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NEPA, NIMBYs and New Technology

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INTRODUCTION

The story of the National Environmental Policy Act of 1970 (NEPA) is well known by now. A statute with scant legislative history is enacted at the onset of the environmental movement. The statute requires federal agencies to prepare an environmental impact statement (EIS) "on proposals for . . . major Federal action significantly effecting the quality of the human environment . . . ."[1] As Justice Marshall subsequently remarked: "[T]his vaguely worded statute seems designed to serve as no more than a catalyst for development of a 'common law' of NEPA . . . . [C]ourts have responded in just that manner and have created such a 'common law.' "[2] Thus, the courts took the statute and crafted it into a meaningful tool of environmental protection.

As NEPA reaches twenty, it is amazing to look back and see how this little-considered statute came to the forefront in a wide variety of environmental conflicts ranging from, early on, channelization[3] through consistent application in highway[4] and nuclear disputes,[5] to genetic engineering today.[6] While the Administrative Procedures Act certainly has widespread applicability,[7] and other statutes can be used to block projects in specific situations, only NEPA has the general applicability to encompass almost all federal government action. Thus, either in the absence of, or as a supplement to, a statute with specific

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1. 42 U.S.C. § 4332(2)(C)(1982).
2. Kleppe v. Sierra Club, 427 U.S. 390, 421 (1976) (Marshall, J., concurring in part and dissenting in part).
3. *See, e.g.,* Sierra Club v. Bergland, 451 F. Supp. 120 (N.D. Miss. 1978); Akers v. Resor, 443 F. Supp. 1355 (W.D. Tenn. 1978); State ex rel. Baxley v. Corps of Eng'rs., 411 F. Supp. 1261 (N.D. Ala. 1976).
4. *See, e.g.,* Adler v. Lewis, 675 F.2d 1085 (9th Cir. 1982); Lathan v. Brinegar, 506 F.2d 677 (9th Cir. 1974); Brooks v. Coleman, 518 F.2d 17 (9th Cir. 1975).
5. *See infra* notes 46-100 and accompanying text.
6. *See infra* notes 101-120 and accompanying text.
7. *See, e.g.,* Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402 (1971).

applicability to a problem, NEPA has become the preferred statute of general appeal in environmental disputes.

The purpose of this article is not to undertake a detailed examination of NEPA and its nuances. The article also does not take a detailed look at risk analysis.[8] Rather, this article looks at how society, through a statute such as NEPA, addresses the risks inherent in "new" technologies. In doing so, we will not assess the merits of the specific technology, but concentrate on the uses of NEPA.

RISK

Judicial involvement with new technology is not a modern phenomenon. For example, the 1834 case of *Earl of Ripon v. Hobart* involved a nuisance claim against the construction of a steam engine for draining low lands.[9] Windmills had previously been used for that purpose. The fear expressed was that this new technology would change and endanger the embankments of the river into which the drainage waters would be pumped. The hallowed case of *Rylands v. Fletcher* illustrates another judicial response to industrialization's perils.[10]

It is clear that throughout the latter half of the nineteenth century there was a broad social consensus that industrialization and railroads were good, particularly if cheap.[11] This view was reflected in the *laissez-faire* attitude of the courts. For example, the famous opinion of *Pennsylvania Coal Co. v. Sanderson* involved mine waters draining from defendant's operations onto plaintiff's property, rendering her water supply unfit for domestic use, destroying the fish in a brook on her property, and corroding her pipes.[12] A verdict for plaintiff was reversed on appeal, with the court emphasizing that defendants were only making the ordinary and natural use and enjoyment of their property, that is, anthracite coal mining. The court also stressed the economic importance of the industry to the state:

> It has been stated that 30,000,000 tons of anthracite and 70,000,000 of bituminous coal are annually produced in Pennsylvania. It is therefore a question of vast importance, and cannot, on that account, be too carefully considered; for, if damages may from time to time be recovered, either in the present form or as for a nuisance, punitive sums may be resorted to to prevent repetition, or to compel abatement of the nuisance. Indeed, if the right to damages in such cases is admitted, equity may, and under the decisions of this court undoubtedly would, at the

8. *See, e.g.,* Huber, *The Old-New Division in Risk Regultion,* 69 VA. L. REV. 1025 (1986); *see generally Symposium: Risk Assessment in Environmental Law,* 14 COL. J. ENVTL. L. (1989).

9. 40 Eng. Rep. 65 (1834).

10. 3 L.R.-E. & I. App. 330 (1868); *See generally* Simpson, *Legal Liability for Bursting Reservoirs: The Historical Context of Rylands v. Fletcher,* 13 J. LEGAL STUD. 209 (1984).

11. *See, e.g.,* Bohrer, *Fear and Trembling in the Twentieth Century: Technological Risk, Uncertainty and Emotional Distress,* 1984 WIS. L. REV. 83, 110.

12. 113 Pa. 126, 6 A. 453 (1886).

> suit of any riparian owner, take jurisdiction, and upon the ground of a continuous and irreparable injury, enjoin the operation of the mine altogether. Whatever rights Mrs. Sanderson may have to the use of this water, and whatever remedy she may have in this case . . . in law or in equity, is the right and remedy of every other riparian owner . . . throughout the commonwealth. . . . Hence, if the responsibility of the operator of a mine is extended to injuries of the character complained of, the consequences must be that mining cannot be conducted, except by the general consent of all parties affected.
>
> It will be observed that the defendants have done nothing to change the character of the water, or to diminish its purity, save what results from the natural use and enjoyment of their own property. They have brought nothing on to the land artificially. The water as it is poured into meadow brook, is the water which the mine naturally discharged. Its impurity arises from natural, not artificial causes. The mine cannot, of course, be operated elsewhere than where the coal is naturally found, and the discharge is a necessary incident to the mining of it . . . .
>
> The defendants, being the owners of the land, had a right to mine the coal. It may be stated, as a general proposition, that every man has the right to the natural use and enjoyment of his own property; and if, whilst lawfully in such use and enjoyment, without negligence or motive on his part, an unavailable loss occurs to his neighbor, it is *damnum absque injuria*, for the rightful use of one's own land may cause damage to another, without any legal wrong . . . .[13]

The opinion continued:

> The right to mine . . . is . . . a right incident to the ownership of coal property; and when exercised in the ordinary manner, and with due care, the owner cannot be held for permitting the natural flow of mine water over his own land, into the water-course . . . . The discharge of this acidulated water is practically a condition upon which the ordinary use and enjoyment of coal lands depends.[14]

The court further stated:

> [W]e are of opinion that mere private personal inconveniences, arising in this way . . . must yield to the necessities of a great public industry, which . . . subserves a great public interest. To encourage the development of the great natural resources of a country trifling inconveniences to particular persons must sometimes give way to the necessities of a great community.[15]

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13. *Id.* at 144-46, 6 A. at 455-57.
14. *Id.* at 146-47, 6 A. at 457.
15. *Id.* at 149, 6 A. at 459.

Clearly the court was emphasizing the rights of industry versus the rights of individuals and the environment. Such an approach was characteristic of the post-civil war industrial boom.

Another opinion of the same ilk stated:

> Railroad companies are public corporations organized and maintained for public purposes. Railroads cannot be operated without causing more or less inconvenience to the public and discomfiture, and possible damage, to persons living adjacent to their lines. All such inconveniences and incidental damages must be endured by the individual for the general good.[16]

Twenty-seven years after *Sanderson,* the Pennsylvania Supreme Court stated: "The exception introduced in the *Sanderson* Case has resulted in the pollution of nearly every stream in the western end of the state, and it has become a serious problem how to obtain pure water sufficient to supply the inhabitants."[17]

Yet, even though the pendulum has changed to individual rights and environmental protection, it was not until 1974, eighty-eight years later, that *Sanderson* was overruled.[18] Even in the first half of the twentieth century, courts tolerated water pollution when a degree of risk was posed to the public at large.[19] It was commonly understood that safe did not mean risk free.

Such nineteenth century disasters as the Johnston City flood[20] did not deter society in continuing to build new dams and other structures. Highways, bridges, dams, airports, pesticides and the like were viewed as progress. Their risks and side-effects were accepted as the inevitable cost of civilization. It was generally recognized that the benefits of an industrialized society have their risks; there is no "free lunch." For example, even though one of the first manifestations of the new environmental awareness in this country was the banning of DDT in

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16. Atchinson, T. & S.F. Ry. v. Armstrong, 71 Kan. 366, 371-72, 80 P. 978, 980 (1905).

17. McCune v. Pittsburgh & Baltimore Coal Co., 238 Pa. 83, 93, 85 A. 1102, 1106 (1913).

18. Commonwealth v. Barnes & Tucker Co., 455 Pa. 392, 319 A.2d 871 (1974).

19. *See, e.g.,* Rose v. Socony-Vacuum Corp., 54 R.I. 411, 173 A. 627 (1934). In fact, at one point, the Pennsylvania Supreme Court adopted language from a lower court in stating, "[w]ithout smoke, Pittsburgh would have remained a very pretty village." Washchak v. Moffat, 379 Pa. 441, 453, 109 A.2d 310, 316 (1954)(quoting Versailles Borough v. McKeesport Coal & Coke Co., 83 Pittsb. Leg. J. 379).

20. In the tragic Johnston Flood of May 31, 1889, 2,209 people died when the South Fork Dam burst fourteen miles above Johnston, spewing 20 million tons of water down the valley. For a description of the disaster, see Jackson, *When 20 Million Tons of Water Flooded Johnston,* SMITHSONIAN, May 1989, at 50. The only liability was for a railroad which had misshipped a passenger's trunk, which was lost in the flood. The court viewed the flood as an act of God, but since the railroad was at fault in mishandling the luggage, it was held liable to the passenger. Wald v. Pittsburgh, C., C. & St. L. R. R., 162 Ill. 545, 44 N.E. 888 (1896).

