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Economic and Technological Feasibility in Regulating Toxic Substances Under the Occupational Safety and Health Act

Jeffrey Lewis Berger* and Steven D. Riskin**

INTRODUCTION

The 1970 Occupational Safety and Health Act (OSH Act)\(^1\) authorizes the establishment and enforcement of standards to protect working people from a wide variety of occupational dangers, ranging from obvious physical hazards to the subtle and latent effects of exposure to toxic chemicals. In the statute's first seven years, the degree to which the complete protection of safety and health should be compromised by the technological difficulty and economic cost of achieving that protection has been an issue of constant controversy. The issue arises under a variety of names in all health and environmental regulation. Under OSH Act, the issue arises under the rubric of feasibility.\(^2\)

OSH Act explicitly mentions feasibility only once, as a factor relevant in the formulation of "permanent standards" for toxic materials and harmful physical agents.\(^3\) In several other contexts the statute uses other phrases which may obliquely indicate a concern for placing technological and economic limitations on absolute safety and health. Neither the statute nor the legislative history, however, defines feasibility or explains how the limitations on safety and health are to be determined. The statute and the

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2. WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 831 (1961) defines the term feasibility as "[t]he quality of being feasible," i.e., "[c]apable of being done."
legislative history left for administrative and judicial development the most basic question of whether economic considerations are relevant to feasibility. Whether the feasibility requirement applies to other types of standards authorized by the Act, how feasibility should be evaluated in the promulgation of standards, and how it should be evaluated in their enforcement also are not clearly indicated. Doctrine on these questions is only slowly emerging from the implementation of the Act.

This Article focuses on feasibility issues found in the setting and enforcement of standards directed at the long-term health effects of toxic substances. In its first seven years, the Occupational Safety and Health Administration (OSHA), which has the primary responsibility for implementing OSH Act, has set few such standards. Under the Carter Administration, however, the agency has promised to end its widely criticized overemphasis of petty safety hazards and to shift its energies towards the control of toxic substances. The promised shift in policy should precipitate an increasing number of controversies between OSHA and industry groups on the feasibility issue. This Article reviews the treatment of the feasibility issue to date at the administrative level and in the courts and suggests how the concept should be implemented in the future.

OSHA's failure to promulgate an adequate number of standards regulating toxic substances can be explained by several factors. First, by their nature, toxic substances present persistent and severe regulatory problems which defy the use of traditional cost-benefit techniques. For example, it is


6. The Carter Administration has strongly endorsed a shift away from OSHA's historic emphasis on occupational safety toward a greater concern for occupational health. The current Assistant Secretary for Occupational Safety and Health, Dr. Eula Bingham, was selected for the post largely because of her professional concentration in occupational cancer and other diseases. Bingham and Secretary of Labor F. Ray Marshall announced this policy change in May, 1977. They promised to end what Marshall called "nitpicking" enforcement efforts, to simplify the safety standards, to revoke those considered unnecessary, and to shift inspection priorities to the higher risk industries. 6 OCCUPATIONAL SAFETY & HEALTH REPORTER [hereinafter cited as OCC. SAF. & H. REP.] CURR. REP. (BNA) 1587 (1977).
generally agreed that for chemicals which induce cancer, completely safe levels of exposure cannot presently be identified and may not in fact exist. The same may be true for numerous other fatal or serious health effects. Each increment of exposure reduction may save an additional life, but the reduction is purchased at ever-increasing costs. Much of the basic information on the amount of exposure reduction needed to save lives and the cost of achieving such reduction is not available. Moreover, most people recoil at attempts to set a maximum dollar amount on spending to save a life. In regulating toxic substances in the workplace, the government is forced to set a normative, value-laden policy on the acceptable balance between worker safety and its cost, and to apply that policy to imprecise, controversial information. Objective, reliable cost-benefit comparisons are never possible. Because there are no identifiable safe levels of exposure, the balancing of safety and cost inevitably pushes into ranges of technological difficulty and economic cost to which employers object, but which still leave workers at risk of their lives.

The formation of a comprehensive doctrine on feasibility under OSH Act has been hindered further by the fact that the statute does not permit the government to speak with one voice. The implementation of OSH Act is divided between two independent and somewhat antagonistic agencies whose roles have not been satisfactorily reconciled by the federal courts of


8. See, e.g., the discussion of byssinosis, the lung disease associated with respiration of cotton dust, in the preamble to OSHA's proposed standard for that substance. OSHA, Occupational Exposure To Cotton Dust, Proposed Standards and Notice of Hearing, 41 Fed. Reg. 56,498, 56,500-02 (1976). Similar difficulties have been encountered in identifying a safe dose for the sterilizing effects of dibromochloropropane. OSHA, Occupational Exposure to 1,2-Dibromo-3-Chloropropane (DBCP), Proposed Standard, Hearing, 42 Fed. Reg. 57,226, 57,270 (1977) [hereinafter cited as Proposed Standard for DBCP]; OSHA, Occupational Exposure to 1,2-Dibromo-3-Chloropropane (DBCP), Final Rule, 43 Fed. Reg. 11,514, 11,517, 11,520 (1978) [hereinafter cited as Standard for DBCP]. This proposal is discussed at text accompanying notes 336-348 infra.

9. See the preamble to the coke oven emissions standard, 41 Fed. Reg. 46,742, 46,750-51 (1976), discussed at text accompanying notes 307-335 infra. See also comments of Secretary of Labor Marshall and Assistant Secretary Bingham, 6 OCC. SAF. & H. REP.—CURR. REP. 1323 (1977); 7 OCC. SAF. & H. REP.—CURR. REP. 3 (1977).

10. For an illuminating treatment of the weaknesses of cost-benefit analysis and related techniques when applied to health and environmental regulation, see Schelling, The Life You Save May Be Your Own, in Problems in Public Expenditure Analysis 127 (S. Chase ed. 1968).
OSHA, a part of the Department of Labor, has the first opportunity to address feasibility at all stages of the regulatory process. OSHA sets standards, inspects workplaces, cites violations, and sets penalties and abatement schedules. The Occupational Safety and Health Review Commission (OSHRC), a small agency independent of the Department of Labor, reviews OSHA's enforcement decisions that are contested by employers or employees. Through the power to modify or reverse OSHA's decisions as to violations, penalties, and abatement schedules, and even in some cases to examine the validity of underlying standards, OSHRC exercises considerable control over OSHA's enforcement program, and indirectly, over the design of standards.\(^{11}\)

Both OSHA's standards and OSHRC's enforcement decisions are subject to review by the federal courts of appeals. The courts are slowly developing useful doctrine on feasibility questions which the agencies have not fully explored or on which they have erred. The courts also function as referees between the two agencies, attempting to reconcile often divergent approaches to the assessment of feasibility. In doing so, however, the courts have made significant errors, and many feasibility issues still remain to be addressed.

The feasibility issue is further complicated by OSH Act's creation of five distinct types of standards. Differences in the substantive provisions and in the procedures through which the various standards are developed call for different approaches to feasibility questions. Of primary interest are the so-called "permanent" standards, developed through a full rulemaking procedure.\(^{12}\) OSHA has promulgated only a handful of such standards in its first seven years. Permanent standards dealing with toxic substances have been set for asbestos, fourteen carcinogens treated as a group, vinyl chloride, coke oven emissions, and most recently, benzene, 1,2 dibromo-3 chloropropane (DBCP), and inorganic arsenic.\(^{13}\) In addition, there are permanent standards directed at physical hazards, notably one for mechan-

\(^{11}\) Relations between OSHA and OSHRC may be improving under the Carter Administration. Bertram Cottine has been appointed to replace Robert Moran as a commissioner of OSHRC. With his appointment, OSHRC is expected to become more sympathetic to the positions of OSHA and employees. See [1978] 365 EMPL. SAF. & H. GUID 4.


With the exception of the coke oven emissions and inorganic arsenic standards, all were preceded by emergency temporary standards set under section 6(c) of the Act, 29 U.S.C. §
ical power presses. These standards all have been or are being vigorously challenged upon promulgation in the courts of appeals. There have been no significant enforcement decisions by OSHRC or the courts involving these standards.

Second, there are emergency temporary standards which may be adopted for a limited time period to protect employees against grave dangers. Although most of these standards were challenged upon their promulgation, the courts have not addressed the feasibility issue in deciding these cases.

Three other types of standards, "deemed" standards, established federal standards, and national consensus standards, make up the vast majority of OSHA regulations. Several thousand such standards were adopted either through abbreviated rulemaking proceedings in 1971, or directly by the statute itself. Although these standards do not concern problems of long-term or latent toxicity, challenges to their enforcement have raised significant questions about the role of technological and economic considerations in the enforcement of a standard. Some of the decisions of OSHRC and the courts in cases challenging these standards seriously distort both the relationship between OSHA and OSHRC, and the form and forum in which the statute directs technological and economic considerations to be heard. These errors threaten to frustrate the enforcement of permanent standards for toxic substances when such standards eventually come before OSHRC.

The overall feasibility problem is whether the safety and health protection that a standard provides warrants the technological difficulty and economic cost of compliance. This problem presents three subsidiary issues that must be considered. The first issue is whether a standard’s burdens on an industry considered as a whole are warranted by the risks to be prevented. This issue is presented directly by the statutory requirement, sometimes explicit, and sometimes inferential, that OSHA set feasible standards.

The second issue is under what circumstances and by which agency an individual employer’s technological and economic hardship is entitled to consideration. This issue has been severely muddled. The Act sets out the specific means for considering individual hardship, as well as the limitations on individual relief. However, OSHRC and the courts have chosen largely to ignore the Act in fashioning relief, and such decisions threaten to undermine the Act’s provisions.

The third issue concerns the meaning of the term "feasible" when used in a standard itself. OSHA uses the term in many performance standards to


govern the way in which an employer must achieve a designated end result, such as limiting employee exposure to a given chemical. In general, performance standards require the use of "feasible" engineering and work practice controls to reduce the concentration of the chemical in the workplace air. When source controls are not "feasible," an employer may comply through the use of personal protective equipment, such as respirators.16 This issue does not arise in pure specification standards, which require the use of particular equipment, methods, or practices.17

OSHA's use in standards of the word "feasible" invites confusion with the term as employed in the Act. The two uses have independent meanings. The word "feasible" in the context of a standard narrowly refers to an individual employer's compliance obligation. The term "feasible" as used in the Act refers to the ability of an entire industry to comply with a standard's requirements. This Article distinguishes between the two uses by always placing the first use in quotation marks.

With these issues in mind, we can turn to the statute, the standards, the enforcement actions, and the cases to examine closely the development of law and policy over the past seven years. The first Section of this Article looks at the statutory provisions and legislative history that bear on the issues described above. Section II analyzes how OSHA and the courts treated technological and economic considerations in setting and reviewing permanent standards promulgated through 1975. These are the "early" standards, covering asbestos, the fourteen carcinogens, vinyl chloride, and mechanical power presses. Section III discusses employers' claims of individual hardship raised before OSHRC and the courts as defenses to OSHA's enforcement of particular standards. It also addresses OSHRC's interpretation of the term "feasible" as used in a standard itself. Section IV studies OSHA's more recent approaches to feasibility issues. It focuses on the standards for coke oven emissions and DBCP and on the proposed generic criteria and model standards for carcinogens, which reflect a somewhat more sophisticated approach to technological and economic issues than did the "early" standards. The Article concludes with a prognosis of the major feasibility issues facing OSHA in years ahead.

16. Engineering and work practice controls, or "source controls," aim to keep the offending substance or agent from entering the worker's environment. Personal protective equipment attempts to isolate the workers from the substances or agents in the air, water, etc., around them. Personal protective equipment is generally regarded as less effective than source controls. Respirators or earplugs, for example, must be properly fitted and worn to seal out the chemicals or noise. The devices are uncomfortable, and sometimes employees resist wearing them. The effectiveness of source controls is not subject to as many individual variables and is therefore easier to monitor. Source controls, however, generally are far more expensive.

17. OSH Act authorizes both kinds of standards:

The term "occupational safety and health standard" means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

OSH Act § 3(8), 29 U.S.C. § 652(8) (1970). Performance standards are more flexible and are
I
THE KEY PROVISIONS AND LEGISLATIVE HISTORY OF THE OCCUPATIONAL SAFETY AND HEALTH ACT

This Section sets out the basic powers that the statute gives OSHA, OSHRC, and the courts, to set, enforce, and review safety and health standards. It concentrates on the provisions of OSH Act and its legislative history that address the role of technological and economic considerations in any of these actions.

A. OSHA Standards

OSH Act authorizes the Secretary of Labor to promulgate a variety of standards applicable to any business affecting interstate commerce. The statute establishes a new Assistant Secretary of Labor for Occupational Safety and Health, the chief officer of OSHA to whom the Secretary’s duties are delegated under the Act. Most of OSHA’s authority and guidance for setting standards comes from section 6 of the statute. There is also a small amount of legislative history on standard setting.

The statutory provisions and the legislative materials are remarkably opaque on the subject of feasibility, as well as on the other substantive characteristics of standards. A generous statutory construction is required to find a feasibility requirement in any general provision of the statute. The only direct use of the term occurs in reference to the setting of permanent standards for toxic substances. OSH Act is silent on whether feasibility must be considered in setting other standards. Several statutory phrases may permit consideration of technological and economic factors in setting standards, but even where a feasibility requirement is clear, the statute provides little indication of the factors and limits relevant to deciding whether a particular standard is feasible.

1. Permanent Standards

Section 6(b) authorizes OSHA to develop permanent standards to meet newly recognized hazards or to replace inadequate interim standards. Permanent standards are established through an informal rulemaking process. OSHA may propose a standard on its own initiative, in response to a petition by employees, employers, or others, or in response to a recommendation of the National Institute for Occupational Safety and Health especially suited to situations in which a goal can be achieved in many ways. In technologically complex industries, performance standards give each employer flexibility to choose the least expensive means of compliance, and free OSHA from the need to evaluate individually the feasibility of numerous specific requirements.

21. Id. § 6(b), 29 U.S.C. § 655(b).
OSHA also may solicit the recommendations of specially appointed advisory committees. Interested persons have the opportunity to comment in writing or at a public hearing. OSHA then promulgates the standard, along with a “statement of reasons” explaining the basis for the standard and responding to the objections and suggestions made in the comment period. OSHA may delay the effective date of a standard for ninety days after promulgation; specific requirements may be phased in at later dates.

The statute gives OSHA little guidance on the content of permanent standards in general. Section 6(b)(1) states that a standard may be set whenever OSHA determines that it would “serve the objectives” of the Act. The statute’s statement of purpose could be construed as limiting these objectives to protecting workers only “so far as possible.” Another possible source of guidance is the basic definition applying to all standards as “a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment or places of employment.” Although the adjectives “safe” and “healthful” are unqualified, one commentator suggests that the phrase “reasonably necessary
or appropriate” is authority for requiring that technological and economic feasibility be taken into account regarding all standards.\(^{31}\)

A provision specifically for toxic substances, however, gives OSHA more definite guidance in setting permanent standards for these health hazards. Section 6(b)(5), which spells out most clearly the degree to which Congress desired health to be protected, states that in regulating toxic substances, or harmful physical agents such as noise, OSHA 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, [and] the feasibility of the standards . . . .\(^{32}\)

The three fragments of legislative history on the feasibility requirement do not answer the question of how feasibility should limit the complete protection of workers’ health. The original draft of section 6(b)(5) lacked the feasibility requirements; they were added by the Senate Committee. Senator Javits, the author of the amendment, explained:

As a result of this amendment [OSHA], in setting standards, is expressly required to consider feasibility of proposed standards. This is an improvement over [the prior wording of the section], which might be interpreted to require absolute health and safety in all cases, regardless of feasibility . . . .\(^{33}\)

Although the Senator used the unmodified noun “standards,” his amendment to section 6(b)(5) was directed at permanent standards for toxic substances, which that provision specifically addresses. The Senate Report states only that section 6(b)(5) standards should “represent feasible requirements.”\(^{34}\) The Conference Report merely repeats that feasibility is one of

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31. Currie, supra note 27, at 1134.
34. Senate Report, supra note 33, at 7. See also the comments of Sen. William, co-sponsor of OSH Act.

Seventh. Under the committee bill, the Secretary is required to set the standard which most adequately and feasibly assures that no employee will suffer any impairment of health or functional capacity, or diminished life expectancy, even if such employee has regular exposure to the hazard for the period of his working life.

The committee bill also requires that the Secretary shall consider, in addition to the attainment of the highest degree of health and safety protection for the employee,
the considerations for the setting of these standards. Like Senator Javits' remarks, these comments refer specifically to standards set under section 6(b)(5).

The feasibility requirement in section 6(b)(5) applies solely to standards for toxic substances. Nevertheless, OSHA and the courts have held that feasibility may be taken into account in setting other permanent standards under section 6(b)(5). However, nothing in OSH Act or its legislative history specifically supports the view that feasibility must be considered in setting section 6(b) standards outside of the toxic substances area.

2. Emergency Temporary Standards

The statute also authorizes OSHA to set emergency temporary standards. Under section 6(c), such a standard may be promulgated prior to the setting of a permanent standard when OSHA finds that it is "necessary to protect" employees from "grave danger" from toxic substances, physically harmful agents, or "new hazards." OSHA may adopt an emergency temporary standard summarily, without regard for the rulemaking requirements of the Administrative Procedure Act concerning notice and comment. The emergency temporary standard also serves as a proposal for the permanent standard. It remains in effect until superseded by the permanent standard, which is to be promulgated within six months after publication of the emergency temporary standard.

Section 6(c) does not mention feasibility, and the legislative history is silent with regard to such considerations in setting emergency temporary standards. It is arguable that such a standard's protectiveness should not be tempered by feasibility considerations and that Congress envisioned the need in some instances to shut down extremely dangerous industries temporarily while control measures are installed. However, the emergency temporary standards set by OSHA in the statute's first seven years—all but one for toxic substances—were less stringent than the permanent standards gained under this and other health and safety laws.


38. Id. § 6(c)(1)-(2), 29 U.S.C. § 655(c)(1)-(2).

39. Id. § 6(c)(3), 29 U.S.C. § 655(c)(3).
which followed. Feasibility issues have been minimized, since OSHA has generally placed initial reliance on the institution of good work practices and the use of personal protective equipment. No court has yet reached the merits on the role of feasibility in emergency standards.

3. "Interim" Standards

To establish safety and health requirements quickly after the enactment of OSH Act, Congress gave OSHA authority to adopt and enforce immediately a large body of pre-existing public and private standards as OSHA standards. Most of these standards address physical safety rather than toxic substance hazards. The legislative history indicates that Congress intended these standards as interim measures, to be superseded where necessary by more protective permanent standards. As a practical matter, most of these standards will remain in effect for a long time, while OSHA struggles with setting permanent standards for toxic substances.

Three types of interim standards are authorized by OSH Act: those previously developed under certain federal statutes and now "deemed" OSHA standards; "established Federal standards"; and "national consensus standards." The three types have been treated similarly by OSHA, OSHRC, and the courts. There are, however, certain feasibility issues peculiar to each.

Congress created the "deemed" standards through direct action in section 4(b)(2) of the statute, where it declared the safety and health regulations originally adopted under five federal statutes covering the

40. Compare, e.g., the emergency temporary standard for vinyl chloride, which reduced the exposure limit to 50 parts per million (ppm), 39 Fed. Reg. 12,342 (1974), with the permanent standard for this chemical, which set the level at one ppm. 29 C.F.R. § 1910.1017(e) (1977).

41. Only two cases have reached the merits of challenges to emergency temporary standards, and these two have been decided on the basis of considerations other than feasibility. See Florida Peach Growers Ass'n v. Dep't of Labor, 489 F.2d 120 (5th Cir. 1974) (vacating the emergency standard for use of certain pesticides); Dry Color Mfrs. Ass'n v. Dep't of Labor, 486 F.2d 98 (3rd Cir. 1973) (vacating the emergency temporary standards for two of the 14 carcinogens). For two other cases which challenged emergency standards on feasibility grounds but where the merits were not reached, see Taylor Diving & Salvage Co. v. Dep't of Labor, 537 F.2d 819 (5th Cir. 1976), and Industrial Union Dep't, AFL-CIO v. Bingham, 570 F.2d 865 (D.C. Cir. 1977).

42. Senate Report, supra note 33, at 5-6.

43. The Senate Report stated:

The purpose of this procedure is to establish as rapidly as possible national occupational safety and health standards with which industry is familiar. These standards may not be as effective or as up-to-date as is desirable, but they will be useful for immediately providing a nationwide minimum level of health and safety.

[A] large proportion of the voluntary standards are seriously out-of-date. Many represent merely the lowest common denominator of acceptance by interested private groups. Accordingly, it is essential that such standards be constantly improved and replaced as new knowledge and techniques are developed.

Id. at 6. See also H.R. REP. NO. 1291, 91st Cong., 2d Sess. 16-17 (1970) [hereinafter cited as House Report].
longshoring and shipbuilding industries, federal construction projects, and certain federal contractors and grantees to be OSHA standards. Congress thus ensured consistency between new OSHA standards and corresponding regulations already in effect. A month after coming into existence, OSHA additionally adopted most of these “deemed” standards as “established Federal standards,” extending their applicability to employers not previously subject to them.45

In section 6(a), Congress directed OSHA to promulgate within two years, without further rulemaking proceedings, as an occupational safety and health standard, “[a]ny national consensus standard, and any established Federal standard, unless [OSHA] determines that the promulgation of such a standard would not result in improved safety or health for specifically designated employees.”46 Several thousand such standards are currently in force, comprising the great bulk of OSHA’s standards. Congress did not indicate in the statute or the legislative history whether OSHA was to consider feasibility issues in adopting these standards under OSH Act. Arguably, Congress made an implicit determination that national consensus standards represent feasible requirements, reasoning that such a standard could not have been adopted with “substantial agreement” by a national standards-producing organization if a significant number of employers disputed its feasibility. Because the national consensus standards generally are derived from self-regulatory measures adopted by the affected industries, they rarely impose technologically or economically burdensome requirements.

