opinion, joined by Justices Brennan, White and Blackmun.

²⁴ 448 U.S. at 708-13 (Marshall, J., dissenting). Justice Marshall criticized the plurality's interpretation of the interplay between sections 3(8) and 6(b)(5) as an impermissible

American Textile, the second recent case in which the Court considered the interplay of sections 3(8) and 6(b)(5), involved a challenge to the cotton dust standard promulgated under section 6(b)(5).²⁵ Finding that exposure to cotton dust at existing levels presented a significant health risk to employees,²⁶ OSHA set the cotton dust standard, as it had the benzene standard in *American Petroleum*,²⁷ at the lowest feasible level without weighing expected benefits against projected costs.²⁸ The standard's validity was at-

imposition of the plurality's own views on proper regulatory policy. *Id.* at 688, 712-13, 723-24 (Marshall, J., dissenting). The dissent attributed to the plurality's significant risk requirement the effect of either "paralyz[ing] the Secretary into inaction," countermanning the Act's protective purposes, or "forc[ing] him to deceive the public by acting on the basis of assumptions that must be considered too speculative to support any realistic assessment of the relevant risk." *Id.* at 716 (Marshall, J., dissenting). Finally, the dissent expressly rejected any construction of the Act which would require the performance of cost-benefit analysis. *Id.* at 717-19 (Marshall, J., dissenting).

²⁵ See 101 S. Ct. 2478, 2483 (1981). The cotton dust standard established mandatory maximum exposure levels for respirable cotton dust at 200 mg/m³ for yarn manufacturing, 750 mg/m³ for slashing and weaving operations, and 500 mg/m³ for all other processes. *Id.* at 2486-87. In selecting the standard, OSHA considered recommendations from various organizations. The industry suggested a 500 mg/m³ standard in yarn manufacturing, which OSHA rejected as not providing a sufficient level of protection. *Id.* at 2487. The Textile Workers' Union of America recommended a 100 mg/m³ standard, which OSHA rejected as beyond the "technological capabilities of the industry." *Id.* at 2487-88. The National Institute for Occupational Safety and Health (NIOSH), the research arm of the Act established under 29 U.S.C. § 671 (1976), recommended a standard of 200 mg/m³ for all segments of the industry. 101 S. Ct. at 2486. Although OSHA adopted this exposure level as the proposed standard, it relaxed this level in promulgating the permanent standard for technological and other reasons. *Id.*; see 43 Fed. Reg. 27,360 (1978). The cotton dust standard appears in 29 C.F.R. § 1910.1043 (1981).

²⁶ 101 S. Ct. at 2487. The cotton dust standard defines "cotton dust" as:

dust present in the air during the handling or processing of cotton, which may contain a mixture of many substances including ground up plant matter, fiber, bacteria, fungi, soil, pesticides, non-cotton plant matter and other contaminants which may have accumulated with the cotton during the growing, harvesting and subsequent processing or storage periods.

Id. at 2483 n.6 (quoting 29 C.F.R. § 1910.1043(b) (1980) (cotton dust standard)). Cotton dust exposure first was regulated under the Walsh-Healey Act, which set a threshold limit value of 1,000 mg/m³ for total cotton dust. 101 S. Ct. at 2485; see Walsh-Healey Act § 1, 41 U.S.C. § 35(e) (1976); 34 Fed. Reg. 7953 (1969). This standard was adopted as an interim standard when the Act was passed. 101 S. Ct. at 2485; see note 2 *supra*.

²⁷ See notes 12-13 and accompanying text *supra*.

²⁸ See 101 S. Ct. at 2487; 43 Fed. Reg. 27,358 (1978). In assessing the economic feasibility of the proposed standard, OSHA considered two financial analyses, one which it had commissioned and one prepared by the industry. The OSHA-contracted analysts estimated the cost of compliance with the 200 mg/m³ proposed standard to be \$2.7 billion, and concluded that such cost would not seriously threaten the industry as a whole. 101 S. Ct. at 2501-02, 2504. The industry estimated at \$543 million the cost of compliance with a less stringent standard than the one ultimately adopted. OSHA scrutinized both analyses, find-

tacked on the ground that under section 3(8) the standard must address a significant risk and must result in significant reduction of the risk in light of the costs involved.²⁹

While recognizing that section 3(8) alone might be construed to incorporate a balancing of costs and benefits, a majority of the Court³⁰ nonetheless refused to hold that section 3(8) imposes this requirement on the Secretary in setting section 6(b)(5) standards.³¹ Instead, the majority interpreted section 6(b)(5)'s feasibility language as precluding cost-benefit analysis.³² In relation to section 3(8), the Court construed this language as an additional and overriding requirement which Congress applied specifically to the subcategory of standards regulating toxic substances.³³ The Court rea-

ing flaws in each, and ultimately determined the total compliance cost of the final standard to be \$656.5 million, 101 S. Ct. at 2498 n.44, which it found "well within" the industry's financial capability, *id.* at 2501. For a full discussion of each estimate and how OSHA made its feasibility determination, see *id.* at 2497-504.

²⁹ 101 S. Ct. at 2489. The industry filed suit in the Circuit Court of Appeals for the District of Columbia pursuant to section (f) of the Act, which provides for preenforcement judicial review of permanent health standards. 29 U.S.C. § 655(f) (1976).

³⁰ Justice Brennan authored the opinion in which Justices White, Marshall, Blackmun and Stevens joined. Justice Stewart dissented on the basis of the court of appeals' application of the substantial evidence test and did not reach the cost-benefit/feasibility issue. 101 S. Ct. at 2506-07 (Stewart, J., dissenting). In a separate dissenting opinion, Justice Rehnquist, joined by Chief Justice Burger, argued that section 6(b)(5) of the Act should be invalidated as violative of the nondelegation doctrine. *Id.* at 2507-10 (Rehnquist, J., dissenting). It is interesting to note that Justice Powell took no part in the decision since he was the only member of the Court to address the cost-benefit/feasibility issue when it was presented in *American Petroleum*. In that case, Justice Powell had opined that the statute mandated a cost-benefit analysis. 448 U.S. at 664-70 (Powell, J., concurring in part and in the judgment); see note 18 *supra*.

