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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:

Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation

RIN 3150-AI47
NRC-2008-0482

# COMMENTS SUBMITTED BY THE OFFICES OF THE ATTORNEYS GENERAL OF THE STATES OF NEW YORK AND VERMONT AND THE COMMONWEALTH OF MASSACHUSETTS CONCERNING THE NUCLEAR REGULATORY COMMISSION'S PROPOSED WASTE CONFIDENCE DECISION UPDATE

Submitted: February 6, 2009


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COMMENTS SUBMITTED BY THE OFFICE OF THE ATTORNEYS GENERAL OF THE STATES OF NEW YORK AND VERMONT AND THE COMMONWEALTH OF MASSACHUSETTS CONCERNING THE NUCLEAR REGULATORY COMMISSION'S PROPOSED WASTE CONFIDENCE DECISION UPDATE

The People of the States of New York and Vermont and the Commonwealth of Massachusetts, by their respective Attorneys General (together "the Commenting States") submit these comments regarding the Nuclear Regulatory Commission's ("NRC") proposed Waste Confidence Decision Update.

**The State of New York's Interest in this Proceeding**

The Waste Confidence Decision Update affects New York State's residents and natural resources. Attorney General Andrew M. Cuomo has taken the lead in opposing the relicensing of the Indian Point nuclear plants. The State of New York has identified serious concerns about the safety and environmental impacts of Indian Point Units 1, 2, and 3, and has set these concerns out in the State's Petition to Intervene in the United State Nuclear Regulatory Commission's proceeding to consider whether to renew the operating licenses for these plants. On July 31, 2008, the Atomic Safety and Licensing Board issued a decision admitting 11

contentions presented by the State for an evidentiary hearing. *See In the Matter of Entergy Nuclear Operations, Inc.*, ASLBP No. 07-858-03-LR-BD01, Memorandum and Order (July 31, 2008). The admitted contentions involve, among other things: weaknesses in the units' aging electrical and piping systems, reactor pressure vessel components, and containment dome; unauthorized radionuclide leaks from various components, and significant accident mitigation analyses. The State of New York has a strong interest in ensuring the safety of this and other nuclear power plants within its borders.

**The State of Vermont's Interest in this Proceeding**

The State of Vermont has a strong interest in the management of waste from nuclear plants. Vermont Yankee Nuclear Power Station is in Vermont and received its original operating license in 1973. The State of Vermont had one contention admitted in the recent license renewal case. *In the Matter of Entergy Nuclear Vermont Yankee, LLC*, ALSBP No. 06-849-03-LR. A second Vermont contention was rejected that contended that the applicant had failed to include new and significant information regarding the likelihood of spent fuel having to be stored onsite for longer than was evaluated in the Generic Environmental Impact Statement ("GEIS") and perhaps indefinitely. It was rejected on the basis of the current Waste Confidence Rule. Additionally, Vermont adopted certain admitted contentions submitted by the New England Coalition.

**The Commonwealth of Massachusetts' Interest in this Proceeding**

The Commonwealth of Massachusetts has a substantial interest in assuring the safe operation of nuclear power plants within or in proximity to its borders. The Commonwealth also recognizes that nuclear power should be a part of the region's energy portfolio so long as proper and adequate safety and environmental precautions are followed pursuant to the National Environmental Policy Act ("NEPA"), the Atomic Energy Act ("AEA"), and the Administrative Procedure Act ("APA"). Therefore, the Commonwealth has opposed efforts by the NRC to extend the licenses for the Pilgrim nuclear power plant, located in Plymouth, MA, and the Vermont Yankee nuclear power plant, located about ten miles from the Massachusetts border in Vernon, Vermont, unless and until the NRC properly addresses new and significant information on the risks of spent fuel pool storage at these facilities.[1] In each proceeding, the Commonwealth contended that the NRC's failure to address appropriately this new and significant information, including a 2001 report prepared by NRC staff, a report by the National Academy of Sciences, and a report prepared by the Commonwealth's own expert, violated NEPA, the

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[1] *See* Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene with Respect to Entergy Nuclear Operations Inc.'s Application for Renewal of the Pilgrim Nuclear Power Plant Operating License (May 26, 2006) (No. 50-293-LR). ADAMS No. ML061630088 (Pilgrim Contention); *see also* Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene with Respect to Entergy Nuclear Operations Inc.'s Application for Renewal of the Vermont Yankee Nuclear Power Plant Operating License (May 26, 2006) (No. 50-271-LR). ADAMS No. ML061640065 (Vermont Yankee Contention).

APA, the AEA, and NRC implementing regulations. This information established that if a fuel pool were to suffer even a partial loss of cooling water, whether caused by terrorist attack, natural phenomena, equipment failure, or operator error, this could cause, over a wide range of scenarios, a catastrophic fire leading to a large atmospheric release of radioactive isotopes, extending beyond Massachusetts borders (Pilgrim) or across the border into Massachusetts communities (Vermont Yankee). In a separate expert report, the Commonwealth demonstrated that such a large atmospheric release could cause thousands of cases of cancer and billions of dollars in economic damage. *See Commonwealth v. NRC*, 522 F.3d 115, 122 – 123 (1st Cir. 2008).

In a parallel petition for rulemaking, the Commonwealth presented these same contentions regarding the risks of spent fuel pool storage and requested that the NRC revisit the conclusion of its 1996 License Renewal Generic Environmental Impact Statement that spent fuel storage poses no significant environmental impacts. *Commonwealth v. NRC*, 522 F. 3d at 123-124. Consistent with the U.S. Court of Appeals for the Ninth Circuit's decision in *San Luis Obispo Mothers for Peace v. NRC,* 449 F.3d 1016 (9th Cir. 2006), *cert. denied*, 127 S.Ct. 1124 (2007), the Commonwealth and other rulemaking supporters also requested the NRC to reverse its policy of refusing to consider the environmental impacts of intentional attacks on nuclear power plants. *See* 449 F. 3d at 1035.

Subsequently, the NRC denied the Commonwealth's rulemaking petition. *See* 73 Fed. Reg. 46204 (Aug. 8, 2008). That decision is now on appeal to federal

court. *See State of New York, Richard Blumenthal, Attorney General of Connecticut, Commonwealth of Massachusetts v. United States Nuclear Regulatory Commission and United States of America*, Docket Nos.: 08-3903-ag(L); 08-4833-ag (CON); 08-5571-ag (CON) (2d Cir. 2008).

## I. Overview

Published for comment on October 9, 2008, the NRC in this proposed rule proposes to amend two of its five Waste Confidence findings, Finding Two relating to the timeframe in which a high-level waste repository will be available, and Finding Four relating to the timeframe for which high-level waste can safely and without significant environmental impacts be stored on-site. *See* 73 Fed. Reg. 59551 (Oct. 9, 2008). Specifically, the Commission seeks to amend Finding Two to establish reasonable assurances that a repository for high-level nuclear waste will be available within 50-60 years beyond the licensed life of a reactor, and to amend Finding Four to establish that if necessary, spent fuel can be stored safely on-site for at least 60 years beyond the licensed life of a reactor. The Commission also proposes and seeks comment on an alternative finding in this rulemaking, which would revise Finding Two to remove any reference to a time period; Finding Two would presumably be revised to say only that the Commission reasonably assures itself that a repository will become available someday.

The proposed rule is arbitrary, grounded neither in science nor law, contrary to NEPA, the AEA, and the APA, and ignores numerous instances of environmental harm from leaking spent fuel pools around the country.

### A. Background on the Waste Confidence Findings

In 1984, the NRC issued a "Waste Confidence Decision" in response to a remand from the United States Court of Appeals for the District of Columbia Circuit in *State of Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979), which raised the question of whether an off-site storage or disposal facility (*i.e.*, a repository) would be available for the spent nuclear fuel produced at two reactors at the expiration of their licenses or whether the spent nuclear fuel could be stored onsite until an off-site solution was available. The D.C. Circuit explained that

> It was anticipated, when most of the nuclear power plants now in operation in the United States were licensed, that spent fuel would be stored at the reactor site only long enough to allow the fuel assemblies to cool sufficiently to permit safe shipment off-site for reprocessing (the extraction from the rods of usable uranium and plutonium) or permanent disposal [and that] [s]pent fuel storage capacity at these plants is therefore limited.

*Minnesota v. NRC*, 602 F.2d at 413-14. Two facilities, Vermont Yankee in Vermont and Prairie Island in Minnesota, had applied for license amendments to allow for expanded on-site spent fuel pool storage in anticipation of filling their spent fuel pools to capacity, which would have happened by 1978 and 1982 respectively. *Id.* Intervenors argued that approval of expanded on-site storage could only be granted after analysis of environmental and safety implications. Staff in each licensing proceeding found, in part because the modifications would entail no increase in the amount of wastes annually generated by the reactor, "reasonable assurances" that the modifications would not endanger public health and safety, and that they satisfied the standards of the Atomic Energy Act and NRC regulations, and

concluded that NEPA did not require the preparation of environmental impact statements because the modifications would not "significantly affect the quality of the human environment," findings which were affirmed by the Atomic Safety and Licensing Appeal Board. *Id.* at 414-15. The D.C. Circuit found insufficient the Commission's "implicit" policy of a "reasonable assurance that methods of safe permanent disposal of high-level wastes can be available when they are needed" and remanded the issue to the Commission to undertake at least a generic rulemaking to establish such a policy. *Id.* at 417. The result was the 1984 Waste Confidence Decision.[2]

### 1. The 1984 Waste Confidence Findings

The 1984 Waste Confidence Decision established five findings designed to allow the continued licensing of nuclear power plants in the absence of an existing repository for high level nuclear waste. Those findings were:

> (1) The Commission finds reasonable assurance that safe disposal of HLW [high level nuclear waste] and SNF [spent nuclear fuel] in a mined geologic repository is technically feasible;
>
> (2) The Commission finds reasonable assurance that one or more mined geologic repositories for commercial HLW and SNF will be available by the years 2007-2009, and that sufficient repository capacity will be available within 30 years beyond the expiration of any reactor operating license to dispose of existing commercial HLW and SNF originating in such reactor and generated up to that time;
>
> (3) The Commission finds reasonable assurance that HLW and SNF will be managed in a safe manner until sufficient repository

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[2] Ironically, radionuclide contamination was subsequently found in Prairie Island's groundwater. *See* NUREG 1437, Vol. 1, Sec. 4.8.2.

capacity is available to assure the safe disposal of all HLW and SNF;

(4) The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the expiration of that reactor's operating license at that reactor's spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations (ISFSIs);

(5) The Commission finds reasonable assurance that safe independent onsite or offsite spent fuel storage will be made available if such storage capacity is needed.