Established federal standards are standards which were previously promulgated under other federal laws and which were in effect on the date OSH Act was enacted. Congress apparently did not consider feasibility issues to be problematic in the adoption of these standards, since affected employers already had had the opportunity to participate in framing applicability.


46. OSH Act § 6(a), 29 U.S.C. § 655(a) (1970). A “national consensus standard” is defined as:

any 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 [OSHA] that persons interested and affected by the scope or provisions of the standard have reached substantial agreement on 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 [OSHA], after consultation with other appropriate federal agencies.

Id. § 3(9), 29 U.S.C. § 652(9). An “established Federal standard” is defined as:

any operative occupational safety and health standard established by any agency of
cable requirements. Moreover, an established federal standard which those employers found unduly economically or technologically burdensome could have been challenged under the Administrative Procedure Act. 

Like permanent standards, section 6(a) and section 4(b)(2) standards may be set in terms of performance criteria, specifications, or both, and they may require the use of source controls or personal protective equipment. There are interim standards of all these types.

4. Pre-enforcement Judicial Review of Standards

Under section 6(f), the validity of any OSHA standard promulgated under section 6 is subject to pre-enforcement review in the federal courts of appeals at the petition of any person adversely affected. To be considered, a petition must be filed within sixty days of the standard’s promulgation. In reviewing a standard’s validity, OSH Act directs the courts to uphold

the United States and presently in effect, or contained in any Act of Congress in force on [the date of enactment of this Act].

Id. § 3(10), 29 U.S.C. § 652(10).

The Senate Report states: “Such standards have already been subjected to the procedural scrutiny mandated by the law under which they were issued; such standards, moreover, in large part, represent the incorporation of voluntary industrial standards.” Senate Report, supra note 33, at 6.

Two commentators have questioned the propriety of applying established federal standards to employers that were not previously subject to them without holding additional rulemaking proceedings. Morey, Mandatory Occupational Safety and Health Standards—Some Legal Problems, 38 LAW & CONTEMP. PROB. 584, 587-90 (1974); Cuttie, supra note 27, at 1124 & n.98. However, there is no reason to conclude that employers originally subjected to established federal standards did not adequately represent the interests of those additional employers over which OSHA subsequently extended coverage. In any case, adversely affected employers had the opportunity to petition for judicial review of such standards after their promulgation by OSHA. OSH Act § 6(f), 29 U.S.C. § 655(f) (1970). See text accompanying notes 50-57 infra. Any affected employer can petition OSHA to modify or revoke a national consensus or established federal standard previously adopted by OSHA. 29 C.F.R. § 1910.3 (1977). Presumably, the denial of such a petition could be reviewed judicially under the Administrative Procedure Act. But see generally Saferstein, Nonreviewability: A Functional Analysis of “Committed to Agency Discretion,” 82 HARV. L. REV. 367, 384-85 (1968).

See notes 16-17 supra, and accompanying text. See also text accompanying note 30 supra.

There is no pre-enforcement review of a section 4(b)(2) standard as such available under section 6(f). Since these standards also were adopted as established federal standards, they are reviewable as section 6 standards. Otherwise, pre-enforcement review of section 4(b)(2) standards could be founded on the particular statute under which they originally were set and the Administrative Procedure Act, 5 U.S.C. § 704 (1970).

This time limit is a vestige of an unsuccessful attempt to cut off the jurisdiction of OSHRC or a court to review a standard’s validity in an enforcement action. See text accompanying notes 211-232 infra, for a discussion of cases in which this provision failed to foreclose scrutiny of validity during enforcement proceedings by the courts. These courts have adopted the questionable position that validity may be reviewed in enforcement proceedings. See text accompanying notes 92-108 infra. In pre-enforcement actions, however, courts respect the time limit because it is explicit, even
OSHA's "determinations" if they are supported by "substantial evidence in the record considered as a whole." Substantial evidence review conventionally follows formal rulemaking in which detailed factual records are developed in the course of adjudicatory proceedings. Courts have experienced difficulty in applying the test to the informal procedure for setting permanent standards and the summary procedure for setting emergency temporary standards established in OSH Act. The same difficulty exists in review of national consensus and established federal standards. OSH Act's informal and summary rulemaking procedures do not create a factual record as comprehensive as the kind from which substantial evidence normally is sought. Unsure of what it must do for its standards to survive judicial review, OSHA has attempted to provide an adequate record for substantial evidence review by adding several features of adjudicatory hearings to its procedures for setting permanent standards. The courts generally have approved OSHA's actions toward formalizing these proceedings, but they have not required it. Nor have they required OSHA to add to the summary procedures for setting other standards.

In reviewing standards under section 6(f), the courts have concentrated on assuring that the agency's "statement of reasons" gives a rational explanation of the conclusions OSHA has reached, and that the statement indicates the available facts, the areas of uncertainty and dispute, the alternative resolutions of those areas, and the policies used to choose between alternatives. Some courts have stated that where Congress gives an agency authority to make decisions in areas of uncertainty and dispute, the agency necessarily has substantial discretion to make policy and value judgments, irrespective of the standard of review. The court's role is to

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54. See, e.g., Industrial Union Dep't, AFL CIO v. Hodgson, 499 F.2d 467, 474 (D.C. Cir. 1974).
57. See, e.g., Industrial Union Dep't, AFL-CIO v. Hodgson, 499 F.2d 467, 474-75 (D.C. Cir. 1974).

[I]t may well be that the controversy [whether the substantial evidence or arbitrary and capricious test applies] is semantic in some degree, at least in the context of informal rulemaking, and that it lacks the dispositional importance that respondents imply. Commentators have suggested that in the "class of cases in which the ground for challenging the agency action is the inadequacy of its evidentiary basis, it is
assure that the agency has considered the relevant information, opinions, positions, and values, and that it has assembled these elements into a rational statement of reasons. The discussion in Section II of section 6(f) cases reviewing OSHA’s determinations regarding the feasibility of permanent standards sets out the principal ways in which the courts have expressed their role.

5. Variances

The statute authorizes OSHA to grant two types of individualized exemptions from standards: variances and temporary extension orders.\footnote{OSH Act § 6(b)(6), (d), 29 U.S.C. § 655(b)(6), (d) (1970).} For terminological simplicity this Article refers to these respectively as “permanent” and “temporary” variances.

A permanent variance is available to allow an employer to accomplish the goals of a standard through means other than those that OSHA has specified. Generally, an employer applies for such a variance in order to use less expensive or more convenient means of compliance. OSHA may grant the variance only if the employer shows by a preponderance of the evidence that the alternative means will assure the same degree of health and safety protection.\footnote{Id. § 6(b)(6)(A), 29 U.S.C. § 655(b)(6)(A).} Under this provision mere cost savings do not justify any compromise in protection.

A temporary variance, postponing an employer’s duty to comply with a standard for up to two years, is available if the employer shows that it is unable to comply because of the unavailability of necessary materials, equipment, or trained personnel, that it is taking “all available steps” to protect its workers in the interim, and that it has plans to come into compliance “as quickly as practicable.”\footnote{Conference Report, supra note 35, at 35. The temporary extension order was added to the Act only at the conference stage. The House conferees obtained it in exchange for accepting the strong language of section 6(b)(5), which the House bill had lacked. Id. See H.R. 16785, 91st Cong., 2d Sess. § 6, reprinted at 116 CONG. REC. 38,725 (1970). There are two other variances available under the Act, for purposes other than relieving individual hardship. An}
petition OSHA for an extension of the time period allowed in a citation to correct the violation of a standard. The grounds that an employer must establish to obtain such an extension are similar to those required for a temporary variance; however, economic hardship is not specifically ruled out as a relevant consideration. Petitions contested as unreasonable by either OSHA or employees are forwarded by OSHA to OSHRC for determination.

The availability of variances for individual employers strongly suggests that a standard should be set with reference to the compliance capabilities of an industry as a whole and that it need not be limited by the ability of the least capable employer in the industry to comply. Congress appears to have contemplated that once the economic needs of an industry as a whole have been taken into account in setting a standard, no special treatment should be given to individual employers in that industry on economic grounds, and only limited consideration should be afforded them for technological difficulties. While some form of relief is needed for individual employers, limits must be placed on the scope of that relief. If employers could obtain indefinite or permanent permission to provide less protection than a standard required, they would have an open invitation to ignore requirements imposed by the standards.

OSH Act does not indicate clearly the procedures OSHA must follow in deciding whether to grant variances. The Act requires notice to employees and an opportunity for a hearing on whether the variance should be granted. OSHA has established its own administrative rules of practice for variance proceedings, which culminate in an appeal of a hearing examiner’s decision to the assistant secretary.

There have not yet been any cases or extensive OSHA proceedings interpreting the substantive and procedural aspects of the variances. However, in such a case, a court would review the agency’s statement of reasons, the employer’s application, and the record of the hearing to determine if OSHA’s decision on a variance application was supported by substantial evidence. As discussed below, certain doctrines have developed in standards enforcement that are markedly inconsistent with these
variance provisions and which have obviated the need for relying upon them to afford individualized relief from a standard's requirements. If these doctrines are abandoned, as we suggest they should be, more activity regarding variances would be expected.67

6. The General Duty Clause

Employers have general obligations in addition to complying with OSHA standards. An employer “shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious harm to his employees.” Congress intended this so-called “general duty” clause to make an employer's common law duties of care to employees enforceable by OSHA and to give the agency a means of reaching hazards not the subject of specific standards.69 At present, the general duty does not cover the latent risks of most toxic substances, since few of these hazards may be considered “recognized.”70 Nevertheless, some feasibility doctrine has developed for the general duty whose applicability to permanent standards must be briefly considered.

Although the general duty is envisioned as a pre-existing “standard” of conduct, it is not specifically defined prior to attempts to enforce it. A specific obligation under the general duty clause is not established until OSHA brings an enforcement action asserting that the obligation has been breached. An employer may have had no notice of his duties prior to being accused of violating them. The courts have required OSHA to prove that “demonstrably feasible” measures exist by which an employer can comply with the asserted obligation.71

B. Enforcement by OSHA and OSHRC

OSHA and OSHRC share the responsibility to enforce standards under sections 8, 9, and 10 of the statute.72 Their shared authority is a novel administrative arrangement. In important respects, OSH Act does not clear-

alternative control plan would offer equivalent protection, or whether compliance really is technologically impossible. Thus, the review principles developed for permanent standards where policy judgments are involved may apply if variance questions ever come to the courts. See note 57 supra.

67. See text accompanying notes 207-251 infra.


70. A “recognized hazard” may be shown where it is “the common knowledge of safety experts who are familiar with the circumstances of the industry or activity in question.” National Realty & Constr. Co. v. OSHRC, 489 F.2d 1257, 1265 n.32 (D.C. Cir. 1973), or where the employer has actual knowledge of the hazard. Brennan v. OSHRC (Vy Lactos Lab), 494 F.2d 460, 463-64 (8th Cir. 1974).


ly indicate the agencies' roles and powers in the enforcement process; largely for this reason, their partnership has not been smooth.

1. **OSHA Enforcement**

OSHA acts in the first instance to schedule inspections, cite employers for violations, and propose abatement schedules and penalties. OSHA's compliance officers may enter workplaces on their own initiative, or upon the request of an employee or a union, to inspect working conditions, structures, equipment, materials, and records for violations of standards. The statute authorizes OSHA to require employers to keep and make available to the agency records of work-related deaths, injuries, illnesses, exposures to toxic substances, and other information.

When a compliance officer finds an apparent violation, OSHA must promptly issue the employer a written citation. Each citation must describe the violation and set a reasonable time for its abatement. OSHA may, and sometimes must, also propose civil or criminal penalties. The penalty provisions have inspired much controversy. Several commentators have argued that the authorized penalties are far too small and inspections too

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74. *Id.* §§ 8(a), (c), 29 U.S.C. §§ 657(a), (c). In *Marshall v. Barlow's, Inc.*, 46 U.S.L.W. 4483 (1978), section 8(a) was declared unconstitutional "insofar as it purports to authorize inspections without warrant." *Id.* at 4487.
76. *Id.* § 9(a), 29 U.S.C. § 658(a).
77. *Id.*
78. The Act establishes the following civil penalty scheme: For a "serious" violation of a standard or of the general duty, an employer "shall" be assessed up to $1000. OSH Act § 17(b), 29 U.S.C. § 666(b) (1970). For a violation "specifically determined not to be of a serious nature" an employer "may" be assessed up to $1000 for each such violation. *Id.* § 17(c), 29 U.S.C. § 666(c). For failure to correct a violation within the permitted abatement period, an employer "may" be assessed not more than $1000 per day of continued failure. *Id.* § 17(d), 29 U.S.C. § 666(d). An employer that "willfully or repeatedly" violates a standard or the general duty may be assessed not more than $10,000 per violation. *Id.* § 17(a), 29 U.S.C. § 666(a).
79. See *Atlas Roofing Co. v. OSHRC*, 430 U.S. 442 (1977) (holding that OSH Act's civil penalty provisions do not violate the Seventh Amendment right to jury trial). See also *Frank Irey v. OSHRC*, 519 F.2d 1200 (3rd Cir. 1975) (companion case to *Atlas Roofing*).
infrequent to be effective economic incentives for compliance with standards.\textsuperscript{80}

2. \textit{OSHRC Review of OSHA Enforcement}

Whether the enforcement action terminates at this point or is reviewed by OSHRC is up to the employer and the employees. An affected party has fifteen working days after issuance of a citation to notify OSHA that it wishes to contest the enforcement, \textit{i.e.,} that it desires review of the enforcement by OSHRC.\textsuperscript{81} If no contest is filed within this period, OSHA's citation, abatement period, and penalties are deemed final orders of OSHRC and are unreviewable by OSHRC or any court.\textsuperscript{82}

If a notice of contest is filed, OSHA may proceed by filing a legal complaint with OSHRC against the employer. If the employer files a timely answer, OSHRC schedules a hearing before an administrative law judge.\textsuperscript{83} The judge hears evidence and arguments and renders a proposed decision. Unless one of the OSHRC commissioners directs review by the full Commission within thirty days, the administrative law judge's opinion becomes a final OSHRC order.\textsuperscript{84} The hearing before the judge and the review by OSHRC are adversary adjudicatory proceedings.

The statute defines OSHRC's powers very generally. After reviewing the hearing examiner's decision on a contested citation, OSHRC is to "issue [a final] order, based on findings of fact, affirming, modifying, or vacating [OSHA's] citation or proposed penalty, or directing other appropriate relief,"\textsuperscript{85} which includes modification of the proposed abatement order. Subsequently, if an employer shows that despite its "good faith effort" it cannot meet the abatement requirements of a final order "because of factors beyond [its] reasonable control," OSHRC again may modify those requirements.\textsuperscript{86}

Other than the provisions for variances, the abatement order is the sole method provided by the statute for the consideration of an individual employer's hardship. The limitation of the abatement period to "a reasonable time" applies to OSHRC's review as well as OSHA's proposed

\textsuperscript{80} See Currie, \textit{supra} note 27, at 1149; Smith, \textit{supra} note 4, at 62-63.
\textsuperscript{81} OSH Act § 10(a), (b), 29 U.S.C. § 659(a), (b) (1970).
\textsuperscript{82} \textit{Id.} § 10(a), (b), 29 U.S.C. § 659(a), (b).
\textsuperscript{83} \textit{Id.} §§ 10(c), 12(j), 29 U.S.C. §§ 659(c), 661(j).
\textsuperscript{84} \textit{Id.} § 12(j), 29 U.S.C. § 661(j).
\textsuperscript{85} \textit{Id.} § 10(c), 29 U.S.C. § 659(c).
\textsuperscript{86} \textit{Id.} Literally, the statute provides that "the Secretary," \textit{i.e.,} OSHA, is to hear such claims and decide whether to extend abatement periods. All parties seem to have treated this as a misprint, the remainder of an earlier draft bill in which all functions were centralized in the Department of Labor. OSHRC has so held. H.K. Porter Co., 1 OSHC 1600 (Rev. Comm. 1974). See Currie, \textit{supra} note 27, at 1143 n. 182.
order. OSH Act does not give any explicit criteria for judging the reasonableness of an abatement period, nor have such criteria been developed. The variance provisions demonstrate, however, congressional intent that an employer generally not be permitted a permanent exemption from full compliance with a standard. To issue or revise abatement periods so as to permit an employer to remain out of compliance permanently or indefinitely would be inconsistent with the explicit limitations on variances.

C. Fundamental Conflicts Between OSHA and OSHRC

The division of authority between OSHA, which promulgates and enforces standards, and OSHRC, which adjudicates their enforcement, raises the question of which agency has control over issues of feasibility. The control problem has three aspects: first, to what extent, if any, OSHRC may consider the validity of a standard in an enforcement proceeding, i.e., the extent to which the standard is feasible for an industry taken as a whole; second, whether OSHRC has any authority to exempt individual employers from a standard; third, when a standard itself incorporates the term "feasible," whether OSHRC's or OSHA's interpretation of the term is entitled to deference by a reviewing court. To the extent that OSHRC has controlling authority in these areas, OSHA's ability to set binding safety and health policy through its standard setting and enforcement powers is limited, and the importance of OSHRC and reviewing courts in policy making is enhanced.

The origin of the control problem is found in the history of Congress' decision to split the standard setting, enforcement, and adjudication functions between two agencies. The bills sent by committees to the floors of the House and Senate would have placed all three functions in OSHA. Contests over citations, abatement schedules, or penalties proposed by OSHA would

Employees would be entitled to participate in the hearing concerning the extension of the abatement period, to press the view that the extension would make the period "unreasonably long." OSH Act. § 10(c), 29 U.S.C. 659(c) (1970). It appears obvious that, despite the misprint regarding the Secretary's role, OSHA also may participate in the hearing to oppose the extension.

87. Nothing in section 10(c), 29 U.S.C. § 659(c) (1970), of the Act so states, but to hold otherwise would create an incentive for the use of the extension to vitiate limitations on the length of the original period may allow.

88. To date, the only court to review a decision by OSHRC to alter an abatement period set by OSHA upheld OSHRC's action. United Auto Workers v. OSHRC, 557 F.2d 607 (7th Cir. 1977), held that substantial evidence supported OSHRC's decision to lengthen the abatement period to a date some four years beyond that fixed by OSHA in the citation. Id. at 611. The court also held by implication that the union did not have the right to question the particulars of the abatement plan, but only whether the period allowed was "unreasonably long." Id. at 610. The meaningfulness of the distinction is elusive since, as the court noted, the union is free to adduce evidence before OSHRC concerning the particulars of the plan, in order to show that it specifies an unreasonably long period. Id. at 611 n.8.

89. See the discussion of the limitations on variances in text accompanying notes 58-62 supra.
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have been heard by that agency itself. With the same agency setting and reviewing its own enforcement of standards, one could have expected consistent decisions on validity and interpretation at both stages. A court's role at either stage would have been to supervise the conduct of a single agency, a role with which courts are familiar.

The full House and Senate, however, were unwilling to rely on an instrument of the Department of Labor to be rulemaker, prosecutor, and judge. Out of a compromise between labor and management forces, committee bills were amended on the floor to establish OSHRC, but the amendments did little more than reassign some of the functions of one agency to a second. Neither these amendments, the floor debates, nor the Conference Report explains how conflicts between OSHA and OSHRC are to be resolved.

1. OSHRC's Review of the Validity of a Standard

The validity of a standard rests on procedural and substantive grounds. The promulgation of a standard must meet minimum due process safeguards, including adequate notice and a statement of reasons. Under OSH Act, the factual determinations must be supported by substantial evidence. The feasibility issue relevant to a standard's validity is whether the standard is feasible for the industry to which it applies, taken as a whole. While the Act explicitly requires the Secretary to consider feasibility in promulgating permanent standards for toxic substances, it does not specify to what extent the validity of a standard may be considered by OSHRC and the courts.

Looking to the statute alone, it appears that Congress gave OSHRC and the courts reviewing enforcement decisions no authority to consider a standard's validity. OSHRC's power to "affirm, modify, or vacate" a citation or a proposed penalty does not imply the power to examine the validity of the underlying standard, and its authority to grant "other appropriate relief" applies to actions such as adjusting abatement periods. OSHRC was created out of congressional dissatisfaction with an enforcement scheme in which OSHA had responsibility both for issuing citations and adjudicating liability thereon and in an effort to speed administrative review. Both concerns are furthered where the statute is construed to

93. See United Auto Workers v. OSHRC, 557 F.2d 607 (7th Cir. 1977). See also Atlantic & Gulf Stevedores, Inc. v. OSHRC, 534 F.2d 541, 553-55 (3rd Cir. 1976) (holding that the power to grant "other appropriate relief" does not include the power to sanction employees for failure to observe a standard).
preclude OSHRC review of the validity of standards at the enforcement stage.

The sixty day time limit in section 6(f) for filing pre-enforcement validity challenges reinforces this view. The purpose of such limitations generally is to force persons to bring their claims of invalidity early, so as to clarify important national policies and rules, and to speed the way for voluntary compliance and swift, uniform governmental enforcement. If review of validity is allowed in enforcement, the sixty day time limit on pre-enforcement challenges serves no useful purpose.