³¹ 101 S. Ct. at 2492. The Court declined to decide whether the "reasonably necessary or appropriate" language of section 3(8), independent of section 6(b)(5), contemplates some form of cost-benefit analysis. *Id.*

³² *Id.* at 2490-92. The majority noted that Congress had used specific language in other statutes to require the performance of cost-benefit analysis. Absent such language, the *American Textile* Court refused to read such a requirement into the Act. See *id.* at 2491-92. Instead, it interpreted the word "feasible" in terms of its plain meaning, "capable of being done." See *id.* at 2490. The Court concluded that in using the term "feasible," Congress itself struck the balance between costs and benefits "by placing the 'benefit' of worker health above all other considerations save those making attainment of this 'benefit' unachievable." *Id.* Thus, the Court reasoned, any different balancing of costs and benefits would violate the congressional mandate in section 6(b)(5). *Id.*

³³ See *id.* at 2492. While holding that a feasibility analysis dominates the establishment of permanent standards pursuant to section 6(b)(5), the Court noted that section 3(8) was not without substantive content. It acknowledged, for example, the significant risk requirement which this section imposes on section 6(b)(5) standard setting. Moreover, the Court indicated that section 3(8) might require OSHA to adopt the least financially burdensome of various equally protective compliance methods. Finally, the Court left open the question

soned, therefore, that to hold section 3(8) controlling would write the feasibility requirement out of the Act, thereby frustrating congressional intent.³⁴

The Supreme Court's decisions in *American Petroleum* and *American Textile* appear facially to conflict. While the former opinion mandates a significant risk standard in assessing when to regulate,³⁵ the latter decision calls for regulation to the extent feasible once the decision to regulate has been made.³⁶ Neither decision, however, mandates the application of quantitative cost-benefit analysis.³⁷ Such avoidance of the cost-benefit approach is nota-

whether section 3(8) imposes cost-benefit analysis on the setting of standards other than those regulating toxic substances. *Id.* at 2493 n.32.

³⁴ See *id.* at 2492. The majority observed that imposition of a cost-benefit analysis on section 6(b)(5)'s feasibility standard would, in effect, write the feasibility standard out of the Act since the exposure levels "would inevitably be set at the level indicated by cost-benefit analysis, and not at the level specified by section 6(b)(5)." *Id.* This, the Court concluded, would allow the provisions of a general definitional section to countermand the express provisions of a section specifically addressed to toxic substance regulation in violation of the "well-settled rule that all parts of a statute . . . are to be given effect." *Id.* The Court refused to impute to Congress such an intention. *Id.*

³⁵ 448 U.S. 607, 642 (1980) (plurality opinion).

³⁶ 101 S. Ct. at 2490. In *American Textile*, the Court found that by placing worker protection above all other considerations, Congress had predetermined the requisite balance between the costs and benefits of toxic substance regulation, thereby leaving OSHA powerless to engage in further balancing, and prohibiting the Court from requiring it. See *id.* at 2488, 2490. Recognizing that section 3(8) may encompass cost-benefit balancing, the *American Textile* Court purported to reject its applicability to toxic substance regulation by asserting section 6(b)(5)'s superiority. *Id.* at 2492. Significantly, however, the decision is predicated upon the fact that OSHA made a valid finding of significant risk, as required by *American Petroleum*, before promulgating the cotton dust standard. *Id.* at 2488-89 n.25. Thus, the Court confirmed section 3(8)'s applicability to section 6(b)(5) standard setting in the form of the significant risk determination and implied that cost-benefit balancing takes place at this level.

³⁷ See 101 S. Ct. at 2491-92; 448 U.S. at 641. The *American Petroleum* plurality declined to address the cost-benefit issue directly, 448 U.S. at 639; see *id.* at 667-68 (Powell, J., concurring in part and in the judgment), and the significant risk requirement which it enunciated clearly does not require precise risk quantification, see *id.* at 655-66. In *American Textile*, the Court expressly rejected the contention that section 6(b)(5) requires a cost-benefit analysis, 101 S. Ct. at 2491-92, and held that "cost-benefit analysis by OSHA is not required by the [Act] because feasibility analysis is." *Id.* at 2490. Clearly, then, *American Textile* does not require the performance of cost-benefit analysis in setting section 6(b)(5) standards. This holding was criticized by Justice Rehnquist, who interpreted it as permitting, but not requiring, performance of cost-benefit analysis. *Id.* at 2508 (Rehnquist, J., dissenting). Although the *American Textile* holding might be susceptible to such interpretation, it is submitted that, if read in context, it precludes this possibility. After pronouncing their holding, the majority explained that performance of cost-benefit and feasibility analyses are mutually exclusive. *Id.* at 2490. Thus, the effect of requiring performance of feasibility analysis, and not cost-benefit analysis, is to preclude the use of cost-benefit analysis in the setting of standards regulating toxic substances.

ble, for although quantitative cost-benefit analysis can be an invaluable decisionmaking tool,³⁸ it is clearly inappropriate in the context of sections 3(8) and 6(b)(5). Effective application of a cost-benefit test is, by definition, dependent upon accurate quantification of both costs and benefits.³⁹ Health benefits, however, resist accurate quantification.⁴⁰ Indeed, although proponents of cost-benefit analysis refer to the anticipated benefits of a health standard in terms of the degree to which the standard will reduce risk,⁴¹ precise quantification of risk, and the extent to which it will be reduced by a proposed standard, often is impossible under current scientific methods.⁴² Moreover, even if precise quantification were

³⁸ Baram, *Cost-Benefit Analysis: An Inadequate Basis for Health, Safety and Environmental Regulatory Decisionmaking*, 8 *ECOLOGY L.Q.* 473, 526 (1980). Cost-benefit analysis is "[a] systematic technique for judging among alternative ways of trying to achieve the same or related objectives . . ." C. AMMER & D. AMMER, *DICTIONARY OF BUSINESS AND ECONOMICS* 99 (1977), which requires the quantification of the anticipated advantages and disadvantages of a proposed project, expressed typically in dollar amounts. See Baram, *supra*, at 477-78 & n.15; Parker, *Quantitative Decision Techniques for the Health/Public-Sector Policy-Maker: An Analysis and Classification of Resources*, 3 *J. HEALTH POL., POL'Y & L.* 388, 389 (1978). A project is considered justified when its anticipated benefits outweigh its projected costs. Baram, *supra*, at 478. Cost-benefit analysis appears first to have been used in the United States to evaluate government navigation projects. See A. DASGUPTA & D. PEARCE, *COST-BENEFIT ANALYSIS: THEORY AND PRACTICE* 12-13 (1972); Rogers, *Benefits, Costs, and Risks: Oversight of Health and Environmental Decisionmaking*, 4 *HARV. ENV'T L. REV.* 191, 210 (1980); Pear, *Fiscal Plans Bear the Telltale Signs of Cost-Benefit Analysis*, *N.Y. Times*, Feb. 14, 1982, § 4, at 2, col. 1. It has been suggested that a cost-benefit analysis is most useful in the context of such public projects since both the advantages and disadvantages accrue to society generally, see A. DASGUPTA & D. PEARCE, *supra* at 19, whereas private regulation often involves the accrual of costs and benefits to different groups, such as labor and management. See generally Parker, *supra*, at 393; Rogers, *supra*, at 210-11.

