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The Demise of Cost-Benefit Analysis in OSHA Standards: American Textile Manufacturers Institute v. Donovan

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THE DEMISE OF COST-BENEFIT ANALYSIS IN OSHA STANDARDS: *AMERICAN TEXTILE MANUFACTURERS INSTITUTE* v. *DONOVAN*

I. INTRODUCTION

In *American Textile Manufacturers Institute v. Donovan*,[1] the Supreme Court addressed the question of whether the Occupational Safety and Health Administration (the Agency or OSHA), in promulgating standards regulating worker exposure to toxic or harmful substances pursuant to section 655(b) of the Occupational Safety and Health Act of 1970 (the Act),[2] is resolved to first conduct a cost-benefit analysis. The Court reserved the issue by determining that "cost benefit analysis by OSHA is not required by the statute because a feasibility analysis is."[3]

During the prior term, the Court had deftly avoided the question of cost-benefit analysis while deciding *Industrial Union Department, AFL-CIO v. American Petroleum Institute*.[4] In *American Petroleum*, a plurality of the Court upheld a Fifth Circuit decision which struck down the benzene regulation because the Agency had not shown that the standard was "reasonably necessary or appropriate to provide safe or healthful employment."[5] Having disposed of the case on the ground that the Secretary failed to make a finding of a significant health risk, the Court did not have to address the further question of whether the Fifth Circuit was correct in requiring a reasonable correlation between costs and health and benefits. The plurality opinion in *American Petroleum* seemed to hint, however, that in

1. 101 S. Ct. 2478 (1981).
2. Pub. L. No. 91-596, 84 Stat. 1590 (1970) (codified at 29 U.S.C. §§ 651-678 (1976)).
3. 101 S. Ct. at 2490.
4. 448 U.S. 607 (1980).
5. *Id.* at 613 (quoting American Petroleum Inst. v. OSHA, 581 F.2d 493 (5th Cir. 1978)).

the future the Court would require cost-benefit analysis in the regulation of toxic substances under Section 655(b).[6]

The purpose of a cost-benefit analysis[7] is to aid decisionmakers in allocating scarce societal resources in the most beneficial manner. Theoretically, the cost-benefit analysis is simple: Each expected cost and benefit associated with a given activity is identified and valued in an equivalent unit, usually dollars, to aid in quantification.[8] All expected costs and benefits are then added separately, and whichever side attains the highest value prevails. Presumably, cost-benefit analysis provides a scientific basis upon which to make decisions.[9]

The use of the cost-benefit analysis in the areas of health and safety, environmental protection, and consumer protection, where human life is at stake however, is fraught with fundamental problems and limitations. Answering the basic questions of how costs and benefits should be identified,[10] what values should

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6. *See* 448 U.S. at 639-40 (Stevens, J.) (reading §§ 655(b)(5) and 652(8) together to force the Agency to find a significant risk of harm to worker health at present levels of exposure, before new regulations are promulgated). Once a significant risk of harm is quantified, a value can be assigned and it is but a short step to full cost-benefit analysis. See notes 7-13 *infra* and accompanying text. *E.g.*, Justice Powell in his concurrence in *American Petroleum* would read cost-benefit analysis into the Act. *See* 448 U.S. at 664, 667-71.

7. As used in this Note the term cost-benefit analysis means "the weighing of the costs of complying with the regulation against the health and safety benefits that will result." Note, *Section 6(b)(5) of the Occupational Safety and Health Act of 1970: Is Cost-Benefit Analysis Required?*, 49 FORDHAM L. REV. 432, 435-36 (1980) [hereinafter cited as *Is Cost-Benefit Analysis Required*]. For more indepth discussions of the benefits and detriments of cost-benefit analysis *see generally* Baram, *Cost-Benefit Analysis: An Inadequate Basis for Health, Safety, and Environmental Regulatory Decisionmaking*, 8 ECOLOGY L.Q. 473 (1980); Green, *Cost-Risk-Benefit Assessment and the Law: Introduction and Perspective*, 45 GEO. WASH. L. REV. 901 (1977) [hereinafter cited as Green, *Cost-Risk-Benefit Assessment*]; Green, *The Risk-Benefit Calculus in Safety Determinations*, 43 GEO. WASH. L. REV. 791 (1975) [hereinafter cited as Green, *Risk-Benefit Calculus*]; Handler, *A Rebuttal: The Need for a Sufficient Scientific Base for Government Regulation*, 43 GEO. WASH. L. REV. 808 (1975); Kasper, *Cost-Benefit Analysis in Environmental Decision-Making*, 45 GEO. WASH. L. REV. 1013 (1977); Rowe, *Governmental Regulation of Societal Risks*, 45 GEO. WASH. L. REV. 944 (1977); Note, *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 (1980) [hereinafter cited as Note, *Standards Regulating Toxic Substances.*].

8. Note, *Standards Regulating Toxic Substances*, *supra* note 7, at 140. *See also* Baram, *supra* note 7, at 477-78.

9. Note, *Standards Regulating Toxic Substances*, *supra* note 7, at 140. *See generally* materials cited note 7 *supra*.

10. See Baram, *supra* note 7, at 482-83 ("Cost-benefit analysis offers no protection

be placed on them now and in the future,[11] and how values are to be assigned to intangible costs and benefits which are not readily identifiable,[12] is a highly subjective task and vulnerable to both honest mistakes and dishonest manipulation by the individual or group doing the analysis.[13] Seen in the practical perspective of trying to construct a cost-benefit analysis which reasonably will anticipate all prospective costs and benefits, the analysis can be a "riddle wrapped in a mystery inside an enigma."[14]

The thesis of this Note is that the decision in *American Textile*, read with the *American Petroleum* case, leaves no significant barriers impeding the Agency from achieving its primary goal of providing workers with the safest work environment possible. This Note will analyze the decision in *American Textile*, and the future of cost-benefit analysis in its wake. Part One outlines briefly the statutory framework of the Act and its

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against historically bad assumptions. . . .") (quoting E. STOKEY & R. ZECHHAUSER, A PRIMER FOR POLICY ANALYSIS 148-49 (1978)). For example, if cost-benefit analysis had been mandated in *American Textile*, would the Agency be correct in including secondary costs which could be avoided by the regulation of a toxic substance, such as welfare and medical costs attributable to the illness contracted by the worker? These secondary costs would include aid to families with dependent children, workers' compensation, medical expenses, and costs of other social services. *See* Note, *Standards Regulating Toxic Substances*, *supra* note 7, at 141 n.145.

11. To conduct a proper cost-benefit analysis, the future costs and the benefits of an activity must be determined. This requires that future costs and benefits be "discounted" to determine their present value. Baram, *supra* note 7, at 486-87. Problems in discounting future values arise, not in the process to be used in discounting these costs, but in the correct discount rate to be applied. Note, *Standards Regulating Toxic Substances*, *supra* note 7, at 141 n.143.