Although Congress considered allowing the review of standards' validity at the enforcement stage, the legislative history affirmatively supports a conclusion that validity challenges are restricted to pre-enforcement review under section 6(f). Commenting on the sixty day time limit on pre-enforcement review, the Senate Report states that, "the provision does not foreclose an employer from challenging the validity of a standard during an enforcement proceeding." The report referred to the Senate bill, which authorized the Secretary of Labor to adjudicate in enforcement proceedings the validity of standards he had himself promulgated—an arrangement justified by administrative economy since the Secretary would already be familiar with the typically vast records supporting issued standards. This justification was destroyed by a floor amendment which drastically revised the reported bill by placing enforcement adjudication in OSHRC—an independent administrative tribunal which possesses neither the pre-existing familiarity with rulemaking records nor the expertise to evaluate them, and which was mandated to decide contested cases with a speed entirely inconsistent with the delay and uncertainty entailed by injecting such rulemaking records and issues into routine enforcement action.

On the House side, the bill favorably reported by the Committee on Education and Labor adopted the approach of the Senate bill. The full House, however, overwhelmingly adopted the substitute bill of Congress-

95. See Yakus v. United States, 321 U.S. 414, 433 (1944) (upholding the provisions in the Emergency Price Control Act that limited challenges to the validity of price control regulations to the pre-enforcement stage).

96. But see Morey, supra note 48, at 596-98.

97. Senate Report, supra note 33, at 8.

98. Id. at 6-8; S. 2193, 91st Cong., 2d Sess. §§ 6, 10 (1969). Cf., e.g., Florida Peach Growers Ass'n v. Dept' of Labor, 489 F.2d 120, 129 (5th Cir. 1974) ("the administrative [rulemaking] record is comprised of some 238 documents occupying approximately two and one half feet of shelf space."). The record in Florida Peach Growers dealt with a temporary rather than a permanent standard and was relatively short.


man Steiger, which established an independent board to review the issuance of citations and created exclusive pre-enforcement judicial review of the validity of standards. References to enforcement review of the validity of standards not only disappear after this point, but are replaced by indications that the conferees believed the validity review issue had been resolved in accordance with the House substitute bill.

Moreover, the courts have held that provisions like section 6(f) preclude review of validity challenges in an enforcement proceeding; this result does not depend solely on whether Congress used the word "exclusive" in designating a specific forum for judicial review, but rests more heavily on the adequacy of the designated method and the need for quick, final resolution in the statutory scheme. While a complete discussion of the question of validity review is beyond the scope of this Article, it is suggested that section 6(f) pre-enforcement review is adequate to encompass validity challenges to standards promulgated under section 6(b) and 6(c). Such review likewise appears to be adequate as to national consensus and established federal standards promulgated under section 6(a), especially in light of Congress' intention to establish an immediate, nationwide system of safety and health regulation by authorizing the Secretary summarily to adopt standards which had already been subject to various forms of due process.


102. Congressman Steiger stated:

The conference committee reported the bill will provide a fair and effective means for the setting of and enforcing of standards and, among other provisions, much needed research in the area of occupational safety and health, diseases and injuries. In reflecting the wishes of the House in regard to the important substantive provision of the bill, with the exception of the standard setting board, the conference committee bill does contain provisions which are either identical to or substantially the same as the House-passed bill in the area of the general duty requirement, the test for judicial review of standards, the issuance of citations, the imminent danger provisions, the penalty provisions, and the establishment of an independent occupational safety and health appeals commission to handle administrative adjudications.


104. The findings of procedural or substantive validity in a section 6(f) proceeding reviewing a challenge to a standard promulgated under section 6(b) should be res judicata as to adjudicated issues. See Associated Indus. of N.Y. v. Dep't of Labor, 487 F.2d 342 n. 10 (2d Cir. 1973). In addition, although emergency temporary standards may be promulgated under section 6(c) without resort to rulemaking proceedings, a statement of reasons by the Secretary in accordance with section 6(c)(1) would afford a sufficient basis for review. See Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 420 (1973). Contra, Currie supra note 27, at 1129-33.
Moreover, section 6(b) and its implementing regulations permit an employer to petition the Secretary for modification or revocation of any standard, under circumstances such as where newly found facts indicate that a standard is no longer feasible or valid for an industry to which it applies. To permit the invalidation of standards in individual enforcement proceedings essentially would preclude the Secretary from effectuating a unified scheme of safety and health compliance based upon policy judgments which were committed to OSHA by Congress. Thus, at the enforcement stage, neither OSHRC nor the courts reviewing its decision should review the validity of a standard. Enforcement litigation to date is confused on the subject of validity. As pointed out in Section III, while some courts have found that Congress intended that there be judicial review of a standard’s validity at the enforcement stage, such review has been limited to the affirmative defense that a standard is economically infeasible and invalid "as applied" to a particular employer.

2. OSHRC’s Role in Granting Exemptions for Individual Employers

The statutory description of OSHRC’s powers is silent on whether OSHRC may exempt an individual employer from the obligation to comply with a standard on the grounds of economic hardship or technological impossibility. In such a case neither the validity of the standard nor its feasibility for the employer’s industry as a whole is at issue; rather OSHRC must inquire into whether a cited standard is enforceable as to the particular employer before it. Thus the question whether OSHRC may grant any such exemptions is separate from OSHRC’s or a court’s role in assessing a standard’s general validity, although the courts have framed the economic infeasibility defense as a challenge to a standard "as applied."

Section III concludes that economic infeasibility and technological impossibility are affirmative defenses to be pleaded and proven by an employer. OSHRC may grant individualized exemptions from the require-

105. See notes 46-48 supra and accompanying text.
108. Several cases have discussed whether an employer may, in an enforcement proceeding, properly raise a challenge as to whether a standard summarily adopted by the Secretary under section 6(a) and extended to all employers under OSH Act actually met the specified criteria of a national consensus or established federal standard so as to justify its summary adoption. See, e.g., Brennan v. OSHRC (Underhill Construction Corp.), 513 F.2d 1032, 1036, 1038 (2d Cir. 1975); Lee Way Motor Freight, Inc. v. Secretary of Labor, 511 F.2d 864, 868-69 (10th Cir. 1974); Associated Indus. of N.Y. v. Dep’t of Labor, 487 F.2d 342, 346, 351-54 (2d Cir. 1974). See also AFL-CIO v. Brennan, 530 F.2d 109 n.5 (3rd Cir. 1975). This question goes more to whether the Secretary acted within his statutory powers than to the validity of the standard as such. See Leedom v. Kyne, 358 U.S. 184 (1958); Gonzalez v. Freeman, 334 F.2d 570, 575 (D.C. Cir. 1964). The decisions noted above have indicated, however, that such challenges are restricted to section 6(f) pre-enforcement review. See Kendler v. Wirtz, 388 F.2d 381 (3d Cir. 1968) and the discussion thereof in Saferstein, supra note 48, at 385-86. In a related case, OSHRC ruled that the Secretary exceeded his authority under section 6(a) when he changed the
ments of a standard on these two grounds only after an employer has attempted various remedies and alternatives. Most significantly, an employer must first utilize appropriate variance and abatement modification methods, so as to exhaust all statutory restrictions on such exemptions.

3. OSHRC's Role in the Interpretation of Standards

The majority of standards for toxic substances require employers to implement "feasible" engineering controls. In reviewing the enforcement of these standards, the term "feasible" must be interpreted; when OSHA and OSHRC disagree on the interpretation, the question of whether a reviewing court should defer to either agency becomes critical.109

The basic deference approach is found in the Supreme Court's decision in Udall v. Tallman:

When faced with a problem of statutory construction, this Court shows great deference to the interpretation given the statute by the officers or agency charged with its administration. . . . "Particularly is this respect due when the administrative practice at stake involves a contemporaneous construction of a statute by the men charged with the responsibility of setting its machinery in motion; of making the parts work efficiently and smoothly while they are yet untried or new." . . . When the construction of an administrative regulation rather than a statute is in issue, deference is even more clearly in order.110

Under OSH Act, the deference question is complex due to Congress' decision to split the setting and enforcement of standards and enforcement review between two agencies. This split has resulted in conflicting views among the circuits as to how competing interpretations should be reconciled.

The Fifth Circuit has accorded deference to OSHA's reasonable interpretation of standards, regardless of the existence of other reasonable interpretations, on the basis of OSHA's standard setting authority.111 The word "should" to "shall" upon promulgating a national consensus standard without resorting to section 6(b) rulemaking. Kennecott Copper Corp., 4 OSHC 1400 (Rev. Comm. 1976). In an unpublished decision the Tenth Circuit affirmed OSHRC's decision that the standard was void. Usery v. Kennecott Copper Corp. No. 76-1735 (10th Cir. 1977) (unreported opinion). See also Adamo Wrecking Co. v. U.S., 98 S. Ct. 566 (1978).

109. Where OSHA and OSHRC agree on an interpretation, the courts normally do not look behind it. See, e.g., Irvington Moore, Div. of Natural Resources, Inc. v. OSHRC, 556 F.2d 431, 434 (9th Cir. 1977), and cases cited therein.


111. See Brennan v. OSHRC (Southern Contractors Service), 492 F.2d 498, 501 (5th Cir. 1974). The Ninth and Tenth Circuits also defer to OSHA's interpretation of the statute. See, e.g., California Stevedore & Ballast Co. v. OSHRC, 517 F.2d 986, 988 (9th Cir. 1975); Clarkson Constr. Co. v. OSHRC 531 F.2d 451, 457 (10th Cir. 1976) ("Ordinarily an administrative agency's interpretation of the legislation under which it operates is entitled to great weight." Id. at 547.)
Eighth Circuit has accorded such deference to OSHRC, reasoning that the right to interpret standards is an adjunct of the power to adjudicate.\textsuperscript{112}

Using a different approach, the Second Circuit finds that its role “is to decide whether the Commission’s interpretation of the Regulation is unreasonable and inconsistent with its purpose,”\textsuperscript{113} and has consistently adopted the more stringent interpretation of OSHA.\textsuperscript{114} Finally, the Third Circuit has held that when OSHRC’s own interpretations are in conflict and the standard is one which was not promulgated by the Secretary of Labor after “notice, hearing and evaluation of evidence,” the court will not defer but will rely on the plain words of the standard before it.\textsuperscript{115}

As a matter of policy, affording OSHRC the primary role in a standard’s interpretation could frustrate the most stringent enforcement of standards. OSHRC’s concern is with individual enforcement and its view is strongly influenced by the needs of individual employers and limited to the facts before it. To the extent that courts do defer to OSHRC, OSHA should be encouraged to set more specification standards and fewer performance standards which incorporate terms such as “feasible,” on which the two agencies may easily differ. However, as OSHRC has been given solely an adjudicatory function, rather than the authority to set standards and administer the Act, deference to its interpretations as set forth by the Eighth Circuit appears to be inconsistent with the scheme of the statute.

Where OSHA has either promulgated a standard subject to section 6(b) rulemaking or adopted an established federal standard which was subject to prior rulemaking under a statute administered by the Secretary of Labor, OSHA’s interpretation should be entitled to deference by the courts. To decide otherwise would subject standards developed by the Secretary to redefinition, thus undermining the exclusivity of pre-enforcement validity review given the courts under section 6(f).\textsuperscript{116} Where OSHA is enforcing a national consensus standard adopted under section 6(a), however, the Secre-

\textsuperscript{112} Brennan v. OSHRC (Ron M. Fiegan), 513 F.2d 713, 715-16 (8th Cir. 1975).

The Fourth Circuit defers to OSHRC because it was “chosen as enforcing agency.” Southern Railway Co. v. OSHRC, 539 F.2d 335, 337-38 (4th Cir.), cert. denied, 429 U.S. 999 (1976); Brennan v. Gilles & Cotting Inc., 504 F.2d 1255, 1261-62 (4th Cir. 1974). As OSHRC was created to review solely the enforcement aspect of OSHA’s various functions of the Act, we think the better view is that deference on statutory interpretations should be accorded to OSHA.

\textsuperscript{113} Brennan v. OSHRC (Gerosa, Inc.), 491 F.2d 1340, 1344 (2d Cir. 1974); accord, Marshall v. Western Electric, Inc., 565 F.2d 240, 244-45 (2d Cir. 1977); Brennan v. OSHRC (Underhill Constr. Corp.), 513 F.2d 1032, 1038 (2d Cir. 1975).

\textsuperscript{114} In Marshall v. Western Elec., Inc., 565 F.2d 240, 245 (2d Cir. 1977), the court found that “[t]he secretary’s interpretation of the standard . . . was better calculated than the Commission’s to achieve the congressional goal of accident prevention and protection against potential danger.”

\textsuperscript{115} Bethlehem Steel Corp. v. OSHRC, — F.2d —, Nos. 77-1425 & 1438, slip op. at 7 (3rd Cir. Mar. 6, 1978).

\textsuperscript{116} See text accompanying note 103 supra.
tary of Labor normally has had no substantive role in its promulgation. In such a case, the Second Circuit's approach to the review of OSHRC's interpretations would be most appropriate in effectuating the broad, remedial purposes of OSH Act and is consistent with the Supreme Court's decision in Udall v. Tallman.117

II

THE DEVELOPMENT OF FEASIBILITY DOCTRINE IN THE PROMULGATION AND REVIEW OF THE "EARLY" PERMANENT STANDARDS

The outlines of feasibility doctrine were drawn by OSHA and the courts of appeals in the setting and pre-enforcement review of permanent standards promulgated by the end of 1975. The "early" permanent standards discussed in this Section cover asbestos, the fourteen carcinogens, vinyl chloride, and mechanical power presses. In reviewing the promulgation of these standards, courts initially had to determine whether section 6(b)(5) permits OSHA to consider economic as well as technological factors in setting standards for toxic substances. Second, courts had to determine the extent to which feasibility considerations could temper the protective requirement of standards. Finally, courts had to develop criteria concerning the economic and technological burdens which occupational safety and health standards could feasibly impose on employers and industries. The fine points and outer limits still await elaboration, but the basic principles of feasibility doctrine were developed in the promulgation and review of the standards discussed below. For the sake of clarity, this discussion takes some liberties with the chronological order of events in order to treat each standard together with its accompanying case.

A. The Standard for Asbestos Dust

In 1972, OSHA set its first permanent standard for a toxic substance, asbestos dust.118 The hazards of working with asbestos include a serious disease of the respiratory system called asbestosis, an increase in the rate of the general forms of lung cancer, and an extreme rise in the rate of mesothelioma, an otherwise rare cancer of the connective tissue surrounding the lungs.119 The previous established federal standard limited employee exposure to airborne concentrations of asbestos fibers to twelve fibers longer than five microns per cubic centimeter (twelve fibers/cm.3).120 The perma-

120. Standard for Asbestos Dust, supra note 118, at 11,318. OSHA had issued an emergency temporary standard for asbestos dust, reducing the exposure limit to five fibers/cm.3, in late 1971. 36 Fed. Reg. 23,207 (1971). The limits are for an eight-hour time weighted average.
The statement of reasons accompanying the standard contains no extended discussion of feasibility doctrine, but it reveals that technological and economic considerations weighed heavily in the design of the standard. It was generally agreed that safe levels of exposure to asbestos dust, as with other carcinogens, could not be identified. To assure workers protection from any "material impairment" of their health, OSHA would have had to eliminate all exposure. In hearings on the proposed standard, several unions adopted this view and pressed for a three-year phased reduction of the permissible concentration to zero. They contended that in assessing the feasibility of a zero exposure limit, OSHA was permitted to consider only technological factors, and that measures were available to allow all industries using asbestos to eliminate employee exposure.

OSHA had two other sources of advice on the standard. NIOSH, charged with recommending proposed standards to OSHA, also adopted the view that there was no known safe level of exposure of asbestos dust. Nevertheless, NIOSH recommended a standard set at two fibers/cm.³, effective in two years. Most industry representatives stated that they could not meet a two-fiber standard, and supported a five-fiber standard. Some industry representatives supported leaving the standard at twelve fibers.

OSHA agreed with NIOSH that it could not determine a safe level of exposure. However, without seriously considering the possibility of totally eliminating exposure, OSHA noted that "[m]ost medical opinion is divided between a two-fiber and a five-fiber standard," and narrowed its choices to those two alternatives. Doubts concerning the safety of any exposure combined with the emphasis in section 6(b)(5) on health protection caused OSHA to reject NIOSH's proposal to delay enforcement of any new standard for two years. Instead, OSHA set a five fiber exposure limit effective immediately, with a reduction to two fibers after four years. This was "deemed necessary to allow employers to make the needed changes for coming into compliance . . . ." OSHA determined that the four year delay "will provide all employers a reasonable time to comply," while "no harm [to workers] is reasonably expected to result from exposures [at five fibers/cm.³] during the transitional period."

OSHA established uniform exposure limits and uniform compliance dates for all employers and industries using asbestos. OSHA noted certain

121. 29 C.F.R. § 1910.1001(b) (1977).
122. Standard for Asbestos Dust, supra note 118, at 11,318. See also the discussion of the unions' position in Industrial Union Dep't, AFL-CIO v. Hodgson, 499 F.2d 467, 477-78 (D.C. Cir. 1974).
123. Standard for Asbestos Dust, supra note 118, at 11,318.
124. Id.
125. Id. at 11,318-19.
126. Id.
evidence which distinguished between the toxicity of different forms of asbestos dust, and acknowledged that the different industries using asbestos varied widely in the time each needed to meet the two-fiber standard, as well as in the lowest exposure limit each eventually could achieve under comparable economic burdens. The standard set by OSHA was based on the less toxic form of asbestos and the economic needs of industries which anticipated the greatest difficulty in compliance. OSHA explained its decision not to set a standard with varying exposure levels and compliance dates keyed to the differences in toxicity and the industries' compliance capability with the statement that ""[r]easons of practical administration preclude a variety of standards for different kinds of asbestos and of workplaces.""

The standard requires the use of engineering controls to meet both the immediate five fiber limit and the later two fiber limit, except where such controls are "technically not feasible." Where the use of engineering controls is insufficient to meet the exposure limit, the standard requires employers to rotate workers to keep their average exposure below the limit. Where such rotation is not "practicable", the standard requires employee use of respirators. Once it is possible to meet the exposure limit through the use of engineering controls alone, other measures may be used only in emergencies.

Some of the feasibility issues in the asbestos standard were reviewed by the District of Columbia Circuit Court of Appeals in Industrial Union Dep't, AFL-CIO v. Hodgson, decided in 1974. The unions argued that the feasibility requirement in section 6(b)(5) did not authorize OSHA to consider economic factors in setting permanent standards for toxic substances. They also specifically challenged the four year delay of the two fiber exposure limit.

The court briskly disposed of the unions' initial claim, holding that OSHA could consider economic factors. Citing Senator Javits' commentary quoted above, the court advanced an analysis of feasibility which has been followed in the setting and review of all subsequent section 6(b)(5) standards:

[P]ractical considerations can temper protective requirements. Congress does not appear to have intended to protect employees by putting their employers out of business—either by requiring protective devices unavailable under existing technology or by making financial viability generally impossible.
Within these broad limits, standards may impose substantial costs on employers in the interest of protecting employees' health, even though certain employers are forced out of business. The court stated:

Standards may be economically feasible even though, from the standpoint of employers, they are financially burdensome and affect profit margins adversely. Nor does the concept of economic feasibility guarantee the continued existence of individual employers. It would appear to be consistent with the purposes of the Act to envisage the demise of an employer who lagged behind the rest of the industry in protecting the health and safety of employees and is consequently financially unable to comply with the new standards as quickly as other employers. 135

The court noted that temporary variances afford relief to individual employers "when timely compliance is technologically impossible." 136

The court prefaced its consideration of the unions' challenge to the standard's four year delay of the two-fiber standard with an examination of the nature of OSHA's standard-setting determinations and the criteria for judicial review. 137 OSH Act "sets forth general policy objectives and establishes the basic procedural framework for the promulgation of standards, but [leaves] the formulation of specific substantive provisions . . . largely to [OSHA]." 138 OSHA's decisions resolving factual controversies in the record can be judicially reviewed under the substantial evidence test specified in the statute. The court noted, however, that section 6(b)(5) authorizes OSHA to go beyond well-established data in setting standards:

[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. 139

Such decisions are not susceptible to substantial evidence review, but they do not escape judicial scrutiny. The court stated that it would review decisions based upon policy determinations to ascertain "whether the agency, given an essentially legislative task to perform, has carried it out in a manner calculated to negate the dangers of arbitrariness and irrationality in the formulation of rules for general application in the future." 140 When standards are challenged, OSHA must explain why it chooses to follow one course rather than another, and must identify which conclusions rest on

135. Id. at 478.
136. Id. at 478 n.23.
137. See the discussion of judicial review at text accompanying notes 52-57 supra.
138. 499 F.2d at 474.
139. Id.
140. Id. at 475 (quoting Automotive Parts & Accessories Ass'n v. Boyd, 407 F.2d 330, 338 (D.C. Cir. 1968)).
determinable facts supported by evidence in the record and which conclusions depend on policy judgments, stating the considerations found persuasive.\textsuperscript{141}

The court applied this dual standard of review to consideration of OSHA's four year delay of the two-fiber standard. The unions argued that workers' health would be endangered by the delay and that employers did not need that much time to comply. The court stressed section 6(b)(5)'s requirement that OSHA "establish those standards that most adequately insure that no employee will suffer material impairment of health."\textsuperscript{142} In the face of conflicting medical evidence in the record, the court questioned but did not overturn OSHA's judgment that no harm was reasonably expected to result from exposures during the delay.\textsuperscript{143} OSHA's decision to allow a four year transition period was not irrational for industries which actually required four years to meet the two-fiber standard: "[I]n those cases, the indeterminate degree of risk involved is counterbalanced by considerations of feasibility; it is not, however, a risk to which employees should be needlessly exposed."\textsuperscript{144} The court criticized OSHA's failure to seek evidentiary support for its decision to set a uniform effective date for the two-fiber standard, despite evidence in the record that significant differences existed in the time needed by employers to meet a two-fiber standard and that some industries could implement such a standard more quickly than others.\textsuperscript{145} The court found no explanation in the record why separate effective dates could not be set for different industries, reducing the delay in imposing the two-fiber standard to two years or less in some cases:

Separate standards for different industries would not appear to create opportunities for employers in one industry to challenge their standards on the grounds that standards for another industry were less demanding. The only relevant question would be whether the time schedule established for each industry was feasible for that industry . . . \textsuperscript{146}

The court did not require OSHA to set separate effective dates for different industries, but remanded this aspect of the asbestos standard "for clarification or reconsideration."\textsuperscript{147}

The case has not returned to court. In 1975, OSHA proposed to lower the exposure limit for asbestos further to 0.5 fibers/cm\textsuperscript{3}.\textsuperscript{148} OSHA stated that instead of reconsidering the compliance dates of the standard currently in

\textsuperscript{141} Id. at 475-76.
\textsuperscript{142} Id. at 479.
\textsuperscript{143} Id. & n. 28.
\textsuperscript{144} Id. at 479.
\textsuperscript{145} Id. at 479-80.
\textsuperscript{146} Id. at 480.
\textsuperscript{147} Id. at 481.
effect, it would address anew the feasibility of meeting the lower exposure limit and consider separate compliance dates for industries with different control capabilities.\textsuperscript{149} This proposal, however, has not yet been promulgated.