³⁹ Zimmerman, *Risk-Benefit Analysis: The Cop-out of Governmental Regulation*, 14 *TRIAL*, Feb. 1978, at 43, 44; see P. SELF, *ECONOCRATS AND THE POLICY PROCESS: THE POLITICS AND PHILOSOPHY OF COST-BENEFIT ANALYSIS* 9 (1975).

⁴⁰ Comment, *Economic Feasibility of Occupational Safety and Health Standards Under OSHA*, 14 *U.C.D.L. REV.* 155, 159-60 & n.24 (1980) (citing H. PESKIN & E. SESKIN, *COST-BENEFIT ANALYSIS AND WATER POLLUTION POLICY* 120-22 (1975)); see H. DASGUPTA & D. PEARCE, *supra* note 38, at 112-17.

⁴¹ See *American Petroleum Inst. v. OSHA*, 581 F.2d 493, 504 & nn.23-24 (5th Cir. 1978), *aff'd sub nom. Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. 607 (1980); Leape, *Quantitative Risk Assessment in Regulation of Environmental Carcinogens*, 4 *HARV. ENV'T L. REV.* 86, 87, 103-04 (1980). In *American Petroleum*, the court of appeals suggested the use of a dose-response curve or animal studies to make projections of expected risks so that "OSHA will be able to make rough but educated estimates of the extent of benefits expected from reducing the permissible exposure level." 581 F.2d at 504.

⁴² See 1A W. CONNOLLY, JR. & D. CROWELL II, *PRACTICAL GUIDE TO THE OCCUPATIONAL SAFETY AND HEALTH ACT: LAW, PRINCIPLES & PRACTICES* 390-91 (1977); Interagency Regulatory Liaison Group, Work Group on Risk Assessment, *Scientific Bases for Identification of*

possible, it would be dependent upon knowledge of confidential information which industry may be reluctant to divulge.⁴³ Additionally, sterile quantification of risk reduction cannot express the intangible benefits that accompany saved lives and improved quality of life.⁴⁴ Therefore, quantification of health benefits based upon projected risk reduction necessarily underestimates the extent of a proposed standard's true beneficial effect and renders the accuracy of the cost-benefit analysis questionable.⁴⁵

Quantification of cost also presents problems under the Act.⁴⁶

Potential Carcinogens and Estimation of Risks, in FEDERAL REGULATION OF CARCINOGENS IN THE WORKPLACE: OSHA'S CANCER POLICY 73, 89 (P. Hutt & A. Keller, chairmen 1980). For an enumeration of the components of quantitative risk assessment, see *id.* at 95. See generally Doniger, *Federal Regulation of Vinyl Chloride: A Short Course in the Law and Policy of Toxic Substances Control*, 7 *ECOLOGY L.Q.* 497, 508-14 (1978); Leape, *supra* note 41, at 90-103.

⁴³ Although the Act requires the Secretary to keep confidential all information which might contain trade secrets, 29 U.S.C. § 664 (1976), industry has been reluctant to provide such information. See *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. 2478, 2499-500 & n.51 (1981).

⁴⁴ See N. ASHFORD, *CRISIS IN THE WORKPLACE: OCCUPATIONAL DISEASE AND INJURY* 325-26, 330 (1976); T. KLEIN, *SOCIAL COSTS AND BENEFITS OF BUSINESS* 107 (1977); Doniger, *supra* note 42, at 518-19; Rodgers, *supra* note 38, at 194-95. The problem of quantifying intangible benefits has led one commentator to suggest their exclusion from cost-benefit calculation. See Note, *Section 6(b)(5) of the Occupational Safety and Health Act of 1970: Is Cost-Benefit Analysis Required?*, 49 *FORDHAM L. REV.* 432, 440 (1980). Others have suggested that quantification of these benefits be postponed as long as possible. Baram, *supra* note 38, at 483-84. Moreover, it has been asserted that quantification of the value of human life, in the context of cost-benefit analysis, is "morally and intellectually irresponsible." *Id.* at 484.

⁴⁵ See Comment, *Cost-Benefit Analysis For Standards Regulating Toxic Substances Under The Occupational Safety and Health Act: American Petroleum Institute v. OSHA*, 60 *B.U.L. REV.* 115, 140-41, 143 (1980). One commentator has observed that "[b]y using the word 'analysis,' [cost-benefit analysis] is given the trappings of a scientific procedure, and thus, its conclusions are taken more seriously by the naive than they deserve to be." Zimmerman, *supra* note 39, at 44; see G. BLOMQUIST, P. GRAVES & G. TOLLEY, 1 *ENVIRONMENTAL POLICY: ELEMENTS OF ENVIRONMENTAL ANALYSIS* 186-87 (1981). This is due to the impossibility of accurate quantification of health risks and benefits, and the subjective nature of placing a dollar value on them. See Zimmerman, *supra* note 39, at 44; Note, *OSHA After American Petroleum Institute: A Proposed Regulatory Budget*, 33 *STAN. L. REV.* 917, 922-23 (1981); Comment, *Economic Feasibility of Occupational Safety and Health Standards Under OSHA*, 14 *U.C.D. L. REV.* 155, 159-64 (1980). Other commentators have observed that applying cost-benefit analysis to the regulation of toxic substances forces the government "to set a normative, value-laden policy judgment on the acceptable balance between worker safety and its cost, and to apply that policy to imprecise, controversial information." Berger & Riskin, *Economic and Technological Feasibility in Regulating Toxic Substances Under the Occupational Safety and Health Act*, 7 *ECOLOGY L.Q.* 285, 287 (1978) (footnote omitted). Thus, they conclude that "[o]bjective, reliable cost-benefit comparisons are never possible" in the area of occupational health regulation. *Id.*

