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Spotlight on Safety at Nuclear Power Plants: The View from Oyster Creek

RICHARD WEBSTER* WITH JULIA LEMENSE**

I. ABSTRACT

This article shows that the ongoing litigation over the relicensing of the Oyster Creek Nuclear Power Plant (“Oyster Creek”) and a few other nuclear power plants continues to put a spotlight on the regulation of safety by the Nuclear Regulatory Commission (“NRC”). The glare of the spotlight has already revealed that the NRC Staff has largely lost touch with the basic purpose of the agency, which is solely to regulate safety, not to promote nuclear power.¹ Instead, at Oyster Creek (and some other nuclear plants), the Staff has appeared more concerned about dismissing any concerns raised by their safety reviews rather than enforcing the safety requirements, which are themselves often unclear or ambiguous. This misguided agenda has been evident in decisions about both ongoing safety and relicensing. Happily, even though the litigation procedures are inadequate, when certain decisions have been vigorously litigated, some relief has been forthcoming from administrative adjudicatory bodies such as the Atomic Safety and Licensing Board (“ASLB”) and the Commission itself. However, the current procedures are extremely hostile to effective

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** Ms. Julia LeMense, Executive Director, Eastern Environmental Law Center, played an invaluable role in the development of this article by working with the author to litigate the Oyster Creek case, co-authoring briefs containing many of the concepts that went into this article, and refining the expression of those concepts. The author would also like to acknowledge the role of the many others who have helped develop the concepts expressed in this article through discussions and collaborations with the author, including Paul Gunter, David Lochbaum, Dianne Curran, Philip Musegaas, Anthony Roisman, John Sipos, Jon Block, and Janice Dean.

1. See U.S. NUCLEAR REGULATORY COMMISSION, History, <http://www.nrc.gov/about-nrc/history.html> (last visited Feb. 19, 2009).

intervention by public-interest groups and many decisions, such as relicensing, can be taken without a hearing or Commission action in the absence of intervention. Therefore, many decisions taken by the NRC Staff go into effect without any searching internal or external review. This lack of effective review reduces the quality of these decisions. Thus, without serious reform of both the safety culture of the staff and the internal and external review procedures, the ability of the NRC to carry out its mandate to ensure that nuclear power plants within the United States are operated safely is seriously in doubt. One element of reform should be to ensure that before major decisions, like relicensing, are taken there is an effective internal review of NRC Staff actions by the ASLB and then the Commission. However, experience has shown that even the Commission is subject to strong pressure from the regulated community. Robust external review of NRC decisions is therefore critical if the agency is to avoid recapture by the industry. The best approach to providing such a review is to actively encourage citizen involvement in the decision-making processes of the NRC through greater transparency, opportunities for funding, and the use of fairer procedures.

II. STRUCTURE

The first issue considered by this article is why the litigation about the relicensing of Oyster Creek shed new light on the NRC's regulation of safety when, at the time the litigation commenced, over forty nuclear power plants had already been relicensed and Oyster Creek itself had been operating for over thirty-six years. There are at least three reasons for this. First, the ability of the public to challenge the ongoing safety of a nuclear power plant is very limited because the designated procedure lacks discovery rights, has seldom resulted in effective relief for public-interest groups, if ever, and is not generally subject to judicial review. The lack of discovery rights is a major impediment to full review because during operation many safety-related documents are unavailable to the public. Second, at the behest of the nuclear industry during the 1990s, the NRC systematically narrowed the scope of the safety issues that could be raised during a relicensing proceeding to exclude most of the issues that were of most concern to many members of the public living close to nuclear plants, such as evacuation. Finally, in 2004, the NRC changed its adjudicatory rules reducing discovery rights and curtailing the right to cross-examination. The net effect is that prior to the litigation involving Oyster Creek, public interest groups in relicensing proceedings had their claims dismissed at a very early stage, prior to any discovery, and the NRC

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approved every relicensing application it received within the twenty-two to thirty month guideline it had set for itself.² Therefore, the Oyster Creek proceeding was the first relicensing proceeding to probe deeply into how the NRC was regulating a specific safety issue with the benefit of substantial disclosure of documents from the licensee. It is also the first relicensing proceeding that went beyond the guideline time-period, although the Commission eventually granted the renewed license on April 1, 2009, a few days before the original license was due to expire.

Next, this article uses publicly available information from various sources, including the Oyster Creek proceedings and related reviews, to conclude that the NRC, as an agency, is not doing an effective job in managing the safety risks at nuclear power plants. More specifically, the ongoing reviews of safety have been shown to be inadequate in certain areas and, at best, questionable in others. Critically, the Oyster Creek proceedings showed that these reviews are hampered by a lack of understanding of the regulatory requirements at each plant. In addition, the safety reviews during relicensing are very limited in scope and, even within that scope, have missed important issues. It is now clear that the safety margins at Oyster Creek are much narrower than when the plant opened in 1969, if indeed there is any margin of safety at all. In addition, the State of New Jersey has alleged that the NRC has failed to adequately assess the risk of terrorism, which was not considered at all during initial licensing or during relicensing. Finally, the NRC has also declared that it did not intend to increase the standards for safety during relicensing. Because safety margins have reduced over time due to aging and new threats, Oyster Creek is now clearly less safe than it was forty years ago. At the same time the NRC has allowed safety margins to reduce at old nuclear plants, it has increased the safety requirements for new plants. This inconsistency in approach has created an increasing gap between the safety-requirements for a new plant and those for a relicensed plant. It is, therefore, hardly surprising that the trend is toward relicensing of old plants rather than replacement with new plants.

Finally, this article describes potential solutions to the problems that have been identified. Although the relicensing proceedings for Oyster Creek and other reactors highlighted these problems, most of the identified failures relate to regulation of ongoing safety. As the NRC itself has repeatedly argued, if regulation of ongoing safety were fully effective, there would be little safety analysis to be done during a relicensing proceeding.

2. 10 C.F.R. § 2.332(b) (2005); 10 C.F.R. pt. 2, app. B (2009).

Thus, without diminishing the importance of a comprehensive review of safety issues associated with relicensing and the need to update safety standards prior to relicensing, this author believes that reform should also be targeted at ensuring the adequate regulation of ongoing safety. Such reforms should include full transparency, technical assistance to public-interest groups, and a “citizen suit” provision that would allow such groups the right to raise issues concerning nuclear safety with the district court. Similarly, the relicensing rules should be amended to make the safety review conducted prior to relicensing comprehensive, to make intervention in the relicensing proceeding more accessible to citizens, and to provide a mandatory hearing on issues where there is no citizen challenge.

A. Statutory And Regulatory Requirements of The Atomic Energy Act Regarding Safety

The Atomic Energy Act (“AEA”) of 1954, limits the original license of commercial nuclear power plants to forty years.³ Section 103 of the AEA, 42 U.S.C. § 2133, grants the Commission authority to issue licenses for the commercial exploitation of special nuclear material. It states that such licenses “may be renewed upon the expiration of” the initial licensed period.⁴ However, the Commission is required to find that the authorized utilization of special nuclear material is “in accord with the common defense and security and will provide adequate protection to the health and safety of the public.”⁵ The “not inimical” standard also governs license renewal of operating nuclear reactors.⁶ Finally, the AEA provides that in any licensing proceeding, the Commission shall grant a hearing at the request of any potentially affected party.⁷

B. Petitions About Ongoing Safety

In theory, citizens may request enforcement of the NRC’s safety-requirements through a petition described by 10 C.F.R. § 2.206. However,

3. 42 U.S.C. § 2011 (2009).

