

**CORROSION PROOF FITTINGS v. EPA: NO DEATH
PENALTY FOR ASBESTOS UNDER TSCA**

INTRODUCTION

Regulation of toxic substances remains one of the most troublesome environmental law issues confronting the legal community and regulatory bodies. The debate concerning toxic substance regulation is in response to both the increasingly large number of substances introduced into commerce,¹ and a greater awareness of the potential negative health effects of existing substances to which the public is exposed.² Paradoxically, as new substances are introduced, the great majority remain unregulated.³

The recognition that significant numbers of toxic materials are used commercially, but that very few are regulated, has led to criticism of both the existing statutes controlling toxic substances, and the process of judicial review as it has been applied to agency regulations that implement toxic substance statutes.⁴ Critics often cite the small numbers of substances regulated and the delay associated with removing toxic substances as proof that existing statutes are either too cumber-

¹ It is estimated that between 1000 and 3000 new substances appear in the workplace every year. Charles Noble, *Keeping OSHA's Feet to the Fire*, TECH. REV., Feb.-Mar., 1992, at 44. These substances appear in a myriad of products; in 1983, OSHA estimated that as many as 575,000 chemical products might be in use. 48 Fed. Reg. 53,280 (1983).

² Typical examples of such substances include asbestos, radon, and polychlorinated biphenyls (PCB's). Increased awareness of their potency or prevalence has led to special control measures in the Toxic Substances Control Act (TSCA), 15 U.S.C. §§ 2601-2671 (1988). Specifically, an asbestos abatement program for schools is established (§§ 2641-2656), a radon reduction program is established (§§ 2661-2671), and a requirement is instituted that PCB's may be used only when "totally enclosed" (§ 2605(e)).

³ Noble, *supra* note 1, at 44 (estimating that less than 25 percent of identified carcinogens in the workplace are regulated). See Sanford E. Gaines, *Science, Politics, and the Management of Toxic Risks Through Law*, 30 JURIMETRICS J. 271 (1990) (noting the "regulatory paralysis" and providing the following statistics: Under section 112 of the Clean Air Act, 42 U.S.C. § 7412 (1982) the EPA has issued final regulations to control emissions of only eight different air pollutants; under the Clean Water Act, 33 U.S.C. § 1317(a) (1987), effluent standards have been established for only six water pollutants, and no new standards have been issued for 12 years. The TSCA has been used to issue only four rules to reduce chemical exposures (including asbestos)).

⁴ See Noble, *supra* note 1, at 51; Cynthia Ruggiero, *Referral of Toxic Chemical Regulation Under The Toxic Substances Control Act: EPA's Administrative Dumping Ground*, 17 B.C. ENVTL. AFF. L. REV. 75, 87, 99 (1989).

some,⁵ require unrealistically precise agency judgement and technical analyses to survive judicial scrutiny,⁶ or divert limited agency resources to conform to court decisions with minimal impacts on health or safety.⁷

Criticism of the existing regulatory scheme for toxic substances was renewed after the Fifth Circuit Court of Appeals' decision in *Corrosion Proof Fittings v. EPA*,⁸ which vacated the Environmental Protection Agency's (EPA) ban on the future importation, manufacture, distribution, and processing of asbestos in almost all products.⁹ The EPA ban was the first use of section 6 of the Toxic Substances Control Act (TSCA),¹⁰ to impose a comprehensive ban on a material across several industries.¹¹ The order vacating the ban followed almost ten years of EPA rulemaking during which the effects of asbestos fibers were reviewed.¹²

⁵ See Ruggiero, *supra* note 4, at 75.; See also Mary L. Lyndon, *Information Economics and Chemical Toxicity: Designing Laws To Produce And Use Data*, 87 MICH. L. REV. 1795 (1989) (need for information on chemical toxicity not being met by the TSCA, current regulatory environment creates disincentives to data production); Bruce A. Ackerman, *Reforming Environmental Law*, 37 STAN. L. REV. 1333 (1985) (current uniform pollution standards embodied in regulations act like "Soviet-style central planning", market permit schemes for controlling pollution should be used); Richard B. Stewart, *Economics, Environment, and The Limits of Legal Control*, 9 HARV. ENVTL. L. REV. 1 (1985) (criticizing use of best available technology standards, paper hearing process, and inconsistent regulation of new and existing sources of pollution).

⁶ See, e.g., Howard Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment*, 5 YALE J. ON REG. 89, 116 (1988) (courts require unrealistically precise quantitative data on a substance's health effects); Richard J. Pierce, *Two Problems in Administrative Law: Political Polarity on the District of Columbia Circuit and Judicial Deterrence of Agency Rulemaking*, 1988 DUKE L.J. 300 (demanding judicial review has lengthened rulemaking period to nearly a decade, and has deterred agencies from making rules).

⁷ See, e.g. Latin, *supra* note 6, at 116; Rosemary O'Leary, *The Impact of Federal Court Decisions on the Policies and Administration of the U.S. Environmental Protection Agency*, 41 ADMIN. L. REV. 549, 562 (1989) (citing the dissenting opinion of Judge Wilkey in *Citizens for a Better Environment v. Gorsuch*, 718 F.2d. 117 (D.C. Cir. 1983), which noted that \$7.6 million and 150 staff years of work had been spent to prevent one cancer death every 13 years).

⁸ 947 F.2d 1201 (5th Cir. 1991), *clarified*, 1991 U.S. App. LEXIS 26930 (1991), *reh'g denied*, 1991 U.S. App. LEXIS 28418 (1991).

⁹ *Toxic Substances: Environmentalists Say Asbestos Decision Proves TSCA Inadequate to Control Chemicals*, 22 ENV'T REP. (BNA) 1607 (October 25, 1991); Michael Weisskopf, *Court Voids EPA Ban on Asbestos*, WASH. POST, Oct. 22, 1991, at A19.

¹⁰ 15 U.S.C. §§ 2601-2671 (1988).

¹¹ *Toxic Substances: Court Vacates Asbestos Ban, Phase-Out, Ruling EPA Failed to Consider Alternatives*, 22 ENV'T REP. (BNA) 1606 (Oct. 25, 1991).

¹² An Advance Notice of Proposed Rulemaking (ANPRM) initiated the EPA rulemaking process in 1979. See 44 Fed. Reg. 60,061 (Oct. 17, 1979). The Final Rule was issued in 1989. See Asbestos; Manufacture, Importation, Processing, Distribution in Commerce Prohibitions, 54 Fed. Reg. 29, 460 (1989) (codified at 40 C.F.R. § 763).

Contrary to the criticisms of those who would rewrite toxic substance control statutes, or restrict the scope of judicial review under these statutes, *Corrosion Proof Fittings* illustrates the importance of the substantive protections accorded private parties under the current toxic substances regulatory statutes. In particular, the Fifth Circuit's decision in *Corrosion Proof Fittings* is a case study in how judicial review can prevent inefficient and wasteful regulation of toxic substances. The court's decision recognizes that toxic substances are neither completely safe nor completely unsafe. Rather, according to the court, the opportunity costs¹³ of not using the substance must be balanced against the benefits which would accrue from a ban. The operative question to be asked is: "How safe is safe?"¹⁴

Part I of this Note reviews the regulatory scheme currently in place for toxic substance control. Part II discusses the asbestos industry and EPA positions, and the court's decision in *Corrosion Proof Fittings*. Part III analyzes the court's methodology and offers an alternate economic thesis supporting the court's holding. Part IV concludes that future regulations promulgated under section 6 of the TSCA will be required to be supported by substantial EPA analysis. This supporting data must indicate that a proposed regulation will reduce risks to human health at a reasonable cost.

I. THE REGULATORY SCHEME

Asbestos is a naturally occurring fibrous material which resists heat and many solvents; it has been widely used in cements, fireproof clothing, insulators, motor vehicle brake linings, and building materials such as roofing shingles and insulation.¹⁵ However, asbestos is toxic, and uncontrolled exposure to asbestos fibers can result in mesothelioma, a cancer of the chest and abdominal linings, as well as asbestoses, and lung cancer.¹⁶ The human health effects of asbestos exposure

¹³ Opportunity costs are the highest valued alternative use for the resources which would in this case be devoted to using other, more costly, substitutes for asbestos. For a general definition, see EDWIN MANSFIELD, *MICROECONOMICS* 165 (4th ed. 1982).