1971,[21] it was only thirteen years earlier that a court found the substance to be safe and upheld its use.[22]

The change in the acceptability of DDT reflects vast changes in society as a whole in this time period as well as changes in scientific knowledge and appreciation of risks.[23] The onset of environmental awareness was signaled with the first earth day on April 22, 1970. For many, the decade of the 1970's became known as the decade of the environment. Three major catalysts led to the change in public attitudes over the environment. They were Rachel Carson's books dealing with the perils of DDT,[24] the Santa Barbara Oil Well Blowout,[25] and the smog problem, especially in Los Angeles.

It is clear that public concerns about risks to human life and health have increased as a result of technological advances. In this respect, major scientific advances bring with them hazards of uncertain probability and magnitude. In addition, concerns over environmental protection and technological risks accompany an increase in affluence. Once society no longer has to worry about the basic economy, it can devote time and attention to the costs of progress. Consequently, there is a big difference in approach today. Traditionally society had followed an implicit policy of ignoring uncertain environmental risks until disaster hit.[26] Today, quite often there is strong resistance to ever allowing the risk to arise. The 1970s reflected the general breakdown in society of a clear consensus on many values and mores as a result of the Vietnam War. In this respect the growth of the environmental movement reflects the polarization of a society no longer certain of its own values.

Opposition is often based on fear: fear both of the known and fear of the unknown; fear that is justified in light of the facts; and fear that is scientifically irrational. In this respect, the judicial confrontation with fear is not new. Traditionally, fear appeared in nuisance cases.[27]

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21. Environmental Defense Fund v. Ruckelshaus, 439 F.2d 584 (D.C. Cir. 1971).

22. Murphy v. Benson, 164 F. Supp. 120 (E.D.N.Y. 1958), *cert. denied,* 362 U.S. 929 (1960).

23. One thesis is that twentieth-century technologies are qualitatively different from the technologies prevalent during the formative era of the common law. Bohrer, *supra* note 11, at 86. The thesis is based on three factors: the much larger size of the potentially affected population; the lack of knowledge and predictability by which technology can cause injuries; and the potentially long period between exposure and manifestation of the injury. Consequently, it is contended that public awareness about risks to human life and health have surged as a result of technological advances. Goodley, *Risk in the 1980's: New Perspectives on Managing Chemical Hazards,* 21 SAN DIEGO L. REV. 1015, 1017 (1984).

24. See R. CARSON, SILENT SPRING (1962); R. CARSON, THE SEA AROUND US (rev. ed. 1961).

25. *See* R. EASTON, BLACK TIDE (1972) and L. DYE, BLOWOUT AT PLATFORM A (1971).

26. Silver, *The Common Law of Environmental Risk and Some Recent Applications,* 10 HARV. ENVTL. L. REV. 61, 62 (1986).

27. *Compare* Mayor and City Council of Baltimore v. Fairfield Improvement Co., 87 Md. 352, 39 A. 1081 (1898) (leprosy nuisance case) *and* Everett v. Paschall, 111 P. 879 at 880 (Wash. 1910):

> If dread of the disease and fear induced by the proximity of the sanitarium, in fact, disturb the comfortable enjoyment of the property of the appel-

Today, it commonly manifests itself in environmental litigation, such as through NEPA.

The era of environmental awareness coincided with NEPA's taking effect at 12:01 a.m. on January 1, 1970. Public opposition to proposed developments through the use of NEPA was not limited to large projects, but existed on a diffuse scale when even small, local, and often mundane, developments were at issue, such as jails,[28] low-income housing,[29] and post office sitings.[30] Most NEPA lawsuits probably do not involve large capital, massive, new technology projects, but rather the smaller, localized project. Often times these projects involved proposals where the benefits would be realized on a wide scale, but the costs would be essentially confined to one area, which becomes hostile to the proposal.

There is general acceptance of the benefits of civilization, such as electricity, running water, mail service and the like, as well as the recognition of the need for the facilities that provide these services. There is also recognition of the need for sewers, sewage treatment plants, transmission lines, resource recovery centers, prisons and the other facilities that handle the "costs" of society. The problem is that everyone wants the benefits, but few want to share the costs. Thus developed the NIMBY[31] phenomenon: "Not in my backyard."[32] Early developments

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> lants, we question our right to say that the fear is unfounded or unreasonable, when it is shared by the whole public to such an extent that property values are diminished. The question is, not whether the fear is founded in science, but whether it exists; not whether it is imaginary, but whether it is real, in that it affects the movements and conduct of men. Such fears are actual, and must be recognized by the courts as other emotions of the human mind.

Board of Health of Ventnor City v. North Am. Home, 77 N.J. Eq. 464 at 456, 78 A. 677 (1910) ("[I]f no real danger . . . exists the mere fact the uninformed people who are unacquainted with the true condition may, or probably will, assume such a danger to exist, cannot be made the basis of equitable relief.") and Nicholson v. Connecticut Half-Way House, Inc., 153 Conn. 507, 218 A.2d 383 (1966).

28. *See, e.g.,* Ely v. Velde, 497 F.2d 252 (4th Cir. 1974); Hanly v. Kleindienst, 471 F.2d 823 (2nd Cir. 1972), *cert. denied,* 412 U.S. 908 (1973).

29. *See, e.g.,* Hiram Clarke Civic Club, Inc. v. Lynn, 476 F.2d 421 (5th Cir. 1973); Nucleus of Chicago Homeowners Ass'n v. Lynn, 524 F.2d 225 (7th Cir. 1975).

30. *See, e.g.,* Chelsea Neighborhood Ass'ns v. United States Postal Serv., 516 F.2d 378 (2d Cir. 1975).

31. NIMBY should not be confused with Luddites, who were led by a man who went by the name of Ned Ludd. The Luddites were involved in several riots which broke out in the last half of the nineteenth century in England. They attacked and destroyed steam-driven spinning machines because of fear the new machinery would cause unemployment. S. STRANAH, THE HISTORY OF THE MACHINE, 122 (1989).

32. A classic example of the NIMBY attitude was expressed by Senator Warren Magnuson of Washington, who opposed the transshipment of Alaskan oil through Washington State. He stated: "Why should Puget Sound become a dumping point for somebody else's oil?" Seattle Post-Intelligencer, Sept. 3, 1977, at A3, col. 3. He got Congress to effectively enact a ban on transshipment through Washington. Of similar import is a statement of a resident near the Three Mile Island nuclear plant: "I don't care if it's a little bit of harm or ten times that amount - I don't want any . . . all those charts are so much gobbledygook to me, an unlearned person." Springfield Morning Union, March 29, 1983, at 3, col. 3.

in NEPA litigation gave NEPA the power to serve as an essential tool of the NIMBY movement. NEPA all too often became an instrument of delay for opponents of a project.[33]

Delay buys time, which opponents can use to build popular and political opposition to the project. New information may develop, partially through the disclosures of the NEPA statement. Inflationary pressures, and other costs, could economically doom the project during the delay. NEPA thereby became an important means to the end: stopping the project.

Much of the public concern reflects itself in emphasizing the risk factor of a proposal. In the past, the emphasis was on the benefits of a project. For opponents, the primary concern is on the putative risks of the proposal — the worst case scenario. Quite often the risks are of a low probability, high magnitude nature; that is, while the potential chance of a mishap occurring is small, the potential consequences of such a mishap are catastrophic.

In terms of the risk factor, the proponents of a project can present a parade of experts who will testify to the benefits of the project and its safety, but will not assuage the opponents for two reasons. First, there can be no guarantees of absolute safety; the low risk hazards can materialize.[34] Examples include the Teton Dam break,[35] the Three Mile

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33. NEPA is not the first statute to be used in efforts to stop new technology. For example, the Freedom of Information Act was utilized to obtain information in attempts to stop at a political level underground nuclear tests in Alaska, Environmental Protection Agency v. Mink, 410 U.S. 73 (1973); American construction of a supersonic transport plane. Soucie v. David, 448 F.2d 1067 (D.C. Cir. 1971).

34. *See, e.g.*, Kellman, *Anxiety Over the TMI Accident: An Essay on NEPA's Limits of Inquiry*, 51 GEO. WASH. L. REV. 219, 247 (1983). "In March 1979, an event with a statistically insignificant probability of occurring did occur. History is full of instances where the improbable occurred. Arguably, law should be as responsive to the lessons of history as to the calculations of technical experts." *Id.*

In a dissenting opinion in a case involving the transportation of nuclear waste materials, Judge Oakes pointed out:

> 'Worst-case' accidents have a way of occurring — from Texas City to the Hyatt Regency at Kansas City, from the Tacoma Bridge to the Greenwich, Connecticut, I-95 bridge, from the Beverly Hills in Southgate, Kentucky to the Cocoanut Grove in Boston, Massachusetts, and from the Titanic to the DC-10 at Chicago to the I-95 toll booth crash and fire — and that alone would end the case for many.

City of New York v. United States Dep't. of Transp., 715 F.2d 732, 753 (2d Cir. 1983) (Oakes, J., dissenting).

35. The Teton Dam was breached at 11:59 a.m. on June 9, 1976 as the reservoir was being filled for the first time. Eleven lives were lost, 25,000 people were left homeless, 300 square miles were totally or partially inundated, and claims approximating $400 million were paid by the Bureau of Reclamation, pursuant to special legislation enacted by Congress. The causes of the Teton Dam break have been extensively analyzed. For the scientific-engineering reasons, see INDEPENDENT PANEL TO REVIEW CAUSE OF TETON DAM FAILURE, REPORT TO UNITED STATES DEPARTMENT OF THE INTERIOR AND STATE OF IDAHO ON FAILURE OF TETON DAM (1976); U.S. DEPT. OF THE INTERIOR, TETON DAM FAILURE REVIEW GROUP, FAILURE OF TETON DAM: A REPORT OF FINDINGS (1977).

The Teton Dam break was not the first incident for the Bureau of Reclamation. It seems that in 1952 they had a near miss on Grand Coulee Dam. M. MORGAN, THE DAM (1954).

