
THINKING ABOUT THE “PRACTICALLY UNTHINKABLE”: ENERGY INFRASTRUCTURE AND THE THREAT OF LOW-PROBABILITY, HIGH-IMPACT EVENTS

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The National Environmental Policy Act¹ requires federal agencies to ascertain and evaluate the possible environmental effects of federally regulated energy infrastructure proposals. But this broad statutory requirement leaves great uncertainty as to which hypothetical risks of environmental harm must be evaluated, and which risks may be set aside as too contingent or otherwise improbable to merit review. Recent events—the Japanese tsunami that disrupted a nuclear power plant, for example, or the deepwater Gulf of Mexico oil spill—remind us that seemingly unthinkable disasters can occur, posing a significant threat of harm to the environment. But two recent court of appeals decisions have created a circuit split on the question of precisely how agencies should approach the possibility of low-probability, high-impact events—or, as they have come to be known, “Black Swans.”

The Tsunami and the Tepco Nuclear Plant

On March 11, 2011, a 9.0 magnitude earthquake twenty miles below the surface of the Pacific Ocean triggered a tsunami.² The thirty-foot waves raced to Japan’s shore, unleashing a measure of devastation that stunned the worldwide audiences that watched the aftermath in unforgettable television footage.

Of the earthquake’s innumerable casualties, the most significant was Tokyo Electric Power Co.’s (“Tepco’s”) Fukushima Daiichi nuclear plant. When the tsunami struck, three of Fukushima’s six boiling-water nuclear reactors were actively operating, their plutonium rods fueling the reactions that supplied electric power to Tepco’s customers. Fukushima was utterly unprepared to handle the events that ensued: the earthquake and tsunami cut off the plant’s outside power supply, as well as its backup diesel generators, leaving Fukushima unable to sufficiently cool the reactor cores or spent fuel pools.³ As the crisis continued, hydrogen buildup led to large explosions at the three reactors, releasing radiation into the atmosphere.⁴ Each of the three reactors suffered a meltdown,⁵ and the seawater that was allowed to flood the reactors, in a desperate attempt to cool them, spread radiation into the ocean.⁶

Tepco and Japanese regulators had designed Fukushima to handle the tectonic events that regularly strike Japan, but even they did not design a plant capable of handling this earthquake, Japan’s largest in *three centuries*.⁷ “The disaster plan didn’t function . . . It didn’t envision something this big.”⁸ Tepco and the regulators “fail[ed] to envision the kind of worst-case scenario that befell Japan: damage so extensive that the plant couldn’t respond on its own or call for help from

nearby plants.”⁹

Or, as Fukushima’s own report on its accident-management protocols acknowledged, “The possibility of a severe accident occurring is so small that from an engineering standpoint, it is *practically unthinkable*.”¹⁰

“Practically Unthinkable”

“Practically unthinkable”—an ironic choice of words. For while virtually every aspect of this tragic chain of events was unprecedented, that particular characterization of an unforeseen disaster is itself *well*-precedented. In just recent memory, the United States has witnessed several major infrastructure catastrophes that were quickly characterized, after the fact, as “unthinkable.”

Most recently, of course, was the April 2010 explosion at the Deepwater Horizon oil rig at the Gulf of Mexico’s Macondo Prospect. The unexpected failure of a blowout preventer to protect against a methane bubble resulted in an explosion that destroyed the rig and allowed nearly five million barrels of oil to leak into the Gulf.¹¹ BP urged that the disaster was caused by no single action (or company): “Rather, a complex and interlinked series of mechanical failures, human judgments, engineering design, operational implementation and team interfaces came together to allow the initiation and escalation of the accident.”¹² According to BP’s CEO, there was “no precedent” for the confluence of events that led to the explosion. Or, as BP’s spokesmen stated in Fukushima-esque terms, the blowout preventer’s failure “seemed inconceivable.”¹³

Now, with the benefit of hindsight, those once-“unthinkable” risks are now very, very thinkable. And so U.S. nuclear facility operators—and nuclear power’s critics, and Congress—are working to ensure that U.S. reactors are protected from the particular threats that ultimately doomed Fukushima.¹⁴