12. How can an Agency seriously put an accurate dollar amount on the price of a life? Agencies have developed at least three ways of valuing lives: (1) placing a dollar amount on the future earnings of a worker whose career is ended prematurely by death or injury; (2) measuring the cost of the ways used to prevent a death when a person is ill or in danger (*e.g.*, how much will society spend to rescue coal miners trapped in a mine after an accident); and (3) the salary differential between an activity with a normal danger level and one which is very hazardous (e.g., working on an oil drilling platform as opposed to extinguishing an out-of-control fire on the same platform). These measures still have their flaws. Note, *Is Cost-Benefit Analysis Required?*, *supra* note 7, at 437-40. The public is unwilling to accept the concept that human life has a dollar value. Wheeler, *The Public's Costly Mistrust of Cost-Benefit Safety Analysis*, Nat'l L.J., Oct. 13, 1980, at 26, col. 2. Commentators also recommend cautious use of cost-benefit analysis when quantifying intangibles. *See* Baram, *supra* note 7, at 484.

13. Baram, *supra* note 7, at 487-90; Note, *Standards Regulating Toxic Substances*, *supra* note 7, at 141.

14. J. BARTLETT, FAMILIAR QUOTATIONS 743 (15th ed. Boston) (1st ed. Boston) (Winston Churchill radio broadcast to England, October 1, 1939).

pertinent sections. Part Two describes the judicial interpretations of the Act. Finally, Part Three discusses the *American Textile* decision and its implications.

II. THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

A. LEGISLATIVE INTENT

Congress expressly passed the Act "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources . . . ."[15] The Act in its inception covered an estimated 4.1 million places of business with 57 million employees.[16]

Section 652(8) defines the term "occupational safety and health standard" as one "which requires conditions, or the adop-

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15. 29 U.S.C. § 651(b) (1970). When the Act was passed in 1970, 14,500 persons were killed annually in work-related accidents. An additional 2.2 million workers were disabled annually, resulting in a loss of 250 million worker days. The accompanying loss to economic productivity is equally staggering. It was estimated that over $1.5 billion in wages were lost due to these injuries. The annual loss to the Gross National Product was estimated at over $8 billion. SENATE SUBCOMM. ON LABOR OF SENATE COMM. ON LABOR AND PUBLIC WELFARE, LEGISLATIVE HISTORY OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, 92d Cong., 1st Sess. 144, *reprinted in* [1971] U.S. CODE CONG. & AD. NEWS 5177 [hereinafter cited as LEGISLATIVE HISTORY].

Toxic substances were singled out for special attention by Congress. The United States Surgeon General, after conducting a study in metropolitan areas, found that 65% of the workers in the study were potentially exposed to harmful physical agents (including noise) or toxic material. In contrast, the study showed that a mere 25 percent of the workers studied were adequately protected by standards limiting exposure to these dangers.

To illustrate the magnitude of the problem and the extent to which it largely had been ignored by the business and industrial communities, Congress pointed to the cotton industry and the effects of cotton dust on workers:

> [D]espite repeated warnings over the years from other countries that their cotton workers suffered from lung disease, it is only within the past decade that we have recognized byssinosis among workers in American cotton mills. Recent studies now show that this illness, caused by the dust generated in the processing of cotton, and resulting in continuous shortness of breath, chronic cough, and total disablement, affects substantial percentages of cotton textile workers. In some states as many as 30% of those in the carding or spinning rooms have been affected, and it has been estimated that as many as 100,000 active or retired workers currently suffer from this disease.

Id.

16. LEGISLATIVE HISTORY, *supra* note 15, at 144.

tion or use of one or more practices, means, methods, operations or processes, reasonably necessary or appropriate to provide safe or healthy employment and places of employment."[17]

An important facet of the Act is the ability of the Secretary of Labor (the Secretary), working through the Agency, to promulgate standards regulating worker exposure to toxic substances.[18]

The Act empowers the Agency to adopt occupational safety and health standards by: (1) adopting any national consensus standard or established Federal standard in force at the time the Act was passed;[19] (2) modifying, promulgating, or revoking any occupational safety or health standard through informal "notice and comment" rule-making procedures;[20] and (3), in the case of extraordinary hazards to workers, by promulgating "emergency temporary standards" to take effect immediately upon publication in the Federal Register.[21]

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17. 29 U.S.C. § 655 (1976).

18. *Id.* § 652(8).

19. *Id.* § 655(A). This authority lasted for two years after the effective date of the Act and provided immediate protection until permanent standards could be promulgated. The Act defines a "national consensus standard" as:

> [A]ny occupational safety and health standard or modification thereof which (1) has been adopted and promulgated by a nationally recognized standards-producing organization under procedures whereby it can be determined by the Secretary that persons interested and affected by the scope or provisions of the standard have reached substantial agreement in its adoption, (2) was formulated in a manner which afforded an opportunity for diverse views to be considered, and (3) has been designated as such a standard by the Secretary, after consultation with other appropriate Federal agencies.

Id. § 652(9).

The term "established Federal standards" is defined as "any operative occupational safety and health standard established by any agency of the United States and presently in effect, or contained in any Act of Congress in force on December 29, 1970." *Id.* § 652(10). The Secretary can refuse to issue both national consensus standards and established federal standards under the Act, if it is determined that "the promulgation of such [a] standard would not result in improved safety or health for specifically designated employees." *Id.* § 655(a).

20. Id. § 655(b). Although the Act specifically exempts the Agency from compliance with the Administrative Procedure Act, 5 U.S.C. §§ 551-559 (1970), the notice and comment rule-making procedure, when combined with the substantial evidence rule for judicial review of Agency standards, makes the procedures similar to the Hybrid procedures of the Magnuson-Moss Act, tit. 2, Pub. L. No. 93-637, 88 Stat. 2183 (codified at scattered sections of 15 U.S.C. (1976)).

21. 29 U.S.C. § 655(c) (1976). This section reads:

When promulgating standards regulating toxic substances under the Act, section 655(b)(5) mandates the Secretary to

> 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. . . . [I]n addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest scientific data in the field, [and] the feasibility of the standards. . . .[22]

This statutory language, which lacks an explicit legislative history, left the Courts to determine what feasibility means and the extent to which it can or should affect the Agency's decision on which and how toxic substances are to be regulated.

III. THE JUDICIAL INTERPRETATION OF SECTION 655(b)(5) OF THE ACT

A. The Circuit Courts

The lower courts outlined the basic contours of both the judicial review of standards regulating toxic substances and the meaning of feasibility under Section 655(b)(5) in two key cases: *Industrial Union Department, AFL-CIO v. Hodgson*[23] and *Soci-*

> The Secretary shall provide, without regard to the requirements of chapter 5 of Title 5, for an emergency temporary standard to take immediate effect upon publication in the Federal Register if he determines (a) that employees are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful or from new hazards, and (b) that such emergency standard is necessary to protect employees from such danger.
> (2) Such standard shall be effective until superceded by a standard promulgated in accordance with the procedures prescribed in paragraph (3) of this subsection.
> (3) Upon publication of such a standard in the Federal Register, the Secretary shall commence a proceeding in accordance with subsection (b) of this section, and the standard as published shall also serve as a proposed rule for the proceeding. The Secretary shall promulgate a standard under this paragraph no later than six months after publication of the emergency standard as provided in paragraph (2) of this subsection.