¹⁴ See Philip Handler, Introduction to National Academy of Sciences Forum on "How Safe is Safe?" quoted in Harold Green, *The Risk-Benefit Calculus In Safety Determinations*, 43 GEO. WASH. L. REV. 791, at 794 (1975).

¹⁵ *Corrosion Proof Fittings*, 947 F.2d at 1207.

¹⁶ 54 Fed. Reg. 29,460, 29,466 through 29,470 (1989).

have been known for decades.¹⁷ Tragically, thousands of workers were exposed to asbestos before federal regulatory controls were applied. In 1986, it was estimated that past exposures to asbestos would result in 3300 to 12,000 additional cancer cases per year, and that 65,000 other workers were then suffering from asbestoses.¹⁸

A. *The Common Law*

Common law remedies have been sought by workers exposed to asbestos. Thousands of workers have filed tort claims, based on strict product liability.¹⁹ The large volume and procedural difficulties of these cases indicate that individual adjudication is not efficient in the context of toxic substance regulation.²⁰ Asbestos mass tort litigation has grown so cumbersome, that proposals to change the overall judicial approach are being suggested.²¹

B. *Environmental Statutes*

Toxic substances are regulated under several federal environmental statutes, each enacted in response to different problems. No single comprehensive toxic substance control statute exists; asbestos regulation has therefore been piecemeal. For example, asbestos is subject to regulatory action under general environmental statutes such as the Clean Water Act,²² which is used to control asbestos effluents. Additionally, Section 112 of the Clean Air Act²³ declares asbestos a hazardous air pollutant and sets National Emissions Standards For Hazardous Air Pollutants (NESHAPs). These air pollution standards greatly

¹⁷ See *Fischer v. Johns-Manville Corp.*, 512 A.2d 466 (1986) (discussing Johns-Manville's knowledge of asbestoses since the early 1930's).

¹⁸ 51 Fed. Reg. 3738 (1986).

¹⁹ "To date, more than 30,000 personal injury claims have been filed against asbestos manufacturers and producers. An estimated 180,000 additional claims of this type will be on court dockets by the year 2010." *In re School Asbestos Litigation*, 789 F.2d. 996, 1000 (3rd Cir. 1986).

²⁰ *Id.*

²¹ See Steven Parent, Comment, *Judicial Creativity In Dealing With Mass Torts In Bankruptcy*, 13 GEO. MASON U. L. REV. 381 (1990) (reviewing attempts by courts to effectively manage the asbestos litigation).

²² Section 1311 of the Clean Water Act, codified at 33 U.S.C.A. §§ 1251-1387 (1988), is used to control effluents of asbestos and other pollutant discharges.

²³ Section 7412 of the Clean Air Act, codified at 42 U.S.C. §§ 7401-7671(q) (1988), is used to control hazardous air pollutants generally, including asbestos.

reduce asbestos exposures to construction workers and the general public.²⁴

C. *Occupational Safety and Consumer Protection Statutes*

For workers, the Occupational Safety and Health Administration (OSHA) has regulated the eight-hour exposure limit for workers since 1971,²⁵ and has steadily lowered the exposure limit.²⁶ The Mine Safety and Health Administration, acting under the Mine Safety Act, also adopted workplace standards limiting asbestos exposure for workers in pits, mines, and milling operations.²⁷

To limit asbestos exposure to consumers, in 1977 the Consumer Product Safety Commission (CPSC) banned consumer patching compounds and artificial emberizing materials, such as artificial logs, containing respirable asbestos.²⁸ The CPSC later required labeling for certain household products containing asbestos.²⁹ Earlier, in 1972, the Food and Drug Administration banned asbestos in general use garments except when used for thermal protection.³⁰ Finally, the TSCA itself includes provisions for an asbestos remediation program for schools, including identification, isolation, and removal of asbestos hazards.³¹

D. *The Toxic Substances Control Act*

The TSCA is the federal statute which comes closest to creating a comprehensive toxic substance control procedure.³² The TSCA was enacted in 1976 to fill regulatory gaps left by the other federal environ-

²⁴ 38 Fed. Reg. 8820 (1973) (establishing NESHAPs).

²⁵ 36 Fed. Reg. 23,208 (1971) (lowering standard to 5 fibers/cc on temporary basis).

²⁶ 37 Fed. Reg. 11,320 (1971) (retaining 5 fibers/cc limit on permanent basis until Jul. 1, 1976, when 2 fibers/cc limit would take effect).

²⁷ Mine Safety Act, codified at 30 U.S.C. §§ 801-962 (1988), *see* 30 C.F.R. §71.702 (1990) for asbestos exposure limit.

²⁸ The CPSC acted under the Consumer Products Safety Act, 15 U.S.C. §§ 2051-2083 (1988).

²⁹ 51 Fed. Reg. 33,910 (1986).

³⁰ Acting under the Federal Hazardous Substances Act, 15 U.S.C. §§ 1261-77 (1988); the regulation is now codified at 16 C.F.R. § 1500.17 (1991).

³¹ *See supra*, note 2 and accompanying text.

³² Toxic Substances Control Act (TSCA), 15 U.S.C. §§ 2601-2671 (1988).

mental and safety statutes.³³ It allows regulation of a substance based on all of its uses in various media and in multiple industries.³⁴ Three explicit policies are set out in the TSCA: (1) that adequate data be developed with respect to the health effects of chemical substances, (2) that adequate authority exist to regulate chemical substances which present an unreasonable risk of injury, and (3) that this authority be exercised in a manner which does not unduly impede or economically prevent technical innovation.³⁵

Section 6 of the TSCA outlines the EPA's options for regulating a substance presenting a health or environmental risk.³⁶ Prior to any regulatory action, section 6 requires the EPA Administrator to first conclude that a substance presents an "*unreasonable* risk of injury to health or the environment."³⁷ This could include a finding that insufficient data exists to conclude a new substance does not present an unreasonable risk.³⁸ After making such a finding, the administrator may impose regulatory requirements on a substance ranging from the use of warning labels, and the maintenance of processing records, to a complete ban on all commercial uses of a substance.³⁹ The Administrator is directed to impose the "*least* burdensome requirements" which "protect adequately" against the risk posed by a substance.⁴⁰

The procedural provisions of the TSCA contain specific requirements for the involvement and protection of interested parties. These provisions supplement those usually accorded private parties in infor-

³³ 54 Fed. Reg. 29,504 (1989) (noting the patchwork of environmental, occupational safety, and consumer protection statutes). See *supra* notes 19-27 and accompanying text.

³⁴ Congressional Research Service, *Legislative History of the TSCA*, at 407, 411, 722, 733, 737 (1976) [hereinafter *TSCA Leg. Hist.*].

³⁵ 15 U.S.C. §§ 2(b)(1)-(3) (1991).

³⁶ Section 6 of TSCA, Regulation of hazardous chemical substances and mixtures states:

If the Administrator finds that there is a reasonable basis to conclude that the manufacture, processing, distribution in commerce, use, or disposal of a chemical substance or mixture, or that any combination of such activities, presents or will present an unreasonable risk of injury to health or the environment, the Administrator shall by rule apply one or more of the following requirements to such substance or mixture to the extent necessary to protect adequately against such risk using the least burdensome requirements.

15 U.S.C. § 2605 (1988).

³⁷ *Id.* (emphasis added).

³⁸ 15 U.S.C. § 2604(f) (1988).

³⁹ *Id.* §§ 2605(a)(1)-(7) (1988).

⁴⁰ *Id.* § 2605(a) (1991) (emphasis added).

mal rulemaking under the Administrative Procedure Act (APA).⁴¹ When issuing a regulation the EPA must publish a statement detailing the effects of the substance on humans and the environment, the magnitude of human and environmental exposure, the benefits conferred by use of the substance, and the economic effects of the regulation.⁴² The EPA must hold hearings on the proposed regulation and interested parties must be allowed to cross examine witnesses if issues of material fact are disputed.⁴³ Judicial review of proposed regulations is specifically provided for in section 19.⁴⁴ The reviewing court is obliged to hold unlawful and set aside a rule in which cross examination was not properly allowed to disclose disputed facts,⁴⁵ or if the court finds "the rule is not supported by substantial evidence in the rulemaking record . . . taken as a whole."⁴⁶

The TSCA also provides for deferring or transferring regulation of a substance to another federal statute if the EPA determines the other statute will adequately prevent an unreasonable risk of harm.⁴⁷ Emphasis on regulatory coordination among different federal statutes and agencies gives the TSCA its comprehensive nature.⁴⁸ Indeed, some commentators propose to use the TSCA as the starting point for a rejuvenated and integrated approach to allow rapid regulation of multi-industry environmental risks.⁴⁹

The TSCA's substantive and procedural protections reflect the caution with which Congress approaches the subject of toxic substance regulation. This caution is based on two factors: (1) the large grant of power delegated to the EPA and its potentially enormous impact on

⁴¹ The usual APA procedures concerning notice and comment pursuant to informal rulemaking (5 U.S.C. § 553) are included under section 6 (c)(2) of the TSCA.