But what about those risks that we cannot see in hindsight—because they have not previously occurred? The purely hypothetical risks for which there is no precedent? How could regulators efficiently and effectively guard against the unprecedented earthquake triggering cascading failures at a coastal nuclear facility, in the years *before* the Fukushima disaster? Or, how could regulators sitting in judgment of a deepwater oil drilling operation meaningfully consider the environmental harm that could ensue if a blowout preventer unprecedentedly failed to protect against a methane bubble, long *before* the Deepwater Horizon incident?

“Black Swans” and the Precautionary Principle

These are no small questions. In fact, the very question of how to anticipate—and guard against—the risk of high-impact, low-probability events has been the subject of a contentious intellectual debate in recent years.

Much of the debate has been sparked by—and captured by the title of—Nassim Taleb’s 2007 bestseller, *The Black Swan*.

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that the public benefits flowing from the actions outweighed their environmental costs.”³⁶ Thus, “by focusing the agency’s attention on the environmental consequences of a proposed project,” including its effect on human populations, before issuing a final approval for the project, “NEPA ensures that important [environmental] effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast.”³⁷

NEPA accomplishes this primarily by requiring the agency to prepare an “environmental impact statement” (“EIS”) for any “major Federal action[] significantly affecting the quality of the human environment.”³⁸ The EIS identifies, *inter alia*, “the environmental impact of the proposed action,” “any adverse environmental effects which cannot be avoided should the proposal be implemented,” and “alternatives to the proposed action[.]”³⁹

Those broad requirements leave no shortage of discretion to the agency; they leave even more discretion to the underlying applicant, with respect to defining the project’s purpose and alternatives.⁴⁰ But perhaps the most complex and contentious aspect of the EIS is identifying the “adverse environmental effects” that would be caused by the proposed action and thus must be analyzed by the agency—for precisely the reasons discussed above. A proposed energy infrastructure project, for example, has reasonably certain environmental effects, at least with respect to the geographic footprint of the project, but it also can give rise to no shortage of hypothetical environmental impacts, ranging in likelihood from the probable to the nearly impossible. Even assuming that the agency, the project’s proponents, and the project’s critics could identify all possible contingencies and environmental effects—even the so-called “Black Swans” threats—measuring the actual risk and possible impact of all such threats is effectively impossible.

Under that shadow of uncertainty, NEPA does not impose the Precautionary Principle; it does not require the agencies to consider any and all hypothetical environmental impacts of the project. While “[r]easonable forecasting and speculation” is “implicit in NEPA,”⁴¹ “agencies may not be precluded from proceeding with particular projects merely because the environmental effects of that project remain to some extent speculative.”⁴² Instead, the agency must strike a pragmatic balance:

[O]nly those effects that are “likely” (or “foreseeable” or “reasonably foreseeable”) need be discussed . . . and, as in other legal contexts, the terms “likely” and “foreseeable,” as applied to a type of environmental impact, are properly interpreted as meaning that the impact is sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision.⁴³

This resembles a sliding scale of risk and possible harm:

Danger . . . is not set by a fixed probability of harm, but rather is composed of reciprocal elements of risk and harm, or probability and severity. . . . That is to say, the public health may properly be found endangered both by a lesser risk of a greater harm and by a greater risk of a lesser harm. Danger depends upon the relation between the risk and

harm presented by each case, and cannot legitimately be pegged to “probable” harm, regardless of whether that harm be great or small.⁴⁴