22. Id. § 655(b)(5) (emphasis added).
23. 499 F.2d 467 (D.C. Cir. 1974).

ety of Plastics Industry v. OSHA.[24]

In *Industrial Union Department, AFL-CIO v. Hodgson,* the AFL-CIO challenged the Agency's issuance of permanent standards regulating worker exposure to asbestos[25] on the grounds that the Act does not permit the Agency to employ an economic analysis when promulgating standards for exposure to toxic substances.[26] The court rejected the union's contention.[27] A unanimous court interpreted the "to the extent feasible" language of section 655(b)(5) to mean that "a standard that is prohibitively expensive is not feasible."[28] The court further found that the Act requires the Agency to consider the economic impact of proposed standards, including the technological feasibilities of achieving the requirements of the proposed standard, and reasoned that "Congress does not appear to have intended to protect employees by putting their employees out of business—either by requiring protective devices unavailable under existing technology or by making financial viability generally impossible."[29]

The court limited the use of economic feasibility as a restriction on the promulgation of standards for toxic substances, however, stating in dictum that "[s]tandards may be economically feasible even though, from the standpoint of employers,

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24. 509 F.2d 1301 (2d Cir.), *cert. denied,* 421 U.S. 992 (1975).

25. The union relied on 29 U.S.C. § 655(b) (1976). Prior to the issuance of permanent standards, the Agency had exercised its powers under § 655(c) to issue temporary emergency standards. 499 F.2d at 471. Section 655(c) appears at note 21 *supra.*

"Asbestos is a generic term applicable to a number of fibrous, inorganic, silicate minerals that are incombustible in air." 499 F.2d at 471. An estimated three to five million workers are exposed annually to asbestos in the building trades and shipyard industries. *Id.* The inhalation of asbestos dust causes asbestosis (severe lung scarring) and manufacturing and construction workers exposed to the dust suffer from disproportionately higher rates of pulmonary cancer. LEGISLATIVE HISTORY, *supra* note 15, at 145.

26. 499 F.2d at 476.

27. *Id.* at 477.

28. *Id.*

29. *Id.* In support of this proposition, the court quoted Senator Javits, author of the amendment adding the feasibility language to the Act:

> As a result of this amendment, the Secretary, in setting standards, is expressly required to consider the feasibility of proposed standards. This was an improvement over the Daniels bill, which might be interpreted to require absolute health and safety in all cases, regardless of feasibility, and the Administration bill, which contains no criteria for standards at all.

Id.

they are financially burdensome and affect profit margins. . . . [T]he concept of economic feasibility [does not] guarantee the continued existence of individual employers."[30] The court indicated that if the proposed standards, for some industries, imposed undue hardship on an industry as a whole, then the Agency should consider that factor in determining feasibility.[31]

In reviewing the asbestos standard, the court showed considerable deference to the decisions made by the Secretary and the Agency on how best to regulate worker exposure to the toxin based upon both the complex scientific nature of the Agency's regulatory task and the quasi-legislative powers conferred on the Agency and the Secretary.

> [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 determination. Decision-making must in that circumstance depend to a greater extent upon policy judgments and less upon purely factual analysis. . . . Judicial review of inherently legislative decisions of this sort is obviously an undertaking of different dimensions.[32]

While *Industrial Union Department* dealt primarily with economic feasibility under section 655(b)(5), the decision in *Society of Plastics Industry v. OSHA* scrutinized the meaning of technological feasibility.[33] In *Society of Plastics,* manufacturers and users of vinyl chloride challenged the Agency's standards governing exposure,[34] contending that the standard was neither technologically nor economically feasible.[35]

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30. *Id.* at 478.

31. *Id.*

32. *Id.* at 474-75. The court noted that the review of Agency determinations in this case was basically a review of fundamental policy, rather than a traditional case in controversy. *Id.*

33. For a detailed explanation of these cases, see Berger & Ruskin, *Economic and Technological Feasibility in Regulating Toxic Substances under the Occupational and Safety Health Act,* 7 ECOLOGY L.Q. 285 (1978).

34. Vinyl chloride is the gaseous raw material used in the manufacture of plastics. The standard governing vinyl chloride appears at 29 C.F.R. § 1910.1017 (1981). *See generally* Doniger, *Federal Regulation of Vinyl Chloride: A Short Course in the Law and Policy of Toxic Substance Control,* 7 ECOLOGY L.Q. 497, 522 (1978).

35. 509 F.2d at 1308. As in the regulation of asbestos, the Agency in 1974 promulgated a temporary emergency standard regulating exposure levels of vinyl chloride. See

The Second Circuit upheld the Agency's vinyl chloride standard and said "the ultimate facts [the possible dangers to workers] are on the frontiers of scientific knowledge. . . . [Under the Act] it remains the duty of the Secretary to act to protect the working man, and to act even in circumstances where existing methodology or research is deficient."[36] The court further stated that the Secretary "may raise questions [or issue new standards] which require the development of new technology, and he is not limited to issuing standards based solely upon devices already fully developed."[37]

B. The United States Supreme Court: *Industrial Union Department, AFL-CIO v. American Petroleum Institute*

In *Industrial Union Department, AFL-CIO v. American Petroleum Institute*, the Supreme Court for the first time dealt with the issue of feasibility under the Act. In *American Petroleum*, the court considered the Agency's standard for worker exposure to benzene.[38] The primary danger from exposure to ben-

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note 25 *supra* and accompanying text. The challenged standard reduced allowable exposure to workers from the temporary emergency standard of 50 ppm. to a new permanent standard of 1 ppm.

36. 509 F.2d at 1308 (quoting Industrial Union Dep't, AFL-CIO v. Hodgson, 499 F.2d at 474.) Dismissing the industry's argument, the court upbraided the plaintiffs for their lack of belief in technology, stating, "it appears that [the industry] simply needs more faith in their own technological potentialities. . . ." 509 F.2d at 1309.

37. 509 F.2d at 1309. The Second Circuit summarily disposed of the economic feasibility issue by noting, "if the petitioners find that they cannot comply for reasons beyond their control, OSHA permits the amendment of standards." *Id.* at 1310. For support, the court cited the temporary variance provision of the Act, § 655(b)(6)(A), which reads in pertinent part:

> Any employer may apply to the Secretary for a temporary order granting variance from a standard or any provision thereof promulgated under this section. Such temporary order shall be granted only if the employer files an application which meets the requirements of clause (B) and establishes that (i) he is unable to comply with a standard by its effective date because of unavailability of professional or technical personnel or of materials and equipment needed to come into compliance with the standard or because necessary construction or alteration of facilities cannot be completed by the effective date, (ii) he is taking all available steps to safeguard his employees against the hazards covered by the standard, and (iii) he has an effective program for coming into compliance with the standard as quickly as practicable.