⁴² 15 U.S.C. § 2605 (1988). To the extent this section requires an assessment of the costs and benefits of the proposed regulation, it is not merely procedural.

⁴³ 15 U.S.C. § 2605 (1988).

⁴⁴ 15 U.S.C. § 2618 (1988).

⁴⁵ 15 U.S.C. § 2618 (c)(i)(B)(ii)(II) (1988).

⁴⁶ 15 U.S.C. § 2618 (c)(1)(B)(i) (1988).

⁴⁷ 15 U.S.C. § 2608 (1988).

⁴⁸ This coordination function has been criticized as adding another barrier preventing EPA from regulating more substances. See *supra*, Ruggiero, note 4.

⁴⁹ See Lakshman Guruswamy, *Integrating Thoughtways: Re-Opening of the Environmental Mind?*, 1989 WIS. L. REV. 463 (advocating an administrative solution to the environmental regulation stalemate by broadly construing TSCA); David J. Hayes, *TSCA: The Sleeping Giant Is Stirring*, NAT. RES. & ENV., Winter 1990, at 3 (noting TSCA's potential as an enforcement mechanism for obtaining environmental data for use throughout the EPA).

economic growth and technological progress,⁵⁰ and (2) the recognition that the rulemaking process inevitably affects a small number of manufacturers and thus is similar to adjudication.⁵¹ Concern about economic impacts is to some degree inconsistent with the TSCA goal of preventing injuries due to toxic substances, since it is often known statistically how many cancer deaths will result from a substance's use. This lack of internal consistency between a statute's means and its stated goals has been previously identified as a problem endemic to many environmental statutes.⁵² This ambiguity in how to interpret the mandates of environmental statutes, including the TSCA, gives the courts an important role in shaping environmental regulation through case law.

II. THE FIFTH CIRCUIT'S DECISION IN *Corrosion Proof Fittings*

In 1986, the EPA concluded that exposure to asbestos "poses an unreasonable risk to human health."⁵³ The EPA's final rule, issued in 1989, divided products containing asbestos into three categories with different effective dates by which commercial use would be prohibited.⁵⁴ The petitioners, an asbestos industry group, challenged the final

⁵⁰ The EPA must consider "the reasonably ascertainable economic consequences of the rule, after consideration of the effect on the national economy, small business, technological innovation. . . ." TSCA § 6(c)(1), 15 U.S.C. § 2605(c)(1) (1988); 122 Cong. Rec. 33,038 (1976) (remarks of Rep. Broyhill) ("Although the authorities granted to EPA are extremely broad, the conferees have made a concerted effort to include in the conference report safeguards against arbitrary action on the part of the EPA . . .").

⁵¹ See TSCA: Hearings on H.R. 7229, H.R. 7548, and H.R. 7664 Before the Subcomm. on Consumer Protection and Finance of the House Comm. on Interstate and Foreign Commerce, 94th Cong. 1st Sess. 394 (1975).

⁵² See Susan Rose-Ackerman, *Progressive Law and Economics and the New Administrative Law*, 98 YALE L.J. 341 (1988) (arguing that internal consistency should be expected of legislators in passing statutes so as to provide clear guidance on the purpose and available means of carrying out the statute's intentions. Rose-Ackerman uses the examples of reducing pollution to zero and eliminating cancer risks as unhelpful statutory goals).

⁵³ 51 Fed. Reg. 3738 (1986).

⁵⁴ The main products covered by each stage of the ban include:

- Stage 1: August 27, 1990: ban on asbestos containing floor materials, clothing roofing felt, corrugated and flat sheet materials, pipeline wrap, and new asbestos uses;
- Stage 2: August 25, 1993: ban on asbestos-containing "friction products" and certain automotive products or uses;
- Stage 3: August 26, 1996: ban on other asbestos-containing building materials including non-roof and roof coatings, and asbestos cement shingles.

⁵⁴ Fed. Reg. 29460-461 (1989).

rule under the TSCA's review provision.⁵⁶

A. *The Asbestos Industry's Position*

In their briefs, the petitioners referred to the EPA ban as "the death penalty" for asbestos manufacturers.⁵⁶ The petitioners' primary ground for vacating the EPA ban was the failure of the EPA to meet the procedural and substantive requirements of the TSCA before proceeding with the ban. Specifically, petitioners alleged the EPA had improperly prevented cross examination of EPA witnesses,⁵⁷ and had relied on "analogous exposure estimates."⁵⁸ These "analogous exposure estimates" were not available and in the rulemaking record during the comment period on EPA's proposed ban.⁵⁹

The petitioners also alleged that the EPA did not have "substantial evidence" to demonstrate a reasonable basis for finding that continued asbestos manufacture under current regulatory controls would present an unreasonable risk of injury. Petitioners cited the low number of statistically predicted cancer deaths compared to the large economic costs of the ban,⁶⁰ and the potential that asbestos substitutes would also present cancer or safety risks.⁶¹ Finally, petitioners noted that a ban was not the least burdensome alternative because other controls—such as workplace controls—could adequately protect against the risk of asbestos exposure.⁶²

⁵⁶ Joint Brief of Petitioners, Asbestos Information Association/North America and The Asbestos Institute at 2, *Corrosion Proof Fittings v. EPA*, 947 F.2d. 1201 (5th Cir. 1991) (No. 89-4596) [hereinafter AIA/NA Brief].

⁵⁷ *Id.* at 1.

⁵⁸ *Id.* at 28-30, 37-39.

⁵⁹ "Analogous exposure estimates" are estimates of the asbestos exposure which are not based on measured values, but rather on exposure data collected during activities which the EPA judged were sufficiently similar that they could be used for rule making purposes.

⁶⁰ AIA/NA Brief, *supra* note 55, at 43, 69-70.

⁶¹ *Id.* at 42-43.

⁶² *Id.* at 42-43, 62-64; Joint Brief of Petitioners, Asbestos Cement Pipe Producers Association and Corrosion Proof Fitting at 27-37 *Corrosion Proof Fittings vs. EPA*, 947 F.2d. 1201 (5th Cir. 1991) (No. 89-4596) [hereinafter A/C Pipe Brief].

⁶³ AIA/NA Brief, *supra* note 55, at 42, 64-67.

B. *The EPA's Position*

The EPA argued that in moving to ban asbestos it had acted reasonably in light of the "asbestos legacy of death and disease."⁶³ The documented and quantifiable human health hazards presented by asbestos were highlighted and compared to the limited laboratory animal toxicity testing data which is often relied on in other regulatory contexts.⁶⁴ The EPA noted that, despite current regulations, the risks to some workers using asbestos materials was still significant,⁶⁵ and that large numbers of people would receive some exposure to asbestos fibers.⁶⁶ The cost of discontinuing asbestos use was estimated by the EPA to be relatively low given the availability of substitutes,⁶⁷ while tangible but unquantifiable benefits from banning asbestos over the long term were cited.⁶⁸ Furthermore, according to the EPA, strict cost-benefit analysis need not be determinative as the EPA was allowed to consider other, unquantified benefits or costs of the ban.⁶⁹

The EPA noted there was no threshold level of asbestos exposure, below which asbestos was not potentially carcinogenic.⁷⁰ A ban was the least burdensome regulatory action that would be effective since warnings, labeling, or other controls would be ineffective in preventing exposure throughout the asbestos product life cycle.⁷¹

EPA cited the ten year period of rulemaking which preceded the final ban,⁷² and more than 100 studies of asbestos effects reviewed during the rulemaking process, as evidence of a reasoned decision reached by the agency based on its expertise.⁷³ The EPA argued that the court should evaluate the rule against an "arbitrary and capricious" standard because this standard and the "significant evidence" standard were ba-

⁶³ Brief of Respondent, EPA at 6, *Corrosion Proof Fittings v. EPA*, 947 F.2d. 1201 (5th Cir. 1991) (No. 89-4596) [hereinafter EPA Brief].

⁶⁴ *Id.* at 36 n.48 ("Because of the numerous human studies on which risk is based, the risks posed by asbestos are far more certain . . .").