49 Fed. Reg. 34658 (Aug. 31, 1984). Based on these findings, the Commission amended 10 CFR Part 51 (specifically, it added 10 C.F.R. § 51.23(a)) to say that the environmental impacts of at-reactor storage after the termination of reactor operating licenses need not be considered in Commission proceedings related to issuance or amendment of a reactor operating license.

**2. 1990 Revisions to the Waste Confidence Findings**

In 1990, the NRC issued a decision revising affirming in general the findings but revising Findings Two and Four to reflect new dates of availability of the first repository and to clarify that, in Finding Four, the expiration of a reactor's operating license referred to the full 40 year initial license as well as any revised or renewed licensing term. Following these revisions, Finding Two then read:

> The Commission finds reasonable assurance that at least one mined geologic repository will be available *within the first quarter of the twenty-first century*, and sufficient repository capacity will be available within 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of an reactor to dispose of the commercial HLW and SNF originating in such reactor and generated up to that time."

(Emphasis added to show revisions from the 1984 rule). 55 Fed. Reg. 38474 (Sept. 18, 1990). Finding Four was amended to read:

> The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (*which may include the term of a revised or renewed license*) of that reactor at its spent fuel storage basin, or at either onsite of offsite ISFSIs.

(Emphasis added to show revisions from the 1984 rule). *Id.* The Commission revised 10 C.F.R. § 51.23(a) to conform to these revisions. *See* 55 Fed. Reg. 38472 (Sept. 18, 1990).

The Commission, in 1999, again confirmed these findings and stated that it would consider undertaking a reevaluation of the Waste Confidence Decision if, *inter alia,* significant and pertinent unexpected events occur, raising substantial doubt about the Decision's continued viability. 64 Fed. Reg. 68005 (Dec. 6, 1999).

**B. The Current Waste Confidence Decision Update**

The NRC is now taking a "fresh look" at the Waste Confidence findings, although it is not reopening the findings pursuant to its 1999 criteria, in anticipation of significant number of applications for new reactors. 73 Fed. Reg. at 59553. Specifically, the NRC seeks to amend Finding Two again, this time to read that

> The Commission finds reasonable assurance that sufficient mined geologic repository capacity can reasonable be expected to be available *within 50-60 years beyond the licensed life for operation* (which may include the term of a revised or renewed license) of any reactor to

dispose of the commercial high-level nuclear waste and spent fuel originating in such reactor and generated up to that time.

73 Fed. Reg. at 59551 (emphasis added to show proposed changes). The Commission also seeks to amend Finding Four again, to read that

> The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely without significant environmental impacts *for at least 60 years* beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in a combination of storage in its spent fuel storage basin and either onsite or offsite independent spent fuel storage installations.

73 Fed. Reg. at 59551 (emphasis added to show proposed changes).

### C. The NRC's Affiliated Rulemaking Regarding Temporary Storage of Spent Fuel

On the same day that it published the proposed Waste Confidence Decision Update, the NRC published a proposed rule which would amend 10 C.F.R. § 51.23(a) to say that if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin either onsite or at offsite independent spent fuel storage installations. 73 Fed. Reg. 59547 (Oct. 9, 2008). The Commenting States are submitting comments on that proposed rule under separate cover.

## II. The NRC Lacks a Reasonable Basis To Support Its Findings That Radioactive Waste Generated By Nuclear Power Plants Can Be Safely Disposed Of

The Waste Confidence proceedings were initiated to "assess [the] degree of assurance that radioactive wastes produced by nuclear power plants can be safely

disposed of, to determine when such disposal or offsite storage will be available, and to determine whether radioactive wastes can be safely stored onsite past the expiration of existing facility licenses until offsite disposal or storage is available." 73 Fed. Reg. 59552.

The NRC's restatement of three Waste Confidence findings and revision of two others is not grounded in fact. Events that have occurred since these findings were issued demonstrate that the initial findings were in error, and undercut any basis to make similar findings at this time. The NRC, despite decades of inaction on waste storage, seeks the public's support yet again of unsupported statements with potentially devastating consequences should the NRC's optimistic findings prove incorrect. Federal agencies have had a long history of attempts to develop safe, permanent radioactive waste disposal, dating back to the 1950s.[3] There is no scientific or technical basis to the NRC's proposed findings, and the NRC lacks a reasonable basis to reasonably ensure that radioactive wastes produced by nuclear power plants can be safely disposed of, especially for an indefinite period of time on-site.

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[3] *See* In the Matter of Proposed Rulemaking on Storage and Disposal of Nuclear Waste, 10 CFR Parts 50 and 51 (Waste Confidence Rulemakings), PR-50, 51 (44 F.R. 61372), Statement of Position of Robert Abrams, Attorney General of the State of New York (July 7, 1980) ("1980 NY Statement of Position") at 9-14. As this filing explained, there is no factual basis for confidence either that nuclear waste will be safely disposed of by any given date or that it will be safely stored indefinitely until it is disposed of safely. *See* 1980 NY Statement of Position. The State of New York maintains the same position today. As Attorney General Abrams stated nearly thirty years ago, "[c]onfidence cannot be predicated on hope." *Id.* at 2.

### A. The NRC Lacks a Reasonable Basis For Its Finding That Sufficient Mined Geologic Repository Capacity Can Reasonably Expected to Be Available (Waste Confidence Finding Two)

Current facts prevent the Commenting States from being reasonably assured that "sufficient mined geologic repository capacity can reasonably be expected to be available within 50–60 years beyond the licensed life for operation" of the nation's 104 operating reactors, as Finding Two requires. Here are the facts:

- Today, DOE facilities have already generated 12,800 tons of waste, and power reactors have generated 58,000 tons, which increases by approximately 2,000 tons per year. The Report to the President and the Congress by the Secretary of Energy on the Need for a Second Repository, December 2008, at 5.

- DOE estimates that total waste generated by the current fleet of operating reactors will total between 109,300 and 130,000 tons, depending on how many reactors are granted extended licenses. *Id.*

- Yucca Mountain is the country's only repository currently undergoing licensing proceedings, and it is statutorily limited to hold only 77,000 tons of waste.

*See* National Waste Policy Act of 1982, Public Law 97–425, 42 U.S.C. 10101 *et seq.*, § 114(d). But in November, 2008, the head of DOE's civilian nuclear waste program told Congress that within two years – that is, by 2010 – the amount of waste produced by the country's 104 nuclear power plants plus defense waste will exceed 77,000 tons. *See* The Report to the President and the Congress by the Secretary of Energy on the Need for a Second Repository, December 2008. DOE called on Congress to remove the 77,000 ton limit of Yucca Mountain, noting that the 77,000 ton limit is not based on any technical considerations related to Yucca Mountain.

*See* The Report to the President and the Congress by the Secretary of Energy on the Need for a Second Repository, December 2008. Moreover, Yucca Mountain's future as a repository site is not certain, and, as the NRC notes in its Federal Register notice, the NWPA bars DOE from investigating any other potential site until the resolution of the Yucca Mountain siting proceeding. 73 Fed. Reg. 59551, 59555. If Yucca Mountain is found not to be a suitable site for a repository, this would leave the country – in 2009, almost sixty years after the federal government's search for a repository began – with no agreed-upon site at all. Should that be the case, the federal government would have to begin the process of locating a suitable repository site again, which has been unsuccessful despite a half-century of trying.

These facts do not inspire confidence in the public that "sufficient mined geologic repository capacity can reasonably be expected to be available within 50–60 years beyond the licensed life for operation" of the nation's 104 operating reactors.

### B. The NRC Lacks a Reasonable Basis for Its Finding That Spent Fuel from Reactors Within the States' Borders Can Be Stored Safely for At Least 60 Years, Or More, Beyond the Licensed Life for Operation (Waste Confidence Finding Four)

As New York argued in 1980, there is no basis for confidence that spent fuel can be stored safely without significant environmental impacts either onsite or offsite for the length of time proposed by the NRC. *See* 1980 NY Statement of Position at 102. Just as there was no basis for confidence then, there is no basis for confidence now that spent fuel from reactors within the States' borders can be

stored safely for at least 60 years beyond the licensed life of the reactors (or, under the NRC's alternate proposal, indefinitely), in either onsite or offsite spent fuel installations.

### 1. The Premise Upon Which the Original Waste Confidence Finding Four Was Based Has Not Been Substantiated

In concluding that spent fuel can be stored safely and without significant environmental impacts for at least 30 years beyond the expiration of a reactor's operating license, the Commission considered four major issues: (1) the long-term integrity of spent fuel under water pool storage conditions, (2) structure and component safety for extended facility operation, (3) the safety of dry storage, and (4) potential risks of accidents and acts of sabotage at spent fuel storage facilities. 49 Fed. Reg. 34658. The Commenting States believe that occurrences over the last twenty-two years undermine at least two prongs of this analysis.