Island nuclear plant accident, the Kansas City Hyatt Regency skywalk collapse,[36] the Mianus River Bridge collapse,[37] the space shuttle Challenger explosion, the Exxon Valdez oil spill, and, most tragic of all, Bhopal. Perhaps most improbable of all, during World War II an Army bomber crashed into the 78th and 79th floors of the Empire State Building, killing 14 and injuring 26. When such a disaster occurs today, the media rush to the scene of the accident and the evening news is saturated for days with the event. One effect of the coverage is to reinforce the fears of the public. When one throws in phrases like Love Canal, the public fear, even if highly exaggerated in a specific instance, cannot be considered irrational. In fact, it is fair for the public to disbelieve and mistrust the experts. It is equally valid for opponents to focus on the potential risks, even if highly improbable, since they do sometimes occur. Thus, for every new proposal, particularly technological innovations, the opponents can ask the question: "Are we creating a Frankenstein?" All too often it seems that the guarantee, "It can't happen here because of 'built-in safeguards,' " has been breached. Consequently, a high degree of skepticism toward assurances of safety has developed.

Second, any new technology will present problems with unknown solutions at the time the project is undertaken. It is assumed that solutions will be found along the way. However, many of these technologies involve what is sometimes referred to in the aerospace industry as "unk-unks," that is unknown unknowns. In other words, a number of uncertainties are expected. It's the totally unexpected ones that create the problems. We can plan for the known, and take appropriate precautions. We cannot plan for the unknown problems and unforeseeable dangers. Hence, precautions and safe handling procedures cannot be guaranteed 100% effective. Consequently, there will be a number of unknown and unanswerable questions. With these uncertainties, it is easy for opponents to capitalize on fears of the unknown, and demand assurances of absolute safety.

Nor does it do any good to point out that environmental risks are nothing new to society. Throughout history, nature has been perverse, subjecting humanity to earthquakes, volcanic eruptions, tornados, hurricanes, landslides, tidal waves, floods, droughts, famines and other "natural" disasters.[38] Uncertainty is inherent in life; there are no absolute guarantees of safety in life. The reason that pointing out natural risks is unconvincing is that frequently these "acts of god" are supposedly uncontrollable whereby man-made risks can be averted. In

36. A suspended balcony (skywalk) collapsed at the Hyatt Regency Kansas City Hotel on July 17, 1981, causing the death of 114 people and severe injuries to scores of others. Firestone v. Crown Center Redevelopment Corp., 693 S.W.2d 99 (Mo. 1985).

37. On June 3, 1983 a rusted span of the Connecticut Turnpike bridge spanning the Mianus River, fell into the river without warning, killing 3.

38. Through the course of writing this article, Hurricanes Hugo and Jerry have ravaged the Caribbean, and the California Earthquake struck the greater San Francisco Bay area with devastating impacts.

short, we may have to accept that which is natural and uncontrollable, but we do not have to accept new risks imposed upon us by humans. It is also important to realize that individuals perceive risks differently: an acceptable risk to one would clearly prove an intolerable risk to another. Acceptability of risk is therefore a subjective factor.

Similarly, it may not avail proponents much to assert that the risks involved with the new technology may actually be less than with the old technology. Newer technologies tend to be safer than the old technologies they displace.[39] However, the public has come to accept, and live with, the old risks. It is fair to say that "[p]anic, protest, and organized resistance . . . greet almost every venture that entails new public risk."[40] In addition, the new risks are often felt in a different locale than the old risks. For the new neighbors these "old" risks are really new risks, and they are thus viewed with skepticism by those near the proposed site.

With new technologies we are often thrust into the frontiers of science. When litigation ensues, courts must confront complicated technical, scientific issues where the experts, even if they can agree, are unable to accurately predict the risks and consequences of the advance. In this respect, it is important to consider Judge Bazelon's opinion in *Environmental Defense Fund v. Ruckelshaus*,[41] a non-NEPA case, when he states:

> We stand on the threshold of a new era in the history of the long and fruitful collaboration of administrative agencies and reviewing courts. For many years, courts have treated administrative policy decisions with great deference, confining judicial attention primarily to matters of procedure. On matters of substance, the courts regularly upheld agency action, with a nod in the direction of the 'substantial evidence' test, and a bow to the mysteries of administrative expertise. Courts occasionally asserted, but less often exercised, the power to set aside agency action on the ground that an impermissible factor had entered into the decision, or a crucial factor had not been considered. Gradually, however, that power has come into more frequent use, and with it, the requirement that administrators articulate the factors on which they base their decisions.
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> Strict adherence to that requirement is especially important now that the character of administrative litigation is changing . . . . [C]ourts are increasingly asked to review administra-

39. *See* Huber, *The Old-New Division in Risk Regulation*, 69 VA. L. REV. 1025, 1053, 1081-82 (1983); Huber, *Safety and the Second Best: The Hazards of Public Risk Management in the Courts*, 85 COLUM. L. REV. 277, 298, 302, 314 n. 138, 336 (1985). Huber further emphasizes that our life expectancies continue to increase in spite of the fact that we are being exposed to new risks and hazards that are supposedly threatening our life style and health. *Id.* at 295.

40. Huber, *supra* note 39, 85 COLUM. L. REV. at 281.

41. 439 F.2d 584 (D.C. Cir. 1971).

> tive action that touches on fundamental personal interests in life, health, and liberty. These interests have always had a special claim to judicial protection, in comparison with the economic interests at stake in a ratemaking or licensing proceeding.[42]

Similarly, in another non-NEPA, environmental decision from the early 1970's, *Industrial Union Department, AFL-CIO v. Hodgson*[43], the court recognized that

> [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 fully factual analysis. Thus, in addition to currently unresolved factual issues, the formulation of standards involves choices that by their nature require basic policy determinations rather than resolution of factual controversies. Judicial review of inherently legislative decisions of this sort is obviously an undertaking of different dimensions.[44]

The final remark to set the stage is Chief Justice Burger's admonition: "Perfect safety is a chimera; regulation must not strangle human activity in the search for the impossible."[45]

NUCLEAR POWER

One of the earliest areas to receive widespread NEPA attention was nuclear power, which epitomizes the low risk, high consequence scenario. In addition, the very concept of nuclear power is frightening to many. There is widespread fear of the power of the atom, which fear can be traced back to Hiroshima and Nagasaki. All the reassurances in the world that nuclear power cannot result in a bomb explosion will not totally eliminate the fears. Once a Three Mile Island or Chernobyl disaster occurs with the attendant publicity, the fears are brought to the surface with a vengeance.

It is important to note that the statutory standards for nuclear power plant licensing do not mandate absolute safety. A license for a nuclear plant is issued if there is reasonable assurance that the proposed plant can be constructed and operated without undue risk to the health and safety of the public.[46] If a license application is contested, the Licensing Board must find reasonable assurance the plant's operation will provide adequate protection to the health and safety of the public.[47]

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42. *Id.* at 597-98.
43. 499 F.2d 467 (D.C. Cir. 1974).
44. *Id.* at 474-75.
45. Industrial Union Dep't, AFL-CIO v. American Petroleum Inst., 448 U.S. 607, 664 (1980) (Burger, C.J., concurring).
46. 42 U.S.C. § 2241 (1982); 10 C.F.R. § 50.35(a) (1987).
47. 42 U.S.C. § 2332(a) (1982); 10 C.F.R. § 50.57(a)(3) (1987). This requirement is not a zero-risk standard; it permits the acceptance of some level of risk. Carstens v. Nuclear Regulatory Comm'n, 742 F.2d 1546, 1557 (D.C. Cir. 1984).

However, it is of more than symbolic import that the germinal NEPA case involved nuclear energy: *Calvert Cliffs' Coordinating Committee, Inc. v. United States Atomic Energy Commission.*[48] The agency contended in *Calvert Cliffs'* that because of the vagueness of NEPA, substantial discretion remained in the agency, and that it needed a reasonable time to adjust to the statute's mandate.

Judge Skelly Wright, a frequent author of environmental decisions, set the tone for interpreting NEPA, by beginning the opinion by stating the court faced the challenge of ensuring that NEPA's "important legislative purposes, heralded in the halls of Congress, are not lost or misdirected in the vast hallways of the federal bureaucracy."[49] The court emphasized that NEPA makes environmental protection a part of the mandate of every federal agency and department. The agency is now compelled to take environmental values into account. Indeed, environmental issues must be considered by the agency just as other matters within the agency's mandate are considered. For the court, the purposes of the impact statement are to aid in the agencies' decision-making process and to inform other agencies and the public of the environmental consequences of the planned federal actions.[50] NEPA applies both to federal agency projects, and more significantly, to agency action, such as issuance of a permit or license when such federal action is required for private projects to move forward. The issuance of the permit constitutes the requisite federal action for NEPA.

Under the contested Atomic Energy Commission rules, environmental factors were to be considered by the regulatory staff, but not by the hearing board unless affirmatively raised by outside parties or staff members. This part of the case is important to us in two respects. First, it led to the court's substantive holding that environmental issues must be considered at every important stage in the decision making process — "at every stage where an overall balancing of environmental and nonenvironmental factors is appropriate and where alterations might be made in the proposed action to minimize environmental costs."[51]

Just as significant was the court's reaction to the AEC's attitude: "We believe that the Commission's crabbed interpretation of NEPA makes a mockery of the Act."[52] In language that will be echoed later, the court stated that the AEC's "responsibility is not simply to sit back, like an umpire, and resolve adversary contentions at the hearing stage. Rather, it must itself take the initiative of considering environmental values at every distinctive and comprehensive stage of the process beyond the staff's evaluation and recommendation."[53] The court also

48. 449 F.2d 1109 (D.C. Cir. 1971).
49. *Id.* at 1111.
50. *Id.* at 1114.
51. *Id.* at 1118.
52. *Id.* at 1117; *see* Aeschliman v. United States Nuclear Regulatory Comm'n, 547 F.2d 622, 627 (D.C. Cir. 1976).
53. *Calvert Cliffs',* 449 F.2d at 1118.

remarked that "the Commission's approach to statutory interpretation is strange indeed—so strange that it seems to reveal a rather thoroughgoing reluctance to meet the NEPA procedural obligations in the agency review process, the stage at which deliberation is most open to public examination and subject to the participation of public intervenors."[54]

It is clear therefore that to the extent NEPA presented a blank check to the judiciary, *Calvert Cliffs'* filled it in. While some of the narrow issues presented in *Calvert Cliffs'* may have been trimmed or modified in later cases, the basic tone was set. In addition, the Court of Appeals for the District of Columbia early acquired a distrust for decisions of the Atomic Energy Commission/Nuclear Regulatory Commission.