Marshaling those considerations, the Supreme Court’s ultimate standard is effectively tort law’s standard of “proximate causation.” In *Metropolitan Edison Co. v. People Against Nuclear Energy*, the leading case on this point, the Court expressly adopted this tort concept as guiding the agencies’ inquiry under NEPA. According to the Court, NEPA’s concept of environmental impact should “be read to include a requirement of a reasonably close causal relationship between a change in the physical environment and the effect at issue,” caused by the federal agency’s decision to approve the project at issue.⁴⁵ The mere *risk* that the agency-approved project could give rise to environmental impact is not *itself* environmental impact: “[A] risk of accident is not an effect A risk is, by definition, unrealized in the physical world.”⁴⁶ And so where the agency’s action does not directly result in the foreseen environmental effect, but instead is merely the first step in a causal chain with numerous “middle links” preceding the hypothetical outcome, those intervening links may “lengthen[] the causal chain beyond the reach of NEPA.”⁴⁷

Applying that standard in *Metropolitan Edison*, the Court held that NEPA did not require the Nuclear Regulatory Commission, in reviewing a nuclear facility license application, to consider purely psychological harm—“anxiety, tension and fear, a sense of helplessness, and accompanying physical disorders”⁴⁸—that could be suffered by persons living near the facility, caused by the increased risk of nuclear accident.⁴⁹

But in rejecting the challenge to NRC’s decision in that case, the Court cautioned against over-reading the Court’s own decision: “We emphasize that in this case we are considering effects”—*i.e.*, the aforementioned “tension and fear”—“caused by the risk of an accident. The situation where an agency is asked to consider effects that will occur if a risk is realized, for example, if an accident occurs at [the nuclear facility], is an entirely different case.”⁵⁰

Two decades later, in cases once again involving the NRC, two federal courts of appeals split on the question of how to apply NEPA under the post-9/11 shadow of nuclear terrorism.

Ninth Circuit: Over-Simplifying the “Chain” Of Events

After the al Qaeda strike of September 11, 2001, the threat of terrorist attack on the nation’s nuclear infrastructure was immediately cognizable. Indeed, the “9/11 Commission Report”—or, the FINAL REPORT OF THE NATIONAL COMMISSION ON TERRORIST ATTACKS UPON THE UNITED STATES—reported that both 9/11 mastermind Khalid Sheikh Mohammed and Mohammed Atta, the al Qaeda agent who carried out the attack, had considered targeting U.S. nuclear facilities.⁵¹ And the threat of terrorist attack quickly became a central issue in the NRC’s review of applications for nuclear infrastructure.

Just three months after the attacks of 9/11, Pacific Gas & Electric Co. applied to NRC for a license to construct and operate a spent fuel storage installation at the site of its Diablo Canyon nuclear power plant.⁵² San Luis Obispo Mothers

for Peace, a non-profit organization opposed to the project, challenged the application and the agency's preliminary approval on the ground that, *inter alia*, they "fail[ed] to address environmental impacts of terrorist or other acts of malice or insanity[.]"⁵³ But the NRC ultimately approved the project application; it refused to analyze the environment impact of a terrorist attack on the facility, concluding that NEPA review of that issue was unnecessary because, *inter alia*, "the possibility of terrorist attack is too far removed from the natural or expected consequences of agency action"; and in any event "the risk of a terrorist attack cannot be determined," such that "the analysis is likely to be meaningless."⁵⁴

But on a petition for review, the Ninth Circuit vacated the NRC's decision, holding that the NRC violated NEPA by categorically refusing to include in its NEPA review the threat of terrorist attack. Importantly, the Ninth Circuit held the NRC could not ignore the threat of terrorist attack simply because, as NRC concluded, "the possibility of a terrorist attack . . . is speculative and simply too far removed from the natural or expected consequences of [NRC's] action . . ."⁵⁵ That argument, the Ninth Circuit concluded, was premised upon a misreading of the Supreme Court's decision in *Metropolitan Edison*.