38. Benzene is a toxic substance that is colorless, aromatic, and evaporates quickly under atmospheric exposure. Its principal uses are as an ingredient in the manufacture of fuels for internal combustion engines, solvents, detergents, and pesticides. 509 F.d at

zene is in the inhalation of fumes.[39] Exposure to high concentrations of the chemical can have an immediate deadly effect on humans,[40] and long-term exposure to lower concentrations produces a slow death.[41]

Prior to the Act, a national consensus standard governed exposure to benzene,[42] limiting exposure to "10 ppm averaged over an 8-hour period with a ceiling concentration of 25 ppm for 10-minute periods or a maximum peak concentration of 30 ppm."[43] In 1971, the Agency adopted this national consensus standard pursuant to section 655(a) of the Act as an established federal standard.[44]

In 1977, the Agency issued its permanent standard which lowered the permissible exposure level to 1 ppm.[45] The Supreme Court, however, characterized the Agency's administrative record supporting the 10 ppm level of exposure as "sketchy at best."[46] Furthermore, the Agency made no findings on how a reduction of exposure from 10 ppm to 1 ppm would significantly reduce the risk, and, in fact, no studies had been conducted showing the correlation between exposure to 10 ppm or less of benzene.[47]

Justice Stevens, writing the plurality opinion, rejected the arguments of all parties involved[48] and held that sections

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1309. (quoting 43 Fed. Reg. 5,918 (1978)). Over one million workers are exposed annually to low-level concentrations of the substance. 448 U.S. at 615-16.

39. 448 U.S. at 616. Once inhaled, the chemical is absorbed by the blood and diffused throughout the body.

40. *Id.* at 617. Exposure to concentrations of 20,000 ppm have an immediate effect on the central nervous system. *Id.* Intermediate levels of exposure, from 500 to 250 ppm, cause mild symptoms of poisoning, nausea, and vertigo. *Id.* (quoting 43 Fed. Reg. 5,921 (1978)).

41. 448 U.S. at 617.

42. *Id.* The full text of this standard may be found at 43 Fed. Reg. 5,919 (1978).

43. 448 U.S. at 617.

44. *Id.*

45. *Id.* at 624-26 (quoting 43 Fed. Reg. 5,918 (1978)). In the intervening period between the adoption of the national consensus standard in 1971 and the permanent standard in 1977, 29 C.F.R. § 1910.1028 (1979), the Agency attempted to promulgate emergency temporary standards, 42 Fed. Reg. 22,516 (1977), which were substantially the same as the eventual permanent standards. 448 U.S. at 623. The Fifth Circuit issued a temporary restraining order preventing the standard from taking effect. *Id.*

46. 448 U.S. at 631.

47. *Id.* at 632-38.

48. *Id.* at 639. The Agency argued that § 652(8) had "no legal significance or at best

655(b)(5) and 652(8) of the Act must be read together when promulgating any permanent standard and required "the Secretary . . . to determine that it [the standard] is reasonably necessary and appropriate to remedy a *significant risk* of material health impairment."[49] The Justice found support for his position in section 655(g)[50] and 655(b)(8).[51]

Justice Stevens wrote that section 655(g) requires that:

> "[I]n determining the priority for establishing standards under this section, the Secretary shall give due regard to the urgency of the need for mandatory safety and health standards for particular industries, trades, crafts, occupations, businesses, workplaces or work environments" . . . . [I]f such an analysis must precede the promulgation of any standard, it seems manifest that Congress intended, at a bare minimum, that the Secretary find a significant risk of harm and therefore a probability of significant benefits before establishing a new standard.[52]

The second section, 655(b)(8), requires that when an existing consensus standard is substantially altered, "the Secretary [shall] publish . . . a statement of reasons why the rule . . . will better effectuate the purposes [of the Act.]"[53] The plurality stated that "[i]f this requirement was intended to be more than a meaningless formality, it must be read to impose upon the Secretary the duty to find that an existing national consensus

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merely requires that a standard not be totally vocational." *Id.* The industry argued that, reading §§ 655(b)(5) and 652(8) together would require the Agency to "quantify both the costs and the benefits of a proposed rule and to conclude that they are roughly commensurate." *Id.*

49. *Id.* at 639 (emphasis added).

50. 29 U.S.C. § 655(g) (1976) reads as follows:

> In determining the priority for establishing standards under this section, the Secretary shall give due regard to the urgency of the need for mandatory safety and health standards for particular industries, trades, crafts, occupations, businesses, workplaces, or work environments. The Secretary shall also give due regard to the recommendations of the Secretary of Health, Education, and Welfare regarding the need for mandatory standards in determining the priority for establishing such standards.

51. *Id.* § 655(b)(8). 448 U.S. at 643-44 (Stevens, J.).

52. 448 U.S. at 643-44.

53. *Id.*

standard is not adequate to protect workers from a continuing and significant risk of harm."[54] Justice Stevens stated that an alternative interpretation of the Act, giving the Secretary broad power to determine what risks are significant, might constitute a breach of the non-delegation doctrine[55] prohibiting the delegation of legislative powers to agencies as outlined in *Schechter Poultry Corp. v. United States*[56] and *Panama Refining Co. v. Ryan.*[57]

The Court also found support in the legislative history of the Act, which showed Congress "was concerned, not with absolute safety, but with the elimination of significant harm."[58]

However, the Court also stated that the threshold of significant risk would not be a great barrier to regulating toxic substances, that the requirement is "not a mathematical strait jacket,"[59] and that the Agency is not required to quantify risks "with anything approaching scientific certainty."[60]

Because the Court did not determine that a finding of significant risk of harm was made before the benzene standard was promulgated, it was unnecessary to address the question of whether the cost of regulation was reasonable in relation to its benefits.[61]

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54. *Id.*

55. *Id.* at 646.

56. 295 U.S. 495 (1935).

57. 293 U.S. 388 (1935).

58. 448 U.S. at 646 (quoting LEGISLATIVE HISTORY, *supra* note 15, at 345) ("What are we going to do about a place in Florida whose mosquitos are getting at the employee . . . . Are we going to say that if employees get bitten by those for the rest of their lives they will not have been done any harm at all?") LEGISLATIVE HISTORY, *supra* note 15, at 245 (remarks of Sen. Dominick).

59. 448 U.S. at 655.

60. *Id.* at 656. As examples of the assessment involved in identifying a significant risk, the Court stated that the chances of a person contracting cancer from a drink of chlorinated water would be insignificant, *id.*, but, odds of one in one thousand that the prolonged inhalation of gasoline vapors containing benzene would cause cancer, might be a significanct risk. *Id.* at 655.

To support a finding of significant risk it need only be supported by "a body of reputable scientific thought." *Id.* at 656. This view of review of Agency activities is expressed in Industrial Union Dep't AFL-CIO v. Hodgson, 499 F.2d at 474-75, and Society of Plastics v. OSHA, 509 F.2d at 1304. See discussion at notes 15-29 *supra* and accompanying text.

61. 448 U.S. at 650.