#### a. Leaking Spent Fuel Pools at Facilities Around the Country, Which Have Contaminated Groundwater and Public Waterways, Call Into Question the Integrity of Spent Fuel Under Water Storage Conditions

Recent reports by the National Academy of Sciences, the NRC's own technical staff and independent experts contradict the NRC's assertion that high-density fuel storage pools pose no significant environmental risk.[4] Instead, these studies show

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[4]*See, e.g.*, NUREG-1738, Final Technical Study of 1 Spent Fuel Pool Accident Risk and Decommissioning Nuclear Power Plants (NRC: January 2001); National Academy of Sciences Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, Safety and Security of Commercial Spent Nuclear Fuel Storage (The National Academies Press: 2006); Gordon Thompson, Risks and Risk-

(continued...)

that absent proper safety precautions, fuel storage pools are potentially susceptible to fire and radiological release from a wide range of conditions, including natural phenomena, operator error, equipment failure, or intentional attack.

In its 1990 rulemaking, the Commission determined that:

> experience with water storage of [spent nuclear fuel] continued to confirm that pool storage is a benign environment for [spent nuclear fuel] that does not lead to significant degradation of spent fuel integrity; that the water pools in which the assemblies are stored will remain safe for extended periods; and that degradation mechanisms are well understood and allow time for appropriate remedial action.

73 Fed. Reg. at 59548. However, spent fuel pools at multiple reactors around the country have, since the original Waste Confidence Decision and even since the 1990 rulemaking, leaked radioactive water into the subsurface.

**Indian Point Unit Two**

In August 2005, the licensee (Entergy) discovered a leak in the spent fuel pool at Unit 2, and further investigation revealed tritium in onsite ground water. Based on hydrological information and sample analyses of monitoring wells, Entergy has admitted that some contaminated ground water likely will, or has migrated to the Hudson River. *See* Indian Point Energy Center License Renewal

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[4](...continued)
Reducing Options Associated with Pool Storage of Spent Nuclear Fuel at the Pilgrim and Vermont Yankee Nuclear Power Plants (May 25, 2006); Jan Beyea, Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant (May 25, 2006); Jan Beyea, Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant (May 25, 2006).

Application, Appendix E, Applicant's Environmental Report (May 2007) ("Indian Point LRA Environmental Report"), at 5-4.

**Indian Point Unit One**

In addition to the detection of tritium, the radionuclides nickel-63, cesium-137, strontium-90, and cobalt-60 have been detected onsite at Indian Point, which appear to have come from leakage in the Unit 1 spent fuel pool, which has been permanently shut down since 1974, but whose spent fuel pool still contained expended fuel and radioactive water until late 2008. Liquid Radioactive Release Lessons Learned Task Force Final Report (Sept. 1, 2006) ("Lessons Learned Report") at 5-6. Radioactive fluid which escaped that pool still exists in groundwater and in the subsurface geologic formations. Hydrogeologic Site Investigation Report for the Indian Point Energy Center, GZA GeoEnvironmental, Inc. (Jan. 7, 2008).

These two sets of leaks may have existed for five to ten years before Entergy identified them in 2005 (Indian Point LRA Environmental Report at 5-5), undermining the NRC's statement that "degradation mechanisms are well understood and allow time for appropriate remedial action." 73 Fed. Reg. at 59548.

**Brookhaven National Laboratories**

In January 1997, ground water samples taken by Brookhaven National Laboratories ("BNL") staff revealed concentrations of tritium that were twice the allowable federal drinking water standards, and some samples taken later were 32 times the standard. *See* General Accounting Office, Information on the

Tritium Leak and Contractor Dismissal at the Brookhaven National Laboratory (GAO/RCED-98-26) (Nov. 1997), at 1. The tritium was found to be leaking from the laboratory's High Flux Beam Reactor's spent-fuel pool into the aquifer that provides drinking water for nearby Suffolk County residents. *Id.* The Department of Energy (DOE) and BNL's investigation of this incident concluded that the tritium had been leaking for as long as 12 years without DOE's or BNL's knowledge. *Id.* A subsequent federal government investigation concluded that Brookhaven employees did not aggressively monitor its reactor's spent-fuel pool for leaks – even going so far as to postpone an agreed-upon monitoring well system – so years passed before tritium contamination was discovered in the aquifer near the spent-fuel pool. *Id.* at 2.

**Seabrook**

In June 1999, the operator of the Seabrook power plant measured elevated tritium concentrations in the sump during routine monitoring. The licensee identified that the tritium activity was associated with an input to the sump from the Containment Annulus. Seabrook's investigation identified the source of the tritium leakage to be from a defect in the liner of the cask loading pool, which is connected to the fuel transfer canal in the Fuel Handling Building. Seabrook detected a maximum tritium concentration of about 750,000 pCi/L in a sample of non-potable water collected from the annulus sump in close proximity to the location of the leak.

**Point Beach**

Also in 1999, tritium and other radionuclides were identified near a retention pond at the Point Beach Nuclear Power Plant, near Manitowoc, Wisconsin. Tritium concentration in sand lenses in the top twelve feet of soil around the former retention pond ranged from 177 to 14,250 pCi/L. Tritium, which originated from leaks from the former retention pond, has been detected in these streams in concentrations ranging from the minimum detectable activity levels of about 200 pCi/L up to 400 pCi/L.

**Salem**

On September 18, 2002, the operator of the Salem Nuclear Station in Delaware found that Unit 1 Spent Fuel Pool water had leaked into a narrow seismic gap between the Unit 1 Auxiliary Building and Unit 1 Fuel Handling Building, and entered the Mechanical Penetration Room. Further licensee investigation identified tritium contamination in non-potable ground water near the Unit 1 fuel handling building. Maximum tritium levels of 15,000,000 pCi/L were identified in the ground water near the seismic gap. Lessons Learned Report at 7-8.

These pools leaked during the reactors' initial licensing term, calling into question the possibility for compromised structural integrity of spent fuel pools as many reactors around the country seek, and are granted, license renewals.

The NRC was sufficiently concerned about these occurrences that it conducted a study in 2006. *See* Lessons Learned Report. The NRC noted in its report on tritium releases that "[m]any of the releases reviewed varied significantly

in methods for estimating and/or monitoring the source term in surface or ground water, predicting or monitoring the distribution of the radionuclide concentrations in the environment through time, and subsequently evaluating current and future dose impacts to the general public or offsite areas. Lessons Learned Report at 13. The NRC has acknowledged that "it lacks regulatory guidance for monitoring and evaluating both the immediate and long-term offsite dose or environmental impact of these inadvertent releases." Lessons Learned Report at 13. There is currently no mandatory groundwater testing requirement in place, only an industry-created voluntary initiative. Lessons Learned Report at iii, 33. The NRC concluded that "systems or structures that are buried or that are in contact with soil, such as [spent fuel pools] ... are particularly susceptible to undetected leakage." Lessons Learned Report at 26. Indeed, NRC concluded that "[spent fuel pool] performance deficiencies are not specifically addressed in the NRC inspection program significance determination process." *Id.*

Yet despite these well-documented unplanned releases, the NRC states in its proposed rule that "[n]othing has occurred ... which calls into question the Commission's confidence in the safety of both wet and dry storage of [spent nuclear fuel] in the normal operation of spent fuel pools. ..." 73 Fed. Reg. at 59548. The Commenting States urge the Commission to consider the increasing frequency of spent fuel pool leaks as evidence "calling into question the Commission's confidence in the safety of both wet and dry storage of [spent nuclear fuel] in the normal operation of spent fuel pools."

Moreover, apart from unintended releases from degradation or other unforeseen problems, increased on-site storage also increases the opportunity for human error resulting in unauthorized releases. The NRC discussed numerous unplanned leaks that occurred because of human error in its Lessons Learned Report. *See* Lessons Learned Report at 34. The Brookhaven example detailed above, in which a federal government investigation concluded that Brookhaven employees did not aggressively monitor its reactor's spent-fuel pool for leaks, resulting in groundwater contamination that had been going on for twelve years, undetected, is one example of human error resulting in radioactive contamination in relation to spent fuel. Other examples include the Hatch facility in 1986, where "licensee personnel did not follow valving procedures for operating spent fuel pool canal seals which resulted in an unmonitored, unplanned release of spent fuel pool water to the onsite environment including a swamp area. The licensee experienced a spill of water (141,000 gallons) containing an estimated 0.20 curies of tritium and 0.373 curies of mixed fission product activity." *Id.* In March, 1991, in an event the NRC considered "serious" at the James A. FitzPatrick facility in Western New York, "licensee personnel did not follow valving procedures for a radioactive waste concentrator which cross-contaminated the auxiliary boiler and caused an airborne radioactivity release (steam plume) from the boiler. This resulted in deposition of onsite contamination and release of contaminated water from a storm drain. An estimated 0.4 to 1.5 curies of mixed fission and activation product activity was released from the boiler, of which an estimated 0.03 to 0.05 curies was released

from the site via a storm drain." *Id.* At the Hope Creek Station in April 1995, in an event the NRC characterized as "of significant regulatory concern," licensee personnel "did not correctly operate a radioactive waste concentrator which caused an airborne radioactivity release resulting in onsite contamination. An estimated 25 gallons of contaminated water, containing approximately 0.085 curies of mixed activation products, was released." *Id.* These examples show the potential for human error in operations relating to nuclear waste that can result in unplanned releases.

Given the increasing number of leaking spent fuel pools around the country, and the lack of monitoring requirements or guidelines for spent fuel pool leaks, a blank check authorization to store spent fuel onsite with no site-specific environmental review is inappropriate, and is in violation of NEPA, the APA, and the AEA.

**b. Recent Events Should Undermine the NRC's Confidence in the Potential Risks of Accidents and Acts of Sabotage at Spent Fuel Storage Facilities.**

**i. Accidents**

The recent July 16, 2007 earthquake in Niigata Province, Japan, which damaged the world's largest nuclear power plant, tipped over storage drums, and released radioactive material into the environment, further demonstrates the vulnerability of nuclear plants to natural forces. *See* Martin Fackler, *Japan Nuclear-Site Damage Worse Than Reported,* N.Y. TIMES (July 19, 2007), *available at* http://www.nytimes.com/2007/07/19/world/asia/19japan.html; THE ASAHI SHIMBUN,

*Radioactive Water Likely Flowed via Electric Cables after Earthquake* (July 23, 2007).