According to the Ninth Circuit, "[t]he events at issue here, as well as in *Metropolitan Edison* . . . form a chain of three events: (1) a major federal action; (2) a change in the physical environment; and (3) an effect."⁵⁶ The chain may have been the same in both *Metropolitan Edison* and the present case, but the two cases involved different *connections* in the chain: *Metropolitan Edison* "was concerned with the relationship between events 2 and 3 (the change in the physical environment, or increased risk of accident resulting from the renewed operation of a nuclear reactor, and the effect, or the decline in the psychological health of the human population)."⁵⁷

"In the present case," by contrast, "the disputed relationship is between events 1 and 2 (the federal act, or the licensing of the Storage Installation, and the change in the physical environment, or the terrorist attack)."⁵⁸ Those connections in the chain, according to the Ninth Circuit, presented precisely the type of case that the Supreme Court stated it had *not* decided in *Metropolitan Edison*: namely, one in which "an agency is asked to consider effects that will occur if a risk is realized, for example, if an accident occurs . . ."⁵⁹

Thus, the Ninth Circuit concluded, where (as in the present case) the question is what change in the physical environment could result from the federal agency's action, "[t]he appropriate inquiry is . . . whether such attacks are so 'remote and highly speculative' that NEPA" does not require their consideration.⁶⁰ The court determined that the NRC's categorical refusal to consider the possibility of terrorist attack was unreasonable.⁶¹ And the court further held that the NRC could not avoid NEPA's requirement by concluding that the risk of terrorist attack was "unquantifiable."⁶²

The Ninth Circuit's analysis appears correct in at least one respect: in *Metropolitan Edison*, the Supreme Court specifically stated that it was "considering effects caused by the risk of an accident," and not the "effects that will occur if a risk [of accident] is realized."⁶³

But the Ninth Circuit erred in attempting to equate its

case and *Metropolitan Edison* as simply involving two separate segments in the same three-point chain. The Supreme Court made clear that *Metropolitan Edison's* "chain" involved not three linked points, but *four*: (1) the agency's action, (2) the resulting increased risk of nuclear incident, (3) the project opponents' *perception* of that risk, and (4) the physical or physiological effects resulting from their perceiving that risk.⁶⁴ The Court held that NEPA required no analysis of that final link because *both* the second *and* the third links, together, stretched the causal chain too far.⁶⁵

And *Metropolitan Edison's* causal chain was not the only one that the Ninth Circuit misperceived; it also misperceived the causal chain at issue in the case at bar, which also involved not three links but at least *five*: (1) the agency's action, (2) the resulting risk (i.e., the increased opportunity for terrorist attack), (3) terrorists' identification of that opportunity, (4) terrorists' action to seize that opportunity, and (5) the results of the terrorists' action. This causal chain is *at least* as lengthy and uncertain as the chain in *Metropolitan Edison*.

And that uncertainty undermines the remainder of the Ninth Circuit's analysis. Even assuming that *San Luis Obispo Mothers for Peace* involved a case in which the NRC was only being asked "to consider the effects that will occur if the risk is realized," there remain several "links" of uncertainty. The "risk" is "realized" when terrorists identify their new opportunity for attack, but there remain the uncertainties of whether the terrorists will decide to seize that opportunity, whether the terrorists effect that decision by conducting a successful attack, and what the effects of that attack would be.

Third Circuit: Seeing Each Link in the Chain

While *San Luis Obispo Mothers for Peace* was pending in the Ninth Circuit, another company, AmerGen Energy, applied to NRC to renew its operating license for the Oyster Creek Nuclear Generating Station.⁶⁶ New Jersey regulators urged that NRC's NEPA review required the consideration of a threat of airborne attack on the nuclear plant.⁶⁷ In this case, as with Pacific Gas & Electric's aforementioned application, NRC concluded NEPA "imposes no legal duty on the NRC to consider intentional malevolent acts" because such acts are "too far removed from the natural or expected consequences of agency action."⁶⁸