⁴⁶ See G. BLOMQUIST, D. GRAVES & G. TOLLEY, *supra* note 45, at 87. It has been recog-

This is largely because a principle function of the Act is to "force" technology, that is, to foster the development of new techniques and devices for improving workplace safety health conditions.⁴⁷ Indeed, a standard which requires, for full compliance, more sophisticated equipment than currently exists properly may be promulgated.⁴⁸ Development of such new technology usually will involve substantial initial expense, which may be expected to decrease in time.⁴⁹ Since calculation of this anticipated expense necessarily is speculative and does not account for technological advancements, the cost figure may be inflated, and hence, may not reflect a standard's true economic impact upon the affected industry.⁵⁰ Moreover, it is likely that the cost of developing new technology would dwarf anticipated health benefits.⁵¹ Notably, then, cost-benefit analysis could discourage industry from developing more efficient methods of improving workplace health conditions. The higher industry can show its compliance cost, the greater will be the likelihood that the anticipated benefits will not justify that cost, and that industry will escape regulation.⁵² Accordingly, cost-benefit analysis actively frustrates the Act's technology-forcing function.

In light of the foregoing, it is evident that quantification of

nized that the quality of available knowledge on the costs and benefits of occupational health regulation is poor. S. KELMAN, *REGULATING AMERICA, REGULATING SWEDEN: A COMPARATIVE STUDY OF OCCUPATIONAL SAFETY AND HEALTH POLICY* 85 (1981). Although costs may lend themselves more easily to quantification than benefits, their precise quantification still is problematical. G. BLOMQUIST, D. GRAVES & G. TOLLEY, *supra* note 45, at 87. For a discussion of the quantification problem generally, see P. SELF, *supra* note 39, at 67-93.

⁴⁷ See *Society of Plastics Indus., Inc. v. OSHA*, 509 F.2d 1301, 1309 (2d Cir.), *cert. denied*, 421 U.S. 992 (1975). Although there is no reference to "technology forcing" in the Act's legislative history, W. CONNOLLY JR. & D. CROWELL II, *supra* note 42, at 394, or in the Act itself, courts have read this function into the Act, see *AFL-CIO v. Brennan*, 530 F.2d 109, 121 (3d Cir. 1975); 509 F.2d at 1309; Berger & Riskin, *supra* note 45, at 320-24.

⁴⁸ See *Society of Plastics Indus., Inc. v. OSHA*, 509 F.2d 1301, 1309 (2d Cir.), *cert. denied*, 421 U.S. 992 (1975). The *Society of Plastics* court admonished the industry petitioners to have "more faith in their own technological potentialities." 509 F.2d at 1309. The Third Circuit adopted this interpretation of the Act, but limited the broad language used in *Society of Plastics*, stating that the required technology must "[loom] on today's horizon." *AFL-CIO v. Brennan*, 530 F.2d 109, 121 (3d Cir. 1975).

⁴⁹ See N. ASHFORD, *supra* note 44, at 338-39; Berger & Riskin, *supra* note 45, at 343. In assessing the feasibility of the proposed cotton dust standard in *American Textile*, OSHA relied in part on expert testimony and a study indicating that "by going to newer equipment . . . there is a likelihood that increased production rates will result in recovery of some or all of the capital cost of control." *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. 2478, 2499 & n.47 (1981).

⁵⁰ See G. BLOMQUIST, D. GRAVES & G. TOLLEY, *supra* note 45, at 88.

⁵¹ See N. ASHFORD, *supra* note 44, at 337.

⁵² See generally Baram, *supra* note 38, at 490; Berger & Riskin, *supra* note 45, at 333.

costs versus benefits is unwarranted under section 3(8) and section 6(b)(5). With respect to such conclusion, it is notable that *American Petroleum's* significant risk standard is not equivalent to quantitative cost-benefit analysis. In contradistinction, the *American Petroleum* decision does not expressly require anticipated benefits to be weighed against estimated compliance costs in assessing the significance of a workplace risk.⁵³ Rather, upon review of a significant risk determination, OSHA is required only to show that the "risk . . . [was] quantified sufficiently to enable the Secretary to characterize it as significant in an understandable way."⁵⁴ Furthermore, the *American Petroleum* plurality stressed that this requirement does not imprison OSHA in a "mathematical straight-jacket,"⁵⁵ and characterized the significant risk determination as one of policy necessarily left to the Agency.⁵⁶ The determination need not be supported by "anything approaching scientific certainty."⁵⁷ As long as it is based on a "body of reputable scientific thought" representing the "best available evidence," the determination will be upheld.⁵⁸ Interestingly, the Court specifically recognized the Agency's need to "use conservative assumptions in inter-

⁵³ *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. 607, 639-40 (1980) (plurality opinion). Although the *American Petroleum* decision reflects a concern that the benzene standard's expected benefits, in terms of reduced risk exposure, would be "relatively small" in light of its substantial compliance cost, *id.* at 629-30, the Court did not expressly require anticipated benefits to be weighed against estimated compliance costs in assessing the significance of a workplace risk. *See id.* at 639-40; Note, *supra* note 45, at 925-28; note 37 *supra*.

⁵⁴ 448 U.S. at 646.

⁵⁵ *Id.* at 655.

⁵⁶ *Id.* at 655-56 n.62. The policy considerations inherent in OSHA determinations have been noted by several circuit courts when reviewing section 6(b)(5) standards. One court discussed these policy decisions, stating:

[S]ome of the questions involved in the promulgation of these standards are on the frontiers of scientific knowledge, and consequently as to them insufficient data is presently available to make a fully informed factual determination. Decision making must in that circumstance depend to a greater extent upon policy judgments and less upon purely factual analysis. Thus, in addition to currently unresolved factual issues, *the formulation of standards involves choices that by their nature require basic policy determinations rather than resolution of factual controversies.*

Industrial Union Dep't v. Hodgson, 499 F.2d 467, 474-75 (D.C. Cir. 1974) (footnote omitted) (emphasis added); *see American Iron & Steel Inst. v. OSHA*, 577 F.2d 825, 831 (3d Cir. 1978), *cert. dismissed*, 448 U.S. 917 (1980); *Society of Plastics Indus., Inc. v. OSHA*, 509 F.2d 1301, 1309 (2d Cir.), *cert. denied*, 421 U.S. 992 (1975); *Synthetic Organic Chem. Mfrs. Ass'n v. Brennan*, 506 F.2d 385, 390 (3d Cir. 1974), *cert. denied*, 423 U.S. 830 (1975).