4. 42 U.S.C. § 2133(c) (2009).

5. 42 U.S.C. § 2232(a) (2009); *see also* 42 U.S.C. § 2133(d) (2009) (“no license may be issued to any person within the United States if . . . in the opinion of the Commission, the issuance of a license to such a person would be inimical to the common defense and security or to the health and safety of the public”).

6. NRC, Nuclear Power Plant License Renewal Regulations, 56 Fed. Reg. 64,943, 64,961 (Dec. 13, 1991) (to be codified at 10 C.F.R. pt. 2, 50, 54, 140).

7. 42 U.S.C. § 2239(a)(1)(A) (2009).

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this process suffers from at least two key problems. First, even though such a petition must “specify the action requested and set forth the facts that constitute the basis for the request” there is no provision for discovery.⁸ Thus, the petitioner must glean all the information required from public sources. This is a very difficult task because even the basic safety requirements that each plant must meet, called the “Current Licensing Basis” (“CLB”), are not compiled.⁹ In fact, experience at Oyster Creek showed that even the NRC Staff got the CLB wrong throughout the hearing process on the safety of the containment system.¹⁰ Finally, many of the underlying documents on specific safety issues are unobtainable because the NRC Staff either does not retain them, or reviews them at the licensee’s site.¹¹ Thus, a lack of transparency is one critical hindrance to citizens participating effectively in the ongoing oversight of nuclear plants.

Second, citizens groups have become disillusioned with the § 2.206 process because the NRC Staff effectively reviews its own work and the rights of appeal are very limited. It is hardly surprising that the Staff normally finds that its own actions are sufficient and justified. Furthermore, petitioners do not have a right to appeal an adverse decision to the Commission.¹² Finally, at least the Second Circuit has found that a refusal to take enforcement action pursuant to a § 2.206 petition is not judicially reviewable under the doctrine articulated in *Heckler v. Chaney*.¹³ However, other courts have found that there is an exception to this presumption of unreviewability, where the § 2.206 petition relates to licensing.¹⁴ At a minimum, petitioners’ rights to judicial review are in

8. 10 C.F.R. § 2.206 (2009).

9. In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Station Units 2 and 3), Memorandum and Order (Ruling on Petitions to Intervene and Requests for Hearing), LBP-08-13, 18-19 (Docket Nos. 50-247-LR, 50 286-LR, July 31, 2008) available at ADAMS Accession No. ML082130436.

10. In the Matter of AmerGen Energy Co., LLC (License Renewal for Oyster Creek Nuclear Generating Station), Initial Decision (Rejecting Citizens’ Challenge to AmerGen’s Application to Renew its Operating License for the Oyster Creek Nuclear Generating Station) LBP-07-17, 19-20, n. 20 (Docket No. 50-0219-LR, Dec. 18, 2007) available at ADAMS Accession No. ML073520402.

11. NRC OFFICE OF THE INSPECTOR GENERAL, Audit of NRC’s License Renewal Program, OIG-07-A-15, 14-15 (Sept. 6, 2007) available at ADAMS Accession No. ML072490486.

12. 10 C.F.R. § 2.206(a) (2009); 10 C.F.R. §2.206(c) (2009).

13. *Heckler v. Chaney*, 470 U.S. 821 (1985); *Riverkeeper, Inc. v. Collins*, 359 F.3d 156 (2d Cir. 2004).

14. *Nuclear Info. Res. Service v. Nuclear Regulatory Comm’n*, 969 F.2d 1169, 1178 (D.C. Cir. 1992).

doubt and petitions for enforcement of NRC regulations during operation are unlikely to be reviewable.

C. Development of the Relicensing Rules

To implement the AEA requirements, the Commission has promulgated regulations that lay out the specific requirements for relicensing. In the early 1980s, the NRC first started to address the standards for license renewal. As a result of that effort, the agency decided in 1991, that “age related degradation will be critical to safety during the term of [a] renewed license.” Accordingly, the Commission established a requirement for a plant-wide review of age-related degradation.¹⁵ The regulations also required licensees to demonstrate that they had effective programs for management of aging equipment.¹⁶ At that time, the NRC excluded other issues, such as emergency planning or updating the CLB, because the NRC believed they were adequately addressed by other existing regulations.¹⁷

In 1995, the Commission further narrowed the scope of the plant-wide review. It decided that with the possible exception of age-related degradation of long-lived passive components, the safety-related effects of aging are adequately managed by the ongoing regulatory scheme.¹⁸ Thus, the Commission narrowed the scope of the safety review upon relicensing to cover only age-related degradation of long-lived passive components.¹⁹ In narrowing the scope of the equipment covered by the rule, however, the NRC did not alter the fundamental principles underlying the 1991, rulemaking, including that: (a) age-related degradation poses a threat to the continued safe operation of nuclear power plants, and (b) safety must be maintained throughout the license renewal period by managing the effects of aging:

The objective of a license renewal review is to determine whether the detrimental effects of aging, which could adversely affect the functionality of systems, structures, and components that the Commission determines require review for the period of extended

15. NRC, Nuclear Power Plant License Renewal, 56 Fed. Reg. 64,943, 64,960 (Dec. 13, 1991).

16. *Id.* at 64,955.

17. *Id.* at 64,959.

18. NRC, Nuclear Power Plant License Renewal Revisions, 60 Fed. Reg. 22,461, 22,464 (May 8, 1995) (to be codified at 10 C.F.R. pt. 2, 51.54).

19. *Id.*

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operation, are adequately managed. The license renewal review is intended to identify any additional actions that will be needed to maintain the functionality of the systems, structures, and components in the period of extended operation.²⁰

Thus, in two steps, the Commission excluded many safety issues from the relicensing process. Ostensibly, the intent behind the 1995 amendments was to base license renewal on a “predictable and stable regulatory process” that permits licensees “to make decisions about license renewal without being influenced by a regulatory process that is perceived to be uncertain, unstable, or not clearly defined.”²¹ These two rulemakings actually made the process more predictable by excluding from the relicensing safety reviews many of the issues that were of most concern to citizens living close to nuclear plants, such as evacuation and the risk of terrorism.²²

The NRC claims that a broader review at the license renewal stage is redundant because the ongoing regulatory schemes, particularly the CLB, the maintenance rule, and corrective actions, provide sufficient protection against safety and health hazards.²³ Each plant’s CLB is required to be maintained during the renewal term in the same manner and to the same extent as during the original licensing term. The maintenance rule requires that nuclear power reactor licensees monitor equipment against licensee-established goals to “provide reasonable assurance” of its functionality.²⁴ The regulations call for immediate corrective actions when “conditions adverse to quality” such as “failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformance” are detected.²⁵ Thus, in theory, there should be few issues to deal with at license renewal.