\textit{Industrial Union Dep't} establishes that OSHA standards for toxic substances may expose workers' health to risk only to the minimum extent and for the minimum length of time that feasibility requires. Further, standards may place substantial financial burdens on employers and the economic feasibility of standards must be judged in terms of their effect on an entire industry. While "practical considerations can temper protective requirements," OSHA must support administrative or policy decisions which do not impose the most stringent possible protective requirements with reasons that are based on evidence contained in the standard-setting record.

\textbf{B. The Standards for the Fourteen Carcinogens}

In January, 1974, before \textit{Industrial Union Dep't} was decided, OSHA set permanent standards for fourteen carcinogens treated together in a single proceeding.\textsuperscript{150} Unlike the asbestos standard these standards are exclusively of the specifications type. They prohibit working with the fourteen chemicals in vessels or systems open to the workplace air; all use must take place in closed systems, under fume hoods, or in glove boxes. In addition, workers are required to wear respirators and protective clothing in certain operations, and to observe personal hygiene procedures when leaving areas where these chemicals are used.\textsuperscript{151}

Feasibility considerations entered into OSHA's decision not to set performance requirements such as maximum exposure limits, and also affected the scope of the chosen specification requirements. A union and public interest group representing affected workers urged OSHA to set performance standards forbidding any worker exposure to these substances, on the grounds that no exposure to carcinogens can be considered safe.\textsuperscript{152} OSHA rejected this recommendation, giving two reasons. The agency agreed that safe exposure levels were unknown, but declined to conclude that safe levels did not exist. Secondly, zero exposure could be guaranteed only by forbidding any use of the chemicals. The specified control measures were aimed at reducing exposure "to the maximum extent practicable consistent with continued use."\textsuperscript{153} An Advisory Committee

\textsuperscript{149} Id. at 47,653, 47,657.
\textsuperscript{151} See subsection (c) of each standard. 29 C.F.R. §§ 1910.1003-.1016 (1977).
\textsuperscript{152} Standard for the 14 Carcinogens, \textit{supra} note 150, at 3758.
\textsuperscript{153} Id.
empanelled by OSHA also recommended setting performance requirements. The Committee urged OSHA to set an exposure limit for each substance at the lowest level at which it was feasible to detect either in the air or in biological fluids such as blood or urine. OSHA rejected this recommendation without discussion.

OSHA exempted from the standards' coverage mixtures of chemicals containing less than specified percentages of the fourteen carcinogens. The exclusions were made "to avoid substantial obstruction, if not stoppage, of the use of many processes and products which are considered useful in industry and even in cancer research, and about which the record contains very little information." As additional reasons for not regulating these mixtures, OSHA cited its ignorance concerning the number of processes and products affected, the availability of substitutes, and the toxicity of low concentrations of these substances when in mixtures with other chemicals.

In establishing this exemption, OSHA essentially balanced health risks against economic considerations and made a feasibility determination. OSHA further justified the decision by citing its ignorance of relevant information. As discussed above, the court in Industrial Union Dep't chided OSHA for not attempting to seek evidentiary support for its policy judgment to set a uniform effective date for the two-fiber asbestos standard in view of significant differences in the compliance capabilities of different industries. OSHA's ignorance concerning these mixtures represents a similar failure to investigate.

In Synthetic Organic Chemical Manufacturers Ass'n v. Brennan (SOCMA II), decided in late 1974, the Third Circuit Court of Appeals rejected a claim by the union and public interest group that OSHA must include a performance requirement in each standard forbidding any measurable exposure to the carcinogens. The court sustained OSHA's decision to set specification standards which allowed exposure as "a reasonable exercise of . . . judgment in the policy making sphere," referring to Industrial Union Dep't's discussion of OSHA's authority to make certain decisions.

155. Standard for the 14 Carcinogens, supra note 150, at 3759.
156. Id.
157. Id.
158. See text accompanying notes 145-147 supra.
159. 506 F.2d 385 (3rd Cir. 1974), cert. denied, 423 U.S. 886 (1975). The case was preceded by another of the same name, known as SOCMA I, which involved only a medical issue not relevant here. 503 F.2d 1155 (3rd Cir. 1974).
160. 506 F.2d at 390. In effect, these petitioners gave up their original claim, made in the rulemaking proceeding, that the exposure level must be set at zero, and adopted the position of the Advisory Committee. See text accompanying note 152 supra.
based on policy judgments and that court’s analysis of section 6(b)(5)’s feasibility requirement.\textsuperscript{161}

Without examining the basis for rejecting the use of performance requirements, the court accepted OSHA’s judgment on its face and failed to consider whether there was evidentiary support. By according OSHA such deference, the court did not subject the fourteen carcinogen standards to as thorough a scrutiny as the asbestos standard received in \textit{Industrial Union Dep’t}. The standards for the fourteen carcinogens may not require the lowest levels of exposure that actually are feasible to achieve. As a result, workers may not be receiving as much health protection as section 6(b)(5) demands.

\textbf{C. The Standard for Vinyl Chloride}

In October, 1974, between the decision in \textit{Industrial Union Dep’t} and \textit{SOCMA II}, OSHA set a permanent standard for vinyl chloride, the gaseous raw material for the nation’s second most widely used plastic.\textsuperscript{162} Earlier that year, vinyl chloride had been identified as a potent carcinogen related to deaths in the vinyl chloride industry.\textsuperscript{163} The vinyl chloride standard resembles the asbestos standard rather than the standards for the fourteen carcinogens. It features a performance requirement which limits the permissible level of exposure to an \textit{average} of one part per million (ppm) in workplace air.\textsuperscript{164} The standard requires employers to achieve this level through immediate use of "[f]easible engineering and work practice controls."\textsuperscript{165} Where such controls are not sufficient to attain the one ppm limit, they must be supplemented by employee use of respirators while a program is instituted to achieve the limit solely by means of engineering and work practice controls "as soon as feasible."\textsuperscript{166}

The appropriate level for the vinyl chloride exposure limit was hotly contested in the standard promulgation proceedings. As with other carcinogens, no safe level of exposure to vinyl chloride had been demonstrated. The stopping point had to be found in considerations of feasibility. OSHA originally had proposed to set the exposure limit at a one ppm \textit{ceiling}, which would have required the maintenance of a substantially lower average concentration.\textsuperscript{167} The vinyl chloride industry opposed the one ppm ceiling as

\textsuperscript{161} \textit{Id.} (quoting \textit{Industrial Union Dep’t}, AFL-CIO v. Hodgson, 499 F.2d 467, 474, 478 (D.C. Cir. 1974)).


\textsuperscript{163} Standard for Vinyl Chloride, \textit{supra} note 162, at 35,890. At that time an emergency temporary standard was set, reducing the permissible exposure limit from 500 parts per million (ppm); 29 C.F.R. § 1910.93 Table G-1 (1974), to 50 ppm. 39 Fed. Reg. 12,342 (1974).

\textsuperscript{164} 29 C.F.R. § 1910.1017(c) (1977).

\textsuperscript{165} \textit{Id.} § 1910.1017(f)(1).

\textsuperscript{166} \textit{Id.} § 1910.1017(f)(2).

too low, claiming that it was technically impossible to achieve and that it would be economically ruinous even to attempt compliance. Unions supported the proposed one ppm ceiling limit, although contending that workers still faced a significant cancer risk at that level and that industry actually could meet a lower level. As a partial concession to the industries' claims, OSHA retreated to the one ppm average in the final standard.

OSHA gave a detailed and candid justification for the level of exposure it chose. Noting the differences between industry and unions on feasibility, and granting the uncertainty of what levels could be attained with current technology and work practices, OSHA stated:

[A]ny estimate as to the lowest feasible level attainable must necessarily involve subjective judgment. Likewise, the projections of industry, labor, and others concerning feasibility are essentially conjectural. . . .

[T]his limit is based on an evaluation of the best available evidence and on a judgment that the health and safety of employees must be protected to the fullest extent feasible. In view of the fact that the releases of [vinyl chloride] in the . . . manufacturing processes are variable, the 1 ppm ceiling . . . would require maintenance of an average level significantly more difficult to attain through feasible engineering controls. Therefore, the exposure limit prescribed in the proposal has been rejected.

OSHA determined that a one ppm average exposure limit was feasible. It conceded that industry could not meet that level in some operations solely with current technology, but concluded that within several years, through the development of new processes, industry could attain that level "for most job classifications most of the time." OSHA noted evidence of differences in the compliance capabilities of the several industries which handled vinyl chloride, but declined to set specific effective dates for full compliance by means of engineering and work practice controls without reliance on employee use of respirators. Instead, OSHA decided to require each employer to institute an independent program of engineering and work practice controls to achieve such compliance "as soon as feasible." This requirement would force each employer to find the quickest way to reduce employee exposures, taking into account particular plants and equipment, while saving OSHA from the effort of ascertaining specific compliance dates feasible for particular industries.

169. Id.
170. Id. at 35,893.
171. Id. at 35,892.
The vinyl chloride industry promptly challenged the exposure limit and engineering control requirements of the final standard on grounds of technological and economic infeasibility. The Second Circuit Court of Appeals upheld the standard for vinyl chloride in *Society of the Plastics Industry v. OSHA*, decided in early 1975. The court closely followed *Industrial Union Dep’t*, adopting both the construction of section 6(b)(5) and the criteria for judicial review of OSHA’s decisions in setting standards for toxic substances propounded by the District of Columbia Circuit. The court sustained OSHA’s choice of a one ppm exposure limit, stating:

[T]he ultimate facts here in dispute are “on the frontiers of scientific knowledge”, and, though the factual finger points, it does not conclude. Under the command of [OSH Act], it remains the duty of [OSHA] to act to protect the workingman, and to act even in circumstances where existing methodology or research is deficient.

The court rejected industry claims of infeasibility in the absence of evidentiary support. Concerning industry’s technological capability, the court was of the view that:

[I]t is not possible to accurately predict the degree of improvement to be obtained from engineering changes until such changes are actually implemented.

We cannot agree with petitioners that the standard is so clearly impossible of attainment. It appears that they simply need more faith in their own technological potentialities.

On the other hand, OSHA “is not restricted by the status quo” and “may raise standards which require improvements in existing technologies or which require the development of new technology.” OSHA “is not limited to issuing standards based solely on devices already fully developed.” In any event, the court pointed out, the vinyl chloride standard does not exclusively rely on engineering and work practice controls for compliance, and it requires the use of respirators if such controls do not bring the level of exposure within the permissible limit. The court brushed aside the allegation that the standard was not economically feasible, concluding that its requirements were “entirely feasible.” However, “if

175. For a discussion of *Industrial Union Dep’t’s* analysis of these issues, see text accompanying notes 137-142 supra.
176. 509 F.2d 1308 (quoting Industrial Union Dep’t, AFL-CIO v. Hodgson, 499 F.2d 467, 474 (D.C. Cir. 1974)).
177. *Id.* at 1309 (quoting from 39 Fed. Reg. 35,890, 35,892 (1974)).
178. *Id.*
179. *Id.*
180. *Id.*
181. *Id.* at 1309-10.
182. *Id.* at 1310.
the petitioners find that they cannot comply for reasons beyond their control," they may seek an amendment of the standard from OSHA under the provisions of OSHA Act.\textsuperscript{183}

\textit{Society of the Plastics Industry} extends the doctrine on feasibility developed in \textit{Industrial Union Dep't}. The decision establishes that standards for toxic substances may impose substantial technological as well as economic burdens on employers. In performing its duty to protect workers' health, OSHA can set standards which exceed an industry's immediate technological capability, and can require an industry to improve existing technologies or develop new technology. OSHA's determinations of what is feasible in framing standards' requirements will not be overturned because of industry assertions that compliance is technologically impossible or economically ruinous unless substantial factual support is provided.

\textbf{D. The Standard for Mechanical Power Presses}

One other "early" permanent standard led to further examination of feasibility requirements. In December, 1974, OSHA promulgated a permanent standard for mechanical power presses.\textsuperscript{184} These powerful metal stamping machines present the danger of crushing workers' fingers and hands. The permanent standard superseded a previously adopted national consensus standard. The national consensus standard contained a performance requirement that equipment and work routines eliminate the need for workers to place their fingers or hands in the stamp's path.\textsuperscript{185} The permanent standard replaced the "no hands in dies" provision with the required use of specified guard systems. Guards permit workers manually to position materials at the point of impact, but reduce the chance that a stamp will strike while hands or fingers are in the way.\textsuperscript{186}

OSHA revised the prior standard because it concluded that it was not "universally possible in the near future" to modify existing presses in order to eliminate the need to place hands in the danger zone. Moreover, OSHA concluded that the costs of modifying machinery which could be adapted and of replacing the rest were "prohibitive".\textsuperscript{187} In OSHA's judgment, the alternative guard systems specified in the new standard would "adequately protect" mechanical power press operators.\textsuperscript{188}

In \textit{AFL-CIO v. Brennan},\textsuperscript{189} decided in late 1975, the Third Circuit Court of Appeals reviewed the feasibility issues underlying the standard. As noted in Section I, the court rejected the unions' threshold contention that

\begin{itemize}
\item \textsuperscript{184} 29 C.F.R. §§ 1910.211, 1910.217 (1977); Standard for Mechanical Power Presses, \textit{supra} note 36.
\item \textsuperscript{185} 29 C.F.R. § 1910.1017(d)(1)-(2) (1974).
\item \textsuperscript{186} Standard for Mechanical Power Presses, \textit{supra} note 36, at 41,843-45.
\item \textsuperscript{187} \textit{Id.} at 41,842.
\item \textsuperscript{188} \textit{Id.} at 41,843.
\item \textsuperscript{189} 530 F.2d 109 (3rd Cir. 1975).
\end{itemize}
OSHA could not consider feasibility determinations in setting standards.\textsuperscript{190} Observing that section 6(b)(5) of OSH Act, dealing with toxic materials, limits OSHA's rulemaking authority to what is technologically feasible, the court reasoned: "If [OSHA] may consider technological feasibility with respect to the elimination of hazards from toxic materials, then a fortiori [OSHA] must be permitted to do so with respect to other hazards . . . ."\textsuperscript{191}

The court also concluded that OSHA may weigh economic consequences in setting standards, citing \textit{Industrial Union Dep't}'s interpretation of section 6(b)(5)'s feasibility requirement.\textsuperscript{192}

The court drew some broad guidelines for the determination of feasibility. Regarding technology, the court paraphrased \textit{Society of the Plastics Industry}'s statement that

\begin{quote}
\textit{at least to a limited extent, [OSH Act] is to be viewed as a technology-forcing piece of legislation. Thus [OSHA] would not be justified in dismissing an alternative to a proposed health and safety standard as infeasible when the necessary technology looms on today's horizon.}\textsuperscript{193}
\end{quote}

OSHA must consider both "existing technological capabilities and imminent advances in the art" in determining the feasibility of an alternative.\textsuperscript{194} However, in certain cases "where total elimination of risk is beyond the reach of present technology," OSHA may nonetheless set standards which afford workers complete protection:

\begin{quote}
We do not question that there are industrial activities involving hazards so great and of such little social utility that [OSHA] would be justified in concluding that their total prohibition is proper if there is no technologically feasible method of eliminating the operational hazard.\textsuperscript{195}
\end{quote}

The court followed the interpretation of economic feasibility advanced in \textit{Industrial Union Dep't}. OSHA cannot "disregard the possibility of massive economic dislocation caused by an unreasonable standard. An economically impossible standard would in all likelihood prove unenforceable."\textsuperscript{196} However, OSHA can set standards which "would put out of business some businesses so marginally efficient or productive as to be unable to follow standards otherwise universally feasible."\textsuperscript{197}

The court concluded that the reasons given by OSHA for promulgating a new standard for mechanical power presses were supported by substantial

\begin{flushleft}
\textsuperscript{190} See note 36 \textit{supra} and accompanying text.  \\
\textsuperscript{191} 530 F.2d at 121.  \\
\textsuperscript{192} \textit{Id.} at 122-23 (citing \textit{Industrial Union Dep't}, AFL-CIO v. Hodgson, 499 F.2d 467, 477-78 (D.C. Cir. 1974)).  \\
\textsuperscript{193} \textit{Id.} at 121 (footnote omitted) (citing \textit{Society of the Plastics Indus., Inc. v. OSHA}, 509 F.2d 1301, 1309 (2d Cir. 1975)).  \\
\textsuperscript{194} \textit{Id.} at 122.  \\
\textsuperscript{195} \textit{Id.} at 121.  \\
\textsuperscript{196} \textit{Id.} at 123.  \\
\textsuperscript{197} \textit{Id.} (footnote omitted).
\end{flushleft}
evidence, but that they did not adequately explain why the new standard would better effectuate the purposes of OSH Act than the national consensus standard. The court stated that "[g]ranted that universal application of the no hands in dies standard is not technologically or economically feasible, it does not follow that a universal departure from the national consensus standard would better effectuate the purposes of [OSH Act]." The court remanded the case to OSHA for an explanation of the reasons why a partial departure from the national consensus standard would be inappropriate.

This decision contributes little of substance to the development of feasibility doctrine. It casually adopts and applies principles established in the judicial review of permanent standards dealing with health hazards of toxic substances to the revision of a national consensus standard addressing a safety hazard. It is questionable whether the same feasibility considerations raised by section 6(b)(5) apply to OSHA's promulgation of other kinds of standards. In any case, the analysis basically restates prior case law without breaking new ground. The court's remand, requiring OSHA to justify relaxation of the "no hands in dies" standard in mechanical power press applications for which compliance is entirely feasible, parallels the remand of the asbestos standard in Industrial Union Dep't. Although based on different grounds, both remands required OSHA to provide adequate reasons to support administrative decisions not to impose the most stringent possible requirements on employers to protect workers.

E. Summary of Feasibility Doctrine in the Promulgation and Review of the "Early" Permanent Standards

Case law establishes that OSHA may consider technological and economic factors in setting standards for toxic substances under section 6(b)(5) of OSH Act. However, such standards must expose workers' health to risk only to the minimum extent and for the minimum length of time that feasibility requires. Courts reviewing the promulgation of standards closely scrutinize OSHA's administrative decisions or policy judgments which do not result in imposition of the most stringent possible protective requirements, and seek adequate supporting reasons based on evidence in the record.

Standards for toxic substances may be technologically feasible although they set requirements beyond the immediate technological capability of industry. OSH Act is technology-forcing legislation and OSHA is not restricted to issuing standards based on fully developed devices. Standards

198. Id. at 119-20, 123. See note 25 supra.
199. Id. at 124 (emphasis supplied by the court).
200. In September, 1977, the court issued an order stating its conclusion that OSHA had satisfactorily complied with the remand and had adequately justified its decision to eliminate the "no hands in dies" requirement for all industries using power presses.
may require employers to improve existing technology or to develop new technology.

Correspondingly, when health hazards warrant, standards may place substantial financial burdens on employers. The economic feasibility of standards must be judged in terms of their effect on an entire industry, not on individual employers. In the interest of protecting workers' health, some employers even may be forced out of business by standards which are generally feasible for their industry but not for them.

The basic principles of feasibility doctrine await elaboration and testing. Courts have not faced difficult cases of standards on review where compliance requirements would significantly burden or substantially change an entire industry. The "early" permanent standards set requirements which were actually within the technological and economic capabilities of the affected industries. These standards appear to have had no serious impact on the profitability, size, or future growth prospects of the regulated industries. The question remains whether by these standards OSHA provided employees the full measure of health protection to which they are entitled.