⁶⁵ *Id.* at 4 (noting that the maximally exposed worker currently may face a 1 in 1000 lifetime risk of developing cancer due to asbestos).

⁶⁶ *Id.* at 4-5 ("Millions of people face individual lifetime cancer risks of 1 in 1,000,000.").

⁶⁷ *Id.* at 6.

⁶⁸ *Id.* at 47-51.

⁶⁹ *Id.* at 51-52.

⁷⁰ *Id.* at 54.

⁷¹ *Id.* at 53-54 ("EPA reached this conclusion based on the high carcinogenic potency of asbestos with no known level of exposure below which a risk does not exist . . .").

⁷² *Id.* at 5.

⁷³ *Id.* at 26.

sically the same in an administrative rulemaking context.⁷⁴ Within this context, the EPA concluded that its technical judgment, reflected in the rule, should be given "the greatest deference."⁷⁵

Finally, the EPA argued that TSCA was the correct statute under which asbestos regulation should proceed and that referral to other agencies or regulations was inappropriate because of the multiple applications and industries in which asbestos appears.⁷⁶ Asbestos is widely used and other statutes would reduce exposure in limited contexts only.⁷⁷ Consumers would be protected under the CPSC administered statutes and workers would be protected by OSHA. The general level of asbestos in the environment, however, would not be regulated absent TSCA regulation.⁷⁸

C. *The Fifth Circuit's Decision*

The United States Court of Appeals for the Fifth Circuit vacated the asbestos ban on both procedural and substantive grounds. Procedurally, the court found the EPA had precluded petitioners from having an ample opportunity for cross-examination⁷⁹ and had impermissibly relied on the "analogous exposure estimates" which were not properly in the rulemaking record.⁸⁰ The court also rejected the EPA's contention that "arbitrary and capricious" was the proper standard of review, finding the "substantial evidence" rule was mandated by the clear terms of the statute.⁸¹ This standard of review allowed the court to engage in "a considerably more generous judicial review."⁸²

Proceeding to the merits, the court found that the EPA had not met its burden of demonstrating that the asbestos products presented

⁷⁴ *Id.* at 62-65.

⁷⁵ *Id.* at 60-61 ("On judicial review, the agency's weighing and analysis of technical information necessary to support a regulation are entitled to the greatest deference.").

⁷⁶ *Id.* at 55-56.

⁷⁷ *Id.* at 55.

⁷⁸ *Id.* Other environmental statutes such as the Clean Air Act and Clean Water Act would only control effluents but not the actual asbestos levels.

⁷⁹ *Corrosion Proof Fittings*, 947 F.2d 1201, 1211 (5th Cir. 1991). However, the court did not find the lack of cross examination so prejudicial as to mandate reversal of the ban by itself.

⁸⁰ *Id.* at 1212-13.

⁸¹ *Id.* at 1213 (relying on a plain reading of TSCA § 6).

⁸² *Id.*

an unreasonable risk,⁸³ nor had the EPA adequately explained why a ban was the least burdensome regulatory alternative.⁸⁴

The court found the EPA's ban unreasonable because the projected economic impacts of the ban (costs) so outweighed the benefits of the ban (lives saved), that the continued use of asbestos did not present an unreasonable risk of injury to human health.⁸⁵ According to the court, the EPA also failed to consider credible evidence that asbestos substitutes (e.g. non-asbestos brake pads, polyvinyl chloride (PVC) pipe, and ductile iron pipe) presented health or safety risks that might outweigh any benefits from the ban.⁸⁶ The court also concluded the EPA had not adequately considered less drastic regulatory options by comparing the costs and benefits of other options to those associated with the complete ban.⁸⁷ The court, however, did find that the EPA decision to pursue regulation of asbestos under the TSCA was correct because of the multi-industry nature of asbestos exposure and the comprehensive nature of the TSCA.⁸⁸ Nonetheless, upon concluding that the asbestos ban could not be supported by reviewing the evidence on the record as a whole, the court vacated the ban, and remanded the petition for review of the ban to the EPA.⁸⁹

III. ANALYSIS OF THE COURT'S METHODOLOGY

The court predicated its analysis in *Corrosion Proof Fittings* on a willingness to engage in a thorough review of EPA's methodology in support of the asbestos ban,⁹⁰ and to determine the reasonableness of continued asbestos use by employing the common law tort standard of reasonableness.⁹¹ The statutory language of the TSCA supports the court's decision to review the EPA's technical conclusions and its direct use of cost-benefit data to judge the reasonableness of the EPA's ban. The inconsistencies found by the court in the EPA's methodology em-

⁸³ *Id.* at 1211-17.

⁸⁴ *Id.* at 1214-18 (It must "cogently explain why it has exercised its discretion in a given manner" and "must offer a 'rational connection between the facts found and the choice made.'").

⁸⁵ *Id.* at 1222-23.

⁸⁶ *Id.* at 1221.

⁸⁷ *Id.* at 1215-16.

⁸⁸ *Id.* at 1215.

⁸⁹ *Corrosion Proof Fittings vs. EPA*, 947 F.2d. 1201, 1229 (5th Cir. Oct. 18, 1991) *opinion clarified*, (Nov. 15, 1991), *rehearing denied*, (Nov. 27, 1991).

⁹⁰ *Corrosion Proof Fittings*, 947 F.2d. at 1213-14.

⁹¹ *Id.* at 1221. *See also* W. PAGE KEETON et al., PROSSER AND KEETON ON THE LAW OF TORTS § 32 (5th ed. 1984).

phasize the need for consistent regulatory controls on toxic substances to ensure inefficient regulations are not promulgated.

A. Unreasonable Risk

Before engaging in rulemaking, the court examined whether the EPA had made the required finding of an unreasonable risk of injury. The court adopted a familiar quantification of the common law tort concept of an unreasonable risk as occurring when the burden of preventing a harm is less than the probability of the harm occurring multiplied by the magnitude of the loss if the harm occurs ($Burden(B) < Probability(P) \text{ times Loss}(L)$).⁹² By adopting this tort law concept of unreasonable risk the court was directly faced with weighing the burden or cost of the asbestos ban (calculated in dollars) against the benefits of the ban (measured in lives saved).

As a threshold issue, the court rejected a reading of the TSCA that would allow the EPA to regulate a substance in pursuit of a risk-free world.⁹³ It has been clear since *Industrial Union Dept., AFL-CIO v. American Petroleum Institute* (The Benzene Case),⁹⁴ that statutes such as the TSCA and Occupational Safety and Health Act do not require or permit government agencies to seek to reduce risks from toxic chemical exposure to zero.⁹⁵ This result can be justified as a matter of simple economic necessity. It is not physically possible in a world of limited resources to reduce all risks to zero.⁹⁶

⁹² *Corrosion Proof Fittings*, 947 F.2d at 1222. ("That the risk be 'unreasonable' necessarily involves a balancing test like that familiar in tort law. The regulation may issue if the severity of the injury that may result from the product, factored by the likelihood of the injury, offsets the harm the regulation imposes upon manufacturers and consumers." (quoting *Forester v. CPSC*, 559 F.2d 774, 789 (D.C. Cir. 1977))). See also WILLIAM M. LANDES & RICHARD A. POSNER, *THE ECONOMIC STRUCTURE OF TORT LAW* 85 (1987) (describing the $B < P \text{ times } L$ test for unreasonableness or negligence and citing *U.S. v. Carroll Towing Co.*, 159 F.2d 169 (2d Cir. 1947)).

⁹³ *Corrosion Proof Fittings*, 947 F.2d at 1215.

⁹⁴ 448 U.S. 607 (1980) (The Benzene Case) (holding that 1 part per million limit on permissible worker exposure limits to benzene was not enforceable since exposure at that level did not present a significant risk).

⁹⁵ *Id.* at 641 ("it is clear that the statute was not designed to require employers to provide absolutely risk-free workplaces whenever it is technologically feasible to do so . . .").