In a subsequent case, *Izaak Walton League of America v. Schlesinger*, the AEC reinforced its negative image in the eyes of the federal judiciary.[55] The AEC's "new" NEPA regulations allowed issuance of a temporary operating license up to twenty percent or more of a plant's capacity without a detailed environmental impact statement. The AEC proposed to license the Quad Cities plant at Cordova, Illinois at fifty percent capacity from December 1971 through March 1972. The thermal pollution effects on the Mississippi River would have been great. A fifty percent operation would have discharged cooling waters 11.5° F. above the river's temperature at a rate of 780 gallons per minute. The effect would have been at least a five degree increase in water temperature 4,000 feet downstream from the point of discharge and would have violated present and proposed Illinois water temperature requirements.

The district court enjoined issuance of the permit. Even though the agency labeled its action "temporary," in reality it constituted final agency action, which required preparation of a NEPA statement prior to issuance of a permit. The effect of *Calvert Cliffs'* and *Izaak Walton League* was an 18-month hiatus before another permit was issued by the AEC. *Calvert Cliffs'* affected sixty-five plants under construction, and operating licenses involving ninety-seven units plus five plants which received operating licenses after January, 1970, and ten under provisional licenses.[56]

Many NEPA suits involving nuclear power issues followed, and many injunctions were issued. For our purposes, the next major case was *Scientists' Institute for Public Information, Inc. v. Atomic Energy Commission, (SIPI)* which involved the nascent technology of the breeder reactor.[57] Breeder reactor technology allows nuclear reactors to generate more enriched uranium fuel than they conserve—seemingly modern alchemy. On the other hand, breeder reactors produce plutonium, which is a highly potent nuclear waste. The problems of nuclear

54. *Id.* at 1119.
55. 337 F. Supp. 287 (D.D.C. 1971).
56. *Calvert Cliffs' Court Decision, Part 1: Hearings Before the Senate Interior Comm.*, 92nd Cong., 1st Sess. 45 (1971).
57. 481 F.2d 1079 (D.C. Cir. 1973).

waste disposal are still perplexing with a final solution not yet in sight. The problems of processing, transporting and storing plutonium would only exacerbate the situation. A related problem is that of nuclear proliferation. The AEC was willing to prepare EIS's for the construction of individual facilities, but refused to do a programmatic EIS on the grounds that such was not required for research and development. Any environmental assessment would be speculative at that point.

Once again, Judge Skelly Wright wrote the court's opinion, and yet again, he noted: "The Commission takes an unnecessarily crabbed approach to NEPA . . . ."[58] The court held that "NEPA requires impact statements for major federal research programs . . . aimed at development of new technologies which, when applied, will significantly affect the quality of the human environment."[59] For the court, Congress had emphasized its concern with new technologies and their affect on the environment in enacting NEPA. The statute explicitly lists "new and expanding technological advances" as one of the activities with the potential to threaten the environment.[60] Consequently, an EIS could be required even though the effects of the breeder reactor were unknown.

In addition to legislative history, the court looked to several factors for its decision. First, research and development is a necessary precondition to implementation of a technology. Second, research and development usually requires an irreversible commitment of resources. Any irretrievable commitment of resources to one area of technology will necessarily foreclose the development of alternative feasible technologies. Also involved is one of NEPA's main functions to bolster the capacity to understand and control the effects of new technology.[61] In *SIPI*, the court stated:

> NEPA's objective of controlling the impact of technology . . . cannot be served by all practicable means, unless the statute's action forcing impact statement process is applied to ongoing federal agency programs aimed at developing new technologies which, when applied, will affect the environment. To wait until a technology attains the stage of complete commercial feasibility before considering the possible adverse environmental effects attendant upon ultimate application of the technology will undoubtedly frustrate meaningful consideration and balancing of environmental costs against economic and other benefits.[62]

The court further stated:

> [O]ne of the functions of a NEPA statement is to indicate the extent to which environmental effects are essentially unknown.

58. *Id.* at 1086.
59. *Id.* at 1091.
60. 42 U.S.C. § 4331(a) (1982) (statement of purpose).
61. *SIPI*, 481 F.2d at 1089-90.
62. *Id.* at 1089.

> It must be remembered that the basic thrust of an agency's responsibilities under NEPA is to predict the environmental effects of proposed action before the action is taken and those effects fully known. Reasonable forecasting and speculation is thus implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as 'crystal ball inquiries.' 'The statute must be construed in the light of reason if it is not to demand what is, fairly speaking, not meaningfully possible . . . .' But implicit in this rule of reason is the overriding statutory duty of compliance with impact statement procedures to the 'fullest extent possible.'[63]

Therefore, *SIPI* directs that an agency's responsibility under NEPA is to predict the environmental effects of a proposed action before the action is taken. Consequently, agencies engaged in long-term technological research and development should develop either formal or informal procedures for regular evaluations of whether the time for drafting a NEPA statement has arrived.

In a subsequent nuclear case, the Court of Appeals for the Second Circuit agreed with *SIPI* that NEPA's requirements "apply to the development of a new technology as forcefully as they apply to the construction of a single nuclear power plant."[64] It is clear that Congress intended NEPA to apply to the decisions to introduce a new technology as well as to the decision to license related technology.[65]

In a subsequent case involving coal development, *Kleppe v. Sierra Club,* the Supreme Court made it clear that an EIS is not required until there is a report or recommendation on a proposal for major federal action.[66] The question is not whether a major federal action is contemplated, but is one proposed. The Supreme Court also cited two lower court opinions: one for the proposition that neither the statute nor its legislative history contemplates that a court should substitute its judgment for that of the agency as to the environmental consequences of its actions,[67] and the other to the effect that the only role for a court is to ensure that the agency has taken a hard look at the environmental consequences of the proposal.[68]

The practical consequences of *SIPI* were more important for the breeder reactor than the legal fine points of the case. As delays set in, and costs mounted, the project became increasingly controversial.

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63. *Id.* at 1092.
64. Natural Resources Defense Council v. United States Nuclear Regulatory Comm'n, 539 F.2d 824, (2nd Cir. 1976).
65. *Id.*
66. 427 U.S. 390 (1976).
67. *Id.* at 410 n. 21 (citing Scenic Hudson Preservation Conference v. FPC, 453 F.2d 463, 481 (2d Cir. 1971), *cert. denied,* 407 U.S. 926 (1972)).
68. *Kleppe,* 427 U.S. at 410 n. 21 (citing Natural Resources Defense Council v. Morton, 458 F.2d 827, 838 (D.C. Cir. 1972)).

Finally, in 1983, Congress cut off all further funding for the project after $1.6 billion had been appropriated, leaving a 100 foot deep hole in the ground the size of three football fields.[69] In this respect the intervenors' use of NEPA illustrates a major impact of NEPA litigation — stalling a project until costs and political/popular opposition doom it.

It is clear that NEPA does not allow a court to second guess the merits of a project because of uncertainties about the future risks. As Judge Bazelon pointed out in a concurring opinion: "These risks are hardest to calculate because they surpass the problems posed by mere ignorance of a new technology. The scientists and decision-makers are asked to assess and make allowance for the probabilities that present scientific understanding is itself terribly wrong."[70]

However, it is equally clear that many judges have used NEPA as a tool where they feel uncomfortable with the agency's handling of the risks involved.

This reality is illustrated by a series of decisions involving nuclear waste disposal costs and NEPA. The litigation, often referred to as *Vermont Yankee,* illustrates the intellectual tug-of-war between the D.C. Circuit and the Supreme Court. The NRC prepared a "Table S-3 Rule," which assigned a set of numerical values intended to reflect the environmental effects of the uranium fuel cycle. The District of Columbia Circuit twice invalidated the rule and, in turn, was twice reversed by the Supreme Court. The NRC concluded the environmental effects were relatively insignificant. The Court of Appeals had great difficulty accepting this premise since the Vermont Yankee plant would produce roughly 160 pounds of plutonium waste a year for forty years. Such highly toxic wastes would have a half-life of 25,000 years and would have to be kept isolated from the environment for 250,000 years before becoming harmless.[71]

The intervenors in the case "reiterated repeatedly that the problems involved are not merely technical, but involve basic philosophical issues concerning man's ability to make commitments which will require stable social structures for unprecedented periods."[72]

The Court of Appeals, relying upon *SIPI,* rejected the Commission's contention that it would be impossible to assess the environmental con-

69. Boston Globe, Dec. 11, 1983 at 2, col. 1. In this respect, the breeder reactor program went the way of the first one in this county. After litigation reaching the Supreme Court, Power Reactor Dev. Co. v. Int'l Union of Electrical, Radio & Machine Workers, AFL-CIO, 367 U.S. 396 (1961) (absolute safety not required), the Enrico Fermi plant opened, and closed almost immediately thereafter due to a serious malfunction. *See* J. FULLER, WE ALMOST LOST DETROIT (1975).

70. Citizens for Safe Power, Inc. v. Nuclear Regulatory Comm'n, 524 F.2d 1291, 1303 (D.C. Cir. 1975) (Bazelon, concurring); *see also* Carolina Envtl. Study Group. v. United States, 510 F.2d 796 (D.C. Cir. 1975).

71. Natural Resources Defense Council, Inc. v. United States Nuclear Regulatory Comm'n, 547 F.2d 633, 638 (D.C. Cir. 1976), *cert. granted,* 429 U.S. 1090 (1977).