Even the requirement of reviewing the aging of passive, long-lived, safety related equipment is subject to exceptions. When the renewal applicant can “demonstrate that their facility has specific programs or processes in place to detect ongoing degradation” the NRC permits some covered structures and components to be “generically excluded from further

20. *Id.* at 22,464.

21. *Id.* at 22,462.

22. Florida Power & Light Co. (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 N.R.C. 3, 6, 21-22 (2001).

23. NRC, Nuclear Power Plant License Renewal Revisions, 60 Fed. Reg. 22,461, 22,464, 22,466 (May 8, 1995) (to be codified at 10 C.F.R. pt. 2, 51 54).

24. *Id.* at 22,470.

25. 10 C.F.R. § 50, app. B, (2009).

aging management review” at license renewal.²⁶ In fact, the nuclear industry has requested that the NRC narrow the license renewal rule even further, which the NRC has promised to do once it “gains more experience with the effect of aging during the period of extended operation.”²⁷

Thus, in 1991 and 1995, the NRC effectively determined that, apart from the possible exception of age-related degradation of long-lived passive components during the license extension period, there are no major gaps in the current regulations that ensure safe operation of nuclear power plants or in their implementation. Unfortunately, this conclusion was not based upon rigorous analysis of the ongoing processes, but rather upon the mere existence of those processes.²⁸ In fact, much empirical and anecdotal evidence, presented below, suggests that the ongoing regulations are much less effective than the NRC assumed when it adopted the relicensing rules.

D. Regulatory Requirements for Relicensing

A renewed license may only be issued if the Commission finds that there is reasonable assurance of future compliance with the CLB.²⁹ In an operating license proceeding, the licensee generally bears the ultimate burden of proof.³⁰ The Commission confirmed in *Florida Power & Light Co. (Turkey Point Nuclear Generating Plant, Units 3 and 4)*, 54 NRC 3, 10 (2001), that because corrosion and other effects become more severe over the extended license period, an applicant for license renewal must demonstrate that its programs are adequate to manage the effects of aging, including sufficient inspections and testing:

Part 54 requires renewal applicants to demonstrate how their programs will be effective in managing the effects of aging during the proposed period of extended operation. . . . Applicants must identify any additional actions, i.e., maintenance, replacement of parts, etc., that will need to be taken to manage adequately the detrimental effects of aging. Adverse aging effects generally are

26. NRC, Nuclear Power Plant License Renewal Revisions, 60 Fed. Reg. 22,461, 22,486 (May 8, 1995) (to be codified at 10 C.F.R. pt. 2, 51 54).

27. *Id.* at 22,487.

28. NRC, Foundation for the Adequacy of the Licensing Bases, A Supplement to the Statement of Considerations for the Rule on Nuclear Power Plant License Renewal (10 C.F.R. part 54), Final Report, NUREG-1412 (Dec. 31, 1991) available at ADAMS Accession No. ML080310668.

29. 10 C.F.R. § 54.29 (2009).

30. Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1), ALAB-697, 16 N.R.C. 1265, 1271 (1982).

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gradual and thus can be detected by programs that *ensure sufficient inspections and testing*.³¹

The critical issue is the meaning of the phrase reasonable assurance. Where there is a high degree of certainty that a facility complies with the CLB requirements, the exact meaning of “reasonable assurance” does not come into play.³² Thus, how the reasonable assurance standard is applied depends on context. Historically, the reasonable assurance standard involved use of a “reasonably conservative range of values of input parameters.”³³ However, in the recent decision largely denying the appeal of the Oyster Creek licensing board initial decision, the Commission found that the licensee could establish reasonable assurance by showing compliance with applicable regulations by a preponderance of the evidence.³⁴ Perhaps mitigating this statement, in the same decision, the Commission directed the Staff to enhance their supervision of modeling studies that involved sensitivity analyses, which use a range of inputs to take account of uncertainty.³⁵ Thus, the best view is probably that an applicant must show that when it uses a reasonably conservative range of input parameters it can meet the CLB throughout any extended period of operation, but licensees may now use the Oyster Creek licensing decision to argue that such an approach is unnecessarily conservative.

III. THE ASSUMPTIONS REGARDING THE EFFECTIVENESS OF ONGOING PROCESSES MADE DURING THE RELICENSING RULEMAKINGS ARE UNSUPPORTED

A. Empirical Evidence

There are many examples of NRC failures to either recognize safety problems or resolve them, but a few dramatic recent events serve to illustrate that the NRC’s current approach to safety has serious flaws.

31. Florida Power & Light Co. (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 N.R.C. 3, 7, 10 (2001) (emphasis added).

32. *E.g.*, North Anna Env’tl. Coal. v. U.S. Nuclear Regulatory Comm’n, 533 F.2d 655, 667-68 (1976).

33. In the Matter of Atlas Corp., DD-99-02, (Jan. 20, 1999).

34. In the Matter of AmerGen Energy Company (License Renewal for Oyster Creek Nuclear Generating Station), Memorandum and Order, CLI-09-07 (Apr. 1, 2009), slip op. at 35.

35. *Id.* at 67-68.

Incredibly, the NRC failed to recognize that the increased threat of terrorism since September 2001 had legal and factual implications for ongoing safety and license renewal that required close analysis. Legally, the NRC failed to recognize that because terrorist attacks on nuclear plants became foreseeable, their potential consequences had to be included in the environmental analysis carried out pursuant to the National Environmental Policy Act, 42 U.S.C. § 4321 (“NEPA”), prior to licensing or relicensing.³⁶ Even after the Ninth Circuit decided this issue, the NRC refused to apply this requirement to relicensing outside that Circuit.³⁷ Factually, in 2005, a National Academy of Sciences Report for Congress showed that the NRC had failed to adequately assess the huge risk of storing spent fuel in elevated pools that are vulnerable to terrorist attack. The consequences of a spent fuel pool fire would be enormous. For example, estimates show that one fuel pool fire could cause 24,000 lung cancers and economic damage that could be ten times that caused by Hurricane Katrina.³⁸ Even though it is privy to safeguard information that the NRC claims has resolved this issue, the State of New Jersey has stated that the spent fuel pool at the Oyster Creek plant is a “major security concern”³⁹ and litigated its ability to raise this issue in relicensing in the Third Circuit.

In 2002, severe corrosion on the top of the reactor pressure vessel caused the Davis-Besse reactor near Cleveland to come within months of a

36. *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1030 (9th Cir. 2006).

37. The State of New Jersey claimed that the NRC should study the potential impact of terrorism as part of the relicensing process for Oyster Creek. However, the Commission ultimately rejected the impact as beyond the scope of the relicensing process. In the Matter of AmerGen Energy Company (License Renewal for Oyster Creek Nuclear Generating Station), Memorandum and Order, CLI-07-08, 1-2 (Feb. 26, 2007) available at ADAMS Accession No. ML070570511. The Commission further stated that “notwithstanding a recent decision by United States Court of Appeals for the Ninth Circuit... we reiterate our longstanding view that NEPA demands no terrorism inquiry.” *Id.* The Commission admitted that while *San Luis Obispo* would require study of the impact of terrorist attacks prior to relicensing, the Commission decided that it “disagree[d] with the Ninth Circuit’s view.” *Id.* at 5. The Commission therefore decided to adhere to the *San Luis Obispo* decision only in the Ninth Circuit by holding that terrorism is “beyond the scope” of relicensing in other Circuits. *Id.* (citing *In the Matter of Duke Energy Corp. (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2)*, 56 N.R.C. 358, 364 (2002)). New Jersey’s appeal of this decision was recently denied by the Third Circuit in part on the basis that the impact from a potential terrorist attack is not caused by the federal action in question. *New Jersey Dept. of Env’tl Protection v. NRC*, 591 F.3d 132 (3rd Cir. 2009).