Justice Powell, while concurring in the judgment, believed the Court should have decided the cost-benefit question.[62] Justice Powell would require that the cost of regulation bear some reasonable relationship to its projected benefits,[63] and argued that Congress did not intend these regulations to ignore economic considerations and cause economic injury to the industries affected by these standards.[64]

The plurality opinion in *American Petroleum* has been both praised and criticized. In praising the opinion, attention focused on the use of cost-benefit analysis as a restraint on the intrusion of the government on private enterprise.[65] In criticizing the opinion, commentators found the opinion encouraging judicial anarchy in the area of administrative law,[66] undercutting the rule-making authority of OSHA,[67] misapprehending the legislative intent of the Act,[68] and contributing to regulatory confusion.[69]

Speculation over the meaning of *American Petroleum* was quickly ended by the Supreme Court's subsequent decision in *American Textile Manufacturers Institute v. Donovan.*

IV. THE AMERICAN TEXTILE DECISION

In *American Textile Manufacturers v. Donovan,* the cotton industry challenged a standard limiting worker exposure to cot-

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62. *Id.* at 664.

63. *Id.* at 667. "It is simply unreasonable to believe that Congress intended OSHA to pursue the desirable goal of risk-free workplace to the extent that the economic viability of particular industries—or significant segments thereof—is threatened." *Id.* at 669.

64. *Id.* at 671. Justice Rehnquist would strike down the Act as an unconstitutional delegation under Schechter Poultry Corp. v. United States, 295 U.S. 495 (1935), and Panama Refining Co. v. Ryan, 293 U.S. 288 (1935). *See* note 55 *supra.*

65. Note, *OSHA after American Petroleum Institute: A Proposed Regulatory Budget,* 33 STAN. L. REV. 917 (1981) (arguing that the Congress should impose a regulatory budget on OSHA regulations, serving as a ceiling on costs of compliance).

66. Rodgers, *Judicial Review of Risk Assessments: The Role of Decision Theory in Unscrambling the Benzene Decision,* 11 ENVTL. LAW 301 (1980) (attacking the *Benzene* decision as allowing too much judicial review of Agency decision-making).

67. Note, *OSHA's Rulemaking Authority Under the Occupational Safety and Health Act:* Marshall v. American Petroleum Institute, 12 LOY. L. REV. 229 (1981).

68. Note, *Occupational Health and Safety—the* Benzene *Case: Life, Liberty and the Pursuit of Health*—Industrial Union Department, AFL-CIO v. American Petroleum Institute, 3 W. NEW ENG. L. REV. 311 (1980).

69. Sullivan, *The* Benzene *Decision: A Contribution to Regulatory Confusion,* 33 AD. L. REV. 351 (1981).

ton dust.[70]

On June 28, 1978, the Secretary issued final standards limiting exposure to cotton dust over an eight hour period to 200 mg/m^3 for yarn manufacturing, 750 mg/m^3 for slashing and weaving operations, and 500 mg/m^3 for the other processes in the manufacture of cotton.[71] In enacting the standard, the Agency believed itself obligated to adopt "the most stringent standard to protect against material health impairment, bounded only by technological and economic feasibility."[72]

The cotton industry attacked the standards primarily on two grounds. The first relied on Justice Powell's in *American Petroleum* that the cost of the regulation did not bear a reasonable relation to its benefit and that the Secretary failed to show the regulation "addresses a significant risk of material health impairment."[73] The other attacked the Secretary's determination that the standards were economically feasible as not supported by substantial evidence.[74]

A. The Majority Opinion

Justice Brennan, writing for the majority, put to rest the debate as to whether cost-benefit analysis was required for

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70. 101 S. Ct. at 2481-83, "Cotton dust" is an airborne particulate by-product of the preparation and manufacture of cotton products, exposure to which produces a condition known as byssinosis. *Id.* at 2482. Byssinosis was one of the diseases expressly mentioned by Congress when it passed the Occupational Safety and Health Act. Legislative History, *supra* note 15, at 143. Byssinosis, also known as "brown lung," is a continuum disease marked by five progressive stages. 101 S. Ct. at 2484. Descriptions of the physical symptoms of byssinosis may be found in *id.* at n.9.

71. 101 S. Ct. at 2486-87. The record compiled on cotton dust is amazing. It consists of exhibits, transcripts of oral and written testimony, post-hearing comments, and briefs totalling more than 105,000 pages. *Id.* The statement of findings and reasons supporting the cotton dust standard runs 69 pages and appears at 29 C.F.R. § 1910.1043 (1980).

72. 101 S. Ct. at 2487.

73. *Id.* at 2489.

74. *Id.* at 2497. Agency standards provided that both engineering controls and respirators be used to meet the exposure standards for cotton dust. 29 C.F.R. § 1910.1043(E)(1)-(3)(f) (1980). In addition, the standards required that employers provide employees unable to wear respirators an opportunity to transfer to another position, if available, with no loss of earnings, employment rights or benefits. *Id.* § 1910.1043(F)(2)(v) (1980). The industry challenged this portion of the standard on the ground that the Agency lacked authority to promulgate such a standard. 101 S. Ct. at 2504. The Court, deferring any ruling on the merits, remanded the question to the circuit court to determine whether this guarantee is related to the achievement of a safe and healthful work environment. *Id.* at 2505-06.

OSHA regulations.

> 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 Section [655(b)(5)]. Thus, cost-benefit analysis by OSHA is not required by the statute because feasibility analysis is.[75]

The Court looked to the "plain meaning of the word *feasible*,"[76] a comparison with other federal laws requiring cost-benefit analysis,[77] and the legislative history of the Act,[78] in reaching its decision.

Analyzing the specific language of section 655(b)(5), the Court found that "Congress uses specific language when intending that an agency engage in cost benefit analysis. . . . [C]ertainly in the light of its ordinary meaning, the word *feasible* cannot be construed to articulate such congressional intent."[79]

The Court then found that reading sections 655(b)(5) and 652(8) together does not mandate a cost-benefit analysis, but merely requires that "standards [relating to toxic materials and harmful substances] be issued to prevent material impairment of health *to the extent feasible*."[80] In section 655(b)(5) the Court noted a conspicuous absence of any indication that Congress im-

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75. 101 S. Ct. at 2490. The Court stated that if cost-benefit analysis could be applied to any decision made by the Agency it may be used in choosing alternative methods of regulating exposure to toxic substances. *Id.* at n.29.

76. *Id.* at 2490 (quoting WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY OF THE ENGLISH LANGUAGE 831 (1976), THE OXFORD ENGLISH DICTIONARY 116 (1933) and FUNK & WAGNALL'S NEW STANDARD DICTIONARY OF THE ENGLISH LANGUAGE 903 (1957)).

77. 101 S. Ct. at 2491. As examples of congressional language requiring either cost-benefit or feasibility analysis, the court cited pertinent sections from a variety of acts. *See, e.g.*, the Consumer Product Safety Act of 1971, 15 U.S.C. § 2056(a) (1976 & Supp. II 1978); the Flood Control Act of 1936, 33 U.S.C. § 701(a) (1976); Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. §§ 1312(b)(1)(2), 1314 (b)(1)(B) (Supp. II 1978); the Energy Policy and Conservation Act of 1975, 42 U.S.C. § 6295 (c)(d) (1976 & Supp. II 1978) and the Clean Air Act Amendments of 1970, 42 U.S.C. § 7545(c)(2)(B) (Supp. II 1978).