The Third Circuit affirmed NRC's analysis. Repeating *Metropolitan Edison's* instruction that a mere risk of effect is not itself an effect, the Third Circuit traced the links in the causal chain, beginning with the NRC's approval of the project and ending with the hypothetical terrorist attack.⁶⁹ And in so doing, the Third Circuit identified some of the links that the Ninth Circuit had not considered. To analyze the threat of a terrorist attack would necessarily require the analysis of the nuclear facility's "status as a particularly vulnerable terrorist target"⁷⁰—or, in terms of the five-link chain discussed above, the question of both how the terrorists would perceive the target, and whether their action on such a perceived opportunity would bear fruit. And with respect to the actual effect that such a terrorist attack would cause, that in turn depends on "[t]he government agencies specifically charged with preventing an airborne terrorist attack," which "also serve as intervening

forces.”⁷¹ Or, stated differently, “an aircraft attack on [the nuclear facility] requires at least two intervening events: (1) the act of a third-party criminal and (2) the failure of all government agencies specifically charged with preventing terrorist attacks.” In light of that lengthy causal chain, the Third Circuit “conclude[d] that this causation chain is too attenuated to require NEPA review.”⁷²

The Third Circuit recognized that its analysis effectively created a split with the Ninth Circuit.⁷³ But it found that split to be no cause for abandoning its analysis and endorsing the Ninth Circuit’s.

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The petitioners challenging NRC’s approval of the Oyster Creek relicense did not seek further review at the Supreme Court. Thus, for the time being, the Court will have no opportunity to resolve the circuit split. Nevertheless, in light of the heightened public awareness of the unexpected threats to nuclear facilities and other infrastructure that has followed the Gulf oil spill and Japanese tsunami, we can expect critics of energy infrastructure projects to cite the possibility of “Black Swan” events—terrorism, natural disasters, or otherwise—as necessary considerations in NEPA analyses. And the fundamental uncertainty of such hypothetical threats, if they are required to be considered in NEPA analyses, will only lengthen the agencies’ process for reviewing infrastructure proposals, and offer litigants greater opportunity to overturn federal approvals of challenged projects.

The answer is neither to require agencies to attempt to predict and analyze the truly unpredictable, nor to give agencies *carte blanche* to ignore the possibility of such events. Rather, it is incumbent upon agencies to do their best, in good faith, to separate the reasonably foreseeable from the truly unknowable; to analyze the former as rigorously as possible; and to act prudently in light of the latter. We cannot pretend to be perfectly protected against Black Swan events, nor can we allow an exaggerated application of the Precautionary Principle to paralyze federal agencies and the development of energy infrastructure.

Endnotes

1 42 U.S.C. §§ 4321-4347.

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3 Peter Behr, *Desperate Attempt to Save 3 Fukushima Reactors from Meltdown*, NYTIMES.COM, Mar. 14, 2011, <http://www.nytimes.com/cwire/2011/03/14/14climatewire-desperate-attempts-to-save-3-fukushima-react-84017.html>.

4 Keith Bradsher et al., *Japanese Officials on Defensive as Nuclear Alert Level Rises*, N.Y. TIMES, Apr. 13, 2011, at A5.

5 Hiroko Tabuchi, *Company Believes 3 Reactors Melted Down in Japan*, NYTIMES.COM, May 24, 2011, <http://www.nytimes.com/2011/05/25/world/asia/25nuclear.html>.

6 Andrew Morse & Mitsuru Obe, *At Plant, a Choice Between Bad, Worse*, WSJ.COM, Mar. 30, 2011, <http://online.wsj.com/article/SB10001424052748704471904576229854179642220.html>.

7 Gautam Naik, *Earth’s Energy Unleashed as Tectonic Plates Shift*, WSJ.COM,

Mar. 12, 2011, <http://online.wsj.com/article/SB10001424052748703327404576194831527140212.html>.

8 Phred Dvorak & Peter Landers, *Japanese Plant Had Barebones Risk Plan*, WSJ.COM, Mar. 31, 2011, <http://online.wsj.com/article/SB10001424052748703712504576232961004646464.html>.

9 *Id.*

10 *Id.* (emphasis added).

11 See Press Release, U.S. Dep’t of the Interior, U.S. Scientific Teams Refine Estimates of Oil Flow from BP’s Well Prior to Capping (Aug. 2, 2010), available at <http://www.doi.gov/news/pressreleases/US-Scientific-Teams-Refine-Estimates-of-Oil-Flow-from-BP-Well-Prior-to-Capping.cfm>.