Seismic issues are potentially problematic at a number of power reactor locations across the United States. Seismologists at Columbia University's Lamont-Doherty Earth Observatory, in August of 2008, published the results of their study on earthquakes in the greater New York City Area, indicating the existence of a new fault line that could "significantly increase" the probability of an earthquake in the greater New York City Area. Lynn R. Sykes, John G. Armbruster, Won-Young Kim, and Leonardo Seeber, *Observations and Tectonic Setting of Historic and Instrumentally Located Earthquakes in the Greater New York City–Philadelphia Area*, Bulletin of the Seismological Society of America, Vol. 98, No. 4, pp. 1696–1719 (Aug. 2008). More significantly, the study found that the Indian Point nuclear power plants sit at the previously unidentified intersection of two active seismic zones. *Id.* The study also found that historic activity of earthquakes of a magnitude more than 5 has been higher in southeastern New York than in many other areas of the central and eastern United States, and that the fault lengths and stresses suggest magnitude-6 quakes, or even 7 – which would be 10 and 100 times bigger than magnitude 5 – are "quite possible." *Id; see also* Robert Roy Britt, *Large Earthquake Could Strike New York City* (Aug. 21, 2008), *available at* http://www.livescience.com/environment/080821-new-york-earthquakes.html.[5]

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[5] The report correctly states that "[m]uch new seismological information (continued...)

An magnitude 5.2 earthquake, with aftershocks registering 4.6, shook the D.C. Cook and Palisades reactors in Michigan in April of 2008. *See* PNO-III-08-004A, Preliminary Notification of Event or Unusual Occurrence (Apr. 18, 2008), ML081090639. The PNO about this unusual occurrence noted that several other Region III and Region IV nuclear power reactors experienced seismic activity from the initial earthquake and the aftershock as well. *Id.* Given the differing seismology of various plants around the country, a generic determination of environmental safety for potentially long-term on-site storage of spent fuel is inappropriate, and is in violation of NEPA, the APA, and the AEA.

**ii. Acts of Sabotage**

Aside from accidents, spent fuel storage pools may be potentially susceptible to fire and radiological release from intentional attacks if the NRC and licensees fail to take measures to protect against such attacks. National Research Council of the National Academies, *Safety and Security of Commercial Spent Nuclear Fuel Storage*: Public Report 17, 40 (2006). On September 11, 2001, terrorists hijacked four jet airliners and crashed three of them into their intended targets. The impact of the fuel-laden planes caused explosions and large, long-lasting fires. Those explosions and fires destroyed a portion of the Pentagon in northern Virginia and caused the

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[5](...continued)
is available since their initial approvals in 1973 and 1975. Nevertheless, the U.S. Nuclear Regulatory Commission so far has not permitted any new information to be used or old information on which the original licenses were based to be contested in considering extensions of licenses." *Id.* at 1717.

collapse of the World Trade Center towers and nearby buildings in New York City. *See* Nat'l Comm'n on Terrorist Attacks Upon the U.S. ("9/11 Commission"), *The 9/11 Commission Report* (2004).

Two of the hijacked planes flew near or over Indian Point, a nuclear power plant located on the Hudson River twenty-four miles north of New York City. *See id.* at 32. The wind direction at the time of the attacks was towards the southeast — that is, from Indian Point towards New York City. *See id.* at 285. Extrapolating from 2000 census information, more than seventeen million people live within fifty miles of the Indian Point reactors and spent fuel pools. *See* Edwin Lyman, *Chernobyl on the Hudson? The Health & Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant* 23 (2004).

The 9/11 Commission's report revealed that Khalid Sheikh Mohammad, the mastermind of the 9/11 attacks, originally planned to hijack additional aircraft to crash into targets on both coasts, including nuclear power plants. *The 9/11 Commission Report*, at 154. As late as July 2001, the terrorists were considering attacking a specific nuclear facility in New York, which one of the pilots "had seen during familiarization flights near New York." *Id.* at 245. This was most likely Indian Point.

In the years since 9/11, the federal government has repeatedly acknowledged that there is a credible threat of intentional attacks on nuclear power plants, including the specific threat of an aircraft attack. For instance:

- On January 23, 2002, the NRC issued an alert to the nation's nuclear power plants warning of the potential for an attack by terrorists who planned to crash a hijacked airliner into a nuclear facility. Kenneth R. Bazinet & Richard Sisk, *Plant Attacks Feared*, N.Y. DAILY NEWS (Feb. 1, 2002), at 5, *available at* 2002 WL 3165383.

- In his 2002 State of the Union address, President Bush stated that "diagrams of American nuclear power plants" had been found in Afghanistan, suggesting that Al-Qaeda may have been planning attacks on those facilities. *The President's State of the Union Address* (Jan. 29, 2002), *available at* http://www.pbs.org/newshour/bb/white_house/sotu2002/sotu_text.html.

- On May 14, 2002, Gordon Johndroe, a spokesman for the Office of Homeland Security, noted that "we know that Al-Qaeda has been gathering information and looking at nuclear facilities and other critical infrastructure as potential targets." Bill Gertz, *Security Boosted at Nuke Facilities*, WASH. TIMES (May 14, 2002), *available at* http://www.ohiocitizen.org/campaigns/electric/pre2003/boosted.htm.

- On May 24, 2002, the NRC reported that the nation's nuclear power plants had been placed on heightened alert as a result of information gained by the intelligence community. *Wide-Ranging New Terror Alerts*, CBS News.com (May 26, 2002), *available at* http://www.cbsnews.com/stories/2002/05/24/attack/main510054.shtml.

- On November 15, 2002, the FBI sent a bulletin to law enforcement agencies, warning them that Al-Qaeda's "highest priority targets remain within the aviation, petroleum, and nuclear sectors." *Text of FBI Terror Warning*, CBSNews.com (Nov. 15, 2002), *available at* http://www.cbsnews.com/stories/2002/11/15/attack/main529501.shtml.

- On May 1, 2003, the FBI issued a Threat Communication warning the nuclear plant operators to remain vigilant about suspicious activity that could signal a potential terrorist attack. *FBI Warns of Nuke Plant Danger*, CBS News.com (May 1, 2003), *available at* http://www.cbsnews.com/stories/2003/09/04/attack/main571556.shtml.

- On September 4, 2003, the United States General Accounting Office ("GAO") issued a report noting that the nation's commercial nuclear power plants are possible terrorist targets and criticizing the NRC's oversight and regulation of nuclear power plant security. GAO, *Nuclear Regulatory Commission: Oversight of Security at Commercial Nuclear Power Plants Needs to Be Strengthened*, GAO-03-752 (2003); *see also* GAO, Testimony Before the Subcomm. on Nat'l Security, Emerging Threats, & Int'l Relations, House Comm. on Gov't Reform, *Nuclear Power Plants Have Upgraded Security, But the NRC Needs to Improve Its Process for Revising the DBT*, GAO-06-555T, at 1 (2006) (stating that, "[a]ccording to the [NRC] . . . , there continues to be a general credible threat of a terrorist attack on the nation's commercial nuclear power plants, in particular by al Qaeda and like-minded Islamic terrorist groups").

- On July 1, 2004, the FBI issued a bulletin to 18,000 law enforcement agencies nationwide warning that recent intelligence continued to show al-Qaeda's interest in attacking a range of facilities, including nuclear plants. *FBI's 4th Warning*, CBSNews.com (July 2, 2004), available at http://www.cbsnews.com/stories/2004/07/08/national/printable628204.shtml.

- On July 11, 2007, the NRC amended the operating license for Indian Point Unit 3 to require the licensee to address large fires and explosions including those caused by planes. Indian Point Unit 3 Operating License, DPR-64, Condition AC, Mitigation Strategy License Condition (July 11, 2007), ML052720273, at 8.

In 2005, the National Academy of Sciences released a report from a study it conducted at the request of Congress, with the sponsorship of the NRC and the Department of Homeland Security, of the security risks posed by the storage of spent fuel at nuclear plant sites. *See* Nat'l Acad. of Scis., *Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report* (2006). Based upon information provided by the NRC, the National Academy of Sciences judged that "attacks with civilian aircraft remain a credible threat." *Id.* at 30. It noted that

terrorists might choose to attack spent fuel pools because they are "less well protected structurally than reactor cores" and "typically contain inventories of medium- and long-lived radionuclides that are several times greater than those contained in individual reactor cores." *Id.* at 36. The National Academy of Sciences concluded that the storage pools are susceptible to fire and radiological release from a wide range of conditions, including intentional attacks with large civilian aircraft. *Id.* at 49, 57. Similarly, the German Reactor Safety Organization, a scientific-technical research group that works primarily for nuclear regulators in Germany, found that large jetliners crashing into nuclear facilities under a variety of scenarios could cause uncontrollable situations and the release of radiation. German Reactor Safety Org., *Protection of German Nuclear Power Plants Against the Background of the Terrorist Attacks in the U.S. on Sept. 11, 2001* (Nov. 27, 2002), *translation available at* http://www.greenpeace.org/raw/content/ international/press/reports/ protection-of-german-nuclear-p.2.pdf.

Nuclear power plants in the United States, all of which were designed and built between the 1950s and 1980s, were not intended to withstand the impact of aircraft crashes or explosive forces. *See* 2/22/06 Comments of Nuclear Energy Institute to NRC in RIN 3150-AH60, at Enclosure 2, p. 10; *NRC: Nuclear Power Plants Not Protected Against Air Crashes*, Associated Press (Mar. 28, 2002); Director's Decision Under 10 CFR 2.206, at 12, *In the Matter of All Nuclear Power Reactor Licensees*, DD-02-04 (Nov. 1, 2002), *available at* http://www.nrc.gov/ reading-rm/doc-collections/petitions-2-206/ directors-decision/2002/ml022890031.pdf.