⁹⁶ Despite the impossibility of preventing all toxic chemical exposures it has been argued by some that even a single excess cancer death due to toxic chemical exposure presents an unreasonable risk of injury. See D. Scroggins, *EPA Health Risk Policy Will Have Broad Impact*, *LEGAL TIMES*, July 15, 1985, at 19 ("One such organization argued that public health agencies should respond to even one 'statistical' death with the same urgency with which a police department

The court then proceeded to address the costs and benefits of the asbestos ban for the individual product categories. The EPA cost analysis estimated the ban on asbestos cement pipe would save three lives at a cost of \$128-\$227 million (\$43-\$76 million per life saved); the ban on asbestos shingles would save 0.32 statistical lives at a cost of \$23-34 million (\$72 - \$106 million per life saved); the ban on asbestos coatings would save 3.33 lives at a cost of \$46-\$181 million (\$14-\$54 million per life saved); and the ban on asbestos paper would save 0.6 lives at a cost of \$4-\$5 million (\$7-\$8 million per life saved).⁹⁷ For these products the total cost of the ban would be \$200-\$300 million to save approximately seven lives (\$30-\$40 million per life).⁹⁸

The Supreme Court has refused to require cost-benefit analyses in the two cases in which toxic substance regulation was at issue,⁹⁹ therefore, the court was careful to state it was properly "the regulatory agency that must make the difficult decision as to what an appropriate expenditure is to prevent someone from incurring the risk of an asbestos-related death."¹⁰⁰ However, the court then concluded that the cost per life saved was excessive and far beyond what Congress thought prudent when it required the EPA to consider the economic impact of its regulations.¹⁰¹

The court provided almost no guidance to divine what level of expenditure Congress considered reasonable to save one life, or in the alternative, what costs the EPA should consider reasonable. The only clue to the court's analysis was an interesting footnote:

As petitioners point out, the EPA regularly rejects, as unjustified, regulations that would save more lives at less cost. For example, over the next 13 years we can expect more than a dozen deaths from ingested toothpicks—a death

would respond to a tip that a dangerous person has threatened to shoot randomly in a Times Square crowd until he kills one person."').

⁹⁷ *Corrosion Proof Fittings*, 947 F.2d at 1222.

⁹⁸ *Id.* The costs and lives saved are projected over a 13 year period, and assume the cost of substitutes will drop 1% per year relative to asbestos products.

⁹⁹ *American Textile Manufacturers Institute v. Donovan*, 452 U.S. 490 (1981) (The Cotton Dust Case); *Industrial Union Dept., AFL-CIO v. American Petroleum Institute*, 448 U.S. 607 (1980) (The Benzene Case).

¹⁰⁰ *Corrosion Proof Fittings*, 947 F.2d. at 1222-23.

¹⁰¹ *Id.* ("The EPA would have this court believe that Congress, when it enacted its requirement that EPA consider the economic impact of its regulations, thought that spending \$200-\$300 million to save seven lives (approximately \$30-\$40 million per life) over thirteen years is reasonable.")

toll more than twice what the EPA predicts will flow from the quarter-billion-dollar bans of asbestos pipe, shingles, and roof coatings.¹⁰²

The court's failure to provide guidance as to what cost per life saved is reasonable in a regulatory setting is particularly noteworthy because the asbestos debate presents this issue in terms starker than any other major toxic substance case.¹⁰³

1. Opportunity Costs

A well reasoned solution to the dilemma of attempting to put a direct cost or value per life saved requires an analysis of opportunity costs.¹⁰⁴ By translating the cost side of the cost-benefit analysis into the number of lives which could be saved in other regulatory contexts using the same resources, a court can decide whether a challenged regulation is an efficient or reasonable use of available resources. The concept of opportunity costs provides a quantitative method for comparing the available alternatives for reducing risk. In this context, the court's comparison of asbestos exposure risks to toothpick hazards was a cogent illustration of the usefulness of considering opportunity costs to determine whether regulatory expenditures are reasonable.

The chief advantages of using the opportunity costs concept is that it avoids direct valuation of a human life by the regulating agency and it results in a more efficient and consistent allocation of resources. By regulating risks in relation to the ambient level of risk in society, the regulating agency is essentially letting the public decide "how safe is safe" by its demonstrated risk aversion in other contexts.¹⁰⁵ By ensur-

¹⁰² *Id.* at 1223 n.23. Contrary to one's first impression upon reading the opinion, this particular example was not briefed by the petitioners, but rather, was independently developed by the court. Interview with Edward Warren, Petitioner's Counsel, Kirkland & Ellis, Washington, D.C. (Jan. 20, 1992) [hereinafter *Interview*].

¹⁰³ *Interview*, *supra* note 102. This cost per life is distinguishable from the typical valuation involved in a wrongful death suit. In those cases, a known individual's estate is being compensated by the party at fault. In the regulatory setting, a statistically predicted death is being prevented through expenditures by society in general. The costs of the regulation are borne by consumers or the public, similar to a tax.

¹⁰⁴ An example of the opportunity cost associated with the proposed ban on asbestos roofing/shingles (\$72-106 million per life saved) is the number of lives which could be saved with an expenditure of \$72-106 million in reducing other environmental or safety risks.

¹⁰⁵ See RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 163-66 (4th ed. 1988) (noting that the amount of money people will demand to voluntarily run small risks can be used to estimate the value people place on regulating a hazard which presents a similar risk).

ing a more efficient and consistent allocation of risk reduction resources, the number of lives saved will also be maximized.¹⁰⁶

At a minimum, an agency should not be prevented from promulgating a regulation on economic grounds, if the cost per-life-saved is as low or lower than the next best alternative use of the regulatory resources. As a lower bound, if the cost per life saved is below that generally expended in similar regulatory applications, the regulation should be immune from attack as unreasonable on purely economic grounds. This analysis, in essence, adopts a common law approach for determining what reasonable expenditures can be required to prevent a statistically predicted cancer death. Using estimates from regulatory and industrial safety data, the cost per life saved from other environmental hazards can be calculated. These other hazards present opportunities for efficiently reducing risks due to toxic substances at costs as low as approximately \$1 million per life saved.¹⁰⁷

A principled method for establishing the maximum expense that should be devoted to preventing a statistically predicted death is to limit the cost to the amount of resources which could be produced with less than one statistically predicted death. Industrial safety and economic data can be used to estimate this upper bound for regulatory cost per life.¹⁰⁸ From industrial safety data, for every \$24 million to \$500 million (\$50 million average) of resources produced, one statistically predicted occupationally-related death would be expected.¹⁰⁹ These considerations still leave a court with a large range of costs

¹⁰⁶ See Frank B. Cross, *Beyond Benzene: Establishing Principles For a Significance Threshold On Regulatable Risks of Cancer*, 35 EMORY L.J. 1, 9 n.43 (1986) (noting that inefficient allocation of available resources results in killing people whose premature deaths were preventable); Peter Huber, *The Old-New Division in Risk Regulation*, 69 VA. L. REV. 1025 (1983) (noting the inconsistency between regulation of existing risks and "new" risks, and arguing for a more consistent regulation of comparable risks within the same market).

¹⁰⁷ See John A. Haigh et al., *Benefit-Cost Analysis of Environmental Regulation: Case Studies of Hazardous Air Pollutants*, 8 HARV. ENVTL. L. REV. 395, 414-18 (1984) (reviews cost per life saved for various regulated air pollutants and concludes that the best current regulatory schemes have a minimum cost of approximately \$1 million per life saved, and also notes the high variability in cost per life saved between different regulations).

¹⁰⁸ By dividing the Gross National Product (GNP) by the annual number of occupational deaths an estimate can be made of the economic resources which can be produced per life "lost" due to an occupational death.

¹⁰⁹ Using a GNP of \$5 trillion and estimates of the number of annual occupational deaths ranging from 10,000 to 210,000. See Noble, *supra* note 1, at 44 (noting that the Office of Technology Assessment (OTA) has reviewed estimates of annual occupational deaths within this wide range, with the most common estimate being 100,000 deaths per year). See also U.S. BUREAU OF THE CENSUS, STATISTICAL ABSTRACT OF THE UNITED STATES 425 (110th edition 1990) (estimating approximate GNP of \$5 trillion dollars).

within which a regulation may or may not be economically efficient. The exact figures will undoubtedly change as societal safety levels improve and technological advances occur.

2. Risk Displacement

The preceding analysis assumes any substitutes for the regulated substance are "risk-free". To provide a more accurate assessment of regulatory costs, it is necessary to evaluate the specific alternatives, or opportunity costs associated with the regulated substance.¹¹⁰ If a significant fraction of the statistically predicted lives which would be "saved" with the regulation, are "lost" through risks attributable to directly substitutable materials, the net lives saved will be reduced and the regulatory cost per life saved will be greatly increased.¹¹¹ Consideration of other environmental risks posed by substitutes is another method of utilizing a common law approach for determining the reasonableness of continued use of a substance.¹¹²

Direct asbestos substitutes include polyvinylchloride (PVC) pipe and ductile iron pipe (replacements for asbestos-cement pipe), and non-asbestos (aramid fiber, mineral wool, and wollastonite) brake pads.¹¹³ Credible evidence was presented that the substitutes would present greater risks than asbestos.¹¹⁴ The replacements for asbestos-cement pipe are both carcinogenic, and in the case of PVC, result in greater

¹¹⁰ This comparative risk assessment is a method of examining the opportunity costs of using asbestos, and involves accounting for any risk associated with asbestos replacements.