38. Letter from Richard Webster, Staff Attorney, Rutgers Env’tl. Law Clinic, to Chief, Rules Review and Directives Branch U.S. N.R.C. 2, 12-15 (Sept. 8, 2006) available at ADAMS Accession No. ML062610359.

39. Letter from Lipoti, Director of N.J. Division of Environmental Safety and Health, to Richard Webster (Jan. 2, 2008).

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melt down. The NRC Office of the Inspector General (“OIG”) concluded that by allowing the plant to operate beyond a deadline for fixing the problem, the agency had placed the economic interests of the plant owner above the safety of the public. In addition, the OIG found that the NRC had “informally established an unreasonably high burden of requiring absolute proof of a safety problem” instead of acting when the licensee can no longer affirmatively show that safety is reasonably assured.⁴⁰ A 2002 survey showed that 47% of the NRC’s employees are afraid to speak out about safety issues because they fear doing so would jeopardize their jobs, and that employees were concerned that pressure from the industry is greatly undermining the agency’s ability to oversee safety. In 2003, the Witt Report regarding the evacuation plan for the Indian Point Nuclear Power Plant highlighted many flaws in that plan.⁴¹

In August of 2007, a cooling tower cell at the Vermont Yankee plant completely collapsed. In October of the same year, a video showing sleeping guards at the Peach Bottom nuclear plant aired on national television. In addition, through participation in the Oyster Creek proceeding, the intervenors discovered that the thickness measurements that the NRC and the licensee had relied upon to show safety for ten years were systematically wrong; the containment was thinner than those results showed and possibly below the CLB requirement.⁴²

More recently the Government Accountability Office (“GAO”) has highlighted the need for better NRC oversight of fire safety.⁴³ Despite the discoveries in the early 1980s of an issue with short circuits and in the late 1980s that certain fire retardant materials failed to meet the specified level of protection, the NRC is still struggling to devise a satisfactory approach to fire protection.⁴⁴ The NRC has also failed to track what measures are

40. NRC Office of the Inspector General Event Inquiry: NRC’s Regulation of Davis-Besse Regarding Damage to the Reactor Vessel Head (Case No. 02-03S), 23 (Dec. 30, 2002).

41. James Lee Witt and Associates, LLC, Review of Emergency Preparedness of Areas Adjacent to Indian Point and Millstone (Mar. 7, 2003) *available at* <http://www.wittassociates.com/1296.xml>.

42. *See, e.g.*, NRC, Safety Evaluation Report Related to the License Renewal Application of Oyster Creek Generating Station, Excerpts, NUREG-1875, 3-127 (Apr. 30, 2007) (finding definite bias in the 1996 readings) *available at* ADAMS Accession No. ML072851132.

43. GAO, NRC’s Oversight of Fire Protection at U.S. Commercial Nuclear Units Could Be Strengthened, GAO- 08-747 (June 2008) *available at* ADAMS Accession No. ML081840045.

44. *Id.* at 18-23.

actually in place to protect from fires; instead it relies on licensee documents that are not available to citizens.⁴⁵

Finally, during the preparation of this article, Vermont Yankee had yet more problems with leakage from the cooling towers and an inspection at Oyster Creek showed that corrosion of the containment was ongoing despite the many assurances that had been provided by witnesses for the NRC Staff and the reactor operator.⁴⁶ In his dissenting opinion regarding the Oyster Creek relicensing, Commissioner Jaczko noted that “the expert testimony the Board found persuasive was optimistic, at best.”⁴⁷

B. Evidence From NRC Adjudications

As discussed above, few NRC Staff decisions are scrutinized by the adjudicatory arm of the NRC, the Atomic Safety and Licensing Board (“ASLB”). Yet, in the proceedings that have occurred, some judges within the ASLB have been critical of how the NRC Staff has been approaching safety issues. For example, one judge recently raised questions about the safety culture of the NRC Staff, stating that the approach taken to two issues “may be symptomatic of safety culture deficiencies, and thus raise a serious question about a foundation of nuclear safety – the culture of the government organization responsible for promoting it.”⁴⁸ Although Judge Farrar stated that an alternative explanation could be that the NRC Staff behavior in that proceeding was “aberrational,” other proceedings confirm that it was not.⁴⁹ For example, as mentioned above, in the relicensing proceeding regarding the Oyster Creek power plant in New Jersey, the Staff announced that the safety of the containment vessel should not be judged by whether it meets the engineering code.

In another recent case, the ASLB found that the NRC Staff had exhibited a “more than casual attitude” regarding the safety of the public

45. *Id.* at 23-24.

46. In the Matter of AmerGen Energy Co. (Oyster Creek Nuclear Generating Station), Motion by Counsel to Reopen the Record and to Postpone Final Disposition of the Relicensing Decision, 3-7, 14-15 (Docket No 50-219-LR, Feb. 2, 2009) *available at* ADAMS Accession No. ML090480395.

47. In the Matter of AmerGen Energy Co. (Oyster Creek Nuclear Generating Station), Memorandum and Order, CLI- 09-07 (Docket No. 50-219-LR, Apr. 1, 2009) (partial dissent of Commissioner Jaczko at 7) *available at* ADAMS Accession No. ML 090930344.

48. In the Matter of Shaw Areva Mox Servs. (Mixed Oxide Fuel Fabrication Facility), Licensing Board Memorandum and Order, LBP-08-11 at 46 (Docket No.70-3098-MLA, Jun. 27, 2008) (concurring opinion of Judge Farrar) *available at* ADAMS Accession No. ML081790253.

49. *Id.*

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living close to a site where piles of radioactive wastes had been left uncovered for ten years after the plant stopped handling radioactive materials.⁵⁰ The Board found that residents who might be affected by groundwater contamination were entitled to greater consideration.

In mandatory hearings on Early Site Permit (“ESP”) applications, the ASLB is obliged to review the Staff’s performance with respect to uncontested issues.⁵¹ In several recent ESP cases, the ASLB has found significant deficiencies in the quality of the NRC Staff’s reviews, thereby supporting the need for greater Commission supervision of the NRC Staff.