72. *Id.* at 652.

sequences. NEPA required the agency to forecast environmental consequences based upon existing technology and extrapolating therefrom. The decisions to license nuclear reactors which generate large amounts of toxic waste requiring special isolation from the environment for several generations is the paradigm of "irreversible and irretrievable commitments of resources" for NEPA.[73] The court held that, "[t]o the extent that uncertainties necessarily underlie predictions of this importance on the frontiers of science and technology, there is a concomitant necessity to confront and explore fully the depth and consequences of such uncertainties."[74]

Judge Bazelon in his concurring opinion reiterated his earlier theme that "[d]ecisions in areas touching the environment or medicine affect the lives and health of all. These interests, like the First Amendment, have 'always had a special claim to judicial protection.' "[75]

The Supreme Court reversed, primarily on non-NEPA issues.[76] The court held the agency only had to follow the prescribed procedures under NEPA, and nothing more. The Court held that the mandate of NEPA is essentially procedural.[77] Its purpose is to ensure a fully informed and well-considered decision — not one the courts necessarily might have reached had they been the decisionmakers.[78]

The court cited its *Kleppe* opinion for espousing a limited judicial role under NEPA: "Neither the statute nor its legislative history contemplates that a court should substitute its judgment for that of the agency as to the environmental consequences of its actions."[79] Questions of safety are to be resolved by the appropriate regulatory agency and not by reviewing courts. Courts are not to substitute their judgment for that of the agency as to the environmental consequences of the action. Congress made the choice to try nuclear power, establishing a reasonable review process in which courts are to play only a limited role. The fundamental policy questions appropriately resolved in Congress and the state legislature are not subject to reexamination by courts under the guise of judicial review of agency actions.[80]

In this respect, the lesson of *Vermont Yankee* is heeded in another nuclear case, *Seacoast Anti-Pollution League v. Nuclear Regulatory Commission*.[81] The court stated that NEPA

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73. *Id.* at 641.
74. *Id.* at 653.
75. *Id.* at 657 (Bazelon, J., concurring).
76. Vermont Yankee Nuclear Power Co. v. Natural Resources Defense Council, Inc., 435 U.S. 519 (1978).
77. *Id.* at 558.
78. *Id.*
79. *Id.* at 555.
80. *Id.* at 557-58. The Court recognized that "[n]uclear energy may some day be a cheap, safe source of power or it may not. But Congress has made a choice to at least try nuclear energy, establishing a reasonable review process in which courts are to play only a limited role." *Id.* at 557-58.
81. 598 F.2d 1221 (1st Cir. 1979).

> may not be turned into a game to be played by persons who — for whatever reasons and with whatever depth of conviction — are chiefly interested in scuttling a particular project. There would be no end to the alternatives that might be proposed if opponents had no obligation to do more than make a facially plausible suggestion that a particular alternative might be of interest, and could then, after awaiting the results, find reasons why the agency's survey was inadequate.[82]

The remand of *Vermont Yankee* involved the NRC's revised ruling that solidified high-level and transuranic wastes would remain buried in a federal repository and hence would have no effect on the environment.[83] The key to the new "S-3 Table" therefore was a zero-release assumption.

The Court of Appeals again overturned the NRC's decision, concluding the rules were invalid because they failed to allow for proper consideration of the uncertainties concerning the long-term isolation of high-level and transuranic wastes and because they failed to allow for proper consideration of the health, socioeconomic and cumulative effects of fuel-cycle activities.[84]

The Court stated that the environmental costs to be considered include significant environmental risks; that is, the probabilities or possibilities of environmental damage. These risks could be due to the underlying randomness of nature or due to human uncertainty over the character of both random and nonrandom phenomena or the ability of future technology to cope with those phenomena.[85]

The apocalyptic words of Judge Edwards in his separate opinion express the underlying concerns in the case. He started by stating, "This case may prove to be one of the most important cases to be decided by the United States courts in this century."[86] He then proceeded to preface his opinion as follows:

> In this case we are required to review the continuing effort of the NRC to pit human intelligence against the most primordial force of nature. This force, when involved in its most awful manifestation, exceeds the power of flood, fire, pestilence, earthquake, hurricane and volcano. In this century, it has been demonstrated in this and other countries that this force can be employed for peace and war — for warming a baby's bottle and for nuclear holocaust.[87]

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82. *Id.* at 1231.

83. Natural Resources Defense Council, Inc. v. United States Nuclear Regulatory Comm'n, 685 F.2d 459, 472, 474 (D.C. Cir. 1982).

84. *Id.* at 477-78.

85. *Id.* at 478-79.

86. *Id.* at 494 (Edwards, J., concurring in part and dissenting in part). This statement is amazing in light of the problem with identifiable injuries the court must address, such as capital punishment, wrongful death, toxic injuries, not to mention problems of discrimination, defamation, invasion of privacy and the like.

87. *Id.* at 495.

In his dissent, Judge Wilkey summarized the court's opinion as follows:

> If there was ever a doubt prior to today, it is now clear that this court is committed to an assumed role as high public protector of all that is good from perceived evils of the nuclear age.[88]

The Supreme Court obviously agreed with Judge Wilkey when it reiterated that judicial review under NEPA or the APA is limited to procedural review.[89] The Supreme Court reaffirmed its view in *Vermont Yankee* that

> We are acutely aware that the extent to which this nation should rely on nuclear power as a source of energy is an important and sensitive issue. Much of the debate focuses on whether development of nuclear generation facilities should proceed in the face of uncertainties about their long-term effects on the environment. Resolution of these fundamental policy questions lies, however, with Congress and the agencies to which Congress has delegated authority, as well as with state legislatures and, ultimately, the populace as a whole. Congress has assigned the courts only the limited, albeit important, task of reviewing agency action to determine whether the agency conformed with controlling statutes.[90]

The Supreme Court reiterated that "[t]he role of the courts is simply to ensure that the agency has adequately considered and disclosed the environmental impact of its actions and that its decision is not arbitrary or capricious."[91]

The reasonableness of the agency's determination was not challenged. Uncertainties exist, as recognized by the NRC, but that doesn't invalidate the conclusion.[92] A reviewing court therefore cannot set aside the agency decision because it is unhappy with the results.[93]

Most significant is the Court's statement that:

> [A] reviewing court must remember that the Commission is making predictions, within its area of special expertise, at the frontiers of science. When examining this kind of scientific determination, as opposed to simple findings of fact, a reviewing court must generally be at its most deferential.[94]

The last major nuclear case for our consideration involves the restart of the plant at Three Mile Island after the accident. At the time of the Three Mile Island (TMI) accident, Unit 1 of the plant was down for

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88. *Id.* at 517 (Wilkey, J., dissenting).
89. Baltimore Gas & Elec. Co. v. Natural Resources Defense Council, Inc., 462 U.S. 87, 97 (1983).
90. *Id.*
91. *Id.* at 97-98.
92. *Id.* at 98.
93. *Id.* at 97 (quoting *Vermont Yankee,* 435 U.S. at 558).
94. *Baltimore Gas & Elec. Co.,* 462 U.S. at 103.

refueling. A long delay ensued before it was allowed to resume operations. Clearly no one wanted to run the risk of a second serious malfunction at the TMI site. In addition, there were many lessons to be learned from the investigation of the accident. An EIS was prepared prior to resumption of operation.

Substantial opposition existed to the restart of TMI. A citizen's group, People Against Nuclear Energy (PANE), contended that restarting the plant would cause severe psychological health damage to persons living in the vicinity and serious damage to the stability, cohesiveness and well-being of the neighboring community. The NRC refused to take evidence on PANE's contention. The NRC had considered the physical effects of the restart in the EIS, including the risk of a nuclear accident. The Court of Appeals overturned the agency's decision.[95]

The Supreme Court again reversed the appellate decision.[96] The Court emphasized that NEPA does not require the agency to assess every impact or effect of the proposed actions, but only the impact or effect on the environment. The context of the statute shows Congress was concerned with the physical environment — "the world around us."[97] The Court analogized to the tort doctrine of proximate causation by reading NEPA to include a requirement of a reasonably close causal relationship between a change in the physical environment and the effect at issue. With respect to risk the Court noted that "[r]isk is a pervasive element of modern life. . . ."[98] Many of the risks are caused by modern technology, and can lead to serious stress. The problem of risk therefore is one factor among many that raise the concern whether the gain from any technological advances are worth the attendant risks. This may be an important public policy issue. However, these concerns are different from the impacts on the physical environment; that is, alteration of our physical environment or depletion of natural resources, which is the central concern of NEPA.[99] Thus, by way of summarizing TMI, fear, by itself, is not a NEPA factor, and cannot be used to stall or delay a project, or new technology, under NEPA.

Many types of impact can be raised, but the scope of an agency's inquiries must remain manageable if NEPA's goal of ensuring a fully-informed and well-considered decision is to be considered. It would also spread agency resources too thin if they had to consider these non-environmental factors which are otherwise outside their congressional assigned functions. *PANE* makes it clear that since NEPA's focus is on environmental consequences, NEPA does not serve as the forum

95. People Against Nuclear Energy v. United States Nuclear Regulatory Comm'n, 678 F.2d 222, 223-26 (D.C. Cir. 1982).

96. Metropolitan Edison Co. v. People Against Nuclear Energy (PANE), 460 U.S. 766, 779 (1983).

97. *Id.* at 772.

98. *Id.* at 775.

99. *Id.* at 775-76.

to discuss the moral and ethical issues inherent in technological advances. Finally, the Court once again stated that the appropriate forum for addressing the merits of nuclear power is the political process, and not NEPA.

However, actions under NEPA against nuclear energy are still continuing.[100]

GENETIC ENGINEERING

One of the threshold technologies for the current generation with revolutionary implications for future generations is genetic engineering. A couple of decades ago, scientists developed the capability of modifying the genetic material, DNA, in a cell. Each cell's DNA contains the genetic code for the organism. Individual segments of DNA, called genes, activate the specific functions of the cell. The genes can be manipulated through gene splicing, in which genetic material is taken from one organism and spliced into another. In other words, DNA segments can be recovered and cloned from one organism and inserted into another—a process commonly referred to as recombinant DNA.

The potential benefits of recombinant DNA are tremendous, including medical advances, improved crop productivity, reduced use of pesticides,[101] pollution control and cleanup technology.[102] A great diversity of genetic engineering research is being undertaken around the world.

On the other hand, genetic engineering poses tremendous philosophical, moral, religious and ethical issues for society. Genetic engineering is a scary subject to many since the process changes DNA, the very essence of the lifeform. There are also fears of creating an Aryan super-race. The adverse environmental consequences can be equally momentous. DNA research entails the risk of experiments gone awry with the creation of an Andromeda strain.[103]

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100. *See, e.g.,* Limerick Ecology Action v. United States Nuclear Regulatory Comm'n, 869 F.2d 719 (3d Cir. 1989).