⁵⁷ 448 U.S. at 656.

⁵⁸ *Id.* (quoting 29 U.S.C. § 655(b)(5) (1976)).

preting the data . . . risking error on the side of overprotection" of worker safety.⁵⁹ It seems that as long as OSHA creates a record which lends itself to the substantial evidence standard of review,⁶⁰ virtually any finding of significant risk will be upheld.⁶¹

In enunciating the significant risk requirement, the *American Petroleum* Court avoided quantitative cost-benefit guidelines for determining *when*, pursuant to section 3(8), regulation of an unhealthy workplace is warranted.⁶² Similarly, the *American Textile* Court properly prescribed a "feasibility" test, rather than quantitative cost-benefit analysis, for determining the *extent* of OSHA regulations.⁶³ Clearly, such a holding comports with the express language of section 6(b)(5).⁶⁴ Nevertheless, the meaning of the term "feasibility" is uncertain since it inadequately defines the degree to which an existing disease rate must be reduced and the maximum amount of expenditure which will be required to achieve such reduction.⁶⁵ Indeed, there are several ways in which feasibility

⁵⁹ 448 U.S. at 656.

⁶⁰ The substantial evidence test normally is applied to formal rulemaking procedures under the Administrative Procedure Act, 5 U.S.C. § 706(2)(E) (1976). While the Occupational Safety and Health Act authorized the creation of standards according to informal, "notice-and-comment" rulemaking procedures, 29 U.S.C. § 655(b)(2), (4) (1976), it specifically provides for judicial review under the substantial evidence test, *id.* § 655(f).

⁶¹ See Comment, *The Significant Risk Requirement in OSHA Regulation of Carcinogens*: Industrial Union Department, AFL-CIO v. American Petroleum Institute, 33 STAN. L. REV. 551, 556-60 (1981).

⁶² See *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. 607, 642 (1980) (plurality opinion).

⁶³ See *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. 2478, 2490, 2506 (1981).

⁶⁴ See *id.* at 2490-92 & nn.28-30; 29 U.S.C. § 655(b)(5) (1976); note 4 and accompanying text *supra*.

⁶⁵ Justice Rehnquist's dissent in *American Textile* and his concurrence in *American Petroleum* are based on the vagueness of the term "feasibility" which, he averred, rises to constitutional dimensions. See *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. at 2509 (Rehnquist, J., dissenting); *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. at 681-86 (Rehnquist, J., concurring in judgment). Indeed, Justice Rehnquist described section 6(b)(5)'s feasibility language as a "legislative mirage, appearing to some Members [of Congress] but not to others, and assuming any form desired by the beholder." *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. at 2509 (Rehnquist, J., dissenting) (quoting *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. at 681 (1980) (Rehnquist, J., concurring)). Accordingly, Justice Rehnquist found this language susceptible of a "remarkable range of interpretations," 101 S. Ct. at 2508 (Rehnquist, J., dissenting); it can be read to require cost-benefit analysis, as the textile industry contended; to permit cost-benefit analysis, as Justice Rehnquist inferred from the majority opinion; or to prohibit it, as OSHA maintained. *Id.* (Rehnquist, J., dissenting). Indeed, this possible range of interpretation was realized in the circuit courts. See note 5 and accompanying text *supra*. Compare *American Petroleum Inst. v. OSHA*, 581 F.2d 493, 503 (5th Cir. 1978) (cost-benefit analysis is required), *aff'd on other grounds sub nom.* *Industrial Union Dep't v. American Petroleum*

analysis can be interpreted to facilitate its application. An absolute feasibility standard, for example, would require industry to eliminate all risk of disease associated with a toxic substance, regardless of economic, technological, or other limiting factors.⁶⁶ Such an application of feasibility analysis, however, may be problematical. The cost of risk reduction may not be static throughout the continuum of reduction for a toxic substance. Rather, as the risk of disease approaches zero, each degree of reduction may require an increasing rate of expenditure.⁶⁷ Moreover, such diminishing returns may vary among toxic substances. Thus, the reduction of the dis-

Inst., 448 U.S. 607 (1980) with *American Textile Mfrs. Inst., Inc. v. Marshall*, 617 F.2d 636, 676-77 (D.C. Cir. 1980) (feasibility is the sole requirement under section 6(b)(5)), *aff'd in part and vacated in part sub nom. AFL-CIO v. Donovan*, 101 S. Ct. 2478 (1981). Thus, noted Justice Rehnquist, instead of providing precise guidelines for the promulgation of standards regulating toxic substances pursuant to section 6(b)(5), the feasibility standard "gives the Secretary absolutely no indication where on the continuum of relative safety he should draw his line." *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. at 675 (Rehnquist, J., concurring). Justice Rehnquist concluded that the feasibility language of section 6(b)(5) is merely an attempt by Congress to sidestep the "fundamental and most difficult policy choice—whether and to what extent 'the statistical possibility of future deaths should . . . be disregarded in light of the economic costs of preventing those deaths.'" *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. at 2509 (Rehnquist, J., dissenting) (quoting *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. at 672), and consequently, constitutes an impermissible delegation of that choice to nonelected officials. 101 S. Ct. at 2509 (Rehnquist, J., dissenting).

⁶⁶ Inclusion of the word "feasible" in section 6(b)(5) was the subject of debate before the OSHA bill was passed. Several senators objected to its inclusion, interpreting it as requiring the establishment of a "utopia free from any hazards," 116 CONG. REC. 37,614 (1970), reprinted in LEGIS. HIST., *supra* note 1, at 480-81 (remarks of Sen. Dominick); see *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. at 677-79. No circuit courts reviewing section 6(b)(5) standards have taken so broad a view of the feasibility language. The first court to review a permanent health standard promulgated pursuant to this section rejected such interpretation, holding that practical considerations, specifically economic considerations, can temper the Act's protective scope. See *Industrial Union Dep't v. Hodgson*, 499 F.2d 467, 477-78 (D.C. Cir. 1974); note 68 and accompanying text *infra*.