In the Clinton ESP proceeding, for example, the ASLB found “many instances” in which “the technical portions of the Staff documents in the record (particularly the SER and to some degree, the EIS) did not support a finding that the Staff’s review supported its decisions.”⁵² In these instances, the ASLB was unable to make judgments about the adequacy of the ESP application because “the record as initially presented to us often did not supply adequate technical information or flow of logic to permit a judgment as to whether the Staff had a reasonable basis for its conclusions.”⁵³ Furthermore, the ASLB was forced to make many inquiries due to “the lack of explanation and lack of clarity found in a large portion of the [final] SER.”⁵⁴ The ASLB further found that the draft SER contained “a plethora of instances where the Staff’s conclusions could only be characterized as conclusory.”⁵⁵ The final SER, although an improvement, “still failed in a large number of instances to logically connect facts to conclusions.”⁵⁶

In addition to the concerns about the lack of clear logic, the ASLB was also concerned that the NRC Staff had not verified the facts asserted by the applicant.⁵⁷ The Board found that, for the relatively simple matters at issue in an early site permit proceeding, this was acceptable, but for construction

50. In the Matter of Shieldalloy Metallurgical Group Corp., Memorandum (Licensing Amendment Request for Decommissioning of the Newfield, New Jersey Facility), LBP-08-08, 13-14 (Docket No. 40-7102-MLA, June 2, 2008) *available at* ADAMS Accession No. ML081540188.

51. Exelon Generation Co., LLC (Early Site Permit for Clinton ESP Site) CLI-05-17, 62 N.R.C. 134 (2005).

52. Exelon Generation Co., LLC (Early Site Permit for Clinton ESP Site), LBP-06-28, 64 N.R.C. 460, 474-75 (2006).

53. *Id.* at 475.

54. *Id.*

55. *Id.* at 480.

56. *Id.* at 481.

57. *Id.* at 491-93.

permits or a combined license application, such an approach would be “extremely troubling.”⁵⁸ It also noted that the Board’s “confidence in the Staff’s judgment would have been materially improved had the more important of those facts [the Staff’s factual findings] been checked.”⁵⁹ The ASLB noted that the wide variation in the level of detail in different subsections of the final SER implied, at minimum, a lack of co-ordination, and, at worst, a lack of supervision.⁶⁰ Emphasizing its concern with the quality of the reporting, the ASLB explicitly stated that it did not conduct further inquiries into these issues because it felt bound by a Commission instruction to defer to the NRC Staff.⁶¹ Without that instruction from the Commission, the ASLB would have conducted “a much more probing review” into the quality of the review and reporting.⁶²

As a result of these issues, the ASLB found nearly ninety safety matters that required further explanation, sixty that required inquiry beyond the first set of questions, and a number that required resolution at an oral hearing.⁶³ In the end, the ASLB found that issuance of the Clinton ESP would not be inimical to common defense and security or to the health and safety of the public.⁶⁴ However, the decision makes clear that to make that finding the ASLB had to prompt the Staff in many areas to provide logical explanations that it could rely upon. In addition, the ASLB would not have been comfortable relying on unverified facts supplied by the applicant, if it had not been instructed by the Commission to do so.

Similarly, in the two other ESP decisions, the Board found many issues that needed clarification and follow-up after the NRC Staff’s review was complete. For example, in the North Anna ESP proceeding, the ASLB issued a “wave of safety questions” initially and finally concluded that seven topics needed to be addressed by oral testimony.⁶⁵ The Board found that after the NRC Staff review, “six fundamental questions” remained for which insufficient information was available prior to the ASLB

58. Exelon Generation Co., LLC (Early Site Permit for Clinton ESP Site), LBP-06-28, 64 N.R.C. 460, 492-93 (2006).

59. *Id.* at 492.

60. *Id.* at 496.

61. *Id.* at 492.

62. *Id.* at 496.

63. *Id.* at 479.

64. Exelon Generation Co., LLC (Early Site Permit for Clinton ESP Site), LBP-06-28, 64 N.R.C. 460, 497-98 (2006).

65. Dominion Nuclear North Anna, LLC (Early Site Permit for North Anna ESP Site), LBP-07-09, 65 N.R.C. 539, 563 (2007).

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proceeding.⁶⁶ Only after taking account of all of the record evidence, including that added by the ASLB proceeding, did the Board find the record was sufficient to support a “not inimical” finding.⁶⁷ Likewise, in the Grand Gulf ESP proceeding the ASLB found that in several instances, it was necessary for the ASLB to “amplify, modify, or change statements” in the SER.⁶⁸ The Board, therefore, deferred a number of issues to later stages.⁶⁹ Thus, in all three ESP proceedings completed to date, the Board felt it necessary to significantly supplement the record of the NRC Staff’s safety review in order to have sufficient information to make the findings required by the AEA.

IV. RULES REGARDING CITIZEN PARTICIPATION IN SAFETY DECISIONS DURING RELICENSING

A. Obtaining Intervenor Status

To obtain an adjudicatory hearing on an issue concerning relicensing, public interest groups must first petition to intervene and have a contention admitted. The rules regarding contentions are provided by 10 C.F.R. § 2.309. First, petitioners must state the contention by providing “a specific statement of the issue of law or fact to be raised or controverted.”⁷⁰ Next petitioners must “[p]rovide a brief explanation of the basis for the contention,”⁷¹ and “a concise statement of the alleged facts or expert opinions which support the petitioner’s position.”⁷² This element of the rule ensures that “full adjudicatory hearings are triggered only by those able to proffer . . . minimal factual and legal foundation in support of their contentions.”⁷³

Petitioners must also demonstrate that the issues raised in their contentions are within the scope of the proceeding.⁷⁴ This hurdle has often proved fatal for petitioners precisely because the scope of the safety issues

66. *Id.* at 629.

67. *Id.* at 599, 629.

68. System Energy Resources (Early Site Permit for Grand Gulf ESP Site), LBP-07-01, 65 N.R.C. 27, 102 (2007).

69. *Id.* at 102-03.

70. 10 C.F.R. § 2.309(f)(1)(i) (2009).

71. 10 C.F.R. § 2.309(f)(1)(ii) (2009).

72. 10 C.F.R. § 2.309(f)(1)(v) (2009).

73. In the Matter of Duke Energy Corp. (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 N.R.C. 328, 334 (1999).

74. 10 C.F.R. § 2.309(f)(1)(iii) (2009).

reviewed during relicensing is so narrow. In addition, the regulations require petitioners to “[d]emonstrate that the issue raised in the contention is material to the findings the N.R.C. must make to support the action that is involved in the proceeding.”⁷⁵ A showing of materiality should not be an onerous requirement, because all that is needed is a “minimal showing that material facts are in dispute, indicating that a further inquiry is appropriate.”⁷⁶

Finally, the contention must be timely. This seems deceptively simple because the NRC asks for petitions to intervene and so petitions made on or before the specified deadline are necessarily timely. However, the deadline for contentions is normally set long before the NRC Staff reaches a conclusion on the adequacy of the relicensing application. Thus, potential petitioners do not get the benefit of seeing which areas are the subject of further inquiry by the Staff, nor do they know how the aging managements programs proposed in the license renewal application will change during the Staff review.

Although the text of the rules is somewhat unclear, the ASLB, in a number of decisions, has recognized that petitioners may add new safety contentions after filing their initial petition, if they act in accordance with 10 C.F.R. § 2.309(f)(2) (2009).⁷⁷ This Section requires a showing that:

- (i) The information upon which the amended or new contention is based was not previously available;
- (ii) The information upon which the amended or new contention is based is materially different than information previously available; and
- (iii) The amended or new contention has been submitted in a timely fashion based on the availability of the subsequent information.⁷⁸

However, as is discussed below, the ASLB in the Oyster Creek proceeding was very reluctant to allow new contentions to be admitted even when they were based on what was ostensibly new and materially different information.