The NRC does not currently require existing nuclear power plants to develop protections against airborne attacks prior to the events of September 11, 2001. The NRC previously found the risks acceptable because of the low probability that an aircraft would *accidentally* hit a nuclear power plant. *See, e.g.,* Power Authority of the State of New York and Consolidated Edison Company, *Indian Point Probabilistic Safety Study* (1982) at 7.6-6 (concluding that the probability of an accidental crash was sufficiently low as to "present no significant hazard"). The NRC did not consider – or considered it extremely unlikely – that anyone would deliberately crash an airplane into a nuclear power plant.

Under current storage practices, the indefinite storage of spent nuclear fuel at power reactor sites long after the reactors have ceased power generation poses significant potential hazards. For example, in terms of volume there will be more spent fuel present after the end of power generation operations than during such power generation when such waste is still being generated and accumulating. Thus, the volume of any release of spent fuel could conceivably be greater during a post-operation phase. Also, by postponing the removal of waste from power reactor sites, NRC's proposed action essentially will extend the duration of the existence of such potential hazard at reactor sites.

In the aftermath of the September 11 attacks and other new and significant information, the NRC's outdated conclusion – that fuel pool storage risks are insignificant – is no longer defensible.

### 2. Given That the Premise Upon Which the Original Waste Confidence Finding Four Was Based Has Not Been Substantiated, Site-Specific Environmental Review of Each Reactor is Required

In light of the above information, the Commenting States object to the NRC's generic finding of safety in relation to temporary storage of nuclear waste. Instead, the Commenting States submit that site-by-site analysis of the potential for environmental impacts is appropriate, and required by the National Environmental Policy Act, given different security risks, seismic conditions, population densities, licensing periods, and differing histories of leaks at each of the nation's facilities. Moreover, the Commenting States submit that consideration of the quantity of waste generated in the renewed licensing term should be considered at license renewal, and urges the NRC to undertake a revision of 10 C.F.R. § 51.23(b) to implement this change. License renewals should consider – if not hinge upon – the facility's ability to store, for the indefinite period of time NRC foresees, all of the facility's spent nuclear fuel.

## III. Federal Agency Reliance on Unsubstantiated Promises is Inappropriate in the Context of Nuclear Safety

The NRC and affiliated federal agencies addressing the problem of nuclear waste storage have failed on numerous occasions to follow through with date-certain commitments so many times that the public can no longer have any confidence in dates-certain at all.

The Atomic Energy Commission made "definite" the choice of a repository at Lyons in 1971, and said that Lyons could receive waste by 1975. The project was

aborted several months later. 1980 NY Statement of Position at 10. Then in the 1970s Carlsbad was chosen, and DOE predicted that a repository at Carlsbad would be available by 1978. *Id.* at 11. Then the Energy Research and Development Administration ("ERDA") told Congress that permanent storage of waste in salt would occur by 1985. ERDA told Congress a repository site would be chosen by 1978, and then 1979. *Id.* at 12. No site was chosen by 1978 or 1979. The NRC then promulgated its Waste Confidence Findings, which said that a repository would be ready by 2007. 49 Fed. Reg. 34658. When that failed to occur, the NRC then revised the Waste Confidence Rule to say that a repository would be available by 2025 ("within the first quarter of the twenty-first century."). Because that date will not be met either, the NRC once again asks the public to be confident – with no basis other than decades of failed assurances – that a repository will be chosen within 50-60 years of the end of the licensed life of a facility. In relation to the potential extended operational life of the nation's oldest reactor, Oyster Creek, the NRC asks for public confidence that spent fuel be stored safely –"temporarily" – at Oyster Creek until 2089, 129 years from the date of the facility's original license.

The NRC has realized how unsubstantiated its estimated dates are, and likely to remedy this problem, now proposes deleting any reference to dates-certain at all, asking the public to believe that despite decades of incomplete attempts to secure a repository location, one will nevertheless be chosen at some unknown date, and that until then – until that unknown date – spent nuclear fuel will be safe either on-site, at nuclear facilities which are unprepared to house the waste long-term, or at

undiscussed and nonexistent off-site locations. This alternative is speculative and unfounded.

## IV. Comments on the Proposed Alternative Approach: The NRC's Confidence in Indefinite Storage is Unwarranted

The NRC seeks specific comments on an alternative approach, revising Finding Two without a reference to a timeframe for the availability of a repository.

As an initial matter, although the NRC proposes this as an "alternative" finding in the Waste Confidence Rule, it proposes to promulgate changes to 10 C.F.R. § 51.23 as though this has already been accepted. 73 Fed. Reg. at 59550. This is premature and inappropriate, as the public has not yet commented on the proposed 60-year time period for "temporary" storage, let alone indefinite storage. The Commenting States have provided additional comments alternative, indefinite approach in their accompanying comments on the NRC's Proposed Rulemaking Concerning Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation.

## V. The NRC's Waste Confidence Decision Update Fails to Comply with NEPA and the AEA

NEPA, 42 U.S.C. §§ 4321-4347, and the implementing regulations adopted by the Council on Environmental Quality ("CEQ"), 40 C.F.R. Parts 1500-1508, place upon the NRC the obligation to consider every significant aspect of the environmental impact of a proposed action and ensures that the Commission will inform the public that it has indeed considered environmental concerns in its decisionmaking process. *Baltimore Gas & Elec. Co. v. Natural Res. Def. Counsel,*

*Inc.*, 462 U.S. 87, 97 (1983). The NRC's Waste Confidence Decision Update, like its 1984 and 1990 predecessors, fails to comply with NEPA and the AEA.

Following NEPA's passage, CEQ promulgated regulations for Environmental Assessments, which are developed during a preliminary step in the environmental review process. *See* 40 C.F.R. § 1508.9. Environmental Assessments should "[b]riefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact." (40 C.F.R. § 1508.9(a)(1)) and identify alternatives to the proposed action (40 C.F.R. § 1508.9(b)). The NRC never published, and does not publish here, an Environmental Assessment of any kind.

Similarly, NRC has failed to meet CEQ's requirements for making a finding of no significant impact. 40 C.F.R. § 1508.13 defines a finding of no significant impact as:

> a document by a Federal agency briefly presenting the reasons why an action ... will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared. It shall include the environmental assessment or a summary of it and shall note any other environmental documents related to it. If the assessment is included, the finding need not repeat any of the discussion in the assessment but may incorporate it by reference.

40 C.F.R. § 1508.13. NRC never published a proper finding of no significant impact despite attempting, in Finding Four, to propose a finding of no significant impact that spent fuel can be stored for at least 30 years beyond the expiration of that reactor's operating license at that reactor's spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations, but it does so without

giving any evidence or analysis whatsoever for that finding. To the contrary, the Commenting States present here evidence that there may indeed be significant environmental impacts from long term spent fuel storage either onsite or offsite. NRC's Waste Confidence Decision update fails to comply with NEPA.

The NRC has consistently declined to review the environmental impacts, or potential environmental impacts, of spent fuel storage consistent with NEPA, the APA, and the AEA. Indeed, despite being titled "Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation," this proposed rule essentially evades meaningful environmental review of this important issue. The State of New York and the Commonwealth of Massachusetts have also challenged the NRC's refusal to undertake meaningful environmental review of spent fuel storage administratively and in federal court as well. *See State of New York, v. Nuclear Reg. Comm'n*, 08-3903-ag (2d Cir., Aug. 8, 2008); *Commonwealth of Massachusetts v. United States Nuclear Reg. Comm'n and United States of America*, 08-5571-ag (1st Cir. 2008); *see also Massachusetts v. NRC*, 522 F.2d 115 (1st Cir. 2008); August 13, 2007 State of New York Comments, PRM 51-13, Re: Proposed Amendment to 10 C.F.R. Part 51 rescinding finding that environmental impacts of pool storage of spent nuclear fuel are insignificant.

The Waste Confidence Decision Update fails to satisfy the requirements of the AEA as well as NEPA because any generic decision to allow for the storage of additional spent reactor fuel and other radioactive waste must be accompanied by (1) thorough, supported, and well-documented safety findings, and (2) an EIS that fully

assesses the environmental impacts of the uranium cycle, including health and environmental impacts and costs; and that examines a reasonable array of alternatives, including the alternative of not producing any additional radioactive waste. *See State of Minnesota v. NRC*, 602 F.2d 412. The NRC's proposed Waste Confidence Decision Update, which relies on speculation instead of science, does not comply with these requirements.

### A. Neither Table S-3, Nor Any Other NRC Analysis, Properly Evaluates the Environmental Impact of Turning Reactor Locations Around the Country Into High Level Waste Repositories

In the 1970s the NRC decided that licensing boards should assume, for purposes of NEPA, that the permanent storage of certain nuclear wastes would have no significant environmental impact (the so-called "zero-release" assumption) and thus should not affect the decision whether to license a particular nuclear power plant. In 1979, the NRC published its final Table S-3 rule. 44 Fed. Reg. 45362 *et seq.* (1979). Table S-3 is a numerical compilation of the NRC's estimates of resources used and effluents released by fuel cycle activities supporting a year's operation of a typical light-water reactor. The State of New York and the Natural Resources Defense Council challenged Table S-3 as violating NEPA and the APA in combined proceedings which were ultimately appealed to the United States Supreme Court. *See Baltimore Gas & Elec.,* 462 U.S. 87. As the Supreme Court explained, the NRC in its Final S-3 Rule "summarized the major uncertainties of long-term storage of nuclear wastes, noted that the probability of intrusion was small, and found the

evidence 'tentative but favorable' that an appropriate storage site could be found." *Id.* at 94. The NRC adhered to the zero-release assumption in its final rule, confident that the solidified waste would not escape and harm the environment once the repository was sealed. The NRC acknowledged that this assumption was uncertain because of the "remote" possibility that water might enter the repository, which was then projected to be in a bedded-salt environment, dissolve the radioactive materials, and transport them to the biosphere. *Id.*

The Commenting States submit that some of the crucial bases upon which Table S-3 was created, and upheld by the Supreme Court – namely, that a repository location was certain and ascertainable, and that transuranic and high level nuclear waste would end up in the federal repository – have been eroded or abolished by subsequent developments. Specifically, (1) no site has been established, even twenty-five years after the Supreme Court considered and upheld Table S-3; (2) the NRC is currently evaluating only one repository location, which is not bedded-salt; and (3) the NRC is now seeking approval to store nuclear waste on-site – in perpetuity – as opposed to in a repository. In light of the lack of confidence in a repository nearly fifty years after the process began, and twenty-five years after *Baltimore Gas and Electric*, the NRC must now analyze what is actually happening: 104 reactor sites around the country are poised to become long-term high-level waste repositories.