⁶⁷ See *Society of Plastics Indus., Inc. v. OSHA*, 509 F.2d 1301, 1308-09 (2d Cir.), *cert. denied*, 421 U.S. 992 (1975). In *Society of Plastics*, industry challenged the validity of a standard regulating vinyl chloride, pursuant to section 6(b)(5), on the grounds that the standard was economically unfeasible. See *id.* at 1308. Petitioners relied on a financial analysis commissioned by the Department of Labor and used to set the maximum permissible exposure level, which noted that "'costs of compliance increase rapidly with decreasing [exposure] levels'" to the toxic agent. *Id.* (quoting FOSTER D. SNELL, INC., ECONOMIC IMPACT STUDIES OF THE EFFECTS OF PROPOSED OSHA STANDARDS FOR VINYL CHLORIDE (1974)). This observation illustrates the law of diminishing returns, also known as the law of variable proportions. See C. AMMER & D. AMMER, *supra* note 38, at 118. Such phenomenon is defined as "[t]he economic principle that, as successive units of a factor of production, (land, labor or capital) are added in a particular enterprise, the additional output they generate decreases." *Id.*

ease rate associated with toxic A may cost twice as much as a similar reduction of the disease rate for toxic B, with most of the additional expense involved in reducing the rate from a minimal level to zero. It appears unfair to force the industry using toxic A to bear an inordinate financial burden to reduce the disease rate to zero, especially if a minimal level previously had been deemed acceptable under the threshold significant risk test. Application of this test illustrates a further inequity in the zero option. An industry not only may be required to spend large sums to reduce a risk from a minimal level to zero, but it may be required to do so when other risks, existing at a minimal level in the first instance, will remain at such level merely because they were initially characterized as insignificant under section 3(8), and hence, were not regulated.

Another possible application of feasibility analysis would relate the required levels of risk reduction and expenditure to the regulated industry's economic capability to purchase such risk reduction, rather than uniformly requiring reduction to zero of disease risks.⁶⁸ Under such an "economic" feasibility standard, the disease rate⁶⁹ must be reduced to the lowest level that the regulated industry can afford.⁷⁰ Unfortunately, such an approach is possessed of the same inequities as "absolute" feasibility. For example, economic feasibility would require industry to reduce risks below an acceptably minimal risk level, frequently at increasing cost, merely because it can afford to do so. As in the case of an absolute feasibility standard, this would impose greater financial

⁶⁸ See *Industrial Union Dep't v. Hodgson*, 499 F.2d 467, 477 (D.C. Cir. 1974). In *Industrial Union*, the Circuit Court of Appeals for the District of Columbia first enunciated the "economic feasibility" test, recognizing that while the Act may require the adoption of standards which could substantially increase production cost, it does not require the adoption of all technologically feasible measures irrespective of their prospective economic impact. *Id.* Rather, a technologically achievable standard which adversely affects the regulated industry's competitive structure might be considered unfeasible under the economic feasibility test. *Id.* at 478; accord, *American Iron & Steel Inst. v. OSHA*, 577 F.2d 825, 835-37 (3d Cir. 1978); *AFL-CIO v. Brennan*, 530 F.2d 109, 122-23 (3d Cir. 1975).

⁶⁹ For purposes of this discussion, a disease rate is a function of two variables: a given part per million exposure and the susceptibility to disease at such exposure level.

⁷⁰ See *AFL-CIO v. Marshall*, 617 F.2d 636, 661-62 (D.C. Cir. 1979), *aff'd in part and vacated in part sub nom. American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. 2478 (1981). In setting the cotton dust standard, OSHA chose the lowest exposure level that the industry could implement without being put out of business by the cost of implementation. See 617 F.2d at 661-62. The circuit court upheld the standard, relying on the guidelines for economic feasibility it had enunciated previously in *Industrial Union*. See *id.*; note 68 and accompanying text *supra*.

burdens on some industries than others for slight differences in the degree of risk reduction and would force the reduction of risks initially characterized as "significant" to levels lower than those of unregulated "insignificant" risks.

The economic feasibility test also is subject to several unique drawbacks. For instance, it is conceivable that, in certain circumstances, such test may undermine the threshold significant risk requirement. While the significant risk determination is the initial triggering mechanism for regulation, it appears that an economic feasibility standard would sanction toxic exposures above the threshold significant risk level should the affected industry not be financially capable of reducing toxic exposures to below such threshold level. Surely, however, if the significant risk requirement is to have any force, it would appear that the disease rate must be reduced to at least this level, irrespective of cost to industry.⁷¹ Another disadvantage of an economic feasibility test is that it would shift the Act's focus by subordinating worker safety to financial considerations.⁷² In so doing, the test may act to the mutual disadvantage of industry and its employees. On the one hand, it has the effect of penalizing profitable industries by requiring them to pay more for safety merely because they have greater available resources, not because they subject workers to greater risk. On the other hand, the test may function to employees' disadvantage, affording workers in one industry a lesser degree of protection than workers in another industry because of differing profit margins of the employing industries.⁷³

Of course, such flaws are not fatal to meaningful and judicious application of feasibility analysis. Indeed, it is submitted that feasibility analysis, when combined with the significant risk standard promulgated in *American Petroleum*, offers a readily discernible

⁷¹ The Act's legislative history reveals congressional awareness of the potentially substantial cost involved in risk reduction and acceptance of such expense as a cost of doing business. See *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. at 2495-96. Moreover, it indicates that Congress intended to impose these costs on industry when necessary to create safe working environments since these costs could otherwise be borne by workers themselves, in medical expenses, wage loss, pain and suffering, and by society generally, in decreased production and compensation payments. *Id.*

⁷² Cf. Sagoff, *Economic Theory and Environmental Law*, 79 MICH. L. REV. 1393, 1415-17 (1981) (cost-benefit analysis subordinates aesthetic and moral values, central to environmental regulation, to economic efficiency).