III

THE TREATMENT OF FEASIBILITY IN STANDARDS ENFORCEMENT

OSHRC and the courts have rendered no important decisions to date directly concerning enforcement of permanent standards for toxic substances. However, through the review of contested enforcement actions involving the general duty clause, and section 6(a) specification and "feasible" performance standards, OSHRC and the courts have developed significant doctrine on technological and economic feasibility. Several decisions confuse the role of OSHRC and the courts in reviewing the validity of standards when feasibility issues are raised, and misconstrue the term "feasible" when used in a standard. It is especially important that these errors do not spread as precedent in cases reviewing the enforcement of permanent standards for toxic substances. The following discussion is divided into three parts. The first concerns feasibility doctrine arising under the general duty clause. The second treats the granting of individualized exemptions from specification standards. The third examines the interpretation of performance standards containing the term "feasible."

A. Feasibility and the General Duty Clause

By its terms, section 5(a)(1)—the general duty clause—does not require the consideration of feasibility in enforcement. In order to afford a cited employer fair notice of his obligations, however, several courts have required the Secretary to demonstrate in enforcement review the feasible measures an employer could have taken to prevent the alleged hazard. 201

201. See text accompanying notes 68-71 supra.
202. See, e.g., National Realty & Constr. Co. v. OSHRC, 489 F.2d 1257 (D.C. Cir. 1973);
The first court decision on the general duty clause, *National Realty & Construction Co. v. OSHRC*, provides a rational, well-balanced approach to feasibility, consistent with the purposes of the Act. Because this approach has been and should be relied upon to properly interpret both feasibility requirements in standard setting and the term "feasible" within a standard, the decision merits detailed discussion.

National Realty & Construction Company was cited for violating its general duty when it permitted an employee to ride on the running board of a front end loader; the employee was killed when the loader overturned on him. In reviewing the enforcement action, the Second Circuit vacated the citation for lack of substantial evidence, as the Secretary had made no showing as to the feasibility of particular measures which should have been taken by the employer. The significance of the decision lies in the court's treatment of the employer's duty to eliminate hazards. The court held that an employer is not strictly liable for all hazards, but that its duty must be achievable; *i.e.*, only preventable hazards give rise to a duty to act. A hazard is preventable, the court continued, if abatement methods are "feasible." This term is to be interpreted as requiring all steps except those "which are so untested or expensive that safety experts would substantially concur in thinking the methods unfeasible." Finally, the court stressed:

This is not to say that a safety precaution must find general usage in an industry before its absence gives rise to a general duty violation. The question is whether a precaution is recognized by safety experts as feasible, not whether the precaution's use has become customary. Similarly, a precaution does not become infeasible merely because it is expensive. But if adoption of the precaution would clearly threaten the economic viability of the employer, the Secretary should propose the precaution by way of promulgated regulations, subject to advance industry comment, rather than through adventurous enforcement of the general duty clause.

Thus, in enforcing feasible requirements, the Secretary may require an employer to go beyond the state of the actual technology in his industry. Not only may compliance be expensive, but an employer may be forced out of

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Brennan v. OSHRC (Hanovia Lamp), 502 F.2d 946 (3rd Cir. 1974). OSHRC and one court have held this requirement applicable to performance standards such as 29 C.F.R. § 1926.28(a) (1977) ("The employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions" which impose a "generalized duty" on employers). Frank Briscoe Co., 4 OSHC 1729, 1730 n.4 (Rev. Comm. 1976). Cf. General Electric Co. v. OSHRC, 540 F.2d 67 (2nd Cir. 1976) (It is sufficient that employer provide the safety equipment.). On the other hand, in proving a violation of a specification standard which suggests methods of compliance on its face, the Secretary is not required to make a prima facie showing of feasibility. The burden of proof is on the employer to show that such methods are infeasible or impossible under the particular circumstances. Ace Sheeteting & Repair Co. v. OSHRC, 555 F.2d 439 (5th Cir. 1977).

203. 489 F.2d 1257 (D.C. Cir. 1973).
204. *Id.* at 1266.
205. *Id.* at 1266 n.37.
business through promulgated regulations. Such an approach regards safety and health compliance as a cost of doing business, and implicitly rejects individual employer defenses that compliance is not required if compliance costs exceed the economic benefit gained through improved safety and health.

B. Feasibility and the Granting of Individualized Exemptions from Specification Standards

In enforcing a specification standard, the Secretary does not have the burden of proving the feasibility of the standards' requirements as applied to the cited employer. Moreover, OSH Act explicitly provides only variances and abatement extensions as the means for accommodating individual hardship. Two lines of cases, however, have recognized claims for individualized exemptions from standards in enforcement proceedings. Courts following the first line have declared that a standard may be invalid "as applied," due to its imposition of severe economic consequences on a particular employer. In a second group of cases, courts have recognized two defenses based on the impossibility of compliance by a particular employer.

Three courts addressed the "as applied" individualized economic infeasibility defense in cases decided in 1976. In each case OSHRC had refused to hear the defense, basing its refusal not on the particular defects of this defense but on the conclusion that it lacked any authority to consider the validity of a standard. On appeal from OSHRC's ruling, two courts considered the defense but decided their cases on other grounds. The other court, however, squarely held that there is an "as applied" economic infeasibility defense.

In Arkansas-Best Freight Systems, Inc. v. OSHRC, the Eighth Circuit Court of Appeals made mention of the "as applied" defense but did...
not rule expressly on its validity. The employer challenged the validity of a personal protective equipment standard to require its workers to wear shoes with reinforced toes. The employer argued that the application of the standard to it was invalid because its compliance costs exceeded the value of the toe injuries that would be prevented. At the outset, the court, in dicta, properly affirmed OSHA's authority to consider economic factors in setting standards, and stated that the validity of the standard's requirements could be reviewed at the enforcement stage. Turning to the merits, the court found that even accepting the employer's estimate of the costs of compliance, "no evidence" of an inability to absorb the costs or to pass them on to its customers had been shown. In so holding, the court rejected the view that to be feasible a standard must effect a favorable balance of benefits over costs, stating: "The Act does not attempt to balance as neatly as does Arkansas-Best the cost of compliance against the cost of employees' injuries." The court found that the standard was within the legislative grant of power which permits the Secretary "to protect the health of employees even though increased production costs may result."

In disposing of the case on the grounds of the employer's failure of proof, the court found it unnecessary to decide whether it was empowered to grant a single employer "an exemption from compliance." The court further noted, without comment, that the employer had not sought pre-enforcement review or post-adoption modification of the standard, nor had it applied for a variance. This refusal to fully examine the "as applied" defense left open the question of whether an employer may present evidence of individual hardship for the first time in an enforcement proceeding and whether OSHRC or a court has the authority to exempt a single employer from a standard despite the employer's failure to apply to OSHA for a variance or modification of the standard under section 6(b).

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212. Id. at 653-54.
213. The court stated: "The Act does not specifically provide for judicial review of the standards promulgated by [OSHA] in enforcement proceedings. It is clear from the legislative history, however, that judicial review during the enforcement stage is intended." Id. at 652-53 (footnote and citations omitted). For a different view of the legislative history, see text accompanying notes 92-108 supra.
214. Id. at 654.
215. Id.
216. Id. at 653 (citing Industrial Union Dep't, AFL-CIO v. Hodgson, 499 F.2d 467, 477 (D.C. Cir. 1974)). In footnote 6, the court also quotes language from Industrial Union Dep't concerning the demise of industry safety laggards. This indicates that it considers an employer's compliance effort vis-à-vis his industry relevant to a claim of economic infeasibility.
217. Id. at 652 n. 3.
218. Two years later, the Eighth Circuit once again reviewed the enforcement of the personal protective equipment standard in United Parcel Service of Ohio, Inc. v. OSHRC, 570 F.2d 806 (8th Cir. 1978). The employer was cited for exposing its employees to foot injuries without requiring that they wear safety shoes, and OSHRC upheld the citation. While finding a violation of the standard, the court on review remanded the case to OSHRC for consideration of a less costly, but adequate means of abating the hazard. This result is a function of the generalized nature of the standard, 29 C.F.R. § 1910.132(a) (1977), which does not require a specific type of foot protection, rather than a shift in the court's view on the validity of the
In *Atlantic & Gulf Stevedores, Inc. v. OSHRC*, an employer disputed the validity of a standard which was applied to require longshoremen to wear hard hats, asserting that the employees resisted the requirement and that any attempt to make them wear the hats would cause wildcat strikes. The employer argued that the prospect of such strikes rendered the standard economically infeasible as applied to it. Although the Third Circuit Court of Appeals upheld OSHRC's decision affirming the citation, it ruled that there is an "as applied" defense to enforcement based on a standard's economic impact on an individual employer.

After holding that Congress desired review of validity to be available in an enforcement proceeding, the court went on to conclude that while at the promulgation stage OSHA bears the burden of proving validity, in enforcement the burden of proving invalidity belongs to the employer.

In addition, the court created a requirement that an employer exhaust his administrative remedies under the OSH Act—variances and modifications of abatement requirements—as well as under other laws prior to raising the defense. The court established the following test for the "as applied" defense: "To carry its burden the petitioner must produce evidence showing why the standard under review, as applied to it, is arbitrary, capricious, unreasonable, or contrary to law. Were we to hold otherwise we would effectively nullify the Congressional circumscription of the right to petition for [direct] review of an OSHA standard."

Citing *AFL-CIO v. Brennan* and *Industrial Union Dep't*, the court acknowledged that economic feasibility was relevant to a standard's validity, and observed that the Secretary had the authority in setting the standard to weigh "the competing considerations of economic burden and

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219. 534 F.2d 541 (3rd Cir. 1976).
220. Id. at 545.
221. Id. at 548-51. See text accompanying notes 92-108 supra. One of the supporting grounds for the court's conclusion deserves comment here. The court stated that "it may become evident that a particular safety and health standard is economically or technologically infeasible, or otherwise unreasonable only after employers have made good faith efforts to comply." Id. at 550.

The court goes on to state that unless validity review is available during enforcement proceedings, such a standard would be unassailable. However, a standard which proves infeasible for an industry after the expiration of pre-enforcement review, may be modified or revoked pursuant to section 6(b).

222. Id. at 551.
223. Id. at 555. The court held that when the economic burden of a standard is not caused directly by the standard itself, but by employees' resistance to it, the employer's first recourse is to its remedies under the National Labor Relations Act.
224. Id. at 551-52.
225. 530 F.2d 109 (3rd Cir. 1975).
226. 499 F.2d 467 (D.C. Cir. 1974).
improvement of safety," and that "he had concluded that stevedores must take all available legal steps to secure compliance." Because the employer had not exhausted available remedies under the National Labor Relations Act or OSH Act, the court held that the employer had not established the infeasibility of the standard and rejected the claim of invalidity.

The First Circuit Court of Appeals faced an identical challenge to the longshoremen's hard hat standard in *LT.O. Corp. of New England v. OSHRC.* This court cited *Atlantic & Gulf* with apparent approval, but rested its holding on narrower grounds. Like the Third Circuit, this court held that the employer had failed to exhaust remedies the inadequacy of which is a precondition to raising the individualized defense of economic infeasibility. However, the court discussed only the employer's failure to pursue its labor law remedies. It is unclear, therefore, whether the court adopted the Third Circuit's view that the employer must also seek relief through a variance or a modification of abatement requirements. If the court did not intend to impose this precondition, then the defense would not merely offer an employer relief beyond that available through variances and abatement periods; it would completely supplant those provisions. Such a view goes too far in allowing employers to avoid the basic scheme for individualized relief set forth in the statute.

In the second line of cases, OSHRC and some courts have recognized two additional affirmative defenses which act to afford individualized relief beyond the variances and abatement modification provisions. These are two closely related impossibility defenses. OSHRC has held that an employer is not subject to a standard if the employer shows the technological or physical impossibility of its doing what the standard requires. OSHRC has also held that an employer need not comply with a standard if the

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227. 534 F.2d. at 548. In discussing the authority of the Secretary in setting standards, the court, noting its decision in *AFL-CIO,* reiterated that OSH Act "is to be viewed as . . . technology-forcing . . . legislation." *Id.*

228. *Id.* at 555.

229. *Id.* at 555-56. The court said that the issue of compliance with an occupational safety and health standard must be considered a mandatory subject of bargaining under 29 U.S.C. § 158(d) (1970). In the event that the employer bargained for and won the right to fire non-complying employees, the employer could obtain an injunction against a strike under 29 U.S.C. § 301 and the doctrine of Boys Markets, Inc. v. Retail Clerks, Local 770, 398 U.S. 235 (1970). *Id.* at 555. In addition, the court noted the availability of an extension of the abatement period which the employer had not sought. Following literally the language of OSH Act § 10(c), 29 U.S.C. § 659(c), the court found that the granting of this extension was within OSHA's (the Secretary of Labor's) power. *Id.*

230. 540 F.2d 543 (1st Cir. 1976).

231. After summarizing the holding and reasoning of *Atlantic & Gulf,* the court stated: "Although we see no reason to disagree with the Third Circuit's view, we need not endorse everything in the court's opinion to reject petitioner's claim." *Id.* at 546.

232. *Id.* at 546-47. See note 229 supra.

233. Isaacson Structural Steel Co., 3 OSHC 1138, 1139 (Rev. Comm. 1975). OSHRC vacated a citation for failure to comply with a standard requiring an employee working on steel
employer shows that compliance would prevent the performance of work necessary to its trade or business.234

Precisely what an employer must show to establish these defenses is not entirely clear. More often than not, they are asserted unsuccessfully; OSHRC affirms the existence of the defenses, but holds that the employer has failed to prove its impossibility claim.235 In theory at least, OSHRC requires a relatively strict showing of impossibility. OSHRC has ruled against employers which have established only that compliance would be "inconvenient" or difficult, or would require changes in working technique,236 although in at least one case OSHRC vacated a citation on the less strict showing that compliance would render certain work "difficult if not impossible."237 In some cases, OSHA successfully rebuts the employer's claim by showing the availability of means to comply that are technically possible and that allow the performance of necessary work.238

OSHRC has never presented any statutory authority for these defenses. Furthermore, it has never fully examined the relationship between these defenses, and variances and abatement modification,239 and it does not require employers to pursue these remedies before raising the impossibility defenses.240 The above criteria for the showing of impossibility demonstrate that the defense will allow an employer permanently to provide less protection than a standard requires—thus providing relief which is unavail-

beams high above the ground to be protected by a safety line attached to a higher point of the structure. The employer had shown that there was no higher point to which to secure the line.

234. This defense is more common. See W.B. Meredith, II, Inc. 1 OSHC 1782, 1783 (Rev. Comm. 1974) (impossible to do work on an elevator shaft with guardrails in place); Consolidated Eng'r Co., 2 OSHC 1253, 1254 (Rev. Comm. 1974) (same); Warnel Corp., 4 OSHC 1034, 1037 (Rev. Comm. 1976) (impossible to install window frames with guardrails in place); Rob't W. Setterlin & Sons Co., 4 OSHC 1214, 1217 (Rev. Comm. 1976) (impossible to do masonry work with guardrails in place).


239. OSHRC has done so regarding the "greater hazard" defense; an employer must demonstrate: (1) that the hazards of literal compliance with the standard are greater than the hazards which exist without compliance; (2) that alternative means of protecting employees are unavailable; and (3) that a variance application under section 6(d) would be inappropriate. See, e.g., Sun Outdoor Advertising, 5 OSHC 1159 (Rev. Comm. 1977).

240. Commissioner Cleary alone among the members of OSHRC has tentatively questioned these defenses. In cases resolved on the grounds of the employer's failure to prove its impossibility claim, Cleary has stated that impossibility is "at most" an affirmative defense.
able through variances and abatement modification and is inconsistent with their express limitations.

The soundness of the impossibility defenses has not been definitively decided by the courts. At least five courts have reviewed cases in which OSHRC held that the employer had failed to meet its burden of proving impossibility. Because the cases were easily resolved on grounds of failure of proof, the Third, Fourth, Fifth, and Tenth Circuit Courts of Appeals did not address the underlying question of whether the asserted defenses are authorized by the statute.\textsuperscript{241} The courts' silence represents a tacit acceptance of the defenses, but does not resolve the question. Only the Second Circuit Court of Appeals has commented on the issue, in a one-sentence alternative holding. In \textit{Brennan v. OSHRC (Underhill Construction Corp.)},\textsuperscript{242} the court rejected an employer's contention that it was not required to comply with the cited standard because the standard interfered with its construction practice, stating:

\begin{quote}
[S]ince this was at most an affirmative defense, under 29 U.S.C. § 661(f) and Fed. R. Civ. P. 8(c), the burden was on the employer to prove [impossibility], a burden unsatisfied below or here.\textsuperscript{243}
\end{quote}

\textit{See, e.g., Garrison & Assoc., Inc., 3 OSHC 1110, 1111 (Rev. Comm. 1975) (concurring opinion); Diebold, Inc., 3 OSHC 1897, 1901 n. 15 (Rev. Comm. 1976), appeal filed, No. 75-1278 (6th Cir. Mar. 8, 1976). In the same note in \textit{Diebold}, Cleary stated his belief that an employer must exhaust opportunities for variances from OSHA before OSHRC may consider an impossibility defense. In a later case, OSHA argued that an employer could get an exemption only through variances; rather than decide the question, Cleary resolved the case on the grounds that the employer had failed to prove its defense, if the defense exists at all. Taylor Building Assoc., 5 OSHC 1083, 1084-85 (Rev. Comm. 1977). Cleary would allow the difficulty or cost of compliance to go to the size of the penalty assessed, Heckler Constr. Co., 2 OSHC 1217 (Rev. Comm. 1974), or to the length of the abatement period allowed, Continental Can Co., 4 OSHC 1541, 1549 (Rev. Comm. 1976) (dissenting opinion).

Cleary drew support for the position that impossibility is "at most" an affirmative defense from \textit{Brennan v. OSHRC (Underhill Constr. Corp.)}, 513 F.2d 1032, 1035 (2d Cir. 1975).

Commissioner Barnako apparently believes that for hardship short of impossibility, an employer's recourse is to variances. Warnel Corp., 4 OSHC 1034, 1037 & n. 11 (Rev. Comm. 1976) (noting availability of permanent variance to relieve employer of difficult, inefficient means of preventing falls).

Although the Commissioners have not taken the view that the availability of variances precludes the existence of impossibility defenses, the availability of variances influenced their decision as to abatement requirements in at least one case. In Deemer Steel Casting Co., 2 OSHC 1577, 1578 (Rev. Comm. 1975), \textit{per} Cleary, OSHRC delayed the establishment of an abatement period until OSHA reached a decision whether to grant a pending application for a variance.

\textit{241. United States Steel Corp. v. OSHRC, 537 F.2d 780, 782-83 (3d Cir. 1976) (employer failed to prove use of safety nets would render impossible performance of necessary work); Dorey Elec. Co. v. OSHRC, 553 F.2d 357, 358-59 (4th Cir. 1977) (same); Ace Sheetng & Repair Co., 555 F.2d 439, 441-42 (5th Cir. 1977) (employer failed to prove impossibility of doing what the standard requires); Lee Way Motor Freight, Inc. v. Secretary of Labor, 511 F.2d 864, 869-70 (10th Cir. 1975) (employer failed to prove that standard was inapplicable to his particular working conditions).}

\textit{242. 513 F.2d 1032 (2d Cir. 1975).}

\textit{243. Id. at 1035.}
Congressional authority to the Secretary of Labor was broad enough [to deal with such problems in original or reviewed standard setting], 29 U.S.C. §§ 655(a), (b), and when reviewed in connection with available remedies by way of individual administrative variances, § 655(d), or judicial review of the standards, § 655(f), this defense must be rejected here. Moreover, even if the employer could raise this defense, on this record he did not meet his burden of showing that other means were not usable to permit [work in compliance with the standard].

Although the statute provides only the variance and abatement methods to accommodate individual hardship, an employer should, under limited circumstances, be permitted to assert claims of economic infeasibility and technological impossibility as affirmative defenses to cited standards. However, as previously argued, a challenge to the general validity of a standard should not be permitted in an enforcement proceeding. To find otherwise will seriously threaten the Secretary's ability to effect a broad, nationwide scheme of safety and health regulation, by subjecting the policy decisions and factual underpinnings of individual standards to constant review by OSHRC and the courts in proceedings where the scope of concern encompasses only a single enforcement against a single employer. Thus, to the extent that the "as applied" approach of Atlantic & Gulf treats a claim of individual economic infeasibility as a challenge to the validity of a standard, it must be stringently qualified.