101. For example, one company plans field tests in 1990 of a new bioherbicide technology designed to reduce farmers' use of chemical herbicides as much as 90%. A small amount of a chemical herbicide is combined with highly concentrated bacteria that attack and kill weeds. Wall St. J., Sept. 29, 1989 at B3D, col. 1 (eastern ed.).

102. For example, in Diamond v. Chakrabarty, 447 U.S. 303 (1980), the Supreme Court upheld the patentability of genetically altered life forms. In this case the controversy involved a petroleum-consuming microbe, which could help degrade the carbon compounds found in petroleum, i.e., help clean up oil spills. Nine years later, with results still to be assessed, bacteria was used in the Exxon Valdez cleanup.

103. The issues involved with genetic engineering have received extensive attention in legal literature. *See, e.g.,* Chalker & Catz, *A Case Analysis of NEPA Implementation: NIH and DNA Recombinant Research,* 1978 DUKE L.J. 57; Parenteau & Catz, *Public Assessment of Biological Technologies: Can NEPA Answer the Challenge?,* 64 GEO. L.J. 679 (1976); Smith, *Biotechnology and the Law: Social Responsibility or Freedom of Scientific Inquiry?,* 39 MERCER L. REV. 437 (1988); Note, *The Rutabaga that Ate Pittsburgh: Federal Regulation of Free Release Biotechnology,* 72 VA. L. REV. 1529 (1986).

Recognizing the potential problems with recombinant DNA, a regime was established for licensing from the National Institutes of Health (NIH). NIH was in the process of licensing a field test of a genetically altered bacteria on a row of potatoes to see if the plants would become more frost resistant.

In a decision that stunned the scientific community, *Foundation on Economic Trends v. Heckler*, Judge Sirica enjoined the test for violating NEPA.[104] He held that, based on *SIPI,* a programmatic impact statement was required. In addition an EIS was required for the test.

The Court of Appeals upheld the injunction against the individual test, but not future NIH permits.[105] With echoes of the beginning of *Calvert Cliffs',* Judge Skelly Wright stated the challenge as: "to ensure that the bold words and vigorous spirit of NEPA are not similarly lost or misdirected in the brisk frontiers of science."[106] For the court the development of a new technology with unknown consequences was precisely the type of governmental action typically requiring programmatic review.[107] The court clearly shared "the District Court's view that NIH should give greater consideration to the broad environmental issues attendant on deliberate release of organisms containing recombinant DNA, and to its responsibility for approving these deliberate release experiments."[108] The court emphasized that NEPA reveals a special concern about the environmental effects of new technology.[109]

For the Court of Appeals "the deficiency rests in NIH's complete failure to consider the possibility of various environmental effects."[110] The government conceded a major action was involved but contended the environmental consideration by NIH was equivalent to the necessary environmental assessment. The Court disagreed since the assessment failed to address the potential consequences of dispersion of genetically altered organisms. The study minimized the risk for the specific proposal, commenting that the number of viable cells would be small, and would be subject to processes limiting survival. The court held NIH must attempt to evaluate the risk that emigration of the organism from the test site will create ecological disruption.[111]

The Court suggested strongly that NIH prepare a programmatic EIS else the failure to do so would likely violate established principles of reasoned decisionmaking in approving individual deliberate release experiments.[112]

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104. 587 F. Supp. 753 (D.D.C. 1984), *aff'd in part, vacated in part,* 756 F.2d 143 (D.C. Cir. 1985).
105. Foundation on Economic Trends v. Heckler, 756 F.2d 143 (D.C. Cir. 1985).
106. *Id.* at 145.
107. *Id.* at 159.
108. *Id.* at 146.
109. *Id.* at 147.
110. *Id.* at 153.
111. *Id.* at 154.
112. *Id.* at 160.

In his concurring opinion, Judge MacKinnon got to the heart of the real issue.

> I can understand how the . . . scientists who are knowledgeable in this field of genetic engineering would approve the experiment by a vote of 19-0 with no abstentions. It would seem an experiment that releases into the environment organisms substantially the same as some already living there, and subject to the same naturally occurring controls, would present no risk. However, the general public and those who have to pass on this action are not knowledgeable in this field and they are easily frightened by new scientific experiments and their possible consequences.[113]

He continued:

> The Foundation's conduct also has delayed this vital experiment for a very considerable period of time. The use of delaying tactics by those who fear or oppose scientific progress is nothing new. It would, however, be a national catastrophe if the development of this promising new science of genetic engineering were crippled by the unconscionable delays that have been brought about by litigations using the National Environmental Policy Act and other environmental legislation in other areas. The protracted litigations involving the Alaska pipeline, nuclear power plants, and the Clean Air Act present only a few examples.[114]

More litigation ensued in the genetic engineering area, but the institutes' EISs were judicially approved.[115] To some extent, NIH's experience with NEPA matches that of most agencies. Once the agency realizes it has to handle the statute, it proceeds to master the nuances. Injunctions subsequently are denied the intervenors in most cases.

In addition, the lessons of the Supreme Court's nuclear NEPA decisions seem to be taking effect for in *Foundation on Economic Trends v. Lyng*, the court stated: "NEPA was not intended to resolve fundamental policy disputes."[116]

It is significant that the judicially mandated delays in genetic engineering tests never stopped the experiments. Purely private tests could proceed independent of NIH. Illegal tests were performed in this country[117] and in 1986 the Wistar Institute of Philadelphia field tested

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113. *Id.* at 161 (MacKinnon, J., concurring).
114. *Id.*
115. *See, e.g.*, Foundation on Economic Trends v. Thomas, 637 F. Supp. 25 (D.D.C. 1986).
116. 817 F.2d 882, 886 (D.C. Cir. 1987).
117. For example, Advanced Genetic Science's permit was revoked when it was discovered that the company had tested the bacterium on its roof, but failed to report the test or some damages to trees to the EPA. The company was fined $20,000. N.Y. Times, March 25, 1986, at A1, Col. 1.

genetically engineered vaccines for animals in Argentina without the knowledge of either the United States or Argentina governments.[118]

Widespread experiments are now proceeding in genetic engineering.[119] Even though research is proceeding at a fast pace, public acceptance is lagging.[120]

WORST CASE ANALYSIS

Little attention was paid to worst case analysis until the Teton Dam Break in 1976. The safety of federal dams was not often questioned by opponents of dam proposals prior to this failure. It was generally assumed that the government does not build large dams that will fail, particularly in the initial filling. Such a failure would be considered highly improbable and remote. It was established that such consequences need not be discussed in an EIS. As the Ninth Circuit Court of Appeals expressed in the contested EIS case involving the Teton Dam:

> Appellants urge that the EIS is inadequate because it fails to discuss many possible environmental consequences. Many of these consequences while possible are improbable. An EIS need not discuss remote and highly speculative consequences .... This is consistent with the (CEQ) Council on Environmental Quality Guidelines and the frequently expressed view that adequacy of the content of the EIS should be determined through use of a rule of reason .... A reasonably thorough discussion of the significant aspects of the probable environmental consequences is all that is required by an EIS.[121]

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118. N.Y. Times, Nov. 11, 1986 at A1, col. 4.

119. During the summer of 1989 experiments were conducted in five states in which tobacco, corn and tomatoes were given a bacterial gene that eliminates the need for chemicals to kill rootworms, budworms and bollworms. The gene produces a natural protein which causes the worm's digestic system to disintegrate. The protein has never been shown to be harmful to mammals. Through genetic engineering, the gene has become a permanent part of the genetic code of each plant cell. Schneider, *Building a Better Tomato: New Era in Biotechnics,* N.Y. Times, Sept. 18, 1989, at A1, col. 1.

120. For example, dairy farmers are currently reluctant to use a genetically engineered bovine growth that boosts cows' milk production 25%. In addition, four large supermarket chains, Safeway, Von's, Krogers and Stop & Shop will not handle milk products from cows that have received the hormone in tests. Wall Street J., Sept. 15, 1989, at B1, col. 3.

Similarly, after the extensive NIH and EPA reviews of the field test at issue in Foundation on Economic Trends v. Lynn, the Monterey County Board of Supervisors blocked the proposed test in the county. *See* Sun, *Local Opposition Halts Biotechnology Test,* 231 SCI. 667 (1986) The tests were ultimately conducted elsewhere in the state.

121. Trout Unlimited v. Morton, 509 F.2d 1276, 1283 (9th Cir. 1974). Not apparent from the Teton Dam opinion is that the environmental impact statement was prepared by one man and completed after its author spent less than a week in the field and in reviewing the files. *Teton Dam Disaster: Hearings Before a Subcomm. of the House Comm. on Gov't Operations,* 94th Cong., 2d Sess. 118 (1976) (Statement of H. Anthony Ruckel, Legal Defense Fund, Sierra Club). It was only 14 pages long. *Oversight — Teton Dam Disaster: Hearings Before the Subcomm. on Energy Research and Development of the Senate Comm. on Energy and Natural Resources,* 95th Cong., lst Sess. 218 (1977) (Statement of Russell Brown, Envtl. Defense Council).