75. 10 C.F.R. § 2.309(f)(1)(iv) (2009).

76. Georgia Inst. Tech., CLI-95-12, 42 N.R.C. 111, 118 (1995); Rules of Practice for Domestic Licensing Proceedings - Procedural Changes in the Hearing Process, 54 Fed. Reg. 33, 171 (Aug. 11, 1989) (final rule) (to be codified at 10 C.F.R. pt. 2).

77. See, e.g., In the Matter of Entergy Nuclear Vermont Yankee, LLC (Vermont Yankee Nuclear Power Station), LBP-05-32, 62 N.R.C. 813 (2005).

78. 10 C.F.R. § 2.309(f)(2)(i)-(iii) (2009).

B. The Adjudicatory Procedures for Licensing Cases

The coup de grace in terms of limiting citizen participation in relicensing was delivered in 2004, when the NRC changed the procedural rules to try to streamline the administrative adjudication of contentions in licensing decisions.⁷⁹ The new rules did away with the trial-type proceeding that had been used and, by default, replaced it with a hybrid approach that allowed for mandatory document disclosure, exchange of direct testimony, briefing prior to a hearing, and a hearing at which all the questioning of witnesses would be by the administrative judges, not by the attorneys for each party.⁸⁰ The new rules only provide for the use of trial-type procedures for reactor licensing hearings if the presiding officer finds that the “contested matter necessitates resolution of issues of material fact relating to the occurrence of a past activity, where the credibility of an eyewitness may reasonably be expected to be at issue, and/or issues of motive or intent of the party or eyewitness [are] material to the resolution of the contested matter.”⁸¹

The First Circuit found that these rule changes would meet the statutory requirements of the Administrative Procedure Act, provided the NRC was true to its word and allowed cross-examination when necessary for a full and true disclosure of the facts.⁸² However, the court warned that if the NRC was not true to its word and did not allow cross-examination when required, “nothing in this opinion will inoculate the rules against future challenges.”⁸³

These procedural rules created many challenges for potential petitioners. For example, while applicants have many years to prepare an application, intervenors only have sixty days to submit their proposed issues for adjudication.⁸⁴ Furthermore, because experts are an essential part of the process, intervenors must quickly find and fund experts on nuclear-related matters willing to testify against the nuclear industry. This is not easy given the limited resources available to most potential petitioners.

79. See *Citizens Awareness Network, Inc. v. U.S.*, 391 F.3d 338, 344 (1st Cir. 2004).

80. *Id.* at 345.

81. *Id.* at 344, n.3 (citing 10 C.F.R. § 2.310(d) (2009)).

82. *Id.* at 351; NRC, *Changes to Adjudicatory Process*, 69 Fed. Reg. 2,182, 2,195-96 (Jan. 14, 2004) (final rule).

83. *Citizens Awareness Network, Inc. v. U.S.*, 391 F.3d 338, 354 (1st Cir. 2004).

84. In the Matter of Shaw Areva Mox Servs. (Mixed Oxide Fuel Fabrication Facility), Licensing Board Memorandum and Order, LBP-08-11 at 45 (Docket No.70-3098-MLA, Jun. 27, 2008) (concurring opinion of Judge Farrar) available at ADAMS Accession No. ML081790253.

Even when a hearing is granted, intervenors face formidable hurdles in obtaining a fair hearing. One judge noted that intervenors had brought valuable issues to the Board's attention, despite these disadvantages and wondered how much more the public might contribute to nuclear safety, if the NRC's procedural rules allowed them to.⁸⁵ For example, raising new issues is very difficult and intervenors are forced to dissipate scarce resources on duplicative filings to try to overcome very strict timing requirements.⁸⁶ Unless the judges are sympathetic, the proceeding "turn[s] into a shell game, with the usual street-corner outcome: whatever guess the Petitioners make will prove wrong."⁸⁷ Furthermore, in nearly all proceedings intervenors must not only litigate against the applicants, they must also litigate against the NRC Staff, who may opt to become a party. Sometimes the Staff litigates issues even more vigorously than the licensee. For example, the NRC Staff recently appealed the decision of the licensing board in the Vermont Yankee license renewal proceeding, even though the applicant decided not to appeal.

V. THE OYSTER CREEK EXPERIENCE

The net effect of the changes in the substantive and procedural rules was to chill citizen participation in relicensing decisions. In 2006, for only the second time in a relicensing proceeding, the coalition of six citizens' groups managed to have a contention admitted. That contention concerned the safety of the steel vessel that comprises the containment system. In 2007, the contention then became the subject of the first-ever public hearing on a relicensing application. At that time over 44 of the 104 nuclear plants in the United States had renewed their licenses without any hearing, a count that has now increased to 55. Showing the positive aspects of citizen participation, after the licensing board admitted the contention, the Oyster Creek licensee improved its proposal for the aging management of the containment five separate times in an effort to moot out the contention.⁸⁸

85. *Id.* at 49.

86. *Id.* at 45.

87. *Id.* at 54.

88. The intervention at Vermont Yankee further illustrates the positive effects of public participation where citizens groups highlighted a safety issue involving metal fatigue calculations; the NRC staff missed the same mistake at nine other reactors, but later acknowledged that the calculations needed to be addressed. Ultimately, the licensing board affirmed that additional metal fatigue calculations needed to be done prior to any licensing decision. Bizarrely, the NRC Staff, but not the applicant, is currently appealing this decision to the Commission.

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The Oyster Creek experience showed that the rules may produce a streamlined decision process when they serve to exclude citizens, but they produce the opposite effect when a contention is fully litigated. In practice, application of the revised rules generated endless procedural motions in response to emerging information and much confusion about the scope of the hearing.⁸⁹ As Judge Farrar recognized, because lawyers and experts cost money, the huge imbalance in resources between citizens and plant operators hampers citizens' ability to get a fair hearing. This became obvious at the Oyster Creek hearing when NRC and Exelon presented at least sixteen expert witnesses to oppose the one witness the citizens could afford.⁹⁰ In addition, two public interest lawyers for the intervenors were opposed by two lawyers for the NRC Staff and four lawyers from a large law firm for the applicant. The resource imbalance is made all the more important because the Board did not permit any cross-examination at the hearing. This means there was no opportunity for the intervenors to compel the applicant's experts to make the intervenor's case or probe for weaknesses in the reassuring statements offered by the licensee. The issue of cross-examination serves well to illustrate how the rules can serve as a Catch-22. In practice, the Board found that cross-examination was only permitted when intervenors could show that a witness was lying, but it is extremely difficult to show that without the ability to depose the witness in advance.⁹¹

Furthermore, if citizens try to find out what is going on at their local plant without resorting to litigation they face many obstacles in obtaining information. For example, prior to the intervention, some of the intervenors tried to obtain measurements of the thickness of the containment shell at Oyster Creek taken in 1996. They found, however, that the NRC did not possess the information and the licensee refused to release it. At one point

89. See generally Nuclear Information and Resource Service, Oyster Creek License Extension Application, <http://www.nirs.org/reactorwatch/licensing/oyster.htm> (last visited Feb. 28, 2009) (listing some of the many pleadings filed in the Oyster Creek relicensing process).