### B. The 30-Year-Old Table S-3 Can No Longer Support the Commission's Current Policy Preference

Additionally, the Commenting States submit that in light of the foregoing, Table S-3, and the bases upon which it was upheld by the Court, are obsolete and that the Table should be re-designed to take into account current conditions.

Now that it is apparent that there is little or no basis for NRC or the public to have confidence about the future of high level waste disposal, and that the NRC may force high level nuclear waste to remain at reactor sites indefinitely, there is no technical or scientific basis for using the generic approach in Table S-3 to address those impacts that are site specific and arise as a result of these changed circumstances. In particular, each nuclear power reactor site could now face the potential for a radiation release due to leakage or failure of on-site storage systems whose useful lives will have to go well-beyond the initially-envisioned 30-year window beyond the reactor's shutdown. Thus, the NRC must perform a Design Basis Threat ("DBT") Analysis and Severe Accident Mitigation Analysis ("SAMA"), and must analyze all potential impacts and alternatives for each nuclear plant. Similarly, off-site land impacts will now have to be considered for each plant with the focus on lost economic development potential and lost tax base increases caused by the indefinite storage of high level nuclear waste sites that will adversely impact land values. Finally, now that it is known that the bases upon which the initial waste confidence findings were made have not proven true, the NRC must prepare a supplemental environmental impact statement for every operating nuclear power

plant, as well as for all plants seeking to increase their initial projected nuclear waste production, to include the site specific evaluations of impacts not previously considered. In short, NRC should no longer rely on the 30-year-old Table S-3 to support its current waste disposal policy.

## VI. Conclusion

The Commenting States do not support the NRC's revised Waste Confidence Findings Two and Four, which are grounded in neither technology nor science, which disregard recent occurrences which call into question the safety of extended temporary on- or off-site storage of spent fuel, and which violate the National Environmental Policy Act, the Atomic Energy Act, and the Administrative Procedure Act. The Commenting States urge the NRC to require and perform a site-specific evaluation of the environmental impacts of spent fuel pool storage at each reactor location across the country, taking into account environmental factors including population density, water resources, seismicity, and subsurface geology.

Dated: February 6, 2009

Respectfully submitted,

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:

Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation

RIN 3150-AI47
NRC-2008-0404

# COMMENTS SUBMITTED BY THE OFFICES OF THE ATTORNEYS GENERAL OF THE STATES OF NEW YORK AND VERMONT AND THE COMMONWEALTH OF MASSACHUSETTS CONCERNING CONSIDERATION OF ENVIRONMENTAL IMPACTS OF TEMPORARY STORAGE OF SPENT FUEL AFTER CESSATION OF REACTOR OPERATION

Submitted: February 6, 2009


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COMMENTS SUBMITTED BY THE OFFICE OF THE ATTORNEY GENERAL OF THE STATES OF NEW YORK AND VERMONT AND THE COMMONWEALTH OF MASSACHUSETTS CONCERNING CONSIDERATION OF ENVIRONMENTAL IMPACTS OF TEMPORARY STORAGE OF SPENT FUEL AFTER CESSATION OF REACTOR OPERATION

The People of the States of New York and Vermont and the Commonwealth of Massachusetts, by their respective Attorneys General (together "the Commenting States") submit these comments regarding the Nuclear Regulatory Commission's ("NRC") proposed rule concerning the "temporary" storage of high level nuclear waste until a repository is available.

## A. The State of New York's Interest in this Proceeding

Attorney General Andrew M. Cuomo has taken the lead in opposing the relicensing of the Indian Point nuclear plants. The State of New York has identified serious concerns about the safety and environmental impacts of Indian Point Units 1, 2, and 3, and has set these concerns out in the State's Petition to Intervene in the United State Nuclear Regulatory Commission's proceeding to consider whether to renew the operating licenses for these plants. On July 31,

2008, the Atomic Safety and Licensing Board issued a decision admitting 11 contentions presented by the State for an evidentiary hearing. *See In the Matter of Entergy Nuclear Operations, Inc.*, ASLBP No. 07-858-03-LR-BD01, Memorandum and Order (July 31, 2008). The admitted contentions involve, among other things: weaknesses in the units' aging electrical and piping systems, reactor pressure vessel components, and containment dome; unauthorized radionuclide leaks from various components, and deficiencies in significant accident mitigation analyses. The State of New York has a strong interest in ensuring the safety of this and other nuclear power plants within its borders.

**B. The State of Vermont's Interest in this Proceeding**

The State of Vermont has a strong interest in the management of waste from nuclear plants. Vermont Yankee Nuclear Power Station is in Vermont and received its original operating license in 1973. The State of Vermont had one contention admitted in the recent license renewal case. *In the Matter of Entergy Nuclear Vermont Yankee, LLC*, ALSBP No. 06-849-03-LR. A second Vermont contention was rejected that contended that the applicant had failed to include new and significant information regarding the likelihood of spent fuel having to be stored onsite for longer than was evaluated in the Generic Environmental Impact Statement ("GEIS") and perhaps indefinitely. It was rejected on the basis of the current Waste Confidence Rule. Additionally, Vermont adopted certain admitted contentions submitted by the New England Coalition.

## C. The Commonwealth of Massachusetts' Interest in this Proceeding

The Commonwealth of Massachusetts has a substantial interest in assuring the safe operation of nuclear power plants within or in proximity to its borders. The Commonwealth also recognizes that nuclear power should be a part of the region's energy portfolio so long as proper and adequate safety and environmental precautions are followed pursuant to the National Environmental Policy Act ("NEPA"), the Atomic Energy Act ("AEA"), and the Administrative Procedure Act ("APA"). Therefore, the Commonwealth has opposed efforts by the NRC to extend the licenses for the Pilgrim nuclear power plant, located in Plymouth, MA, and the Vermont Yankee nuclear power plant, located about ten miles from the Massachusetts border in Vernon, Vermont, unless and until the NRC properly addresses new and significant information on the risks of spent fuel pool storage at these facilities.[1] In each proceeding, the Commonwealth contended that the NRC's failure to address appropriately this new and significant information, including a 2001 report prepared by NRC staff, a report by the National Academy of Sciences, and a report prepared by the Commonwealth's own expert, violated NEPA, the AEA, the APA, and NRC implementing regulations. This information established

[1] *See* Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene with Respect to Entergy Nuclear Operations Inc.'s Application for Renewal of the Pilgrim Nuclear Power Plant Operating License (May 26, 2006) (No. 50-293-LR). ADAMS No. ML061630088 (Pilgrim Contention); *see also* Massachusetts Attorney General's Request for a Hearing and Petition for Leave to Intervene with Respect to Entergy Nuclear Operations Inc.'s Application for Renewal of the Vermont Yankee Nuclear Power Plant Operating License (May 26, 2006) (No. 50-271-LR). ADAMS No. ML061640065 (Vermont Yankee Contention).

that if a fuel pool were to suffer even a partial loss of cooling water, whether caused by terrorist attack, natural phenomena, equipment failure, or operator error, this could cause, over a wide range of scenarios, a catastrophic fire leading to a large atmospheric release of radioactive isotopes, extending beyond Massachusetts borders (Pilgrim) or across the border into Massachusetts communities (Vermont Yankee). In a separate expert report, the Commonwealth demonstrated that such a large atmospheric release could cause thousands of cases of cancer and billions of dollars in economic damage. *See Commonwealth v. NRC*, 522 F.3d 115, 122 – 123 (1st Cir. 2008).

In a parallel petition for rulemaking, the Commonwealth presented these same contentions regarding the risks of spent fuel pool storage and requested that the NRC revisit the conclusion of its 1996 License Renewal Generic Environmental Impact Statement that spent fuel storage poses no significant environmental impacts. *Commonwealth v. NRC*, 522 F. 3d at 123-124. Consistent with the U.S. Court of Appeals for the Ninth Circuit's decision in *San Luis Obispo Mothers for Peace v. NRC,* 449 F.3d 1016 (9th Cir. 2006), *cert. denied*, 127 S.Ct. 1124 (2007), the Commonwealth and other rulemaking supporters also requested the NRC to reverse its policy of refusing to consider the environmental impacts of intentional attacks on nuclear power plants. *See* 449 F. 3d at 1035.

Subsequently, the NRC denied the Commonwealth's rulemaking petition. *See* 73 Fed. Reg. 46204 (Aug. 8, 2008). That decision is now on appeal to federal court. *See State of New York, Richard Blumenthal, Attorney General of Connecticut,*

*Commonwealth of Massachusetts v. United States Nuclear Regulatory Commission and United States of America*, Docket Nos.: 08-3903-ag(L); 08-4833-ag (CON); 08-5571-ag (CON) (2d Cir. 2008).