Similarly, in Save Lake Washington v. Frank, 641 F.2d 1330, 1335 (9th Cir. 1981), the agency did not employ worst case analysis in its risk assessment when it had incor-

After the collapse environmentalists unsuccessfully contested several EISs on the grounds the statement did not consider the consequences of a dam failure.[122] For example, in *Warm Springs Dam Task Force v. Gribble,* which involved questions of seismic safety of a proposed dam, the court held that remote and highly speculative consequences need not be discussed.[123] The opinion stated:

> Any substantial risk that the dam could fail would be intolerable; and, if the agency were to proceed in the face of that risk, that would constitute an abuse of agency discretion. Everyone recognizes the catastrophic results of the failure of a dam; to detail these results would serve no useful purpose.[124]

Other cases arguing for a worst case analysis met a similar fate. For example, it was claimed in *Friends of the Earth v. Nuclear Regulatory Commission* that the NRC should prepare a supplement to the EIS on a proposed nuclear power plant.[125] The basis of the argument was that the original impact statement failed to discuss the possible impact of a "Class 9 accident," which is a core meltdown.[126] The agency had not considered the possibility in the EIS on the grounds that an accident of that magnitude was too unlikely to consider. Plaintiffs contended the agency's policy should be reconsidered in light of the accident at Three Mile Island. The court rejected this claim on the grounds these issues were being addressed in the general licensing proceeding for the plant:

> The licensing proceedings themselves potentially offer all the benefits plaintiffs contend preparation of a supplemental EIS would afford. These include more informed agency action, elucidation of the public, and generation of data as a continuing basis for planning against the event of a major accident.[127]

In another nuclear case, *Carolina Environmental Study Group v. United States,*[128] the D.C. Circuit Court stated:

> Because each statement on the environmental impact of a proposed action involves educated predictions rather than certainties, it is entirely proper, and necessary, to consider the probabilities as well as the consequences of certain occurrences in ascertaining their environmental impact. There is a point at

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porated one in its EIS, even though the agency's action could have catastrophic environmental consequences. The discussion of "remote and conjectured consequences" is simply not required by NEPA even if desirable.

122. *See, e.g.,* Mansfield Area Citizens Group v. United States, 413 F. Supp. 810, 823 (M.D. Pa. 1976).

123. 621 F.2d 1017 (9th Cir. 1980).

124. *Id.* at 1026-27.

125. 15 Env't Rep. Cas. (BNA) 1110 (Sept. 26, 1980).

126. A core meltdown was the nuclear problem at the heart of the movie, *The China Syndrome* (Columbia 1978).

127. 15 Env't Rep. Cas. (BNA) at 1112.

128. 510 F.2d 796 (D.C. Cir. 1975).

> which the probability of an occurrence may be so low as to render it almost totally unworthy of consideration.[129]

In 1977 President Carter issued an executive order directing the Council on Environmental Quality to promulgate binding regulations.[130] The CEQ subsequently issued a number of regulations, including in the aftermath of Three Mile Island the worst-case analysis requirement.[131] Under the CEQ regulations, if scientific uncertainties exist, but can be cured by further research, the federal agency must either conduct or commission the research. If the research cannot be done, a worst-case analysis must be performed.[132]

The worst-case analysis requirement picks up on the theme that NEPA is an environmental full disclosure law. Consequently, the document should alert the agencies, general public and Congress to all known possible environmental consequences.[133] In this respect the significant aspect of the worst-case analysis is that courts often required its preparation where the potential impacts were catastrophic but the probabilities of occurrence were small.

After adoption of the CEQ regulations, it was easy for a court to invalidate an EIS on grounds of inadequacy for failure to perform a worst case analysis. The first major case applying the CEQ worst case analysis was *Sierra Club v. Sigler,* which dealt with a proposed oil tanker superport development in Galveston Harbor.[134] The project would be the first in the United States to permit oil tankers to operate in a wildlife sanctuary.[135] The EIS oil spill analysis contained three elements: (1) a probability analysis; (2) a dispersion model, and (3) an environmental impact analysis. The study concluded based upon these analyses that the project would not cause a significantly greater probability of an oil spill that currently exists and that the likely environmental harm of a spill would not be significantly greater than existed under present conditions.[136] The Corps of Engineers therefore considered the worst case to be a remote possibility, and hence unnecessary. The Corps proceeded to issue the requisite permits.

The trial court found incredible the assumption that the CEQ regulations intended to require a decision "founded upon uninformed speculation and conjecture."[137] The court faulted the Sierra Club for failing

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129. *Id.* at 799. Yet another case held that an alleged failure of the EPA to guarantee against plant malfunction of a wastewater treatment project was not a proper NEPA consideration. Township of Parsippany-Troy Hills v. Costle, 503 F. Supp. 314, 324 (D.N.J. 1979).

130. Exec. Order No. 11,991, 3 CFR 123 (1977), *reprinted in* 42 U.S.C. § 4321 (1982).

131. 40 C.F.R. § 1502.22 (1981).

132. *Id.*

133. Environmental Defense Fund v. Corps of Eng'rs, 325 F. Supp. 749, 759 (E.D. Ark. 1971), *aff'd* 470 F.2d 289 (8th Cir. 1972).

134. 695 F.2d 957 (5th Cir. 1983).

135. *Id.* at 962.

136. *Id.* at 968.

137. Sierra Club v. Sigler, 532 F. Supp. 1222, 1233-34 (S.D. Tex. 1982), *aff'd in part, rev'd in part,* 695 F.2d 957 (5th Cir. 1983).

to present evidence to show the worst case analysis "could have been predicated on anything more than guesswork."[138]

The Court of Appeals reversed, holding a worst case analysis was required pursuant to the CEQ regulations. Even if the possibility of a total loss of cargo by a supertanker is remote, a worst case analysis is required since a catastrophic oil spill was a possibility. As the court recognized:

> A total cargo loss by a supertanker is undoubtedly a significant adverse impact. No party can seriously question the importance of the analysis of such an oil spill to this permit decision. Indeed, the probabilities and consequences of oil spills are at the heart of this controversy. And all parties acknowledge that an analysis of a supertanker oil spill involving a total cargo loss beyond 24 hours after it occurs is beyond the state of the art.[139]

Significantly though, *Sigler*'s approach to the concept of remoteness of risk is illuminating. A worst case analysis should be prepared indicating to the decisionmaker the probability or improbability of its occurrence, but remoteness of probability is only a factor to be considered in the decisionmaking process in reaching the substantive decision.[140] *Sigler* also recognized that NEPA does not require an agency to take the action that is the most compatible with environmental protection.[141]

Subsequent to *Sigler* was *Southern Oregon Citizens Against Toxic Sprays, Inc. v. Clark (SOCATS),*[142] where the Ninth Circuit held a worst-case analysis was required even when significant scientific uncertainty exists about the safety of a program and the uncertainty cannot be eliminated by further studies.[143] It was not necessary that the worst case be probable or reasonably likely to occur.[144] A worst-case analysis was required because "[t]he possibility that the safe level of dosage for herbicides is low or nonexistent creates a possibility of significant adverse effects on the human environment."[145] Interestingly the literature review by an independent expert found no credible evidence linking the herbicide to cancer and other ailments.[146]

Significantly, *SOCATS* relied heavily on *Sigler,* but a critical distinction exists between the two cases. In *Sigler,* unlike *SOCATS,* all

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138. *Id.* at 1234.
139. 695 F.2d at 973.
140. *Id.* at 974.
141. *Id.* at 977.
142. 720 F.2d 1475 (9th Cir. 1983).
143. *Id.* at 1479.
144. *Id.*
145. *Id.*
146. The trial court held that the testimony as to uncertainty in the scientific community as to the carcinogenicity of the herbicide, 2, 4-D, coupled with the potential danger to human health, required preparation of a worst case analysis. *Id.* at 1477.

parties agreed that a total cargo loss could occur and could wreak catastrophic damage in the Bay. In *SOCATS*, there was a dispute as to whether the risk existed at all.

The CEQ reacted to *Sigler* and its progeny[147] by issuing revised regulations substantially relaxing the worst case analysis requirement. The CEQ felt that in some cases worst case analysis would be "pure conjecture" that "could appear to be an indulgence in speculation for its own sake."[148] Agencies were required to devote time and resources to analyses which were not useful to decisionmakers. The CEQ felt that a conjectural analysis lacking a credible, scientific basis is not useful to the decisionmaker or the public.[149]

In the revised CEQ guidelines, agencies must still evaluate future events that have "a low probability of occurrence but catastrophic consequences" if they do occur.[150] But the inclusion should be based on "credible scientific support," not based on pure conjecture and "without a sound rationale or valid data."[151] Obviously, the CEQ has attempted to draw a line between the conceivable and the abstract.

The revised CEQ regulations provide that federal agencies, in the face of unavailable information concerning a reasonably foreseeable significant environmental consequence, prepare "a summary of existing credible scientific evidence which is relevant to evaluating the . . . adverse impacts" and prepare an "evaluation of such impacts based upon theoretical approaches or reasonable methods generally accepted in the scientific community."[152]

Recently the Supreme Court held in *Robertson v. Methow Valley Citizens Council* that federal agencies are not required to prepare a worst-case analysis in evaluating the environmental impacts of a project for which there is insufficient information.[153]

The case arose out of the Forest Service's decision to issue a special use permit authorizing the development of an Alpine ski resort in the North Cascades. The area is presently "pristine." The environmental study recommended a number of mitigation measures to be

147. *See, e.g.*, San Luis Obispo Mothers for Peace v. Nuclear Regulatory Comm'n, 751 F.2d 1287 (D.C. Cir. 1984); Save Our Ecosystems v. Clark, 747 F.2d 1240 (9th Cir. 1984); Village of False Pass v. Watt, 565 F. Supp. 1123 (D. Alaska 1983), *vacated in part and aff'd in part sub nom.* Village of False Pass. v. Clark, 733 F.2d 605 (9th Cir. 1984). *But see* City of New York v. United States Dep't of Transportation, 715 F.2d 732 (2d Cir. 1983), *cert. denied* 465 U.S. 1055 (1984) (potential adverse impacts of transporting nuclear wastes through densely populated areas were so unlikely to occur that action could not be termed "significant").

148. *CEQ Proposal to Revise NEPA Regulations to Remove Requirement for Worst-case Analysis With Incomplete Data,* [Current Developments] Env't Rep. (BNA) 686, 688 (Aug. 9, 1985)

149. *Id.*

150. *Id.* at 689.

151. *Id.*

152. 40 C.F.R. § 1502-1522(b) (1987).