¹¹¹ Huber, *supra* note 106, at 1073 ("Every regulation of one source of risk will cause some secondary 'risk displacement', encouraging producers or consumers to favor alternative, less stringently regulated processes or products that will themselves be risky to some degree . . . risk-excluding regulation that disregards the possibility of substitution may increase risk.").

¹¹² See Cross, *supra* note 106 (Cross reviews various risk thresholds for carcinogens which have been held reasonable or de minimus, and concludes a common law risk threshold has been established. Cross deduces from prior regulatory patterns that a lifetime risk of one chance in one hundred thousand for environmental risks, one chance in ten thousand for occupational risks, and one chance in one thousand for the maximally exposed individual is the upper limit that should be accepted). Cross' analysis is helpful in a regulatory situation where there is no risk associated with a substitute. It is less helpful in situations where regulation will displace one risk with another. An oft cited example of this latter and more typical situation is the appropriate level of risk for an anticancer drug, where both the costs and benefits will be weighed in lives lost. See also Huber, *supra* note 106, at 1046. In the sense that any resources spent regulating a substance represent lost regulatory opportunities elsewhere, setting an arbitrary risk threshold, without accounting for the associated regulatory costs, will not lead to an efficient allocation of risk reduction resources.

¹¹³ AIA/NA Brief, *supra* note 55, at 56-63; A/C Pipe Brief, *supra* note 61, at 25-33.

¹¹⁴ AIA/NA Brief, *supra* note 55, at 56-63; A/C Pipe Brief, *supra* note 61, at 25-33.

health risks due to exposure to vinyl chlorides during manufacture.¹¹⁵ Non-asbestos brake pads generate toxic fibers, similar to asbestos, and are predicted to deliver degraded braking performance when installed in cars originally designed for asbestos brake pads.¹¹⁶

The EPA failed to assess the potential risk of asbestos substitutes in a meaningful manner, effectively preventing any quantitative evaluation of the asbestos ban's effect on overall health risk levels.¹¹⁷ The court characterized this flaw in EPA's position as depriving the ban of a reasonable basis.¹¹⁸ The court's insistence on a comparison with known substitutes is necessary if a goal of overall health risk reduction to toxic substances is to be achieved. Without accurately assessing the opportunity costs associated with asbestos use there is no assurance that the resources expended are in fact achieving any health risk reduction.¹¹⁹

B. *Least Burdensome Regulatory Alternative*

The TSCA's powerful clause in section 6 requires the EPA to adopt regulations "to the extent necessary to protect adequately against such risk using the least burdensome requirements."¹²⁰ This clause can be construed as a grant of power to the EPA to regulate products until there is a de minimus health risk. It can also be interpreted as a limitation on the EPA's regulatory powers, constraining it to choose the least burdensome regulation which can adequately reduce an unreasonable health risk to a reasonable level. The court specifically rejected the for-

¹¹⁵ AIA/NA Brief, *supra* note 55, at 56-63; A/C Pipe Brief, *supra* note 61, at 25-33.

¹¹⁶ AIA/NA Brief, *supra* note 55, at 50-67.

¹¹⁷ *Corrosion Proof Fittings*, 947 F.2d at 1220 ("First, TSCA instructs the EPA to consider the relative merits of its ban, as compared to the economic effects of its actions. The EPA cannot make this calculation if it fails to consider the effects that alternate substitutes will pose after the ban.").

¹¹⁸ As the court stated:

The EPA's explicit failure to consider the toxicity of likely substitutes thus deprives its order of a reasonable basis. . . . In short, a death is a death, whether occasioned by asbestos or by a toxic substitute product, and the EPA's decision not to evaluate the toxicity of known carcinogenic substitutes is not a reasonable action under TSCA.

Id. at 1220-21.

¹¹⁹ *Id.* at 1220 ("Eager to douse the dangers of asbestos, the agency inadvertently actually may increase the risk of injury Americans face.").

¹²⁰ 15 U.S.C. § 2605 (1988).

mer interpretation and adopted the latter reading of the statutory language, based largely on the legislative history.¹²¹

Implicit in the EPA's contention that a ban was required to protect the public adequately is the notion that a zero-risk regulatory goal is acceptable.¹²² The EPA's main argument for a zero-risk goal, and therefore a complete asbestos ban, was the simple fact that there is no level of zero-risk asbestos use.¹²³ The court quickly disposed of this contention by noting, "[i]f that were the standard, it would be no standard at all, for few indeed are the products that are so safe that a complete ban of them would not make the world still safer . . . reducing risk to zero, however, was not the task Congress set for the EPA in enacting the TSCA."¹²⁴

The court in *Corrosion Proof Fittings* recognized that the EPA's zero-risk criterion is problematic for air pollutants. For airborne substances, assuming eventual uniform dispersion, there will be universal public exposure at some non-zero level.¹²⁵ For example, if the air molecules from a single breath were uniformly dispersed in the atmosphere, there is a greater than 99 percent chance that any later breath would contain at least one molecule from the initial breath.¹²⁶ Therefore,

¹²¹ *Corrosion Proof Fittings*, 947 F.2d at 1216 n.17 ("As the Senate sponsor of the 'least burdensome' requirement stated, Congress did 'not want to give the Administration unlimited authority and let him say, 'I will impose this control, if there are other controls that are effective and are less burdensome on the industry.'" 122 CONG. REC. 8295 (1976) (statement of Sen. Cannon).").

¹²² As the court stated:

EPA does not explain how it can determine that the risks of a substance cannot be addressed in another way if it refuses to make a finding that the alternatives will not discharge the EPA's TSCA burdens. It cannot simply state that there is no level of zero risk asbestos use and then impose the most burdensome alternative on that sole basis.

Corrosion Proof Fittings, 947 F.2d at 1216-17.

¹²³ The absence of a threshold exposure level below which there is no health risk is simply a feature of the linear dose-response model now universally applied in assessing the effects of low dose exposures to toxic substances. Exposing 10 people to 0.1 of a lethal dose would statistically result in one death. Likewise, exposing 1000 people to .001 of a lethal dose would result in one statistical death. Exposing a person to any non-zero exposure level, no matter how small, will result in some fractional increase in the statistically predicted deaths. The linear dose-response curve has been widely adopted because it simply is not feasible to accurately determine the health effects of very low levels of exposure, it is easier to calculate the resultant health effects of exposures, and the model is reasonably robust to slight changes in modeling assumptions.

¹²⁴ *Corrosion Proof Fittings*, 947 F.2d at 1216-17.

¹²⁵ This assumes the asbestos fibers are nonbiodegradable and are easily transported through the atmosphere. The EPA made both of these assumptions. See EPA Brief, *supra* note 63, at 19. See also 51 Fed. Reg. 3738 (1986).

¹²⁶ See JOHN A. PAULOS, INNUMERACY 24 (1988). Paulos provides this counterintuitive example. There are approximately 10^{44} total air molecules, and 10^{23} molecules in a single breath.

under the EPA's criteria, a ban is not only the least burdensome regulatory alternative, it is the only regulatory option which can adequately protect the public. By definition, carcinogenic substances are assumed to have no level at which there is a zero-risk when a linear dose-response curve is assumed.¹²⁷ Any carcinogenic substance could be banned under the EPA's interpretation, no matter how useful the substance was, or how small the risk the substance presented.