## I. Overview

The NRC's proposed rule would amend 10 C.F.R. § 51.23(a) to say that if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for an unknown period of time beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin or at either onsite or offsite independent spent fuel storage installations. 73 Fed. Reg. 59547 (Oct. 9, 2008). Phrased differently, the NRC here proposes a generic determination of no significant environmental impact from the temporary storage of spent fuel after cessation of reactor operation. The proposed rule is arbitrary, grounded neither in science nor law, contrary to the National Environmental Policy Act ("NEPA"), the Atomic Energy Act ("AEA"), and the Administrative Procedure Act ("APA"), and ignores numerous instances of environmental harm from leaking spent fuel pools around the country.

To fully understand the context of the proposed rule, a brief review of the Waste Confidence proceedings is in order.

### A. Background on the Waste Confidence Rule

In 1984, the NRC issued a "Waste Confidence Decision" in response to a remand from the United States Court of Appeals for the District of Columbia

Circuit in *State of Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979), which raised the question of whether an offsite storage or disposal facility would be available for the spent nuclear fuel produced at two reactors at the expiration of their licenses or whether the spent nuclear fuel could be stored onsite until an offsite solution was available. The D.C. Circuit explained that

> It was anticipated, when most of the nuclear power plants now in operation in the United States were licensed, that spent fuel would be stored at the reactor site only long enough to allow the fuel assemblies to cool sufficiently to permit safe shipment off-site for reprocessing (the extraction from the rods of usable uranium and plutonium) or permanent disposal [and that] [s]pent fuel storage capacity at these plants is therefore limited.

*Minnesota v. NRC*, 602 F.2d at 413-14. Two facilities, Vermont Yankee in Vermont and Prairie Island in Minnesota, had applied for license amendments to allow for expanded on-site spent fuel pool storage in anticipation of filling their spent fuel pools to capacity, which would have happened by 1978 and 1982 respectively. *Id.* Intervenors argued that approval of expanded on-site storage could only be granted after analysis of environmental and safety implications. Staff in each licensing proceeding found, in part because the modifications would entail no increase in the amount of wastes annually generated by the reactor, "reasonable assurances" that the modifications would not endanger public health and safety, and that they satisfied the standards of the Atomic Energy Act and NRC regulations, and concluded that NEPA did not require the preparation of environmental impact statements because the modifications would not "significantly affect the quality of the human environment", findings which were affirmed by the Atomic Safety and

Licensing Appeal Board. *Id.* at 414-15.[2] The D.C. Circuit found insufficient the Commission's "implicit" policy of a "reasonable assurance that methods of safe permanent disposal of high-level wastes can be available when they are needed" and remanded the issue to the Commission to undertake at least a generic rulemaking to establish such a policy. *Id.* at 417. The result was the 1984 Waste Confidence Decision.

### 1. The 1984 Waste Confidence Findings

The 1984 Waste Confidence Decision established five findings designed to allow the continued licensing of nuclear power plants in the absence of an existing repository for high level nuclear waste. Those findings were:

> (1) The Commission finds reasonable assurance that safe disposal of HLW [high level nuclear waste] and SNF [spent nuclear fuel] in a mined geologic repository is technically feasible;
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> (2) The Commission finds reasonable assurance that one or more mined geologic repositories for commercial HLW and SNF will be available by the years 2007-2009, and that sufficient repository capacity will be available within 30 years beyond the expiration of any reactor operating license to dispose of existing commercial HLW and SNF originating in such reactor and generated up to that time;
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> (3) The Commission finds reasonable assurance that HLW and SNF will be managed in a safe manner until sufficient repository capacity is available to assure the safe disposal of all HLW and SNF;
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> (4) The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the expiration of that reactor's operating

[2] Ironically, radionuclide contamination was subsequently found in Prairie Island's groundwater. *See* NUREG 1437, Vol. 1, Sec. 4.8.2.

> license at that reactor's spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations ("ISFSIs");
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> (5) The Commission finds reasonable assurance that safe independent onsite or offsite spent fuel storage will be made available if such storage capacity is needed.

49 Fed. Reg. 34658 (Aug. 31, 1984). Based on these findings, the Commission amended 10 C.F.R. Part 51 (specifically, it added 10 C.F.R. § 51.23(a)) to say that the environmental impacts of at-reactor storage after the termination of reactor operating licenses need not be considered in Commission proceedings related to issuance or amendment of a reactor operating license.

### 2. 1990 Revisions to the Waste Confidence Findings

In 1990, the NRC issued a decision revising affirming in general the findings but revising Findings Two and Four to reflect new dates of availability of the first repository and to clarify that, in Finding Four, the expiration of a reactor's operating license referred to the full 40 year initial license as well as any revised or renewed licensing term. Following these revisions, Finding Two then read:

> The Commission finds reasonable assurance that at least one mined geologic repository will be available *within the first quarter of the twenty-first century*, and sufficient repository capacity will be available within 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of an reactor to dispose of the commercial HLW and SNF originating in such reactor and generated up to that time."

(Emphasis added to show revisions from the 1984 rule). 55 Fed. Reg. 38474 (Sept. 18, 1990). Finding Four was amended to read:

> The Commission finds reasonable assurance that, if necessary, spent

> fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (*which may include the term of a revised or renewed license*) of that reactor at its spent fuel storage basin, or at either onsite of offsite ISFSIs.

(Emphasis added to show revisions from the 1984 rule). *Id.* The Commission revised 10 C.F.R. § 51.23(a) to conform to these revisions. *See* 55 Fed. Reg. 38472 (Sept. 18, 1990).

The Commission, in 1999, again confirmed these findings and stated that it would consider undertaking a reevaluation of the Waste Confidence Decision if, *inter alia,* significant and pertinent unexpected events occur, raising substantial doubt about the Decision's continued viability. 64 Fed. Reg. 68005 (Dec. 6, 1999).

**B. The Current Waste Confidence Decision Update**

The NRC is now taking a "fresh look" at the Waste Confidence findings, although it is not reopening the findings pursuant to its 1999 criteria, in anticipation of significant number of applications for new reactors. 73 Fed. Reg. at 59553. Specifically, the NRC seeks to amend Finding Two again, this time to read that

> The Commission finds reasonable assurance that sufficient mined geologic repository capacity can reasonable be expected to be available *within 50-60 years beyond the licensed life for operation* (which may include the term of a revised or renewed license) of any reactor to dispose of the commercial high-level nuclear waste and spent fuel originating in such reactor and generated up to that time.

73 Fed. Reg. at 59551 (emphasis added to show proposed changes). The Commission also seeks to amend Finding Four again, to read that:

> The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely without significant environmental impacts *for at least 60 years* beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in a combination of storage in its spent fuel storage basin and either onsite or offsite independent spent fuel storage installations.

73 Fed. Reg. at 59551 (emphasis added to show proposed changes).[3] Along with these changes, the NRC also seeks to amend 10 C.F.R. § 51.23 to essentially reflect changes to Finding Four. The following comments address this proposed regulatory change.

## II. The Premise Upon Which the Original Waste Confidence Finding Four Was Based Has Not Been Substantiated

In concluding that spent fuel can be stored safely and without significant environmental impacts for at least 30 years beyond the expiration of that reactor's operating license, the Commission considered four major issues: (1) the long-term integrity of spent fuel under water pool storage conditions, (2) structure and component safety for extended facility operation, (3) the safety of dry storage, and (4) potential risks of accidents and acts of sabotage at spent fuel storage facilities. 49 Fed. Reg. 34658. The Commenting States believe that occurrences over the last twenty-two years undermine at least two prongs of this analysis.

[3]The Commenting States simultaneously are submitting comments on the Proposed Waste Confidence Decision Update under separate cover.

### A. Leaking Spent Fuel Pools at Facilities Around the Country, Which Have Contaminated Groundwater and Public Waterways, Call Into Question the Integrity of Spent Fuel Under Water Storage Conditions

Recent reports by the National Academy of Sciences, the NRC's own technical staff and independent experts contradict the NRC's assertion that high-density fuel storage pools pose no significant environmental risk.[4] Instead, these studies show that absent proper safety precautions, fuel storage pools are potentially susceptible to fire and radiological release from a wide range of conditions, including natural phenomena, operator error, equipment failure, or intentional attack. The environmental impacts of a fire in a spent fuel pool may be severe, extending over a geographic area larger than a state's legal boundaries and continuing for decades.

In its 1990 rulemaking, the Commission determined that:

> experience with water storage of [spent nuclear fuel] continued to confirm that pool storage is a benign environment for [spent nuclear fuel] that does not lead to significant degradation of spent fuel integrity; that the water pools in which the assemblies are stored will remain safe for extended periods; and that degradation mechanisms are well understood and allow time for appropriate remedial action.

73 Fed. Reg. at 59548. However, spent fuel pools at multiple reactors around the

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[4] *See, e.g.*, NUREG-1738, Final Technical Study of 1 Spent Fuel Pool Accident Risk and Decommissioning Nuclear Power Plants (NRC: January 2001); National Academy of Sciences Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, Safety and Security of Commercial Spent Nuclear Fuel Storage (The National Academies Press: 2006); Gordon Thompson, Risks and Risk-Reducing Options Associated with Pool Storage of Spent Nuclear Fuel at the Pilgrim and Vermont Yankee Nuclear Power Plants (May 25, 2006); Jan Beyea, Report to the Massachusetts Attorney General on the Potential Consequences of a Spent-fuel Pool Fire at the Pilgrim or Vermont Yankee Nuclear Plant (May 25, 2006).

country have, since the original Waste Confidence Decision and even since the 1990 rulemaking, leaked radioactive water into the subsurface.

**Indian Point Unit Two**

In August 2005, the licensee (Entergy) discovered a leak in the spent fuel pool at Unit 2, and further investigation revealed tritium in onsite ground water. Based on hydrological information and sample analyses of monitoring wells, Entergy has admitted that some contaminated ground water likely will, or has migrated to the Hudson River. *See* Indian Point Energy Center License Renewal Application, Appendix E, Applicant's Environmental Report (May 2007) ("Indian Point LRA Environmental Report"), at 5-4.