153. 109 S.Ct. 1835 (1989).

undertaken, but did not prepare a detailed mitigation plan. The Court of Appeals held this failed to meet NEPA's requirements, and further held that if the Forest Service had difficulty obtaining adequate information to make a reasoned assessment of the environmental impact on the mule deer herd, then the agency had a duty to prepare a worst-case study. For the Court of Appeals, worst case analysis did not derive from the CEQ regulations, but was a requirement that had been judicially created prior to the regulation's adoption. The Ninth Circuit further held that NEPA imposes a substantive requirement that "action be taken to mitigate the adverse affects of major federal action."[154]

The Supreme Court reversed, finding no basis for the CEQ's worst case requirement constituting a codification of prior NEPA case laws.[155] The revised regulations have a well-considered basis for the new approach and hence are entitled to deference.

The Supreme Court reiterated the two major purposes of NEPA as first, ensuring that the agency in reaching a decision will both have available and carefully consider detailed information concerning significant environmental impacts, and second, that the relevant information will be made available to the larger audience that may play a role in both the decision-making process and in the implementation of that decision.[156]

Certainly, the publication of the EIS will provide a springboard for public comment.[157] The Supreme Court has emphasized that while agencies have to take a "hard look" at environmental consequences, and that the statute is action-forcing, still the statute is procedural.[158] NEPA does not mandate particular results, but simply provides the necessary process. The agency can decide, for example, that the project's benefits outweigh the environmental costs. What NEPA prohibits is "uninformed—rather than unwise—agency action."[159]

Two conflicting themes underlie the worst case analysis problem. First, as we saw earlier, even remote probabilities can occur. On the other hand, much of the worst case analysis is reminiscent of an old Saturday Night Live skit dealing with "What if?" That particular skit involved the question: "What if Napoleon had the Bomb?" To the best of this writer's memory, the skit proceeded with Dan Aykroyd and John Belushi flying over Waterloo in a B-52 Bomber.

Second, the informational component of NEPA is particularly important in low-risk, high gravity situations because it means the decision-maker cannot dismiss the risk out of hand in light of the potential con-

154. Methow Valley Citizens Council v. Regional Forester, 833 F.2d 810, 817-19 (9th Cir. 1987).
155. 109 S. Ct. at 1848-49.
156. *Id.* at 1846.
157. *Id.*
158. *Id.*
159. *Id.*

sequences. On the other hand, the opponents can focus on the potential gravity to arouse widespread opposition to the project based on fear.

LESSONS TO BE LEARNED

Legal

After reviewing the cases, particularly the Supreme Court decisions, it is clear that NEPA does not create a common law of environmental protection. What appeared to be a blank check twenty years ago has exceedingly tight limits today.

NEPA is informational. It does not change the standards of any other statute, nor does it add to the substantive requirements of other statutes. NEPA mandates full disclosure so that an informed decision is made. The decisionmaker can then proceed with the decision. If the decisionmaker believes the benefits outweigh the costs or risks of the proposal, that decision is proper. Thus, NEPA may change the calculus of the equation, but it does not change the equation itself.

NEPA is not a statute of safety. It neither mandates nor ensures safety. Life is not risk-free; neither is NEPA. Zero risk is not the standard of many statutes, and certainly not the standard of NEPA. So long as there has been full disclosure, the project can commence, absent a violation of some other procedural or substantive rule. As one court clearly recognized, the project when finished may be a complete blunder, but "NEPA insists that it be a knowledgeable blunder."[160]

Consequently, attempts to use NEPA to ensure zero-risk or absolute safety will fail if the court follows precedence, and the agency provides full disclosure in the impact statement. Injunctive relief will still issue in specific cases though for a number of reasons. First, agencies will still sometimes believe NEPA doesn't apply to them. The result in such a situation will be the same as what normally occurs; the agency will discover to its dismay that NEPA applies.

Second, there will be situations in which the agency does not want to be forthcoming. There is a natural inclination to minimize risks, while emphasizing the advantages of the proposal. In addition, if the project is controversial, the proponents may not want to supply, through the mechanism of a NEPA statement, information that the opponents will use to arouse public opposition. Such a reaction can be expected when the proponents strongly believe in the proposal and also believe the risk is so small as to be virtually nonexistent. In this low-risk, high-magnitude scenario the proponents will not want to see "demagogues" arouse opposition based upon disclosure of the worst case scenario. If the omissions are great enough, then there will be significant omissions and non-disclosures and an injunction will issue. The proponents will have only themselves to blame in this situation.

160. Matsumoto v. Brinegar, 568 F.2d 1289, 1290 (9th Cir. 1978).

The final scenario for injunctive relief occurs when a court has some misgivings about the safety of the project, particularly if new technology with unknown risks is present. Opponents will point out problems in the EIS, highlighting the potential risks involved. It is highly foreseeable that a judge would then seek more information and assurances before approving the EIS. In reality, anyone can flyspeck an EIS. When the potential gravity is great, any problem, or omission, can be made to seem great. If fear is the basis for opposition, then it may be impossible to totally assuage the opponents. However, there should be an attempt to sufficiently build the record/NEPA statement with sufficient information that the final reviewing court will uphold it. Full disclosure for NEPA purposes does not mean total disclosure of the universe.[161]

Factual

NEPA has barely put a dent in the development of genetic engineering, while it is generally recognized today that nuclear power is not presently a viable energy option for the future. There are obviously several reasons for this difference. One is clearly the difference in popular reactions. There has always been a substantial body of opposition to nuclear power. Accidents like TMI simply fueled the opposition. On the other hand, most of the opposition to genetic engineering has been concentrated in only a few vocal opponents. A large body of organized public opposition simply has not materialized; widespread public concern about the research and application is lacking. It may be that genetic engineering is viewed as just another in a long history of agricultural improvements. It may also be that the subject does not appear frightening to the public.

In addition, much of genetic engineering is done in small laboratories and experimental fields. Nuclear power plants necessarily involve massive, capital-intensive structures. No one in this country is going to surreptitiously build a 1000 megawatt power plant—nuclear or otherwise. Genetic research can be performed though with only a few people knowing of the particular experiment.

The size of these capital-intensive power plants makes them vulnerable to delay, regardless of the cause of the delay. Delay adds substantially through inflation to the cost of a power plant. A year or two of delay with compound interest will add substantially to the projected costs of a project and negatively to the cost-benefit equation. Thus, whether the delay is due to NEPA litigation, changes in regulatory rules, labor problems, or whatever, the effect on nuclear power is the same. Delay is costly. NEPA is the ideal legal tool of delay.

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161. As expressed in one NEPA case:
> The EIS need not discuss every nuance of a proposed action, nor need it give various questionable effects the weight demanded by various proponents or opponents . . . . Instead it must give a reasonable and balanced discussion sufficient to permit an informed choice of alternatives.

Johnston v. Davis, 698 F.2d 1088, (10th Cir. 1983).

Genetic engineering research is relatively low-cost, and can be undertaken by thousands of skilled scientists around the world. Delay to one project will not necessarily affect others. In fact, it is quite possible that recombinant DNA research would not only survive, but actually continue, during a legal ban. The fact of the matter is that NEPA does not work well to stop low cost, diffuse projects. Thus, if the opposition to the new technology, such as genetic engineering, is based on philosophical, moral, ethical, religious or other policy grounds, NEPA is not the proper forum.

If anything more than delay is envisioned for a new project or technology, then a different statute and regulatory regime will have to be established. NEPA serves as a source of information once a major federal action occurs, but drops out of the picture once the information is released. NEPA is a decision making tool—not a policy tool.

Finally, it should be recognized by all that NEPA is a legal tool with legal consequences. Compliance with NEPA does not ensure political acceptability. Ultimately, the fate of all new technologies rests in the political arena. If what is required at the political level are guarantees of absolute safety, NEPA will fail every time. There is no way to ensure zero risk with any new technology.

CONCLUSION

The Environmental movement and NEPA litigation have coalesced for twenty years. During this time the NIMBY phenomenon has advantaged itself through NEPA in delaying and halting new developments. It is clear though that today those seeking to obstruct through NEPA will have less success.

For this same twenty year period a judicial tug-of-war existed between the lower federal courts, especially the D.C. Circuit, and the Supreme Court. On the one hand the lower courts often assigned themselves the position of ultimate arbitrator of acceptable risks, public health and safety through the guise of NEPA scrutiny. The Supreme Court has held in a series of NEPA cases, many of them dealing with nuclear power, that these questions, often on the frontiers of knowledge, are to be decided either by the legislature or the administrative agencies specifically delegated the issue. The role of the courts is only to ensure that the proper procedures are followed, and not to pass on the merits of the project. It is not for the courts to pass on the acceptability of risk.

This judicial philosophy seems to be catching on. By way of illustration, some of the interests which engaged in the ultimately unsuccessful litigation against genetic engineering, sued to enjoin the launch of the shuttle Atlantis with the Galileo probe. The probe will travel too far from the sun to be powered by solar panels. Instead, it will be powered by two radioscope thermoelectric generators fueled by plutonium. The Department of Energy claims extensive safety precautions

are utilized. Opponents state "After the Challenger explosion, Chernobyl, and the Valdez accident, we have learned that technology can go terribly wrong."[162] An injunction was denied, with the court stating:

> Countdown has already begun . . . and the government states that the mission is ready for launch. The court concludes that NASA has complied with requirements of the National Environmental Protection Act. 'It is not the function for the court to decide whether the government's decision to go forward with the Galileo mission is a good one.'[163]

Instead, the court only needed to rule whether NASA's EIS has enough information "to allow the agency to take a hard look at the issues and make a reasoned decision."[164] The Galileo Mission illustrates the conflict between the Renaissance Man and the NIMBY Man. The Renaissance Man reaches for the stars and searches the universe. The NIMBY Man is scared of the Galileo's shadow.

For the foreseeable future, those seeking to obstruct the application of new technology and processes will have to find a new legal tool to rely on. As long as the federal agencies make the requisite disclosures in the NEPA statements, their proposals will survive a NEPA attack. The proposal may still fail in the political arena, but that is a different issue. NEPA is not a safety statute.

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162. N.Y. Times, Oct. 10, 1989 at C10, col. 3. One fear expressed is that in one scenario, we could "kiss Florida goodbye." Grossman, *Kiss Florida Goodbye?*, N.Y. Times, Oct. 17, 1989 at A27, col. 2.

163. Boston Globe, Oct. 11, 1989, at 3, col. 4.

164. *Id.*