12 BP, DEEPWATER HORIZON ACCIDENT INVESTIGATION REPORT 11 (2010).

13 See Marian Wang, *Despite Previous Equipment Failure, BP Says Spill ‘Seemed Inconceivable’*, PROPUBLICA, May 11, 2010, <http://www.propublica.org/blog/item/despite-known-instances-of-equipment-failure-bp-says-spill-seemed-inconceiv>.

14 Matthew L. Wald, *T.V.A. Considers Improvements for 6 U.S. Nuclear Reactors*, NYTIMES.COM, Apr. 14, 2011, <http://www.nytimes.com/2011/04/15/science/earth/15nuclear.html>; see also Matthew L. Wald, *Risk from Spent Nuclear Reactor Fuel Is Greater in U.S. than in Japan, Study Says*, NYTIMES.COM, May 24, 2011, <http://www.nytimes.com/2011/05/25/business/energy-environment/25nuke.html>.

15 See generally NASSIM TALEB, *THE BLACK SWAN* (2007).

16 *Id.* at xvii.

17 *Id.* at xvii-xviii. For Taleb’s more succinct explanation of his argument, see Stephanie Baker-Said, *Flight of the Black Swan*, BLOOMBERG MARKETS, May 2008, at 38-50, available at <http://www.fooledbyrandomness.com/bloombergProfile.pdf>.

18 See, e.g., Shannon Harrington et al., *The Rush to Hedge Against Black Swan Events*, BUSINESSWEEK, July 26, 2010; Adam Piore, *Planning for the Black Swan*, SCIENTIFIC AM., June 2011, at 49-53. See generally Symposium, *The Age of Uncertainty*, 21 CRITICAL REV. 401 (2009) (debating Taleb’s “Black Swan” theory).

19 See, e.g., RICHARD POSNER, *CATASTROPHE: RISK AND RESPONSE* (2004); CASS SUNSTEIN, *WORST-CASE SCENARIOS* (2007); FRANCIS FUKUYAMA ET AL., *BLINDSIDE: HOW TO ANTICIPATE FORCING EVENTS AND WILD CARDS IN GLOBAL POLITICS* (2007).

20 POSNER, *supra* note 19, at 140-48, 171-87.

21 See, e.g., Edward A. Parson, *The Big One: A Review of Richard Posner’s Catastrophe: Risk and Response*, 45 J. ECON. LIT. 147 (2007).

22 Cass R. Sunstein, *Beyond the Precautionary Principle*, 151 U. PA. L. REV. 1003, 1003-04 (2003) (citing, e.g., INTERPRETING THE PRECAUTIONARY PRINCIPLE (Timothy O’Riordan & James Cameron eds., 1994)).

23 RON SUSKIND, *THE ONE PERCENT DOCTRINE* 62 (2006).

24 Thomas L. Friedman, *Going Cheney on Climate Change*, N.Y. TIMES, Dec. 9, 2009, at A43. Friedman is far from the only public intellectual to draw connections between terrorism and climate change, with respect to the Precautionary Principle.

25 Sunstein, *Beyond the Precautionary Principle*, *supra* note 22, at 1020.

26 *Id.* at 1020-21.

27 Cass R. Sunstein, *On the Divergent American Reactions to Terrorism and Climate Change*, 107 COLUM. L. REV. 503 (2007); Cass R. Sunstein, *Irreversible and Catastrophic: Global Warming, Terrorism, and Other Problems*, 23 PACE ENVTL. L. REV. 3 (2005).

28 42 U.S.C. §§ 4321-4347.

29 40 C.F.R. §1500.1(a).

30 42 U.S.C. § 4331.

31 *Vt. Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 558 (1978).