90. In the Matter of AmerGen Energy Co. (License Renewal for Oyster Creek Nuclear Generating Station), Initial Decision, LBP-07-17, 29 n. 32 (Docket No. 50-0219-LR, Dec. 18, 2007) available at ADAMS Accession No. ML073520402.

91. The legality of the Board's decision is called into question by a subsequent inspection report that shows that many of the witnesses at the hearing gave testimony in favor of relicensing that was either incorrect or overly optimistic. Webster, *supra* note 38. Although the NRC promised the First Circuit that it would allow cross-examination whenever required for full and true disclosure of the facts, it is now apparent that the procedures at the Oyster Creek hearing were insufficient to generate such disclosure from the licensee. Citizens Awareness Network, Inc. v. U.S., 391 F.3d 338, 351 (1st Cir. 2004).

in the proceeding the licensing board even faulted the intervenors for failing to obtain this information prior to filing their contention, when in fact they had made diligent efforts to obtain it.⁹² As discussed above, when this information was finally disclosed it showed that these measurements showed that the metal thickness in all ten areas measured had increased, which is physically impossible.⁹³

Even during litigation, licensees may try to exclude citizens or limit their participation by refusing to release information. For example, even though the NRC has recognized that there may be a problem with the metal fatigue calculations at Oyster Creek, Exelon has refused to release these calculations.⁹⁴ The NRC Staff managed to review these calculations, but shielded them from release through the Freedom of Information Act by carrying out their work in the licensee's office.⁹⁵

In addition, because the information obtained is highly technical, citizens need experts to interpret it. In the wake of the 1979, accident at Three Mile Island, all of the major accident reviews recommended that funding be made available to responsible citizens' groups so that they could act as a deterrent to regulatory agency complacency. Congress has so far failed to do this, but it is long overdue.

During the Oyster Creek proceeding, the citizens attempted to file a number of contentions based upon new information, but this proved a frustrating process. For example, during the Oyster Creek proceeding, the NRC Staff commissioned Sandia National Laboratories ("Sandia") to review the modeling providing the basis for the acceptance criteria for the thickness of the containment vessel at Oyster Creek.⁹⁶ Although Sandia used favorable assumptions about the thickness of the vessel, Sandia found that a key enhancement used by the licensee to increase the apparent strength of the vessel was not justified in certain circumstances and that the vessel barely met the safety requirements.⁹⁷ However, when citizens

92. In the Matter of AmerGen Energy Co. (License Renewal for Oyster Creek Nuclear Generating Station), Memorandum and Order (Granting Permission to File a New Contention), LBP-06-22 at 31-32 (Docket No. 50-021-LR, Oct. 10, 2006) *available at* ADAMS Accession No. ML062830381.

93. Oyster Creek Nuclear Generating Station, Safety Evaluation Report, *supra* note 42.

94. E-mail from Polonsky to Webster, (Apr. 11, 2008) (on file with author).

95. N.R.C. Response to Freedom of Information Act Request 2008-0283, (Aug. 13, 2008).

96. Jason P. Petti, Sandia National Laboratories, Structural Integrity Analysis of the Degraded Drywell Containment at the Oyster Creek Nuclear Generating Station, SAND2007-0055 at 11 (Jan. 12, 2007) *available at* ADAMS Accession No. ML070120395.

97. *Id.* at 77-82.

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sought to admit a new contention based upon the new work by Sandia, the Board found that the information was not new, because Sandia had merely reviewed old data and the intervenors could have commissioned their own similar study.⁹⁸ This is akin to telling the finders of the Rosetta Stone that it was not important and it contained no new information, because those who were trying to translate hieroglyphics could have done so without it, had they been sufficiently skilled. Clearly, had citizens known about Sandia's study at the time the initial contentions were due, they could have easily alleged that the acceptance criteria which were based on the enhancement were incorrect. Because this information did not come out until over a year after the time for initial contentions were due, citizens were denied the opportunity to fully litigate this issue.

In the initial decision on Oyster Creek the Board found that there was reasonable assurance that the containment system met and would continue to meet the CLB. Judge Barrata, however, in an additional statement, warned that additional analysis was needed prior to the commencement of the extended period of operation and set out some requirements for the analysis. Specifically, he stated that he believed that the licensee failed to "fully" show that "there is reasonable assurance that the factor of safety required by the regulations will be met throughout the period of extended operation."⁹⁹ This is because "to date . . . no analysis of the actual condition of the drywell has been done."¹⁰⁰ Therefore, "[t]o date we do not know what the actual safety factor is."¹⁰¹ Adding to the uncertainty caused by this lack of analysis is "a very limited knowledge of the actual thickness of the shell" because "there are large areas of the drywell in the sand bed region that do not have recent measurements or any measurements at all."¹⁰² Therefore, "it [is] essential to have a conservative best estimate analysis of the drywell shell before entering the period of extended

98. In the Matter of AmerGen Energy Co. (License Renewal for Oyster Creek Nuclear Generating Station), Memorandum and Order (Denying Citizens' Motion for Leave to Add a New Contention), 8-12 (Docket No. 50-0219-LR, Apr. 10, 2007) *available at* ADAMS Accession No. ML071000374.

99. Oyster Creek Nuclear Generating Station, Initial Decision, *supra* note 90, Additional Statement of Judge Baratta at 1 (Although Judge Baratta did not style his "statement" as a dissent, he states that he differs with his colleagues on whether the licensee has shown reasonable assurance that the factor of safety, a CLB requirement, will be met. Because such reasonable assurance is required before a license renewal can proceed, Judge Baratta's statement is effectively a dissent.).

100. *Id.* at 4 (emphasis in original).

101. *Id.*

102. *Id.* at 5.

operation.”¹⁰³ In addition, that analysis must take account of the uncertainty.¹⁰⁴ Therefore, the applicant should be required to perform a series of sensitivity analyses.¹⁰⁵ On appeal, the Commission found that it was unclear whether a proposed license condition would meet Judge Baratta’s requirements. The Commission, therefore, remanded this question back to the licensing board. On remand, the Board held another hearing on this issue in September 2008 and subsequently recommended imposing additional conditions on the analysis, including more robust sensitivity analysis and further work by Sandia on the issue of the enhancement discussed above, which citizens were able to raise belatedly on remand.¹⁰⁶ The Commission has somewhat vaguely endorsed these recommendations in its decision to relicense Oyster Creek.¹⁰⁷

Furthermore, it appears that the problems observed at Oyster Creek may reflect systemic problems with the relicensing process. In an audit of a number of relicensing reviews, including that for Oyster Creek, the NRC Office of Inspector General (“OIG”) highlighted that NRC’s relicensing safety reviews suffered from a lack of quality control and were inconsistent in terms of thoroughness.¹⁰⁸ In addition, the safety review of the Oconee plant stated that Staff had verified adequate performance of the coating system, when in fact problems with coating failures were well known to the NRC.¹⁰⁹ In a follow up memorandum, the OIG found that because the Staff had destroyed their working papers after each review was complete, it is very difficult to verify in detail how well the safety reviews were carried out.¹¹⁰

The Oyster Creek intervenors together with Riverkeeper and a number of other intervenors in other proceedings have also shown that the NRC’s relicensing safety reviews rely excessively upon unchecked licensee

103. *Id.* at 4.