As with the technological impossibility defense, the "as applied" economic infeasibility defense permits an employer, under the limited circumstances discussed below, to request an exemption in an enforcement proceeding, based on its own economic situation. This approach questions neither the general validity of a standard, nor the facts and policy judgments underlying its promulgation, but goes only to whether the standard is enforceable as to an individual employer. If new facts develop after the period for pre-enforcement review which call the general economic or technological feasibility of a standard into question for the industry, an employer may petition the Secretary to modify or revoke the standard under section 6(b). The decisions on economic infeasibility and technological impossibility in enforcement proceedings involving specification standards uniformly treat these claims as affirmative defenses to be pleaded and proven by an employer. While no single decision has spelled out the burden of proof in detail, the decisions indicate that before these defenses are available, an employer must exhaust all remedies under OSH Act and other

244. Id. at 1036.
245. See text accompanying notes 92-108.
246. We note, however, that the Secretary has "open-ended discretion" in setting priorities for the adoption, modification or revocation of standards. National Congress of Hispanic American Citizens v. Usery, 534 F.2d 1196 (D.C. Cir. 1977).
applicable laws. When claiming technological impossibility, an employer must demonstrate that there are no available means for compliance and that a variance request would be inappropriate. The employer must also seek modification of the abatement requirements, especially if applicable technology ""looms on today's horizon." 247 When claiming "as applied" economic infeasibility, an employer must demonstrate the inability to absorb or pass on the costs of compliance, i.e., that financial viability is threatened. It must also request a variance and an abatement modification if appropriate. 248 

In addition, the employer must show that the cited standard "as applied" is arbitrary, capricious, or contrary to law. 249 The contention that individual compliance should be based on a balance of benefits over costs has been rejected by courts in both the general duty and "as applied" cases. Thus, the National Realty decision, involving the general duty clause, echoes the specification standard cases in interpreting feasibility to permit OSHA to require all compliance methods, even to the point of "threaten[ing] the economic viability of the employer." When coupled with Commissioner Cleary's view that abatement extensions may be granted on the grounds of economic adversity, 250 the rejection of cost-benefit analysis implies that an "exemption from compliance" may be granted only if the employer is unable, at any time, to meet the costs of compliance. This approach should be coupled with a greater use by OSHA of graduated abatement plans. 251 While the decisions involving the technological impossibility and economic infeasibility defenses all have concerned safety specification standards, these defenses may be raised in the health area as OSHA sets permanent standards for toxic substances which require specific abatement methods.

The overall approach as outlined above encourages employers to include safety and health compliance as a planned cost of doing business and spurs private research and development of more effective and less expensive means of compliance. 252 It also recognizes that, under certain circumstances, the prevention of a hazard may be physically impossible or may require unreasonable costs. Neither OSHRC nor the courts have as yet held a standard's requirements to be economically infeasible "as applied." It is important to stress that the above noted decisions generally reject an interpretation of feasibility which requires the balancing of costs and benefits in enforcement as a prerequisite to required compliance. As the following discussion of enforcement decisions involving standards containing the

248. See notes 58-67 supra and accompanying text.
249. Atlantic & Gulf Stevedores, Inc. v. OSHRC, 534 F.2d 541 (3rd Cir. 1976).
250. See note 280 infra and accompanying text. See also note 240 supra.
251. See note 274 infra. Such plans are now used in the health area.
252. But see note 341 infra and accompanying text.
word "feasible" will show, OSHRC and the Seventh Circuit have errone-ously departed from this view.

C. Interpretation of Standards Containing the Term "Feasible"

This Part examines the meaning of the term "feasible" as it appears in a standard itself. As noted in Section II, in the permanent standards for asbestos and vinyl chloride, the term governs whether an employer must use engineering and work practice controls or whether it may rely on personal protective equipment. OSHRC and the courts have not yet considered the meaning of the term in those standards. However, the term is also used to govern the use of engineering controls in section 6(a) standards which regulate toxic substances and other harmful physical agents. In cases decided in 1976 and 1977, OSHRC interpreted a similar use of the term "feasible" in the established federal standard for noise. The following discussion analyzes the doctrine developed in this context and assesses its applicability to the permanent standards.

The noise standard is aimed solely at the acute and chronic effects of sound on hearing. The standard sets forth a table of maximum noise levels permitted for various periods of exposure. It requires that employees be protected from such levels by the use of "feasible administrative or engineering controls." To the extent that such controls do not bring noise levels within the permitted limits, the standard requires the use of personal protective equipment such as earmuffs or earplugs.

The standard's regulatory history gives no indication whether the term

255. 29 C.F.R. § 1910.95 (1977). As noted above, the Commission has also required the Secretary to demonstrate the feasible measures an employer could have taken regarding certain performance standards, see note 202 supra and accompanying text, but has not interpreted the term feasible in this context.
256. Id. Table G-16. For example, an employee may be exposed to an average sound level of no more than 90 A-weighted decibels (dBa) for an eight hour period, and to an average of no more than 115 dBa for 15 minutes. The decibel scale is logarithmic; a decibel level of 73 represents twice the sound pressure of 70 decibels. The A-scale is a weighting of different frequencies to approximate sound levels as perceived. See generally AMERICAN INST. OF PHYSICS, AMERICAN INSTITUTE OF PHYSICS HANDBOOK 3-7 to 3-8 (1972).
257. 29 C.F.R. § 1910.95(b)(1), (c) (1977). There is considerable debate concerning whether the noise standard should be revised to lower the permissible sound levels. OSHA proposed to amend the standard in some respects in 1974. OSHA, Occupational Noise Exposure, Proposed Requirements and Procedures, 39 Fed. Reg. 37,773 (1974). The proposal was criticized for continuing to allow average exposures as high as 90 dBa by the Environmental Protection Agency, which has the responsibility to comment on such proposals under the Noise Control Act, 42 U.S.C. § 4903(c)(2) (Supp. V 1975). EPA recommended a standard set at 85 dBa. EPA, Proposed OSHA Occupational Noise Exposure Regulation, Request for Review and Report, 39 Fed. Reg. 43,802 (1974). A revised standard has not yet been promulgated.
“feasible” was intended to encompass only technological considerations alone or both technological and economic considerations. OSHA and OSHRC differ sharply on the conditions under which engineering controls must be used and when sole reliance on personal protective equipment is permitted. Moreover, the OSHRC commissioners disagree among themselves and, when the issue has arisen, have voted consistently two-to-one to vacate citations. In most of these cases, however, Commissioners Barnako and Moran, who made up the majority, have reached their conclusions through different interpretations of the standard. Commissioner Cleary has dissented, taking a third view of the standard’s meaning. Barnako’s view that the costs and benefits of controls must be weighed to determine whether they are feasible and therefore required, recently was approved by the Seventh Circuit Court of Appeals, the only court to address the question to date. There are, however, reasons to consider the question unsettled. Barnako’s interpretation has certain drawbacks that have not been fully considered. The discussion here will focus on the case law regarding technological feasibility and the OSHRC view of economic feasibility.

Reynolds Metals, the leading case, considered the extent of OSHA’s burden to show that engineering controls are technologically “feasible.” OSHA presented expert testimony that techniques exist and are generally available to reduce noise levels in manufacturing plants like the cited employer’s. The expert had not analyzed the particular noise problem

258. The standard’s regulatory history is summarized in notes to two OSHRC decisions. Turner Co., 4 OSHC 1554, 1558 n. 9 (Rev. Comm. 1976), set aside and remanded, 561 F.2d 82 (7th Cir. 1977); Continental Can Co., 4 OSHC 1541, 1546 n. 14 (Rev. Comm. 1976).

259. There have been two cases focusing on the availability of “feasible” administrative controls, as well as engineering controls. West Point Pepperell, Inc., 5 OSHC 1258, 1260 (Rev. Comm. 1977); Love Box Co., 4 OSHC 1138, 1141-42 (Rev. Comm. 1976). The “feasibility” issues are the same. To simplify matters, however, in the following discussion we refer only to engineering controls.

260. See, e.g., Continental Can Co., 4 OSHC 1541 (Rev. Comm. 1976) (Barnako, Moran, concurring). Moran took the view in most of these cases that engineering controls were not technologically “feasible” unless they enabled full compliance with the standard, i.e., unless such controls could bring noise levels below 90 dBA, eliminating the need for personal protective equipment. Reynolds Metals Co., 3 OSHC 2051, 2052 (Rev. Comm. 1976) (Moran, concurring); Continental Can, 4 OSHC at 1549 n. 18 (Moran, concurring). Barnako and Cleary reject this view, holding that source controls may be “feasible” even though permissible levels are still exceeded and personal protective equipment is still needed. Continental Can, 4 OSHC at 1545-46 (Barnako), id. at 1549 (Cleary, dissenting on other grounds). They reason that the use of such controls lessens the need for personal protective equipment. In Continental Can, they determined that controls which would reduce noise levels by one half, i.e., by three decibels, would offer a “clearly significant” reduction. Id. at 1545 n. 13.


262. See notes 275-275 infra and accompanying text.

263. Turner Co. v. Secretary of Labor, 561 F.2d 82 (7th Cir. 1977). See note 271 infra.

at the plant involved, and he could not state specifically which measures Reynolds could have taken. OSHA contended that this showing of the general availability of applicable controls sufficed to establish technological "feasibility". In the lead opinion, however, Barnako held that OSHA must produce evidence of the particular controls the cited employer could have used. In dissent, Cleary argued for a middle ground: that OSHRC should presume the existence of controls applicable to the cited plant once OSHA had shown the general availability of applicable controls. The employer would then have the burden of showing that these controls were technologically inapplicable to its facilities. Cleary contended that this distribution of the burden of proof would be more appropriate than Barnako's, because the employer has a greater knowledge of and access to information concerning its compliance capabilities than does OSHA. Barnako's holding, however, has been followed and extended in the subsequent cases.

Later cases concern the relevance of economic considerations in determining whether engineering controls are "feasible." The controlling interpretation and the rejected views are stated most fully in three cases: Continental Can; Castle & Cooke Foods; and Great Falls Tribune.

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265. See id. at 2051-52. OSHA expressed this policy in August, 1978, in the Industrial Hygiene Field Operations Manual, which guides compliance personnel in their enforcement responsibilities. The Manual defines "feasibility" as the "[e]xistence of general technical knowledge as to materials or methods which are available or adaptable to specific circumstances with a reasonable possibility that employee exposure to violative conditions of noise, dust or other substances or conditions will be reduced." The Manual states: "General knowledge of industry and available and developing technology indicates that feasible engineering controls will exist in most cases." The Manual indicates the following sources from which compliance personnel may draw information on which to base the judgment that controls are "feasible":

(a) Similar situations observed elsewhere with adequate engineering controls to reduce employee exposure.
(b) Written source materials or conference presentations that indicate equipment and designs are available to reduce employee exposure in similar situations.
(c) Studies by a qualified consulting firm, professional engineer, industrial hygienist, or insurance carrier that show engineering controls are technically feasible.
(d) Studies and materials collected and prepared by the Technical and Analytical Assistance Unit.
(e) Equipment catalogs and suppliers that indicate engineering controls are technically feasible and are or will become available within the citation's abatement period.

INDUSTRIAL HYGIENE FIELD OPERATIONS MANUAL, Ch. I(H)(3)(a)(I) in OSHA, FIELD OPERATIONS MANUAL & INDUSTRIAL HYGIENE FIELD OPERATIONS MANUAL, EMPL. SAF. & H. GUIDE (CCH) ¶ 4483.80 at 1765 (Mar. 1977) [hereinafter cited as FOM & IHFOM (CCH)].

266. 3 OSHC at 2051-52.

267. Id. at 2052-54. In a subsequent case, per Cleary, OSHRC vacated a citation on the grounds that OSHA had presented no evidence of source controls generally applicable to the employer's type of plant. Love Box Co., 4 OSHC 1138, 1141 (Rev. Comm. 1976).


269. 4 OSHC 1541 (Rev. Comm. 1976).

270. 5 OSHC 1435 (Rev. Comm. 1977), appeal filed, No. 77-2565 (9th Cir. July 14, 1977).

271. 5 OSHC 1443 (Rev. Comm. 1977), appeal filed, No. 77-2566 (9th Cir. July 14, 1977).
In these cases, the employers conceded the existence of controls technologically applicable to their facilities. They contended, however, that the controls must also be "economically feasible," i.e., have benefits exceeding their costs. OSHA argued that economic factors have a much more limited relevance to the meaning of "feasible" as used in the noise standard, contending that an employer is in violation of the standard once it is established that controls are technologically possible. OSHA would allow the employer a long abatement period, however, if the employer showed that the cost of the controls would seriously threaten its survival.

Barnako's lead opinions adopt and extend the employers' view by requiring OSHA to prove by a preponderance of the evidence that the benefits of the engineering controls alleged to be "feasible" justify their costs. He judges whether this showing has been made by weighing "all the relevant cost and benefit factors." The costs and benefits are assessed in comparison with those of the personal protective equipment otherwise required. The "feasibility" of the source controls is established only if the

The doctrine of these three cases was affirmed by the Seventh Circuit Court of Appeals in Turner Co. v. Secretary of Labor, 561 F.2d 82 (7th Cir. 1977). The court reversed the case below, in which OSHRC had affirmed a citation on the questionable holding that the employer had conceded the issue of economic "feasibility", Turner Co., 4 OSHC 1554, 1564-65 (Rev. Comm. 1976), and remanded the case for a determination as to whether the health benefits of engineering controls justify their costs. The court adopts the reasoning of, and largely paraphrases, Continental Can and Castle & Cooke Foods. For this reason we do not discuss the case separately.

272. Continental Can Co., 4 OSHC at 1543; Castle & Cooke Foods, 5 OSHC at 1436; Great Falls Tribune Co., 5 OSHC at 1446.
273. Continental Can Co., 4 OSHC at 1542; Castle & Cooke Foods, 5 OSHC at 1437; Great Falls Tribune Co., 5 OSHC at 1446.
274. Continental Can Co., 4 OSHC at 1542 n.4; Castle & Cooke Foods, 5 OSHC at 1438.

OSHA's Industrial Hygiene Field Operations Manual, Ch. I(H)(3)(b)(1), states:

The employer's economic cost of abatement will not be considered to be a factor in the issuance of a citation. However, if the cost of utilization of effective engineering or administrative controls, or combination, which would bring the employer into compliance with permissible exposure limits would so seriously jeopardize his financial condition as to result in the probable shutdown of his establishment or a substantial part, then only a personal protective equipment program should be required in the interim, and an extended abatement date should be granted to permit the extended implementation of feasible engineering or administrative controls taking into account the employer's financial condition. The burden of proof of economic infeasibility rests upon the employer.

FOM & IHFOM (CCH), supra note 265, ¶ 4483.80. See an earlier statement of the same policy in the Field Operations Manual, Ch. X(G)(7)(c)(2), EMPL. SAF. & H. GUIDE (CCH) ¶ 4380.7 at 78 (Jan. 1976).

275. Continental Can Co., 4 OSHC at 1547. Although the Commission stated that it recognized the primacy of implementing engineering and administrative controls as provided in the standard, it considered as part of its cost-benefit analysis the relative effectiveness, reliability, and convenience of personal protective equipment. As to the benefits of noise reduction, it considered the number of employees exposed to the excessive noise and net reduction in exposure which would result from controls. As cost factors, it considered relevant the direct costs of installing and maintaining controls, and the indirect costs due to loss of productivity or efficiency resulting from their implementation. Id. at 1545, 1547-48.
additional protection they offer over the personal protective equipment justifies the additional costs.  

Most of the noise cases which have reached the merits have found the costs to exceed the benefits. Barnako views the marginal benefit of engineering controls for noise as almost insignificant, concluding that earplugs or earmuffs properly fitted and used protect hearing almost as well as reductions in the ambient noise level achieved through source controls. Reasoning from the proposition that personal protective equipment allows only modest additional threats to health, Barnako judges the further benefits to be gained from engineering controls not to be worth the high costs. Barnako argues that to require the use of source controls despite their unfavorable balance of benefits and costs would assign too high a priority to the noise hazards. Even though noise can cause significant harm, it is not life-threatening and must be considered less serious than exposure to carcinogens, for example. In his view, resources either would be better applied towards reducing currently recognized risks of more serious harm, or should be reserved for the abatement of such hazards discovered in the future.

Cleary dissents from this interpretation, essentially adopting OSHA's view that the term "feasible" requires OSHA to show no more than the existence of controls generally applicable to noise sources similar to the employer's, and that longer abatement periods should be allowed where an

276. Castle & Cooke Foods, 5 OSHC at 1441 (Moran, concurring); Id. at 1438 (Barnako, lead opinion). Cf. Continental Can Co., 4 OSHC at 1547 ("[W]e cannot overlook" personal protection equipment.).


277. Continental Can Co., 4 OSHC at 1547. Source controls, in Barnako's opinion, benefit only the relatively few employees who cannot or will not use personal protective equipment. Id. at 1545. In a subsequent decision, he also argues that in all but very rare cases, hearing loss can be detected and arrested before serious damage or total deafness result. Castle & Cooke Foods, 5 OSHC at 1439 (1977).

278. West Point Pepperell Inc., 5 OSHC at 1260; Castle & Cooke Foods, 5 OSHC at 1440. In Great Falls Tribune Co., the estimated capital cost was $12,500 per employee, 5 OSHC at 1446, although in other cases, the capital costs are estimated to be between $3000 and $4000 per employee. OSHRC has affirmed a citation in only one case that can be viewed as a decision on the merits. In Anheuser-Busch, Inc., 4 OSHC 1999 (Rev. Comm. 1977), OSHA presented evidence of some "simple and economical" measures that would achieve "significant" noise reductions. The employer failed to contest this evidence at all. OSHRC, per Cleary, held that OSHA had met its burden of proof on economic "feasibility." Id. at 2000. But see Turner Co. v. Secretary of Labor, 561 F.2d 82 (7th Cir. 1977), discussed in note 271 supra. In that case the court reversed the OSHRC decision resting on a similar concession of the economic "feasibility" issue. Anheuser-Busch may be distinguishable and still good law to the extent that it establishes that a citation will be affirmed if OSHA proves the availability of "simple and economical" controls capable of achieving "significant" reductions. OSHRC takes this view in Castle & Cooke Foods, 5 OSHC at 1439.

279. This reasoning ignores the employer's affirmative duty to discover and correct all prescribed hazards. See note 299 infra and accompanying text.
employer's economic survival is threatened. He argues further that OSHRC may consider economic factors only in fashioning abatement periods, which is the appropriate place for assigning priorities among hazards. \(^{280}\) In support of his interpretation, Cleary first asserts that the noise standard is intended to force the development of new engineering controls, a purpose which is nullified if an employer may escape the obligation to use engineering controls at all because of economic considerations. \(^{281}\) Second, he cautions that “[e]ffective cost-benefit analysis is a complex, multi-faceted procedure,” \(^{282}\) which requires resources and expertise that OSHRC lacks. \(^{283}\) In his view, the balancing of costs and benefits is more appropriately performed by OSHA in a general rulemaking proceeding. \(^{284}\) Third, placing the burden of showing economic as well as technological feasibility on OSHA exacerbates the problem he noted in Reynolds Metals, that OSHA's ability to enforce the standard will be severely hampered by poor access to the information needed to prove a violation. \(^{285}\) Finally, on the merits of the cost-benefit analysis itself, Cleary would assign more weight than Barnako does to the increment of protection afforded by engineering controls. \(^{286}\)

\(^{280}\) Continental Can Co., 4 OSHC at 1550, 1552-54; Great Falls Tribune Co., 5 OSHC at 1447-48.

\(^{281}\) Continental Can Co., 4 OSHC at 1549-51.

\(^{282}\) Castle & Cooke Foods, 5 OSHC at 1442.

\(^{283}\) Continental Can Co., 4 OSHC at 1553-54. He calls Barnako's cost-benefit analysis "crude." \(^{284}\) Id. at 1553.

\(^{284}\) Id. at 1554.

\(^{285}\) Id. at 1553.

\(^{286}\) Castle & Cooke Foods, 5 OSHC at 1442; Great Falls Tribune Co., 5 OSHC at 1447-48.

Similar issues are presented by the national consensus standard for air contaminants, which sets forth maximum exposure levels to protect employees from the acute and chronic effects of some 400 gases and dusts. See 29 C.F.R. § 1910.1000 (1977). This standard's directions for compliance are nearly identical to those of the noise standard. To protect employees from excessive exposures, "administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees within the limits prescribed in this section." \(^{286}\) Id. § 1910.1000(e).

In Republic Granite Co., 4 OSHC 1711 (Rev. Comm. 1976), OSHRC vacated a citation for failure to use feasible engineering controls to curb excess exposures to silica dust. Exposure to silica dust can result in silicosis, a serious or fatal lung disease. See generally Hermitage Concrete Pipe Co., 3 OSHC 1920, 1922-23 (Rev. Comm.), appeal filed, No. 76-1316 (6th Cir. Mar. 17, 1976). Commissioner Moran determined that the workers received equivalent protection from respirators, and that the use of the engineering controls would cause a significant decrease in the quality and marketability of the employer's product, and would make the company non-competitive. He stated that these factors must be balanced to determine feasibility and judged that economic loss was unwarranted since it would be balanced by no additional health protection. 4 OSHC at 1712-13. In concurring, Barnako rejected the notion of competitive disadvantage, stating that "[i]f respondent is required by the standard to use [controls], its competitors must do so." \(^{286}\) Id. at 1713. Commissioner Cleary dissented on essentially the same grounds as he had in the noise cases. \(^{286}\) Id. at 1714-15. In a similar case, Worley Bros. Granite Co., 4 OSHC 2043 (Rev. Comm. 1977), Cleary again dissented, stating that concerns regarding marketability go only to the fashioning of an abatement order and not to an employer's duty to implement feasible controls.
This examination of the Commission decisions begins with the basis advanced by Commissioner Barnako for the interpretation of the noise standard to require cost-benefit balancing:

Although Congress intended that standards be economically feasible, the history of this standard reveals that no attention to this factor was necessarily paid in its promulgation. The standard was first promulgated pursuant to the Walsh-Healey Act [41 U.S.C. § 35 (1970)], which contained no requirement that economic feasibility be considered. It was then, under [§ 6(a)] of this Act, made applicable to all employers throughout the country pursuant to procedures which precluded further consideration of its economic feasibility. . . . Thus, were we to hold that economic feasibility is irrelevant in enforcing the standard, the consequence would be that the standard would be applied without any consideration having been given to its economic consequences, either on a national basis or on an industry-by-industry basis. Such a result would be inconsistent with the intent of Congress as expressed by the Court in Industrial Union Department, AFL-CIO v. Hodgson.27

Thus, to meet "the intent of Congress," OSHRC grafted a cost-benefit test onto the standard.