78. 101 S. Ct. at 2493-97.

79. *Id.* at 2491 (emphasis added).

80. *Id.* at 2492 (emphasis in the original). The Court noted that the industry's argument that § 652(b) imposes an overriding requirement of cost-benefit analysis to § 655(b)(5) would be contrary to Congress' intent. *Id.*

posed a cost-benefit requirement on standards promulgated under section 655(b)(5).[81]

The Court argued that while the legislative history showed that Congress did not intend to impose the chimerical goal of a risk-free workplace,[82] it did intend that "the Act would create substantial costs for employers . . . when necessary to create a safe and healthful working environment."[83]

The industry claimed that the Secretary's economic feasibility estimates for the cost of complying with the cotton dust standard were not supported by substantial evidence as required in section 655(f) of the Act. Specifically, they charged that: "(1) . . . OSHA had underestimated the financial cost necessary to meet the standard's requirement and (2) that OSHA incorrectly found that the Standard would not threaten the economic viability of the cotton industry."[84] In reviewing the Agency findings, the Court said it would reverse only if the circuit court "misapprehended or gravely misapplied" the standard.[85]

The Agency, in constructing a cost estimate for industry compliance with the standard, had the benefit of two analyses—one commissioned by the Agency and the other by the industry. Both estimates were severely flawed and the Agency totally rejected its own study.[86] However, the Agency did adopt

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81. 101 S. Ct. at 2493.

82. For this proposition the Court cited the statements of Senators Javits in LEGISLATIVE HISTORY, *supra* note 15, at 197 and Dominick, *id.* at 480-482, 502.

83. 101 S. Ct. at 2496. The Court quoted Senator Yarborough's statement concerning the costs of compliance:

> One may well ask too expensive for whom? Is it too expensive for the company who for lack of proper safety equipment loses the services of its skilled employees? Is it too expensive for the employee who loses his hand or leg or eyesight? . . . We are talking about people's lives, not the indifference of some cost accountants.

Id. (quoting LEGISLATIVE HISTORY, *supra* note 15, at 510).

84. 101 S. Ct. at 2497.

85. *Id.* (quoting Universal Camera Corp. v. NLRB, 340 U.S. 474, 491 (1951)).

86. 101 S. Ct. at 2497-99. The Agency commissioned Research Training Institute (RTI) and the Industry commissioned Hocutt-Thomas (H-T). RTI's estimated cost of compliance of $1.1 billion for engineering controls was rejected for three reasons: (1) the estimate was based on the false assumption that the controls would be applied to all equipment in the cotton mills (equipment processing synthetic fibers are exempted); (2) the study did not take into account the fact that some portions of industry were at or near compliance with the new standard; and, (3) the study did not use accurate data on

the industry-commissioned study, discounted by thirty percent, to determine the industry's compliance costs.[87] The Court held that because of the unavailability of more reliable information and because the Act requires only that standards be promulgated on the basis of the best available evidence, "the Agency acted reasonably in adopting the [industry] estimate."[88]

The Court found no problem in concluding that the industry could bear the cost of complying with the standards promulgated by the Agency. The Agency concluded, based on its own discredited study, that, with minor dislocations on a firm-by-firm basis, the industry could absorb the cost of the regulations.[89]

The Court also held that the substantial evidence test was not misapprehended or applied in the lower court.[90]

B. The Dissents

In dissent, Justice Stewart found that the Agency's finding of the feasibility evidence was merely "unsupported speculation."[91] Justice Stewart would require OSHA to conduct a cost-benefit analysis to determine the economic feasibility of the Agency's proposed standards.[92] Unlike the majority, this dissent found the Agency's reliance on cost projections derived from the discredited studies to be insufficient to support a finding that the standard was economically feasible, based on substantial evidence.[93]

Justice Rehnquist, joined by Chief Justice Burger, repeated

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the industry. *Id.* at 2498.

The H-T study was similarly flawed. It put industry compliance costs for engineering controls at $543 million. The Agency found this estimate overstated for four reasons: (1) some mills had complied with the standards already; (2) the study failed to take into account an industry trend toward the replacement of older machinery; (3) the study failed to take into account new technologies; and (4) the study included controls covering synthetic machines not covered by the standard. *Id.* at 2498-99.

87. *Id.* at 2499.

88. *Id.* at 2500.

89. *Id.* at 2501-04.

90. *Id.* at 2504.

91. *Id.* at 2507.

92. *Id.* Justice Stewart's opinion makes no mention of how he would formulate the cost-benefit analysis.

93. *Id.*

the essence of his concurring in the judgement opinion in *American Petroleum*,[94] by invoking the non-delegation doctrine. Justice Rehnquist would find the Act unconstitutional because "Congress failed to *choose* among those plausible interpretations."[95] This failure, he argues, amounts to an abdication of the Congress' responsibility to make legislative decisions.[96]

C. Analysis

The Court's decision in *American Textile* prohibiting the use of cost-benefit analysis by the Agency is a sound and reasonable interpretation of the Act. Justice Brennan's use of the ordinary and natural meaning of the word *feasible* together with a comparison with health environment-related statutes convincingly shows that Congress uses at least two separate methods of curtailing agency discretion in decision-making.[97]

These distinct patterns of legislation are evident, for example, in the Surface Mining and Central Reclamation Act of 1977[98] and Outer Continental Shelf Act Amendments of 1978.[99] The Surface Mining Act requires that miners protect non-mineral resources and values "to the extent possible, using the best technology currently available."[100] The Outer Continental Shelf Amendments illustrate the cost-benefit approach. These Amendments prohibit the Secretary of the Interior from regulating offshore drilling operations where "the incremental benefits [to health, safety, and the environment] are clearly insufficient to justify the incremental cost of using such technologies."[101] This clear duality in legislative intent is evident in several regulatory statutes.[102] The Court's conclusion that "where cost-benefit analysis is intended, Congress clearly indicated it on the face of the statute,"[103] is decidedly supported by the duality in legislative intent and the purposeful inclusion of feasibility language by Congress.

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94. *Id.* at 2507. See 448 U.S. at 671.
95. 101 S.Ct. at 2510 set forth in the margin at *.
96. *Id.* at 2508-09.
97. *See* notes 59 and 60 *supra* and accompanying text.
98. 30 U.S.C. §§ 1201-1328 (Supp. II 1978).
99. 43 U.S.C. §§ 1331-1356 (Supp. II 1978).
100. 30 U.S.C. § 1265(b) (Supp. II 1978).
101. 43 U.S.C. § 1347(b) (Supp. II 1978).
102. *See, e.g.*, Statutes cited in note 77, *supra*.
103. 101 S. Ct. at 2491. See notes 77, 96-99, *supra* and accompanying text.