104. *Id.* at 5.

105. *Id.* at 6.

106. Memorandum (Addressing The Issue Referred By The Commission Regarding The Adequacy Of AmerGen’s Proposed 3-D Finite Element Structural Analysis Studies), In the Matter Of AmerGen Energy Co, LLC (License Renewal for Oyster Creek Nuclear Generating Station), 16-17 (Oct. 29, 2008).

107. In the Matter of AmerGen Energy Co. (Oyster Creek Nuclear Generating Station), Memorandum and Order, CLI- 09-07 at 67-68 (Docket No. 50-219-LR, Apr. 1, 2009) available at ADAMS Accession No. ML 090930344.

108. NRC OFFICE OF THE INSPECTOR GENERAL, Audit of NRC’s License Renewal Program, OIG-07-A-15, 7, 19-21 (Sept. 6, 2007).

109. *Id.* at 22-23.

110. Memorandum from Bell, Inspector General, NRC, to Klein, Chairman, NRC, 4 (May 8, 2008).

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summary documents, and that the NRC Staff prematurely destroyed the working documents showing in detail how the safety review at Oyster Creek was conducted.¹¹¹ Although the Commission did not grant any relief to remedy these problems, Commissioner Jackzo indicated in his dissent that additional examination of the adequacy of the safety review should have been carried out.¹¹²

In summary, through participation in the Oyster Creek proceeding and review of public NRC documents, citizens were able gather over 50,000 pages of documents that were not previously in the public domain and show:

1. the current licensing basis (“CLB”) is unclear and NRC Staff have repeatedly attempted to manipulate the CLB to favor the applicant;
2. “reasonable assurance” is a catch phrase that is not clear enough for enforcement purposes;
3. the acceptance criteria applied to the thickness measurements at Oyster Creek were inadequate to maintain the CLB;
4. measurements that Exelon and the previous owner had relied upon to show safety for ten years were systematically biased in favor of greater metal thickness;
5. the modeling work upon which the applicant was relying was outdated, used a questionable enhancement, and did not take full account of the uncertainties;
6. Exelon violated a commitment to monitor an important drain for eight years before anyone noticed because its commitment tracking was inadequate;
7. NRC Staff have a policy of reviewing important documents away from NRC offices and then shielding the reviewed documents from FOIA requests;

111. Supplemental Petitions by Listed Petitioners for Additional Investigation and Correction of Deficiencies Regarding License Renewal Reviews, for Oyster Creek, Indian Point, Pilgrim, and Vermont Yankee Nuclear Power Plants, 3-6 ((Dockets Nos. 50-219-LR (Oyster Creek), 50-247-LR & 50-286-LR (Indian Point), 50-293-LR (Pilgrim), and 50-271-LR (Vermont Yankee), May 15, 2008)) *available at* ADAMS Accession No. ML081640245 (parties filed identical supplemental petitions).

112. In the Matter of AmerGen Energy Co., et al., Commission Memorandum and Order Responding to the Petition and Supplemental Petition Filed By Intervenor Groups (Dockets Nos. 50-219-LR (Oyster Creek), 50-247LR & 50-286-LR (Indian Point), 50-293-LR (Pilgrim), and 50-271-LR (Vermont Yankee), 34-5 (CLI-08-23, Oct. 6, 2008)) (dissenting opinion of Judge Jaczko) *available at* ADAMS Accession No. ML082800440.

8. NRC Staff do not retain their working documents showing what they actually do during safety reviews. It is therefore impossible for the Commission to check the work of the staff;
9. The NRC Staff's attitude is that unless there is an obvious problem, they should not do any in-depth review – safety-culture is lacking. Often, the staff does not check the facts given to it by the licensee; and
10. Public participation leads to better decision-making.

The Oyster Creek experience has confirmed that the problems at the NRC are deep rooted and has further undermined public confidence in the agency. The Oyster Creek proceeding has accomplished what the Commission and the industry may have hoped changes to the relicensing and procedural rules would avoid; it has provided a window into NRC's ongoing safety processes and found them wanting.

VI. CONCLUSIONS - RECOMMENDATION FOR NRC REFORM

The deficiencies highlighted above show that the nuclear industry in the United States is like the financial industry was prior to the crisis of 2008; there are many risks that are not being properly managed or regulated. Just like the financial industry, the nuclear industry could be destroyed if any of these risks actualize into another major incident like that at Three Mile Island in 1979. Therefore, citizens and the nuclear industry should now come together to create good processes for maintaining the safety of operating nuclear plants.

With regard to ongoing safety, these processes should include:

- i. Published, clear plant-specific safety standards upon which citizens, the NRC, and investors can rely (i.e. codification of the Current Licensing Basis ("CLB") and licensee commitments);
- ii. Requirements that CLB safety standards be met with a specified high degree of statistical certainty;
- iii. A centralized publicly accessible database of exemptions, corrective actions, violations of CLB safety standards, and violations of licensee commitments;
- iv. Prompt notice to interested parties when the safety requirements in the CLB or licensee commitments are changed or not met;

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- v. Citizen access to all non-proprietary non-safeguards licensee documents containing information relevant to nuclear safety and access to redacted versions of proprietary or safeguards documents;
- vi. A publicly available log of all NRC documents withheld from public release and a simple process to challenge Staff decisions to withhold documents;
- vii. Technical assistance grants to local citizens groups to enable them to hire expert assistance; and
- viii. A citizen suit provision (with fees when citizens prevail) so that disputes about ongoing safety that the NRC Staff declines to address can be resolved in the District Court under the Federal Rules of Civil Procedure and citizen groups would not be forced to bear the costs of stepping in to make up for the failure of the NRC.

Recommended improvements specific to the relicensing process include:

- i. Expand the scope beyond the aging management of long-lived passive components to include:
 - a. A comprehensive review of whether safety standards in the CLB should be improved based on a presumption that relicensed plants should meet the same standards as new plants, unless the applicant can show that that the cost of achieving the higher safety standard would be disproportionate to the benefits;
 - b. A de novo review of current compliance with all CLB safety standards and licensee commitments; and
 - c. Plant-specific resolution of generic safety issues.
- ii. Change the Part 2 adjudication rules to more closely mirror the federal rules of civil procedure, including:
 - a. Notice pleading with a liberal standard for adding or amending issues for adjudication as more information comes to light;
 - b. Flexibility on timing;
 - c. Construe disputed facts in favor of petitioners;
 - d. Full discovery of the licensee's knowledge, including depositions;
 - e. The right to live cross-examination; and
 - f. Preventing NRC itself from participating as a party.
- iii. Provide a mandatory hearing on safety issues where there is no intervenor.

In the absence of these improvements, the NRC will struggle to escape capture by the nuclear industry and, even if it is temporarily invigorated by the addition of new Commissioners that regard citizen participation more favorably and emphasize safety over production, it will tend to revert to ineffectiveness like the Atomic Energy Commission before it.