From the outset, Commissioner Barnako’s analysis is erroneous, stemming from his misapplication of the Industrial Union Dep’t case. In that decision, the court addressed OSHA’s role in promulgating permanent standards under section 6(b)(5), holding that OSHA may consider economic feasibility as a limitation in setting the most stringent requirements. The decision does not address the promulgation of a section 6(a) standard, nor did Congress intend that feasibility, much less economic feasibility, be considered under that section. Rather, this case addresses itself to the Secretary’s role in promulgating section 6(b)(5) permanent standards, holding that OSHA may consider economic feasibility as a limitation to setting such permanent standards.288 Indeed, Barnako’s interpretation directly contradicts Congress’ requirement that OSHA summarily adopt established federal standards such as the noise standard, without further considerations where they had been subject to prior procedural and substantive scrutiny.289

Under the guise of interpreting the term "feasible," OSHRC has impermissibly questioned the wisdom and validity of the noise standard, and has done precisely what the exclusivity of section 6(f) pre-enforcement review was designed to prevent; i.e., OSHRC has substituted its judgment

As Barnako proposes to balance individual cost-benefit factors in every case, see note 275 supra, we seriously question whether his approach would ever result in uniform industry use of engineering controls.

287. Continental Can Co., 4 OSHC at 1547.
289. See text accompanying notes 46-48 supra. See also note 258 supra.
for that which was delegated to OSHA. Although OSHRC could properly interpret the term "feasible" so as to require OSHA to make a limited showing on the economics of a standard, its cost-benefit approach goes much further. Although the Commission acknowledges the stated primacy of engineering controls in the noise standard, its test effectively precludes their required implementation since cost-benefit equations cannot be reliably developed in this area due to a lack of relevant information and differences in valuation.

The mandated consideration of cost-benefit factors, as discussed by OSHRC, has no place in the review of standards' enforcement against an individual employer. Cost-benefit analysis "is an economic tool with which decision makers can estimate whether a governmental intervention will increase or decrease welfare," measured as "the sum of the value of goods, services, jobs and profits, minus the value of health and environmental damages." The difficulty with this approach is that the positive, preventive effect of health standards on human life cannot be effectively quantified in numerical or dollar amounts for inclusion in a cost-benefit analysis. The observations of several commentators with regard to applying cost-benefit analysis to air pollution standards apply with equal force to health standards:

While it is indisputable that some air pollutants endanger health, there is relatively little sophisticated information on cause/effect relationships between certain levels of particular pollutants and amounts of public health damage.

The economic, technological, and social relationships relevant to air pollution standards are largely unknown. It is difficult to predict the cost and difficulty of meeting a regulation as well as its long-range impacts of capital and employment dislocations.

All of these uncertainties make conclusive, "scientific" benefit/cost calculations impossible.

The greatest stumbling block to the utility of benefit/cost analysis is the problem of valuation. This is especially true in a field where industry has been able to quantify the cost of abating pollution better than the government and environmentalists have been able to quantify the cost of pollution's damage. The barrage of cost data presented by industry spokesmen goes largely unanswered by equally specific data on damage costs.

Our society rebels against assigning dollar values to intangibles such as human lives, health, and comfort, or to the ecological and aesthetic importance of an endangered species or a degraded atmosphere. A life is worth more than the actuarial value of a person's

290. See text accompanying notes 92-108 supra.
291. See note 275 supra.
future earnings. Health and environmental costs are fundamentally incommensurate with costs of pollution control.\textsuperscript{293}

Requiring strict "proof" in enforcement or standard setting proceedings that a standard's requirement effect an increase in "welfare" ignores what has been uniformly recognized in the court decisions discussed in Sections II and III—that the regulation of safety and health primarily involves policy questions which have been delegated to OSHA under OSH Act.

Other arguments against cost-benefit analysis are founded on basic principles which are essential to the continued effectiveness of the Act. First, the insertion of cost-benefit determinations into every application of a "feasible" performance standard would severely reduce the possibility of uniform application of these standards. As recognized by Congress, such uniform application is necessary to prevent intra- or inter-industry competition from undermining compliance.\textsuperscript{294} Secondly, as discussed above, a cost-

\begin{itemize}
\item \textsuperscript{293} Id. at 166-67 (citations omitted). We further suggest that cost-benefit analysis is of only limited utility in standard setting. As discussed in Note, \textit{Cost-Benefit Analysis and the National Environmental Policy Act of 1969}, 24 STAN. L. REV. 1092, 1105-06 (1972) with regard to water resource project evaluation:
\begin{itemize}
\item The above discussion of limitations and abuses is not meant to suggest that cost-benefit analysis be rejected as a mode of analysis in government investment decisions; rather it is meant to suggest that the legitimate role of cost-benefit analysis may be so limited that it would be unwise to attempt to use cost-benefit analysis for purposes or in contexts in which it is not now used. Although cost-benefit analysis suffers from severe limitations and is subject to abuse, it has a legitimate role to play in weeding out the least efficient proposed government investments. The actual application of cost-benefit analysis to water resources project evaluation has been limited for the most part to this function of weeding out the worst projects: those projects which manifest a benefit-cost ratio of less than one are rejected; other factors then determine which of the remaining projects will in fact be constructed. Cost-benefit analysis therefore serves as an obstacle to, but not a criterion for, project approval.
\end{itemize}
\item The issues of information and valuation under OSHA become even more complex when dealing with carcinogens which pass through the placenta of pregnant women and localize in fetal tissue or which have carcinogenic effects in later generations not directly exposed to carcinogens in utero. See Rice, \textit{An Overview of Transplacental Chemical Carcinogenesis}, 8 TERATOLOGY 113 (1973). For a discussion and further citations with regard to the effects of toxic substances on men, women and their offspring, see Samuelson, \textit{Employment Rights of Women in the Toxic Workplace}, 65 CALIF. L. REV. 1113 (1977).
\item \textsuperscript{294} See LEG. HISTORY, supra note 33, at 144; note 286 supra. As the Senate Committee Report stated,
\begin{itemize}
\item Although many employers in all industries have demonstrated an exemplary concern for health and safety in the workplace, their efforts are too often undercut by those who are not so concerned. Moreover, the fact is that many employers—particularly smaller ones—simply cannot make the necessary investment in health and safety, and survive competitively, unless all are compelled to do so.
\end{itemize}
\item Senate Report, supra note 33, at 4.
\end{itemize}

The House Report stated:

[U]niform national standards must be promulgated and enforced to assure equal protection to both workers and employers. Otherwise, an employer investing in current occupational health precautions would receive no future benefits, not even in the reduction of workmen's compensation costs. He might be paying for the past neglect of another employer. Uniform enforcement will also reduce or eliminate the disadvantage that a conscientious employer might experience where inter-industry or intra-industry competition is present.
benefit enforcement analysis cuts against the stated primacy of instituting engineering and administrative controls over the use of personal protective equipment. The rationale behind the preference for controls is sound and consistent with the Congressional purpose of assuring healthful working conditions "so far as possible." Finally, the Commission's use of a cost-benefit analysis blunts the technology-forcing thrust of the Act. The research, development, and implementation of new technology to control employee exposure is initially an expensive process. These efforts, however, will likely produce effective controls which can be incorporated into new facilities at a much lower cost. Permitting an employer to rely on personal protective equipment to comply with the Act, because controls are too expensive, reduces the incentive to investigate new and more effective compliance methods and rewards industry inaction in coping with safety and health hazards.

OSHRC and the courts should reject any further use of cost-benefit balancing in determining in an enforcement proceeding whether particular controls are economically feasible. Instead, where a standard adopted under section 6(a) uses the term "feasible" to qualify the implementation of engineering controls, OSHA should be required to make a prima facie showing as to the existence of controls which are generally applicable to the cited hazard. This would afford an employer adequate notice of the requirements allegedly violated under the standard. The employer would then have the burden of showing that the suggested controls are technologically or economically infeasible as to its operation. The showing would involve

LEG. HISTORY, supra note 33, at 144, 854; House Report, supra note 43, at 24. See also the remarks of Senator Ralph Yarborough, former chairman of the Senate Labor Committee:

[In 1968, when Congressman O'Hara and I introduced into the House and Senate the first comprehensive occupational health and safety bill, we drew the critical fire of several organizations who claim that legislation of this type is too expensive. 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? . . . [F]or the widow trying to raise her children on meager allowance under workmen's compensation and social security? . . . That is what we are dealing with when we talk about industrial safety. We should have uniform standards so that no one industry would gain an advantage over any other industry. It would be far cheaper for our economy . . . . We are talking about people's lives, not the indifference of some cost accountant. We are talking about assuring the men and women who work in our plants and factories that they will go home after a day's work with their bodies intact."


295. See note 16 supra.

296. Congress hoped to achieve its objective of preventing accidents by encouraging employers "to institute new and to perfect existing programs for providing safe and healthful working conditions." Brennan v. OSHRC (Cerosa), 491 F.2d 1340, 1343 (2d Cir. 1974) (quoting from OSH Act § 2(1), 29 U.S.C. § 651(1) (1970)).

297. In determining whether an employer can sustain the costs of compliance, the possible reduction of his tax burden because of the implementation of engineering controls and other required compliance methods should be considered. At present an employer can reduce his tax burden by depreciating the cost of property used in his business, e.g., engineering controls,
the same considerations relevant to the technological impossibility and "as applied" economic infeasibility defense.\textsuperscript{298} This approach accords with the view set forth in this Article that feasibility issues properly go to the ability of the industry as a whole to comply and do not turn on the capabilities of a single employer. More importantly, it supports the employer's obligation under OSH Act to discover and correct proscribed hazards before any inspector arrives, and to engage in the research and development of new methods of compliance.\textsuperscript{299}

It is not necessary to require OSHA to make any prima facie showing on economics with regard to section 6(a) "feasible" standards. The Act did not require that feasibility, much less economic feasibility, be considered in their summary promulgation, as Congress assumed that a national consensus standard would not have been approved and an established federal standard would not have been previously adopted if they could not be complied with financially by a substantial portion of employers. In any case, if OSHA demonstrates the general applicability of suggested controls, such a showing implies that they are generally affordable, \textit{i.e.}, economically feasible.\textsuperscript{300}


In February of 1978, Congressman John Anderson and Congressman Steiger introduced separate bills in the House of Representatives which would amend the Internal Revenue Code of 1954 to provide for rapid amortization by employers of "OSHA-required property" such as engineering controls. H.R. 10692, 95th Cong., 2d Sess. (1978) (Anderson bill, permitting 24-month amortization); H.R. 11078, 95th Cong., 2d Sess. (1978) (Steiger bill, permitting 12-month amortization). Their approach is similar to that taken with regard to pollution control facilities, whose costs may be amortized or "written-off" over five years instead of their useful life. I.R.C. § 167 (1976). We strongly support the use of tax incentives to encourage the implementation of engineering controls and to ease the burden of their cost. Such an approach would greatly aid small businesses, which normally could not sustain a large short-term capital outlay. Moreover, in industries which are already suffering from strong competition from foreign goods, \textit{e.g.}, the steel industry, rapid amortization would, at least temporarily, reduce the need to pass on compliance costs to consumers, perhaps give greater economic relief than full use of the investment tax credit, and would not appreciably reduce overall long-term tax revenues. \textit{See} I.R.C. §§ 46(c)(5) (1976); 124 CONG. REC. E315 (daily ed. Feb. 1, 1978) (Statement of Rep. Anderson); Testimony of Congressman Steiger submitted to the House Ways and Means Committee (April 6, 1978) (suggesting the alternative of "a one year expensing of OSH Act expenditures" in lieu of rapid amortization). \textit{See also Smith, The Feasibility of an "Injury Tax" Approach to Occupational Safety, 38 L. & CONTEMP. PROB. 730 (1974).}

\textsuperscript{298} See text accompanying notes 233-252 supra. We note, however, that the employer would not have to demonstrate that a variance would be inappropriate as all effective engineering controls are per se required by a "feasible" standard.

In judging whether a standard as applied to an individual employer is "feasible," it would be appropriate to consider whether an abatement plan could be fashioned to encompass the employer's financial condition by requiring progressive implementation of engineering controls along with strict use of personal protective equipment.


\textsuperscript{300} To require the Secretary to make a minimal showing, such as that the suggested controls are "simple and economical," misses the point. An employer's duty to implement "feasible" controls stems from the fact that they are generally within the technological and economic capabilities of other employers engaged in similar work. Moreover, whether a
In the event that OSHRC continues to follow Commissioner Barnako's interpretation of the term "feasible" as used in section 6(a) health standards, the question of whether it applies to permanent standards for toxic substances will become important. The provisions of the permanent vinyl chloride standard follow those of the noise standard rather closely. The term "feasible" is unmodified, and nothing in the rulemaking record affirmatively suggests that OSHA intended to limit the meaning of the term. Thus, on the face of the standard, Barnako's interpretation could apply, allowing OSHRC to weigh the costs and benefits of controls.

However, Commissioner Barnako's imposition of a cost-benefit analysis is based on his assertion that no consideration was given to economic feasibility in the promulgation of the noise standard. This is not the case with the vinyl chloride standard, nor with any of the other recently promulgated health standards. Feasibility must be considered in the promulgation of section 6(b)(5) standards and the term has been interpreted to include economic as well as technological considerations. In such a case, it would clearly be erroneous for OSHRC to re-evaluate the economic determinations made during promulgation by applying a cost-benefit analysis in enforcement. Similarly, this reasoning would apply to reject Commissioner Barnako's requirement that OSHA demonstrate the specific controls an employer should implement, since with section 6(b)(5) standards it has already been determined that controls are technologically feasible for the affected industry. Challenges to the economic and technological feasibility of permanent standards are limited to section 6(f) pre-enforcement review.

Perhaps in reaction to adverse decisions on feasibility, the later permanent health standards specify that controls must be implemented unless they are "technologically not feasible" or "except to the extent that the employer can establish that such controls are not feasible." This approach recognizes that where a standard has been found to be technologically and economically feasible for an industry during rulemaking, OSHA's prima facie burden in enforcement is limited to proof that controls contemplated by the standard were not implemented. It likewise affirms that it is the employer's burden to prove that controls are infeasible as applied to its facilities. These new standards remain to be tested before OSHRC. They will be discussed in detail in Section IV.

D. Summary of the Doctrine of Feasibility in Standards Enforcement

The enforcement of specification standards adopted under section 6(a),
and the general duty clause has produced a body of feasibility doctrine, consistent with that found in pre-enforcement decisions. OSHRC and the courts have recognized two affirmative defenses to the enforcement of section 6(a) specification standards—technological impossibility and economic infeasibility "as applied." The economic infeasibility defense goes only to validity of a standard "as applied" to a particular employer; underlying validity of a standard may not be considered at the enforcement stage. OSHRC and the courts have erred in their failure to strictly require the use of variance and abatement procedures before considering these defenses.

In reviewing section 6(a) performance standards requiring engineering controls which contain the term "feasible", OSHRC and one court have impermissibly substituted their judgment for OSHA's through an interpretation of the term to require cost-benefit analysis. Such analysis has no reliable basis in the review of standards' enforcement under OSH Act, which mandates its own system of setting and enforcing standards based on the interpretations, factual determinations, and policy judgments of OSHA, subject to specified standards of review. While it is unlikely that cost-benefit analysis will be extended to the review of the enforcement of permanent standards for toxic substances, OSHA should clarify its views and determinations of feasibility during standards' promulgation. OSHA should set standards which, by their terms and underlying considerations, afford OSHRC and the courts limited justification for reviewing the Secretary's interpretation of the term "feasible" when used in a standard.

IV
THE TREATMENT OF FEASIBILITY IN RECENTLY PROMULGATED OR PROPOSED STANDARDS

In late 1976, after a two year hiatus following the promulgation of the vinyl chloride standard, OSHA recommenced setting standards for toxic substances. This Section considers three of OSHA's major recent actions. In October, 1976, OSHA promulgated a permanent standard for coke oven emissions,\(^{304}\) and in November, 1977, the agency proposed a permanent standard for DBCP.\(^ {305}\) Most important, in October, 1977, OSHA proposed generic criteria and model standards for regulating large numbers of carcinogens.\(^ {306}\) In these actions, OSHA is applying and extending the feasibility


\(^{305}\) Standard for DBCP, supra note 8.

doctrine developed through the setting and review of the earlier permanent standards. The agency is also responding to some of OSHRC's doctrine concerning the interpretation of the term "feasible" used in standards themselves.

A. The Standard for Coke Oven Emissions

In October, 1976, OSHA promulgated a standard to regulate the release of carcinogenic gases, vapors, and dusts from coke ovens.\(^{307}\) The standard replaced the more lenient national consensus standard set in 1971.\(^{308}\) The new standard reflects the most substantial consideration to date of technological and economic feasibility. It also embodies the most extensive combination of performance and specification requirements.

The standard's basic features may be summarized as follows. It applies to all facilities that convert coal into coke.\(^{309}\) The standard establishes a performance requirement which sets a permissible exposure level in terms of the "benzene-soluble fraction of total particulate matter" (BSFTPM) found in workplace air; employees may not be exposed to an eight-hour average exceeding 150 micrograms per cubic meter (ug/m\(^3\)).\(^{310}\) Supplementing the performance requirement, the standard sets out a list of specific engineering and work practice controls which must be used on existing batteries no later than January, 1980.\(^{311}\) The "best available" controls must be instituted on new and rehabilitated batteries.\(^{312}\) Where these measures alone will not reduce exposures to the limit, the standard requires employers to research, develop, and implement new controls capable of doing so.\(^{313}\)


308. 29 C.F.R. §§ 1910.1000 (Table Z-1), 1910.1002 (1976). Under section 1910.1029(f)(1)(i)(a), the old standard remains in effect for existing coke oven batteries until the new standard is completely phased into effect in January, 1980. In the interim, concurrent duties exist: employers must implement controls required under the new standard "at the earliest possible time."

309. 99 percent of the coke ovens conform to essentially the same design. Standard for Coke Oven Emissions, supra note 304, at 46,760. The remaining facilities are of the so-called beehive design. The standard regulates these somewhat differently than the majority design. Compare 29 C.F.R. § 1910.1029(f)(1)(i), (ii) with (iii). See note 335 infra.

310. 29 C.F.R. § 1910.1029(b), (c) (1977). This substance was selected as an indicator of exposure, not as the carcinogen itself. Coke oven emissions are a mixture of many gases and kinds of particulate matter. No one is sure which chemical or chemicals are the cause of the excess types of cancers found among coke oven workers. According to OSHA, levels of BSFTPM are reasonably well correlated with cancer incidence. Standard for Coke Oven Emissions, supra note 304, at 46,752-55.


312. Id. § 1910.1029(f)(1)(ii).

313. Id. § 1910.1029(f)(1)(ii)(b). Presumably, employers could pool their research and development efforts or contract them to other firms.
The ovens must meet more stringent requirements than existing ovens.\textsuperscript{314} Finally, the standard allows use of respirators in place of sole reliance on source controls in more limited circumstances than any previous standard for carcinogens.\textsuperscript{315}

OSHA determined that it must set an exposure limit at the lowest feasible level since no safe level of exposure to coke oven emissions could be identified.\textsuperscript{316} The agency based its choice in large part on the current performance of the most advanced facility in operation. A three-day test at United States Steel's plant in Fairfield, Alabama, the generally acknowledged industry leader in emission control, showed that a 150 ug/m\(^3\) level had been attained for at least one day at all locations monitored. Since this plant did not use all existing source controls, OSHA concluded that its emissions could be reduced even further. Most other coke ovens, being similarly designed and constructed, could be modified to achieve comparable emission levels.\textsuperscript{317} Although some existing plants might not be able to meet the exposure limit solely with currently available controls, OSHA pointed to new technology being tested as evidence that means of compliance could be found. Based on this evidence and its technology-forcing authority, OSHA concluded that the 150 ug/m\(^3\) level was technologically feasible.\textsuperscript{318} The agency further determined that the specified controls established as minimum requirements for existing coke ovens were technologically feasible for "virtually all" installations, given that each control was being used at one or more plants and had been available for some time.\textsuperscript{319}

OSHA analyzed industry's compliance costs for the coke oven emissions standard, the effect of the costs on the economy, and the safety and health benefits of the standard. Although various compliance costs studies spread cost estimates over a range of $130 million to $1.3 billion, OSHA concluded that costs were most likely to be around $200 million,\textsuperscript{320} thereby producing no significant effect on the economy.\textsuperscript{321} OSHA determined that compliance, even using the highest cost estimate, was "well within the financial capability of the coking industry."\textsuperscript{322} After rejecting several methods for evaluating the costs and benefits of the standard, OSHA concluded:

[A]lthough we cannot rationally quantify in dollars the benefits of the standard careful consideration has been given to the question of whether these substantial costs are justified in light of the hazards. OSHA concludes that these costs are necessary in order to ade-

\textsuperscript{314} Compare id. § 1910.1029(f)(1)(ii) with id. § 1910.1029(f)(1)(i).
\textsuperscript{315} Id. § 1910.1029(f)(1)(i)(a), (f)(1)(ii), (f)(1)(iii), (g).
\textsuperscript{316} Standard for Coke Oven Emissions, supra note 304, at 46,755-56.
\textsuperscript{317} Id.
\textsuperscript{318} Id. at 46,756.
\textsuperscript{319} Id. at 46,759-60.
\textsuperscript{320} Id. at 46,748-49.
\textsuperscript{321} Id. at 46,749-50.
\textsuperscript{322} Id. at 46,751.
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quately protect employees from the hazards associated with coke oven emissions. 323

Thus, in OSHA’s judgment, the coke oven standard was economically feasible.