The legislative history of the Act, although replete with concern that the Act not mandate a risk-free workplace, viewed worker health as paramount.[104] Imposing a cost-benefit analysis on the Act would condition worker protection on the economic cost of such measures, and rearrange the priorities set by Congress.[105]

Furthermore, the decision in *American Textile* precludes the application of President Reagan's Executive Order requiring that all major regulatory proposals of agencies be subjected to strict cost-benefit analysis.[106] The decision has wider implications: the Court has apparently ruled that all regulatory statutes which employ the economic feasibility standard may be barred from complying with the order.[107] Viewed in separation of power terms, the decision prevents the executive from circumventing Congress through the use of executive orders.[108]

Justice Stewart's dissent, unlike the majority, would rearrange the priorities set by the Act based upon the dictates of cost-benefit analysis. The non-delegation doctrine reasoning advanced by Justice Rehnquist and joined by Chief Justice Burger is outmoded by political and legislative realities, except in ex-

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104. "The Congress declares it to be its purpose and policy . . . to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources. . . ." 29 U.S.C. § 651 (1970). See also LEGISLATIVE HISTORY, *supra* note 15, at 1150-51 (remarks of Sen. Eagleton); *id.* at 444, 510 (remarks of Sen. Yarborough); *id.* at 1029-33. (remarks of Congressman Dent) *id.* at 502 (remarks of Sen. Dominick); *id.* at 502-03 (remarks of Sen. Williams).

105. See notes 7-14 *supra* and accompanying text.

106. See Executive Order No. 12,291, 46 Fed. Reg. 13,193 (1981). This interpretation of the effect of *American Textile* is supported by an analysis of Youngstown Sheet & Tube Co. v. Sawyer, 343 U.S. 579 (1952). *Youngstown* set out three situations where the President's power is challenged and the legal consequences of each. In the third category, the President's power is at its lowest: "Where the President takes measures incompatible with the express or implied will of Congress." *Id.* at 637. In this situation, the President may "rely only upon his own constitutional powers *minus* any constitutional powers of Congress over the matter." *Id. American Textile* falls into this third area of analysis. The Court in *American Textile* ruled that Congress mandated a feasibility rather than a cost-benefit analysis when OSHA issues standards governing exposure to toxins. Thus, the President's power to require a cost-benefit study is nil.

If the President's executive order were given legal effect after *American Textile*, the President would be granted legislative power unconstitutionally. This may be the reason that the Court rejected the Administration's motion, after President Reagan's inauguration, to vacate the court of appeals judgment and allow the Agency to reopen the record on cotton dust. See 101 S. Ct. at 2488 n.25.

107. *See* Note, 95 HARV. L. REV. 319, 326 (1981).

108. *Id.*

treme situations.[109]

D. IMPLICATIONS

It is clear that, absent a change in the composition of the Court or the language of the statute, the Supreme Court will not infuse a cost-benefit analysis into the Occupational Safety and Health Act of 1970.[110] However, even after *American Petroleum* and *American Textile*, many unanswered qustions remain. The Agency answered the question of how standards will be formulated when it determined to replace the old evaluation system[111] with a new four-step formula. The new system is based on: (1) a determination of significant risk of worker health impairments; (2) the potential for risk reduction; (3) an analysis of the economic feasibility of the standard; and (4) a cost-effectiveness evaluation of the most efficient way to achieve protection.[112]

The most important and scientifically difficult part of this analysis is the determination of what constitutes a significant risk of harm to workers, hence, worthy of regulation. This question was left unanswered by *American Petroleum*[113] and was not an issue in *American Textile*.[114]

At present, scientific knowledge about toxic and carcinogenic substances is poor.[115] Scientific knowledge about the cause

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109. *See* Carter v. Carter Coal Co., 298 U.S. 238 (1936); Schechter Poultry Corp. v. United States, 295 U.S. 495 (1935).

110. The retirement from the Court of Justice Stewart, and his subsequent replacement by Justice O'Connor, will not affect the Court's position on the Act and cost-benefit analysis because the change does not affect the majority in *American Textile*.

111. Under the old evaluation system, OSHA used a three-step process under which the Agency (1) determined if exposure to a substance posed a significant risk of material health impairment to the worker; (2) evaluated the potential for risk reduction by regulation; and (3) analyzed the costs and benefits of alternative methods of regulations. [Current reports] 10 O.S.H. REP. (BNA) 1425 (1981).

112. [Current reports] 11 O.S.H. REP. (BNA) 131 (1981).

113. While the plurality in *American Petroleum* discussed methods of establishing significant risk, the Court never explicitly stated how the Agency could meet its burden. 448 U.S. at 655-58; Note, *The Supreme Court's New Occupational Health Standard for Benzene Exposure: Regulated Industry's Triumph over Employee Health*, 3 UTAH L. REV. 525, 548-49 (1981).

114. 101 S. Ct. at 2488 n.25; 43 Fed. Reg. at 27,350 (1978).

115. Berger & Ruskin, *supra* note 33, at 286-87; McGarrity, *Substantive and Procedural Discretion in Administrative Resolution of Science Policy Questions: Regulating Carcinogens in EPA and OSHA*, 67 GEO. L.J. 729, 733-36 (1979). *See generally*, Amicus Curiae Brief for Natural Resources Defense Council, Inc., Industrial Union Dep't, AFL-

and effects of industrial diseases and cancer is especially lacking in three broad areas: (1) how toxic substances cause disease on the cellular level;[116] (2) the limitations of human and animal research in identifying acceptable levels of human exposure;[117] and (3) the statistical difficulties of translating animal reactions into chemicals.[118] Faced with these scientific problems, some commentators suggested that it would be impossible for OSHA to

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CIO v. American Petroleum Institute, 448 U.S. 607 (1980) (available immediately on LEXIS, Genfed library, Briefs file). OSHA's Proposed Rule on the Identification, Classification, and Regulation of Toxic Substances Posing a Potential Carcinogenic Risk was the focus of the plurality in *American Petroleum*. 29 C.F.R. § 1990 (1980). The so-called cancer policy adopted by OSHA was subsequently amended to comport with the decision in *American Petroleum*. 46 Fed. Reg. 4,889 (1981).

116. There are essentially two theories about how carcinogens cause cancer in individual human cells: the "multiple" strike theory, and the "single" strike theory. Under the "multiple" strike theory, a cell requires several exposures to one or more carcinogenic substances to become cancerous. Until the point at which cancer becomes carcinogenic, it is theorized, the cell repairs itself or certain defenses are mobilized to neutralize the carcinogenic substances introduced into the cell. In the "single" strike theory, there is no repair or defense by the cell; exposure to the smallest amount of a carcinogen produces uncontrolled cancer. See Doniger, *supra* note 34, at 510, 511.