⁷³ See Wheeler, *High Court Coughs Up 'Faulty' Ruling on Cotton Dust Standard*, NAT'L L.J., July 27, 1981, at 28, 29, col. 2 (feasibility analysis accords workers in high-profit industries more protection than those in less profitable industries).

level of safety and defines the expenditures necessary to achieve such level of safety. At the outset, it is evident that the significant risk and feasibility tests are susceptible to graphical interpretation. The threshold significant risk test, of course, is the maximum acceptable disease rate, and must be achieved irrespective of cost. Thus, if a vertical axis is defined to be the disease rate and the horizontal axis is defined as cost, the threshold significant risk standard may be represented as a zero-slope curve,⁷⁴ having a vertical axis intersect at a *preestablished* maximum allowable disease rate.⁷⁵ Significantly, in this regard, one commentator has suggested that such maximum allowable disease rate should not be preestablished, but rather, should vary in accordance with the toxic being regulated.⁷⁶ It appears, however, that such approach can only engender inconsistent and inequitable regulatory efforts. Indeed, it is submitted that a maximum allowable disease rate, although initially defined in light of legislative and judicial guidance, must not be redefined from toxic to toxic. Otherwise, employees exposed to any given toxic might be permitted to suffer greater risks than those exposed to another toxic. Clearly, therefore, the zero-slope significant risk properly may be represented as a constant.

The section 6(b)(5) feasibility test may, of course, be plotted on the same axes as is the section 3(8) significant risk standard. Unlike the constant and zero-slope significant risk curve, however,

⁷⁴ As its name indicates, the slope of a line measures the inclination of a nonvertical line segment plotted on a Cartesian coordinate system. See I. MILLER & S. GREEN, *ALGEBRA AND TRIGONOMETRY* 107-08 (2d ed. 1970); note 75 *infra*. A line which inclines upward from left to right on the coordinate plane has a positive slope. *Id.* at 108. Conversely, the slope of a line which inclines downward is negative. *Id.* Slope is expressed in numbers; the larger the number, positive or negative, the steeper the slope, upward or downward. See A. SIMON, *ALGEBRA AND TRIGONOMETRY WITH ANALYTIC GEOMETRY* 99-101 (1979). The slope of a horizontal line, then, is zero since it does not incline. See M. DOLCIANI & W. WOOTON, *MODERN ALGEBRA STRUCTURE AND METHOD* 374 (rev. ed. 1973) (the slope of every horizontal line is zero); I. MILLER & S. GREEN, *supra*, at 108. See generally E. VANCE, *MODERN ALGEBRA AND TRIGONOMETRY* 80-85 (3d ed. 1973).

⁷⁵ The Cartesian system is a two-dimensional coordinate system consisting of perpendicular lines, the vertical and horizontal coordinate axes. See T. DAVIS, *ALGEBRA AND TRIGONOMETRY* 70-73 (1972); I. MILLER & S. GREEN, *supra* note 74, at 102. To represent the threshold significant risk level on the coordinate plane, the vertical axis is designated as the disease rate and graded from the point of origin, the point at which the vertical and horizontal axes intersect, in increasing incidents of disease contraction. Similarly, the horizontal axis is designated as compliance cost and graded from the point of origin in increasing dollar amounts. Significant risk, as a constant value, is represented as a horizontal line, intersecting the vertical axis at the point which represents a nontrivial incidence of disease requiring regulation. This point is the vertical axis intersect.

⁷⁶ See generally Comment, *supra* note 61.

the feasibility plot must be representative of a range of risk reduction options, for the cost of diminishing the disease rate from exposure to a toxic substance is proportional to the extent of such reduction.⁷⁷ Indeed, each unit of reduction of the disease rate requires an expenditure of additional resources. Thus, if no money is spent, the disease rate will remain unchanged. Conversely, the disease rate will approach zero as more funds are allocated to shield workers from the disease causing toxic. This range of expenditures, which purchases increasing improvements in a given disease rate, may be termed a "feasibility curve." It is apparent, of course, that the feasibility curve associated with each toxic substance will be unique since the cost of shielding workers from various toxics will vary in proportion to, *inter alia*, the ease of filtering the toxic.⁷⁸ Thus, one may develop a number of feasibility curves, one for each toxic substance.

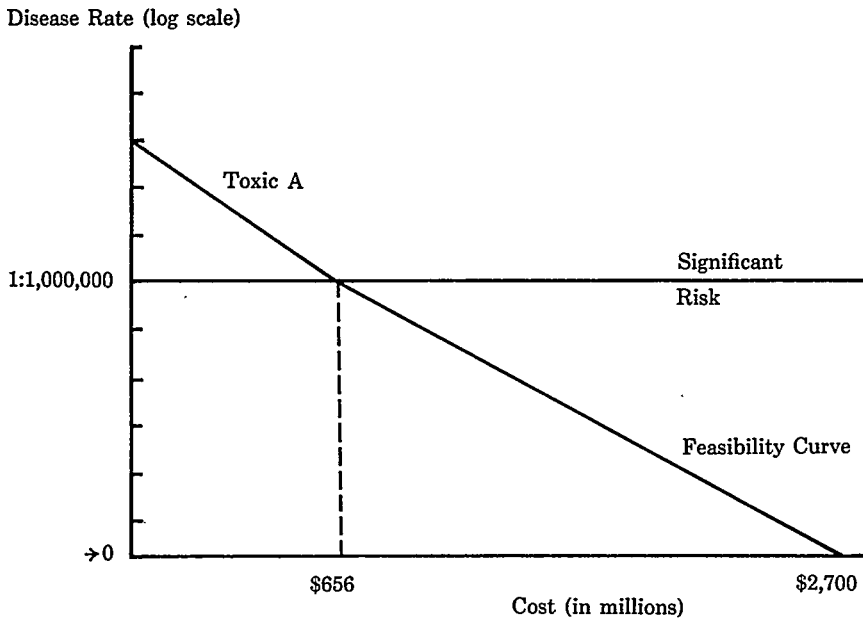
Once the threshold significant risk curve and the relevant feasibility curve are determined, their combined graphical depiction provides a ready means for determining how much must be spent in reducing exposure to a toxic substance. Plotting both the significant risk standard and the feasibility curve for a given toxic on the same graph, the level of expenditure required to reduce a given exposure level is the point where the two curves intersect. Assume, for example, that 1:1,000,000 cases of contraction of a disease is an acceptable significant risk.⁷⁹ Assume further that 1:1,000 workers

⁷⁷ See note 67 and accompanying text *supra*.

⁷⁸ A variety of factors impact upon the cost of reducing exposure to toxic substances. A major factor is the method used to reduce the exposure. For example, OSHA standards often can be implemented by alternative methods: work practice controls, such as sweeping and the use of personal protective devices which remove the toxic substance from the environment after emission, or source controls, such as improved machinery which prevent emission. Source controls typically are substantially more expensive than work practice controls, yet OSHA mandates implementation of section 6(b)(5) standards by source controls whenever possible. This is because OSHA interprets the Act as placing primary responsibility upon employers to provide safe and healthful working environments in the first instance. See *ITO Corp. v. OSHA*, 540 F.2d 543, 546 (1st Cir. 1976). See generally H. NORTHROP, R. ROWAN & C. PERRY, *THE IMPACT OF OSHA* 525-28 (1978).