OSHA deserves commendation for the prodigious amount of data, analysis, determinations, and conclusions presented in support of the technological and economic feasibility of the coke oven emissions standard. However, a number of confusing feasibility issues lurk within the requirements of the standard itself.

The coke oven standard requires source controls to achieve substantial and, ultimately, full compliance with its exposure limit. The standard does not permit use of respirators to meet the exposure limit except: (a) during the period needed to install “feasible” source controls; (b) in maintenance and repair work for which source controls are “technologically not feasible”; (c) until “feasible” source controls can achieve full compliance alone; and (d) in emergencies. 324 The specified minimum or best available engineering and work practice controls must be used “except to the extent that the employer can establish that such controls are not feasible.” 325 The standard places the burden of showing the infeasibility of required controls on the employer. 326

This latter provision may relieve OSHA of the burden of proof imposed by OSHRC in several enforcement cases, discussed in Section III, but it leaves the grounds for the infeasibility defense open to interpretation. The standard does not specify whether the defense can be made on economic as well as technological grounds. The discussion of the provision in OSHA’s promulgation statement does not provide a clear answer. 327 The example given there by OSHA suggests that economic factors are implicit in many technological feasibility determinations. But, since OSHA already had determined in the course of promulgating the coke oven emissions standard that its requirements were economically feasible for the coking industry, the agency should not have presented employers with the opportunity to raise individual claims of economic infeasibility. Neither should OSHA present

323. Id.
327. In the Standard for Coke Oven Emissions, supra note 304, OSHA stated:

The question of whether an employer has met its burden of establishing that a particular control or set of controls is infeasible on a particular battery involves the consideration of many complex factors, and a rational balancing process. Factors such as levels of exposure, useful remaining life of the battery, and the efforts made by the employer to implement the control or a reasonable alternative are relevant. For example, if a battery is nearing the end of its useful life, exposures are well in excess of the permissible exposure limit, and effective controls are infeasible because of design, weight or technological factors, OSHA believes that the requirement to implement feasible engineering controls would include rehabilitation [of] the battery or building a new battery which would accommodate the controls.

Id. at 46,760.
OSHRC the opportunity to ascertain whether such claims can be raised. The standard properly allows employer claims of technological infeasibility, since OSHA recognized that not all required controls will be feasible for every employer. Of course, the employer that successfully demonstrates the infeasibility of a particular control still remains subject to all the other requirements of the standard.

The requirement that "best available" controls be implemented on new and rehabilitated coke oven batteries leaves for enforcement proceedings determination of whether newly developed controls are feasible. Furthermore, the research and development program provision, first used by OSHA in the coke oven emissions standard, raises the question whether such a program is a feasible requirement in itself. OSHA did not indicate the limits of the obligation in the standard or its background statement.

The coke oven standard was recently challenged in the Third Circuit Court of Appeals, in American Iron & Steel Institute v. OSHA. The industry's major contentions regarding feasibility were that the Fairfield plant tests did not support the 150 ug/m³ exposure limit and that an "open-ended" research and development requirement was more than OSHA may impose under its technology-forcing authority. In March, 1978, the Third Circuit Court of Appeals decided the case. It rejected industry claims that the coke oven emission standard's exposure limit was not technologically or economically feasible. The court found that the "industry leader" approach provided a sufficient basis for OSHA's choice of the 150 ug/m³ exposure limit. Furthermore, the court was not convinced that implementation of the standard would have a traumatic economic effect on industry and concluded that OSHA had sufficient data to properly balance industry compliance costs against employee health needs in judging the standard's economic feasibility. However, the court held that the standard's open-ended research and development requirement exceeded OSHA's authority under section 6(b)(5) of the OSH Act and vacated that provision.

As to the other aspects of the standard, the court found substantial evidence in the record to support the mandated controls and procedures, noting that although one or more controls may not be practicable at some coke oven batteries, the standard allows an exception for the employer that proves particular controls are not feasible. Additionally, the court found

328. F.2d --, 6 OSHC 1451 (3rd Cir. 1978).
330. F.2d --, 6 OSHC at 1457.
331. Id. at --, 6 OSHC at 1459.
332. The court stated: "The statute does not permit the Secretary to place an affirmative duty on each employer to research and develop new technology. Moreover, the speculative nature of the research and development provisions renders any assessment of feasibility practically impossible." Id. at --, 6 OSHC at 1461.
333. Id. at --, 6 OSHC at 1461-62.
the burden of proof imposed on an employer to obtain a permanent variance from a health standard to be neither unreasonable nor an undue hardship. It remanded the case to OSHA for further consideration of the application of the standard to non-coke oven employees exposed to coke oven emissions. Lastly, the court vacated a requirement concerning a qualitative fit test for respirators which OSHA had conceded was unsupported by the record. The standard was affirmed in all other respects.

The extensive consideration of technological and economic issues, the use of the industry leader as the benchmark for the exposure limit, and the specification of numerous particular requirements in the standard for coke oven emissions all stand out as improvements over OSHA's past practice in setting standards. However, there are two reasons why such detail will not be seen in many standards or preambles. First, OSHA took a long time to prepare this standard, held unusually extensive promulgation hearings, and compiled an extraordinarily detailed record on these issues. If OSHA begins to set more standards, it will not have as much time and resources to devote to any one hazard. Second, the coke oven industry is unusually homogeneous; nearly all facilities conform to the same basic design. Therefore, the control capabilities of the industry leader fairly approximated what other facilities could accomplish. There are few instances in which the homogeneity of the regulated industry is so pronounced. Nevertheless, it should be possible in many instances to divide the industries subject to a given standard into subgroups of technologically similar facilities. Among each subgroup, it should be possible to identify the cleanest facility and to set the exposure limit for the subgroup according to that facility's control capabilities. It should also be possible to identify some minimum specifications feasible for all members of the subgroup. The extra effort at this stage will often be rewarded by the promulgation of a standard that is both stricter and easier to enforce.

B. The Proposed Standard for DBCP

In March, 1978, OSHA promulgated a permanent standard for DBCP. DBCP is a pesticide which was discovered in 1976 to cause

334. Id. at —, 6 OSHC at 1461.
335. The exceptions are the so-called beehive ovens, making up about one percent of the facilities. The standard subjects them to the same exposure limit as the rest. Control requirements for these ovens are somewhat more relaxed, however. Employers with such facilities are required to meet the limit through the use of source controls "at the earliest possible time, . . . except to the extent that the employer can establish that such controls are not feasible." 29 C.F.R. § 1910.1029(f)(1)(iii) (1977). These employers are not held to a specific timetable or to a research and development program. Nonetheless, the preamble to the standard presents no evidence that the 150 ug/m³ limit is technologically or economically feasible for these facilities. The differences between these types of facilities may be important. However, none of the petitioners raised the point.
336. Standard for DBCP, supra note 8. The standard went into effect on April 17, 1978 and
sterility in male employees who manufacture it. It is also a suspected carcinogen. Because DBCP was not previously regulated by any OSHA standard, in September, 1977, OSHA set an emergency temporary standard limiting DBCP exposures in workplace air to ten parts per billion (ppb). The permanent standard reduces the limit further, to one ppb. Like other standards, it would place primary reliance on source controls, to be supplemented by personal protective equipment.

The promulgation of the DBCP standard is significant because for the first time it appears that an OSHA standard will eliminate all domestic production of a chemical. After hearing of the standard’s promulgation, the two domestic manufacturers announced that they will not resume DBCP production due to the costs of complying with the exposure levels in the standard. The chemical continues to be manufactured outside of the United States, however, and will be imported under the exemption in the standard for sealed and intact containers. Additionally, the standard does not regulate exposure to DBCP resulting solely from its use as a pesticide. The responsibility for regulating the use of DBCP as a pesticide rests with the Environmental Protection Agency. Since EPA has already issued two suspension orders concerning DBCP and holds out the possibility of discontinuing all uses of the chemical as a pesticide, the combined effect of OSHA’s standard and EPA regulation might be totally to eliminate the use of DBCP.

is codified in 29 C.F.R. § 1910.1044. The emergency temporary standard previously occupied this number. OSHA, Emergency Temporary Standard for Occupational Exposure to 1,2 Dibromo-3-chloropropane (DBCP); Hearing, 42 Fed. Reg. 45,536 (1977).

337. 43 Fed. Reg. at 11,516-17.
339. 29 C.F.R. § 1910.1044(c); Standard for DBCP, supra note 8 at 11,527.
340. 29 C.F.R. § 1910.1044(g); Standard for DBCP, supra note 8, at 11,528.
342. Id. at 82. The exemption for sealed and intact containers is found in 29 C.F.R. § 1910.1044(a)(2)(ii); Standard for DBCP, supra note 8 at 11,527.
343. 29 C.F.R. §1910.1044(a)(2)(ii); Standard for DBCP, supra note 8 at 11,527.
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The DBCP standard brings OSHA one step closer to the combination of factors described in *AFL-CIO v. Brennan* where there are industrial activities involving hazards so great and of such little social utility that [OSHA] would be justified in concluding that their total prohibition is proper if there is no technologically feasible method of eliminating the operational hazard. In issuing the proposed standard, OSHA noted the possibility that the permanent standard's requirements might render DBCP production unprofitable, thereby causing production to cease. However, in light of the evidence submitted during the rulemaking proceedings, OSHA determined that compliance with the standard would be economically feasible and did not expect manufacture of the chemical to discontinue. In making its finding of feasibility, OSHA "considered the relative sophistication of the companies presently manufacturing DBCP" and concluded that they would implement the specified controls given the favorable economic incentives to continuing production of the chemical. Although, in OSHA's view, DBCP did not squarely present the issue posed in *AFL-CIO v. Brennan*, of deliberately enacting a standard to totally prohibit an industrial activity of little social utility, in the future OSHA should not shy away from such a result if supported by the evidence.

C. The Proposed Model Standards for Carcinogens

Recognizing that it has issued very few permanent standards for toxic substances, OSHA recently proposed an approach to regulating carcinogens that promises to remove some of the bottlenecks in the standards development process. In October, 1977, OSHA proposed generic criteria and model standards for identifying and regulating carcinogenic chemicals. The proposal would establish certain principles for defining and controlling carcinogens; these issues would be foreclosed from re-examination in subsequent proceedings to set a standard for a particular substance.

The bulk of the proposal discusses certain issues about the nature of cancer and how it is caused that are not presently capable of definitive

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345. 530 F.2d 109, 121 (3d Cir. 1975). See text accompanying note 195 supra.
346. Proposed Standard for DBCP, supra note 8, at 57,275-76.
347. Standard for DBCP, supra note 8, at 11,520.
348. Id. at 11,519-20. OSHA estimated the compliance costs for each plant manufacturing DBCP to be approximately $1,100,000 coupled with an annual operating cost of approximately $50,000. Amortizing the capital costs and including the annual operating costs, OSHA concluded that the continued production of DBCP appeared economically feasible in light of the United States Department of Agriculture estimate of $300 million in crop losses should DBCP not be available.
350. Id. at 54,148-49. OSHA would adopt a model emergency temporary standard and two model permanent standards. One would be for substances which meet the agency's criteria for treatment as a carcinogen. The other would be for substances which meet only some of the
scientific resolution, but which critically affect whether and how a substance shall be regulated. To decide what action to take, OSHA must make policy judgments resolving the scientific uncertainties. For example, the definitive identification of safe doses for a carcinogen is currently impossible. OSHA has consistently determined that the protective policies of the statute require it to assume that no level of exposure is safe. These issues arise and are resolved in essentially the same manner each time OSHA moves to regulate a carcinogen. To hear and respond to the presentation of the same conflicting and inconclusive evidence, expert testimony, and argument wastes much time and a significant fraction of OSHA’s limited resources. Ultimately, the repetitious consideration of these issues limits the number of chemicals that OSHA can regulate. Consequently, OSHA proposes to dispose of these issues in a single general rulemaking procedure. The resulting rules could be amended in further general proceedings if a significant scientific breakthrough occurred, but they would not be subject to reconsideration in proceedings to set a standard for a particular chemical.\textsuperscript{351}

The proposal also addresses certain general feasibility issues. While most questions of feasibility would remain the subject of the subsequent proceedings regarding individual chemicals,\textsuperscript{352} the proposal would codify two policies adopted in the setting of earlier standards and foreclose them from further consideration: first, the exposure limit for a chemical with no known safe dose must be set at the lowest feasible level;\textsuperscript{353} and second, in permanent standards, the burden would always be on the employer relying on respirators to show the "infeasibility" of source controls.\textsuperscript{354} In addition, the proposal clarifies the role of feasibility considerations in the setting of emergency temporary standards. OSHA would set the exposure limit for an emergency temporary standard at the lowest level it judged could be met "immediately" by the regulated industry, using "any practicable combination of engineering controls, work practices and personal protective devices and equipment."\textsuperscript{355} OSHA affirmed its preference for source controls over personal protective equipment, but stated that it "recognizes, as a very practical matter, that in many instances, the immediate reduction of exposure will be primarily through the use of respiratory protection . . . and the institution of good housekeeping practices" such as covering open contain-
ers of a regulated substance.\textsuperscript{356} This is not a retreat from OSHA’s view that respirators are not an adequate long-term control method, only an acknowledgment that in most instances major technological changes in an industrial operation require more time than the short six-month term of a temporary standard.

The proposal takes a significant step towards recognizing that some hazards, such as the risk of cancer, are serious enough to warrant the complete prohibition of any occupational exposure to a substance. In its previous regulation of carcinogens, OSHA always set exposure limits and control requirements which were within the technological and financial capabilities of affected industries. Now OSHA has proposed that "where there are suitable substitutes that are found to be less hazardous to the worker, no occupational exposure to the toxic substance will be permitted" by the permanent standard.\textsuperscript{357} Such a prohibition might extend to all of a substance’s uses or only to specific applications. Unless the substance could be used in a completely closed system, the prohibition on exposure in effect would ban the chemical’s use.\textsuperscript{358} The frequency with which OSHA will take such action depends on what the agency means by the phrase “suitable substitutes.” Where an alternative chemical is available and can be used at comparable cost, it will be an easy decision; where an alternative chemical costs substantially more, or where its use requires expensive changes in the affected industries’ machinery and processes, the decision will be more difficult for OSHA to make.

OSHA should take its complete prohibition approach further. Some chemicals are not beneficial enough in any case to justify the hazards of working with them. DBCP, discussed above, is an example.\textsuperscript{359} It is appropriate and consistent with the statutory feasibility requirement to set a permanent standard for such a substance which prohibits occupational exposure whether or not substitutes are available. The cost of instituting closed systems, if technologically possible, would most likely not be justified by the commercial value of the substance and the “no exposure” standard would effectively result in banning its continued production.

The proposal tentatively addresses the problem of setting priorities, demonstrating that OSHA is looking for ways to determine which chemicals to regulate first and to what extent. The agency noted that on the basis of data gathered by NIOSH, there are hundreds of substances that fulfill OSHA’s proposed criteria for identifying carcinogens. At a loss for a means of choosing which to regulate first, OSHA suggested taking them in al-

\textsuperscript{356} Id. at 54,176.
\textsuperscript{357} Id. at 54,148, 54,171, 54,174; Proposed 29 C.F.R. § 1990.160(c)(1)(i), (c)(3), id at 54,189.
\textsuperscript{358} Id. at 54,174.
\textsuperscript{359} See text accompanying notes 336-348 supra.
A better priority system can be devised based on the number of workers exposed and the estimated potency of the carcinogen.

The more difficult problem is determining what degree of control is warranted for each substance. As we have noted, OSHA always has treated all cancer hazards as equally serious and has chosen permissible exposure levels, without articulating what degree of burden on an industry it believes is warranted to reduce a given risk. As OSHA begins to regulate larger numbers of toxic substances, the need to make at least some rough distinctions between degrees of hazards, and to consider how great an expenditure for exposure reduction each degree deserves will become more apparent. OSHA raised the possibility in its proposal that quantitative risk estimates may be used in deciding what level of control is feasible in setting individual standards. Such risk estimates might be used to highlight the health benefits which can be achieved by different levels of expenditure for controls. OSHA cautioned, however, that the reliability of extrapolations derived from mathematical models which predict different levels of risk are uncertain because the models are based on assumptions about how cancer is caused that can be neither verified nor disproved.

Risk estimates might be useful in helping to "standardize" OSHA's determinations of feasible levels of exposure. By consistently using a single mathematical model, OSHA could begin to assure that exposure limits reflect roughly comparable balances of risks and benefits. Other variables, of course, are the number of exposed employees, the costs of exposure reduction, and the broad economic impacts of imposing burdens on given industries. These factors might result in the selection of different levels of risk for different substances. Risk estimates must not be accepted, however, as accurate predictions of the health effects to be expected from lower doses. There simply is not yet enough information to justify reliance on the accuracy of any particular model.

The proposed generic criteria and model standards have aroused extreme controversy. Some critics honestly disagree with OSHA's positions.

360. Proposed Generic Criteria and Model Standards for Carcinogens, supra note 7, at 54,169-70. For a better method, see Slesin & Sandler, supra note 349.

361. OSHA stated:

While OSHA is of the view that "threshold" or "no-effect" levels cannot be set for chemical carcinogens, some have said that it may be desirable to attempt to quantify risk for the purpose of evaluating the expense and level of control considered feasible in view of the risk posed by any given substance. However, because [of the difficulties in predicting the effects of low exposures to carcinogens], it appears that such consideration should apply, if at all, only at the point of considering the feasibility of the regulatory provisions of any given standard—not the risk as determined pursuant to this proposed regulatory framework.

Id. at 54,167.

362. Id.

on the scientific issues that the proposal covers. Others desire OSHA’s case-by-case approach to continue, because it limits the number of chemicals OSHA can regulate. Hearings were scheduled for May, 1978. Legal challenges to OSHA’s final regulations can be expected.

D. Summary of Feasibility Doctrine from the Recent Standards and Proposals

The recently promulgated and proposed permanent standards for toxic substances follow the doctrine on feasibility developed in the setting and review of the “early” standards, with several notable new developments. The coke oven emissions standard is the first to key requirements of the standard to the compliance capabilities of the industry leader, rather than to the less advanced employers in an industry. Furthermore, by specifying particular controls to be used, OSHA limits OSHRC’s power to determine the standard’s requirements through interpretation of the term “feasible”.

The standard for DBCP is the first to impose requirements which might effectively ban production and use of a substance in light of its health hazards. The proposed standard would require complete reconstruction of the facilities for producing the chemical, at a cost probably not justified by its limited usefulness. OSHA may have broken an important psychological and political barrier when it promulgated such a standard.

The proposed generic criteria and model standards for carcinogens represent a pioneering effort to develop a consistent, coordinated approach to toxic substance hazards and to speed up the individual rulemaking process. OSHA takes a major step forward in proposing that no exposure will be permitted to carcinogenic substances for which safer substitutes exist.

All the standards and proposals shift the burden of proof on the “feasibility” of source controls to the employer that wishes to rely on personal protective equipment. This places the burden on the party with the greatest access to relevant information. The shift may give rise to attacks for making these standards too onerous; however, it still leaves interpretation of what is not “feasible” to OSHRC in enforcement actions.

V

CONCLUSION

Without sufficient guidance from Congress, OSHA, OSHRC, and the courts have been uncertain of their roles in implementing the Occupational Safety and Health Act, particularly with regard to their duties surrounding issues of technological and economic feasibility. This Article’s analysis shows the slow development of a large body of doctrine out of a single, tantalizingly vague word. The statute calls for OSHA to strike a compromise between the achievement of absolute safety and the maintenance of the economic status quo. In setting the “early” permanent standards, OSHA
failed to address the terms of the compromise with much precision. In reviewing those standards, the courts generally were able to state only broad outer boundaries for this compromise. In recent actions demonstrating its intent to regulate more substances more stringently, OSHA has shown a greater sophistication in handling the balancing process. To successfully achieve a more ambitious regulation of substances, OSHA must give increased consideration to which chemicals should have priority and what degree of control is warranted for given degrees of risk.

OSHRC and the courts have erred in enforcement cases by considering individual employer exemptions from compliance with standards, without consistently requiring prior resort to statutory variance and abatement provisions. Several courts have considered validity issues in testing the economic infeasibility of a standard’s requirements in enforcement proceedings. While OSHRC and courts may consider the economic effects of a standard “as applied” to a particular employer, they lack statutory authority to question the underlying validity of a standard at the enforcement stage. OSHRC and the Seventh Circuit have interpreted section 6(a) standards containing the term “feasible” to require weighing the costs and benefits of implementing engineering controls as a measure of the duty of compliance. The effect of these decisions has been to allow employers to rely on relatively inexpensive but less reliable personal protective equipment, reversing the order of priorities set forth in these health standards.

To a large extent, however, OSHRC’s role is ultimately under OSHA’s control, as the latter agency determines whether the term “feasible” should be in the standard at all. OSHA’s use of extensive specifications in the coke oven emissions standard and its shift of the burden of proof on “feasibility” in recent standards should limit the adverse consequences of OSHRC’s interpretation.

The next few years are critical to determining if the Occupational Safety and Health Act will succeed in reducing the unacceptably great hazards of toxic substances in the workplace. The success of the effort largely depends on how OSHA, OSHRC, and the courts develop feasibility doctrine in this period.