117. Human experiments (epidemiological studies) are the most useful way of determining if a substance is toxic and what level of exposure humans can safely tolerate. There are three principal limitations on the usefulness of these studies: (1) the ethical problems which accompany attempts to expose humans to fatal substances; (2) the latency period between exposure to a harmful substance and the development of a disease, usually 15-40 years; and (3) the limited reliability of any human experimentation because of exposure to other toxic substances in the environment, making it difficult to show a causal connection between a given exposure and the accompanying disease. *Id.* at 511-12. Because certain animals (e.g., rats) have response characteristics similar to those of humans, and because of their shorter life spans, controlled environment, and the lack of ethical problems, animals are suitable for experimentation. *Id.* at 512. However, animals have a limited usefulness. Scientists can determine the cancer-causing potential of substances (carcinogenicity), but, these animal tests do not yield risk assessments. *Id.* at 513.

118. Unless huge experiments involving literally millions of animals (so-called "Mega-Mouse" experiments) are conducted, mathematical extrapolations must be used to translate test results into models showing the correlation between low levels of exposure to a toxic substance and the expected incidence of cancer (dose-response curves). Problems occur with these extrapolations because the mathematical models differ widely in the construction of dose-response curves, sometimes by as much as a factor of 100,000. *Id.* at 513.

It is also difficult to translate dose-response data across species lines from animals to humans. For example, the National Academy of Sciences conducted a study to predict the incidence of cancer from the effect of drinking one can of diet soda per day. "The results suggested that in each 50 million people there could be as few as 0.0007 cancers per year or as many as 3640. This is a range of error more than 5,000,000-fold." Amicus Curiae Brief for Natural Resources Defense Council, Inc., Industrial Union Dep't, AFL-CIO v. American Petroleum Institute, 448 U.S. 607 (1980) (available immediately on LEXIS, Genfed library, Briefs file).

meet Justice Steven's "significant risk" threshold.[119] A close reading of Justice Steven's opinion in *American Petroleum,* however, suggests the opposite conclusion. In dictum, Justice Stevens stated not only that "the requirement that a significant risk is not a mathematical strait jacket"[120] but that "[the Agency] is not required to support its finding that a significant risk exists with anything approaching scientific certainty."[121] In a footnote, the plurality noted that both human and animal studies provide an adequate basis upon which to base a decision to regulate toxic substances.[122] Justice Stevens concludes his analysis of how the Agency might prove "significant risk" by stating that "so long as they are supported by a body of reputable scientific though, the Agency is free to use conservative assumptions in interpreting data with respect to carcinogens, risking error on the side of over-protection rather than underprotection."[123] The *American Petroleum* plurality, in what may be its most telling statement, recognized that "[OSHA's] determination . . . [of] a particular level of risk will be based on policy considerations."[124] The Court expressly left open the question as to what type of judicial review would be applied to those decisions.[125] Clearly, the reason the Court struck down the

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119. *See,* Note, *supra* note 67, at 253-54; Note, *Industry's Triumph, supra* note 113, at 555; Note, *supra* note 68, at 345-46. *Contra,* Comment, *The Significant Risk Requirements in OSHA Regulation of Carcinogens:* Industrial Union Department, AFL-CIO v. American Petroleum Institute, 33 STAN. L. REV. 551, 566 (1981).

120. 448 U.S. at 655.

121. *Id.* at 656. *See also* note 60 *supra.*

122. 448 U.S. at 657 n.64.

123. *Id.* at 656.

124. *Id.* at 655-56 n.62.

125. Although standards promulgated under the Act are to be reviewed under the substantial evidence test, 29 U.S.C. § 655(g) (1976), the Judiciary has developed methods to require the Agency to provide somewhat more than is required under the substantial evidence test to support its findings. *See* Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402 (1971); Ethyl Corp. v. EPA, 541 F.2d 1 (D.C. Cir. 1976) (en banc), *cert. denied,* 426 U.S. 941 (1976). In areas where scientific knowledge is sparse or in areas involving highly technical matters, the introduction of a subjectively higher standard of review may hinder or even preclude the regulatory goals of Congress. For example, the implied rejection in *American Petroleum* of the "single strike" theory of cancer causation in humans may result in the deaths of workers from exposure to toxic substances which would have been preventable using the "single strike" theory as a basis for regulation. For a discussion of the "single strike" theory see note 116, *supra. See generally* Leventhal, *Environmental Decisionmaking and the Rule of the Courts,* 122 U. PA. L. REV. 509 (1974); Stewart, *The Development of Administrative and Quasi-Constitutional Law in Judicial Review of Environmental Decisionmaking: Lessons from the Clean Air Act,* 62 IOWA L. REV. 714 (1977).

benzene standard was that a rigid carcinogen policy was employed by the Agency, not because projections could not be constructed showing a reduced level of risk at exposures below 10 ppm.[126]

In *American Textile* the Court accepted the lower court's interpretation of the Act on the issue of economic feasibility.[127] That view permits OSHA to choose methods of achieving its exposure levels that will, if necessary, impose such substantial costs on industry that some employers might be forced out of the market-place.[128] Although the Court was silent on the issue, the point of economic infeasibility may be reached when the competitive balance of an entire industry is destabilized[129] or where the industry becomes non-competitive with foreign competitors in domestic markets.[130] The Agency's ability to impose substantial costs on an industry to achieve its exposure levels must be distinguished from OSHA's ability to mandate that the most costly methods be used to reach its goals. By implication, the Court, in *American Textile*, directed the Agency to choose the most cost-effective method of achieving its goals.[131] Should OSHA, for example, choose the most expensive method of protecting workers from toxic substances when a less expensive method would assure the same level of protection, the decision probably would not meet the "reasonably necessary or appropriate" test of section 652(8).[132] So long as OSHA's cost-effective-

126. "In light of the fact that there are literally thousands of substances used in the workplace that have been identified as carcinogens or suspect carcinogens, the government's theory would give OSHA power to impose enormous costs that might produce little, if any, discernible benefit." 448 U.S. at 645 (refuting the government's argument that §§ 652(8) and 655(b)(5) merely required "OSHA to issue standards that are reasonably calculated to produce a safer or more healthy work environment.").

127. *Industrial Union Dep't, AFL-CIO v. Hodgson* and *Society of Plastics Industry v. OSHA* are discussed at notes 23-37 and accompanying text, *supra*.

128. See note 30 and accompanying text, *supra; Cf.* 101 S. Ct. at 2495-97.

129. See Note, 95 HARV. L. REV. 319, 325 (1981) (arguing that OSHA could determine if the competitive balance of an industry is disrupted by using an anti-trust analysis). *Cf.* 101 S. Ct. at 2496 n.38.

130. There is no reason to assume that a loss of competitive advantage to foreign competitors would preclude a finding of economic infeasibility.

131. 101 S. Ct. at 2493 n.32. Cost-benefit analysis must be distinguished from cost-effectiveness. "Cost-benefit analysis . . . is used by the decision-maker to establish societal goals as well as the means for achieving these goals, whereas cost-effectiveness analysis only compares alternative means for achieving given goals." Baram, *supra* note 7, at 474.

132. A choice of controls to regulate explosure would not be "reasonably necessary" if another method would provide the same level of protection.

ness analysis is not used as a "Trojan horse" for cost-benefit analysis, however, and worker protection is not sacrificed, cost-effectiveness analysis is a useful device.

James D. Fisher