⁷⁹ See *Industrial Union Dep't v. American Petroleum Inst.*, 448 U.S. 607, 655 (1980) (plurality opinion). The 1:1,000,000 disease rate relied upon in this Comment as a proper threshold significant risk level is extrapolated from the Court's discussion of significant risk in *American Petroleum*. In its discussion, the Court stated that a 1:1,000,000,000 probability of contracting cancer "clearly could not be considered significant." *Id.* Conversely, a 1:1,000 risk of disease "might well [be] consider[ed]. . . significant." *Id.* One in one million is chosen as an intermediate figure between the two disease rates discussed in *American Petroleum* to represent a significant risk. It must be noted that the use of this figure does not suggest its adoption as the proper significant risk level for all purposes. Notably, in discuss-

exposed to more than 1000 micrograms of cotton dust per cubic meter of air will contract bysinosis. Finally, assume that the cost of reducing the disease rate of bysinosis to 1:1,000,000 would be \$656 million and that reduction of the disease rate to zero would cost \$2.7 billion.⁸⁰ The significant risk versus feasibility curve for this example would be represented as follows:

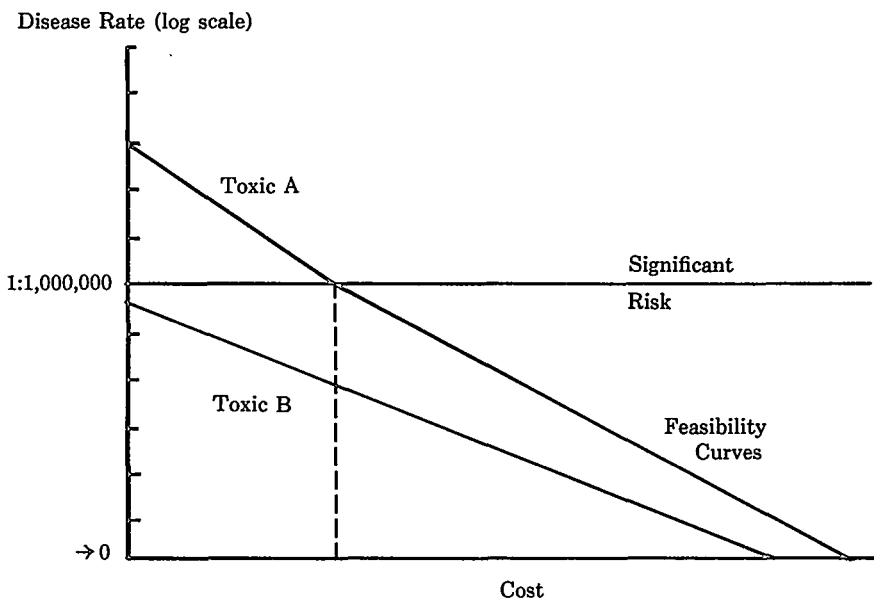


It is evident from the preceding graph that the proper expenditure level is \$656 million, and is identified by the point of intersection of the significant risk and feasibility curves. The equitable

ing the toxicity of food additives, one commentator recognized that no present methodology permits absolute safety at any exposure level to toxic substances. Rodricks, *Regulation of Carcinogens in Food*, in *FEDERAL REGULATION OF CARCINOGENS IN THE WORKPLACE: OSHA'S CANCER POLICY* 54, 62 (1980) (P. Hutt & A. Keller, chairmen 1980). Thus, the commentator reasoned, there is a need for an "operational definition of safety," which presents a "reasonable certainty of no harm." *Id.* at 63. The commentator approved of a "maximum lifetime risk of . . . not greater than one-in-one million." *Id.* at 65.

⁸⁰ See *American Textile Mfrs. Inst., Inc. v. Donovan*, 101 S. Ct. at 2501-04. The \$656 million and \$2.7 billion figures are borrowed from the cost estimate used in promulgating the cotton dust standard. See *id.* The factual situation in text, however, is different from the factual situation with which OSHA and the reviewing court were faced. Therefore, use of these figures is merely illustrative and does not purport to be representative of *American Textile*.

nature of this paradigm is demonstrated merely by plotting the feasibility curve for another toxic, toxic *B*, on the same graph. The parameters of toxic *B* are (1) the disease rate at the current exposure level is 1:1,500,000, and (2) the cost of reducing exposure sufficient to obtain a zero disease rate is \$2 billion. Notably, in this case, the *American Petroleum* significant risk threshold test provides that exposure levels to toxic *B* need not be reduced, for the substance does not pose a significant health risk. Surely, however, toxic *A*, merely because the current disease rate is greater than the significant risk level, need not be reduced to a disease rate below the disease rate for toxic *B*. The significant risk/feasibility curve intersection, however, forestalls this inequity:



The above graph vividly demonstrates that if the disease rate associated with toxic *A* is to be reduced to below 1:1,500,000, the industry using toxic *A* has been overregulated vis-a-vis the industry using toxic *B*. Should the significant risk/feasibility curve intersection be used as a risk reduction objective, however, it is clear that overregulation cannot occur. Indeed, it is through such interpretation of the *American Petroleum* and *American Textile* decisions that inequitable and unwarranted overregulation may be pre-

vented since in no case must a given disease rate be reduced to below the preestablished maximum allowable rate. Hence, although not all industries will be confronted with OSHA regulations—because not all work environments pose significant risks to those employed therein—those industries which are forced to reduce toxic exposures need only achieve the disease rate already obtained by other nonregulated employers.

CONCLUSION

From an industrial employer's perspective, an OSHA decision to regulate may appear to be an unfortuitous and inequitable event, given that such employer, but not other unregulated employers, must spend scarce resources to achieve what OSHA has determined to be an acceptable toxic exposure level. Apparent inequity will be transformed into real injustice, however, should certain industries remain unregulated while others, because subject to OSHA regulations, must achieve lower toxic exposure levels than their unregulated counterparts. It is hoped that the paradigm outlined in this Comment can serve to forestall such a result.

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