1. The "Least Restrictive Means" Standard

An alternative to the EPA's broad reading of TSCA's statutory powers would be to literally interpret the section 6 requirement that a proposed regulation must be "the least burdensome" regulatory alternative. The court in *Corrosion Proof Fittings* appeared to apply this standard when it stated, "The EPA's regulation cannot stand if there is *any other regulation* that would achieve an acceptable level of risk as mandated by TSCA."¹²⁸ A plain reading of the statute would appear to support this interpretation. This is similar to the "least restrictive means" standard which is used in other contexts, particularly in evaluating the validity of restrictions on commercial speech.¹²⁹

2. The "Reasonable Fit" Standard

A strict limitation of TSCA's statutory reach, to the *single* least burdensome regulation would eviscerate TSCA as a toxic substance control device. Regulations promulgated under TSCA would be subject

The probability that any single molecule would be from the initial breath would therefore be 10^{22} divided by 10^{44} . The probability that any single molecule would not be from the initial breath is therefore $(1 - 10^{22}/10^{44})$. Therefore, the probability that a later breath contained at least one molecule from the initial breath would be $[1 - (1 - 10^{22}/10^{44})]^{10^{22}}$. This probability is very close to one, and is well over 0.99. *Id.*

¹²⁷ A linear dose-response curve models the relationship between a given exposure level and the subsequent risk of developing an injury as a linear function. Increasing or decreasing a dose or exposure level by a factor of two will result in a factor of two change in the predicted risk of injury. This linear modeling is useful where the individual exposures are low (much less than a lethal dose) and the exposed population is large. The total impact of exposure to a toxic substance can then be modeled as the sum of the individual exposure levels times the expected risk at the exposure level. Since the risk of injury is modeled as varying in proportion to the exposure or dose, there will always be risk associated with any non-zero exposure. Use of this linear model by the EPA therefore ensures there is no level of "risk-free" asbestos exposure. *See also supra* note 123.

¹²⁸ *Corrosion Proof Fittings*, 947 F.2d. at 1216 (emphasis added).

¹²⁹ The "least restrictive means" test was established in *Central Hudson Gas v. Public Service Comm'n*, 447 U.S. 557 (1980).

to challenges as being overbroad. Petitioners would be free to posit a different regulation, slightly narrower in scope, which could arguably result in a similar reduction in toxic substance exposure. The Supreme Court, in the context of commercial speech regulation essentially abandoned the "least restrictive means" test based on these considerations.¹³⁰ The burden on the government in demonstrating that a regulation was the "least restrictive means" to advance a legitimate government interest, was too great.¹³¹ The Supreme Court ultimately settled for requiring a "reasonable fit" between the regulation's goals and the means chosen.¹³²

A pragmatic approach to interpreting TSCA's "least burdensome" clause would be to adopt the "reasonable fit" test. In judging a specific regulatory alternative, though, it is necessary to measure the reasonableness of the fit. Typical regulatory situations involve those relating to common daily experience. Environmental regulations are, however, designed to prevent statistically predicted cancer deaths. There is a distinct lack of relevant experience to bring to bear in judging the reasonableness of such a regulation. In general, all that will be known about the various regulatory alternatives is the cost per statistically predicted life saved.

3. Marginal Costs and Benefits of Regulation

The quandary of how to compare the burdens and the benefits of proposed TSCA regulations can be solved by comparing the marginal cost per life saved.¹³³ The marginal cost per life saved can be derived by comparing the costs and benefits as the regulation is varied in scope (products application or industries regulated), and severity (stringency of the regulation; e.g. total ban, restriction on output, warning labels).

¹³⁰ The standard was abandoned in *Board of Trustees of State Univ. of New York v. Fox*, 492 U.S. 469 (1989).

¹³¹ *Id.* at 481.

¹³² *Id.* at 480.

¹³³ The marginal cost per life saved is the cost to save an additional life by varying the scope or severity of a regulation. For example, assume reducing auto emissions by 10% costs \$100 million and prevents 100 statistically predicted cancer deaths. Also assume that reducing auto emissions by 15% costs \$300 million and prevents 150 statistically predicted cancer deaths. The marginal cost of preventing the 50 additional cancer deaths caused by the 5% difference in auto emissions is \$4 million per life (\$200 million to prevent 50 additional cancer deaths). It is this marginal cost which is compared between regulatory alternatives to determine where the resources devoted to risk reduction can be most effectively employed.

Regulatory alternatives which can save lives at the least marginal cost are the most efficient, and should be pursued.

Significantly, the EPA, the petitioners, and the reviewing court dealt with the individual product types on a case-by-case basis.¹³⁴ To achieve regulatory efficiency individual product line adjudication is necessary. This case-by-case approach allows a more accurate determination of the unreasonableness of the risk presented by a substance. The same substance can be a potent toxin in one form, and a vital necessity in another.¹³⁵ By comparing the costs of applying regulatory controls to each product line, the marginal cost of regulating a substance in that particular product form can be determined. Comparison to regulatory costs for other products or substances in the same risk market can then be made to determine the reasonableness of the regulatory action.¹³⁶

The reviewing court's central objection to the EPA's analysis was a failure to address the merits of other, less drastic, regulatory measures.¹³⁷ "The EPA rejected calculating how many lives a less burdensome regulation would save, and at what cost."¹³⁸ Without making a quantitative determination of the merits of other regulatory options besides a ban, the reviewing court found the EPA could not meet its burden of demonstrating a less costly measure would not be adequate.¹³⁹ Requiring the EPA to evaluate quantitatively the merits of other regulatory actions results in a comparison of the marginal costs of other regulatory measures, besides a ban. The court's endorsement of cost-benefit analyses to compare the marginal cost of regulatory alternatives is implicit in its requirement that only regulations which impose the least cost per life saved should be promulgated.

¹³⁴ See *Corrosion Proof Fittings*, 947 F.2d at 1224-29; AIA/NA Brief, *supra* note 55, at 50-97; EPA Brief, *supra* note 63, at 128-228.

¹³⁵ See Huber, *supra* note 106, at 1074 n.211 (noting that chromium is essential to human health in small quantities, but is a carcinogen when consumed in large quantities).

¹³⁶ Different approaches have been suggested for defining appropriate risk markets. See Huber, *supra* note 106, at 1076 (arguing that the risk market should be comprised of products that are functional substitutes), see also Cross, *supra* note 106, at 46-50 (arguing that the type of risk, such as environmental or occupational, should be used to determine the appropriate risk level to be accepted).

¹³⁷ *Corrosion Proof Fittings*, 947 F.2d at 1216 ("[T]he EPA must show not only that its proposed action reduces the risk of the product to an adequate level, but also that the actions Congress identified as less burdensome also would not do the job.").

¹³⁸ *Id.*

¹³⁹ *Id.* at 1216 ("[T]he proper course for the EPA to follow is to consider each regulatory option, beginning with the least burdensome, and the costs and benefits of regulation under each option.").

C. Substantial Evidence and Hard Look Judicial Review

The Fifth Circuit found the TSCA's review provision explicitly provides that a court require EPA regulatory actions to be supported by "substantial evidence in the rule making record taken as a whole."¹⁴⁰ The court noted that the substantial evidence standard "affords a considerably more generous judicial review than the arbitrary and capricious test."¹⁴¹ The court's adoption of a "hard look" judicial review is also in accord with the legislative intent of the TSCA review provision.¹⁴²

"Hard look" judicial review of agency actions has been criticized as deterring agency rulemaking, inviting judicial judgment on technical matters and thus displacing the agencies experience and expertise, and usurping Congress' delegation of power to the agency.¹⁴³ The court's "hard look", as applied in *Corrosion Proof Fittings*, provides a partial answer to these criticisms. In rejecting the EPA's asbestos ban, the court carried out Congress' original intent of providing a meaningful judicial review to ensure EPA did not act arbitrarily. In performing this review function, the court did not displace the EPA's technical judgement, but rather required the EPA to provide a sound technical basis for its ban.

The reviewing court focused its review of the asbestos ban on the substantive aspects of the EPA's analysis rather than the procedural aspects. This focus on the substance of EPA's assessment is characteristic of hard look judicial review. The court explicitly indicated that it

¹⁴⁰ *Corrosion Proof Fittings*, 947 F.2d at 1213.

¹⁴¹ *Id.* at 1214 (quoting *Abbot Laboratories v. Gardner*, 387 U.S. 136, 143 (1967), *overruled on other grounds*, *Califano v. Sanders*, 430 U.S. 99, 97 (1977)).

¹⁴² Any doubt about legislative intent with regard to the standard of review was resolved in the petitioners' reply brief:

EPA lawyers purport to rely on the TSCA Conference Committee Report that states: "in rulemaking proceedings such as those contained in this bill . . . the traditional standard for review is that of 'arbitrary and capricious.'" EPA Brief at 65 n.80 (emphasis by EPA). This carefully cropped quote might suffice were it not for the very next sentence: "However, the conferees have adopted the 'substantial evidence' test because they intend that the reviewing court focus on the rulemaking record to see if the Administrator's action is supported by the record." *TSCA Legislative History* at 709 (1976).