32 See, e.g., 33 U.S.C. § 1341 (Clean Water Act); 16 U.S.C. § 1278 (Wild & Scenic Rivers Act); 15 U.S.C. § 717f (Natural Gas Act); 16 U.S.C. § 808

- (Federal Power Act); 42 U.S.C. § 2133 (Atomic Energy Act).
- 33 42 U.S.C. § 4332(2)(C).
- 34 See, e.g., *Marsh v. Ore. Natural Res. Council*, 490 U.S. 360, 373-74 (1989) (“hard look”); *Calvert Cliffs’ Coordinating Comm., Inc. v. AEC*, 449 F.2d 1109, 1114 (D.C. Cir. 1971) (describing NEPA’s requirements generally).
- 35 *Calvert Cliffs*, 449 F.2d at 1112. NEPA created the Council on Environmental Quality (“CEQ”), 42 U.S.C. § 4342, which in turn promulgated general regulations guiding the other agencies that apply NEPA in their own respective regulatory spheres. See 40 C.F.R. ch. V.
- 36 *Envtl. Def. Fund v. Massey*, 986 F.2d 528, 532 (D.C. Cir. 1993) (quoting *Jones v. D.C. Redevelopment Land Agency*, 499 F.2d 502, 512 (D.C. Cir. 1974)).
- 37 *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989).
- 38 See 42 U.S.C. § 4332(2)(C).
- 39 *Id.* That said, before an EIS is prepared, the relevant federal agency must first ascertain whether the EIS requirement applies at all—i.e., whether the agency proceedings involve a “major Federal action” with “significant” environmental effects. *Id.* This threshold determination may be accomplished through use of a less formal “environmental assessment.” See 40 C.F.R. §§ 1501.4, 1508.9.
- 40 See, e.g., *Citizens Against Burlington, Inc. v. Busey*, 933 F.2d 190, 199 (D.C. Cir. 1991).
- 41 *Scientists’ Inst. for Pub. Info. v. AEC*, 481 F.2d 1079, 1092 (D.C. Cir. 1973).
- 42 *Alaska v. Andrus*, 580 F.2d 465, 473 (D.C. Cir. 1978).
- 43 *Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir. 1992); see also 40 C.F.R. § 1508.8(b) (defining a federal action’s “indirect effects” as those effects that are “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable”).
- 44 *Ethyl Corp. v. EPA*, 541 F.2d 1, 18 (D.C. Cir. 1976).
- 45 See *Metro. Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 774-75 (1983).
- 46 *Id.* at 775 (emphasis in original).
- 47 *Id.*
- 48 *Id.* at 774 (quotation marks omitted).
- 49 *Id.* at 774-76.
- 50 *Id.* at 775 n.9.
- 51 FINAL REPORT OF THE NATIONAL COMMISSION ON TERRORIST ATTACKS UPON THE UNITED STATES 245, 530 n.148 (2004).
- 52 *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1021 (9th Cir. 2006), cert. denied, 549 U.S. 1166 (2007).
- 53 *Id.* at 1022.
- 54 *Id.*
- 55 *Id.* at 1030.
- 56 *Id.* at 1029.
- 57 *Id.*
- 58 *Id.* at 1030.
- 59 *Id.* at 1029 (quoting *Metro. Edison*, 460 U.S. at 775 n.9)).
- 60 *Id.* at 1030.
- 61 *Id.*
- 62 *Id.* at 1031-32. In any event, the court held, the NRC had not actually supported its conclusion that the threat of terrorist was as a matter of fact unquantifiable. *Id.* at 1032.
- 63 460 U.S. at 775 n.9.
- 64 *Id.* at 775 (“[T]he element of risk and its perception by [observers] are necessary middle links.” (emphasis added)).
- 65 *Id.*
- 66 *N.J. Dep’t of Env’tl. Protection v. NRC*, 561 F.3d 132, 135 (3d Cir. 2009).
- 67 *Id.*
- 68 See *id.* The NRC further concluded that a terrorism review would be “redundant” because “the core damage and radiological release from [terrorist] acts would be no worse than the damage and release to be expected from” other technical failures at the plant. *Id.* at 135-36.
- 69 *Id.* at 137-42.
- 70 *Id.* at 141.
- 71 *Id.*
- 72 *Id.* at 140.
- 73 *Id.* at 142.