AIA/NA Brief, *supra* note 55, at 15.

¹⁴³ See, e.g., Antonin Scalia, *Judicial Deference to Administrative Interpretations of Law*, 1989 DUKE L.J. 511; Jerry L. Mashaw and David L. Harfst, *Regulation and Legal Culture: The Case of Motor Vehicle Safety*, 4 YALE J. ON REG. 257 (1987); Peter L. Strauss, *Considering Political Alternatives to "Hard Look" Review*, 1989 DUKE L.J. 538.

did not consider agency procedural flaws, the usual grist of judicial review, to be of primary importance. "The petitioners allege that the EPA's rulemaking procedure was flawed. Most of these contentions lack merit . . . [T]he EPA's general failure to accord the petitioners adequate cross-examination . . . is not sufficient by itself to mandate overturning the rule."¹⁴⁴

However, the EPA procedural flaws that affected the substance of the technical evaluation were treated more seriously. "We cannot reach the same conclusion in another area, however. The EPA failed to give notice . . . that it intended to use 'analogous exposure' data in calculating the benefits of certain product bans."¹⁴⁵ The EPA's "analogous exposure" estimates accounted for the majority of the projected health effects for several product categories.¹⁴⁶ For gaskets, roofing shingles, and paper products the analogous exposures accounted for almost 80 percent of the anticipated benefits of the ban.¹⁴⁷ Thus, use of analogous exposures was crucial to reducing the cost per life saved. Without the analogous exposures, the cost per life saved of the ban on these products would be higher by at least a factor of two.¹⁴⁸ Similar effects occurred for other product categories.¹⁴⁹

The court's review also delved into the technical assumptions used in the EPA analysis. This judicial review included the court's rejection of the EPA's contention that the widespread exposure levels (numbers of people exposed) were a separate and independent basis for banning asbestos. It was not the absolute numbers of people exposed to asbestos that were important, but rather the product of the number of exposed individuals and the exposure levels.¹⁵⁰ The court correctly noted that human exposure effects were already factored into the statistically predicted deaths by the EPA's linear dose-response curve, and the Agency was therefore "double counting" the exposure effects.¹⁵¹

¹⁴⁴ *Corrosion Proof Fittings*, 947 F.2d at 1210.

¹⁴⁵ *Id.* at 1211.

¹⁴⁶ *Id.* at 1211 n.10.

¹⁴⁷ *Id.* at 1212 n.11.

¹⁴⁸ *Id.*

¹⁴⁹ *Id.*

¹⁵⁰ This is a result of the EPA's linear dose-response curve. For example, exposing a million (10^6) people to a billionth (10^{-9}) of a lethal dose would only result in 0.001 (10^{-3}) predicted asbestos deaths ($10^6 \times 10^{-9} = 10^{-3}$). While exposure of a thousand people to 1/100th of a lethal dose would result in 10 statistically predicted asbestos deaths. The total number of statistically predicted deaths already includes the aggregate effect of the total population exposure.

¹⁵¹ *Corrosion Proof Fittings*, 947 F.2d at 1219 ("[T]he EPA's redundant use of population exposure to justify its actions cannot stand.").

The EPA's inconsistent method of discounting future costs and benefits of the ban was likewise rejected.¹⁵² The EPA analysis discounted the costs of complying with the ban, but made no similar discounting of the benefits (lives saved).¹⁵³ By discounting future costs, but not benefits, it is possible to reduce the cost per life saved to any desired level. This would prevent meaningful comparisons from being made between regulatory alternatives.

The hard look judicial review of the EPA's asbestos ban can be justified by TSCA's statutory requirement that a regulation be supported by "substantial evidence on the whole record."¹⁵⁴ This standard was intentionally adopted for this rulemaking by Congress to prevent excessive and overly burdensome regulations.¹⁵⁵ The court's review found significant errors in the EPA's cost-benefit analysis of the ban. These errors included a misunderstanding and misapplication of the linear dose-response curve, failure to treat consistently the discounting of future costs and benefits, use of "analogous estimates" not properly in the record, inadequate consideration of the health and safety effects of substitute materials, and reliance on the incorrect "arbitrary and capricious" standard of review.¹⁵⁶

In overturning the rule, the reviewing court was performing the function Congress intended when the TSCA was enacted. The court in *Corrosion Proof Fittings* prevented an inefficient asbestos ban from being promulgated, a ban which might have actually increased the health risk to workers and consumers.

CONCLUSION

The specific judicial review powers delegated to the courts by Congress in the TSCA were intended to prevent unfettered or excessive EPA regulation of beneficial industries and products. The court in *Corrosion Proof Fittings* did not hesitate in using these provisions to apply a hard look review to the EPA's asbestos ban. This review included a thorough evaluation of the EPA's technical judgment and its statutory

¹⁵² *Id.* at 1218 ("Because the EPA must discount costs to perform its evaluations properly, the EPA also should discount benefits to preserve an apples to apples comparison . . .").

¹⁵³ *Id.*

¹⁵⁴ See *supra* note 46 and accompanying text.

¹⁵⁵ See *supra* note 122 and accompanying text.

¹⁵⁶ *Corrosion Proof Fittings*, 947 F.2d at 1207-23. See *supra* notes 79, 82, 119, 143, 145, 146, 152 and accompanying text.

interpretation. Ultimately the court rejected the EPA's statutory interpretation and found errors in the technical analyses.

The court's adherence to a balancing test in determining the reasonableness of continued use of asbestos is an explicit rejection of the EPA's zero-risk regulatory goals. Adopting a reasonableness standard is necessary to limit the EPA's discretion and to prevent widely used and relatively safe substances from being arbitrarily banned. Based on the evidence presented in the record, the remaining asbestos products were no more dangerous, and were perhaps less dangerous, than comparable substances or substitutes. The court in *Corrosion Proof Fittings* recognized that no substance can be absolutely safe; the important question concerns how safe a substance is relative to other comparable products or widely shared risks. While the EPA still retains the power to determine what absolute level of safety it will require (or cost per life saved), this standard of safety cannot be a zero-risk goal. The standard must bear a reasonable relationship to risks posed by similar products or substitutes.

Based on *Corrosion Proof Fittings*, courts will be encouraged to review the detailed assumptions made by the EPA in promulgating a TSCA ban. Numerous errors and inconsistent assumptions were made by the EPA to support the asbestos ban. The primary error was technical, a fundamental misunderstanding of the effects of a linear dose-response curve.¹⁵⁷ This led the EPA to conclude a zero-risk regulatory goal was desirable and possible, and that a ban was the least burdensome regulatory option. The EPA, therefore, made no quantitative findings as to effectiveness of less onerous regulatory alternatives. Other errors included the EPA's inconsistent treatment of the asbestos ban's benefits (undiscounted) and costs (discounted to present value), and the use of analogous exposure evidence which was not properly in the record.

The cumulative effect of these inconsistencies was the promulgation of an expensive and inefficient ban on asbestos. The ban would have wasted significant societal resources, and might have actually increased overall health risks due to the increased production and use of potentially unhealthful substitute materials.

If future regulatory bans promulgated under section 6 of the TSCA are to be efficient, they will require more extensive analyses of costs and benefits. Courts may be less likely to accept the EPA's con-

¹⁵⁷ See *supra* notes 123, 125, 126, 127, 151 and accompanying text.

tention that a ban is the least burdensome alternative without an evaluation of the cost of other regulatory alternatives. The reasonableness of a proposed regulation will be scrutinized largely in terms of the cost per life saved. This approach ensures a more efficient use of regulatory resources and a larger reduction of risks from toxic substances.

For widely employed substances, used in multi-industry or multi-product applications, an outright ban is problematic. There is usually a highly valued application for which the given substance is uniquely suited.¹⁸⁸ The available alternate material is often a poorer or less-safe substitute. An across-the-board ban of a substance may thus be costly and may potentially increase risk.

The TSCA will not serve as an omnibus environmental statute which can quickly or easily regulate a toxic substance on a multi-industry basis. Rather, any regulatory action must be justified product by product. Individualized product adjudication will be necessary to determine if a substance, when used in a particular product or industry, presents an unreasonable risk.

Granta Y. Nakayama

¹⁸⁸ For asbestos, a typical example is asbestos-cement pipe. This product's relative safety resulted in a high cost per life saved (\$43 - \$76 million per life saved). The substitutes, PVC and ductile iron pipe, were also arguably more risky. See *supra* note 115 and accompanying text.