**Indian Point Unit One**

In addition to the detection of tritium, the radionuclides nickel-63, cesium-137, strontium-90, and cobalt-60 have been detected onsite at Indian Point, which appear to have come from leakage in the Unit 1 spent fuel pool, which has been permanently shut down since 1974, but whose spent fuel pool still contained expended fuel and radioactive water until late 2008. Liquid Radioactive Release Lessons Learned Task Force Final Report (Sept. 1, 2006) ("Lessons Learned Report") at 5-6. Radioactive fluid which escaped that pool still exists in groundwater and in the subsurface geologic formations. Hydrogeologic Site Investigation Report for the Indian Point Energy Center, GZA GeoEnvironmental, Inc. (Jan. 7, 2008).

These two sets of leaks may have existed for five to ten years before Entergy

identified them in 2005. *See* Indian Point LRA Environmental Report at 5-5.

**Brookhaven National Laboratories**

In January 1997, ground water samples taken by Brookhaven National Laboratories (BNL) staff revealed concentrations of tritium that were twice the allowable federal drinking water standards, and some samples taken later were 32 times the standard. *See* General Accounting Office, Information on the Tritium Leak and Contractor Dismissal at the Brookhaven National Laboratory (GAO/RCED-98-26)(Nov. 1997), at 1. The tritium was found to be leaking from the laboratory's High Flux Beam Reactor's spent-fuel pool into the aquifer that provides drinking water for nearby Suffolk County residents. *Id.* The Department of Energy (DOE) and BNL's investigation of this incident concluded that the tritium had been leaking for as long as 12 years without DOE's or BNL's knowledge. *Id.* A subsequent federal government investigation concluded that Brookhaven employees did not aggressively monitor its reactor's spent-fuel pool for leaks – even going so far as to postpone an agreed-upon monitoring well system – so years passed before tritium contamination was discovered in the aquifer near the spent-fuel pool. *Id.* at 2.

**Seabrook**

In June 1999, the operator of the Seabrook power plant measured elevated tritium concentrations in the sump during routine monitoring. The licensee identified that the tritium activity was associated with an input to the sump from the Containment Annulus. Seabrook's investigation identified the source of the

tritium leakage to be from a defect in the liner of the cask loading pool, which is connected to the fuel transfer canal in the Fuel Handling Building. Seabrook detected a maximum tritium concentration of about 750,000 pCi/L in a sample of non-potable water collected from the annulus sump in close proximity to the location of the leak.

**Point Beach**

Also in 1999, tritium and other radionuclides were identified near a retention pond at the Point Beach Nuclear Power Plant, near Manitowoc, Wisconsin. Tritium concentration in sand lenses in the top twelve feet of soil around the former retention pond ranged from 177 to 14,250 pCi/L. Tritium, which originated from leaks from the former retention pond, has been detected in these streams in concentrations ranging from the minimum detectable activity levels of about 200 pCi/L up to 400 pCi/L.

**Salem**

On September 18, 2002, the operator of the Salem Nuclear Station in Delaware found that Unit 1 Spent Fuel Pool water had leaked into a narrow seismic gap between the Unit 1 Auxiliary Building and Unit 1 Fuel Handling Building, and entered the Mechanical Penetration Room. Further licensee investigation identified tritium contamination in non-potable ground water near the Unit 1 fuel handling building. Maximum tritium levels of 15,000,000 pCi/L were identified in the ground water near the seismic gap. Lessons Learned Report at 7-8.

These pools leaked during the reactors' initial licensing term, calling into

question the possibility for compromised structural integrity of spent fuel pools as many reactors around the country seek, and are granted, license renewals.

The NRC was sufficiently concerned about these occurrences that it conducted a study in 2006. *See* Lessons Learned Report. The NRC noted in its report on tritium releases that "[m]any of the releases reviewed varied significantly in methods for estimating and/or monitoring the source term in surface or ground water, predicting or monitoring the distribution of the radionuclide concentrations in the environment through time, and subsequently evaluating current and future dose impacts to the general public or offsite areas. Lessons Learned Report at 13. The NRC has acknowledged that "it lacks regulatory guidance for monitoring and evaluating both the immediate and long-term offsite dose or environmental impact of these inadvertent releases." Lessons Learned Report at 13. There is currently no mandatory groundwater testing requirement in place, only an industry-created voluntary initiative. Lessons Learned Report at iii, 33. The NRC concluded that "systems or structures that are buried or that are in contact with soil, such as [spent fuel pools] ... are particularly susceptible to undetected leakage." Lessons Learned Report at 26. Indeed, NRC concluded that "[spent fuel pool] performance deficiencies are not specifically addressed in the NRC inspection program significance determination process." *Id.*

Yet despite these well-documented unplanned releases, the NRC states in its proposed rule that "[n]othing has occurred ... which calls into question the Commission's confidence in the safety of both wet and dry storage of [spent nuclear

fuel] in the normal operation of spent fuel pools. ..." 73 Fed. Reg. at 59548. The Commenting States urge the Commission to consider the increasing frequency of spent fuel pool leaks as evidence "calling into question the Commission's confidence in the safety of both wet and dry storage of [spent nuclear fuel] in the normal operation of spent fuel pools."

Moreover, apart from unintended releases from degradation or other unforeseen problems, increased on-site storage also increases the opportunity for human error resulting in unauthorized releases. The NRC discussed numerous unplanned leaks that occurred because of human error in its Lessons Learned Report. *See* Lessons Learned Report at 34. The Brookhaven example detailed above, in which a federal government investigation concluded that Brookhaven employees did not aggressively monitor its reactor's spent-fuel pool for leaks, resulting in groundwater contamination that had been going on for twelve years, undetected, is one example of human error resulting in radioactive contamination in relation to spent fuel. Other examples include the Hatch facility in 1986, where "licensee personnel did not follow valving procedures for operating spent fuel pool canal seals which resulted in an unmonitored, unplanned release of spent fuel pool water to the onsite environment including a swamp area. The licensee experienced a spill of water (141,000 gallons) containing an estimated 0.20 curies of tritium and 0.373 curies of mixed fission product activity." *Id.* In March, 1991, in an event the NRC considered "serious" at the James A. FitzPatrick facility in Western New York, "licensee personnel did not follow valving procedures for a radioactive waste

concentrator which cross-contaminated the auxiliary boiler and caused an airborne radioactivity release (steam plume) from the boiler. This resulted in deposition of onsite contamination and release of contaminated water from a storm drain. An estimated 0.4 to 1.5 curies of mixed fission and activation product activity was released from the boiler, of which an estimated 0.03 to 0.05 curies was released from the site via a storm drain." *Id.* At the Hope Creek Station in April 1995, in an event the NRC characterized as "of significant regulatory concern," licensee personnel "did not correctly operate a radioactive waste concentrator which caused an airborne radioactivity release resulting in onsite contamination. An estimated 25 gallons of contaminated water, containing approximately 0.085 curies of mixed activation products, was released." *Id.* These examples show the potential for human error in operations relating to nuclear waste that can result in unplanned releases.

Given the increasing number of leaking spent fuel pools around the country, and the lack of monitoring requirements or guidelines for spent fuel pool leaks, a blank check authorization to store spent fuel onsite with no site-specific environmental review is inappropriate, and is in violation of NEPA, the APA, and the AEA.

### B. Recent Events Should Undermine the NRC's Confidence in the Potential Risks of Accidents and Acts of Sabotage at Spent Fuel Storage Facilities.

#### 1. Accidents

The recent July 16, 2007 earthquake in Niigata Province, Japan, which

damaged the world's largest nuclear power plant, tipped over storage drums, and released radioactive material into the environment, further demonstrates the vulnerability of nuclear plants to natural forces. *See* Martin Fackler, *Japan Nuclear-Site Damage Worse Than Reported,* N.Y. TIMES (July 19, 2007), available at http://www.nytimes.com/2007/07/19/world/asia/19japan.html; THE ASAHI SHIMBUN, *Radioactive Water Likely Flowed via Electric Cables after Earthquake* (July 23, 2007).

Seismic issues are potentially problematic at a number of power reactor locations across the United States. Seismologists at Columbia University's Lamont-Doherty Earth Observatory, in August of 2008, published the results of their study on earthquakes in the greater New York City Area, indicating the existence of a new fault line that could "significantly increase" the probability of an earthquake in the greater New York City Area. Lynn R. Sykes, John G. Armbruster, Won-Young Kim, and Leonardo Seeber, *Observations and Tectonic Setting of Historic and Instrumentally Located Earthquakes in the Greater New York City–Philadelphia Area*, Bulletin of the Seismological Society of America, Vol. 98, No. 4, pp. 1696–1719 (August 2008). More significantly, the study found that the Indian Point nuclear power plants sit at the previously unidentified intersection of two active seismic zones. *Id.* The study also found that historic activity of earthquakes of a magnitude more than 5 has been higher in southeastern New York than in many other areas of the central and eastern United States, and that the fault lengths and stresses suggest magnitude-6 quakes, or even 7 — which would be 10 and 100 times

bigger than magnitude 5 — are "quite possible." Id; see also Robert Roy Britt, *Large Earthquake Could Strike New York City* (Aug. 21, 2008), *available at* http://www.livescience.com/environment/080821-new-york-earthquakes.html.[5]

An earthquake registering 5.2, with aftershocks registering 4.6, shook the D.C. Cook and Palisades reactors in Michigan in April of 2008. *See* PNO-III-08-004A, Preliminary Notification of Event or Unusual Occurrence (Apr. 18, 2008), ML081090639. The PNO about this unusual occurrence noted that several other Region III and Region IV nuclear power reactors experienced seismic activity from the initial earthquake and the aftershock as well. *Id.* Given the differing seismology of various plants around the country, a generic determination of environmental safety for potentially long-term on-site storage of spent fuel is inappropriate, and is in violation of NEPA, the APA, and the AEA.

**2. Acts of Sabotage**

Aside from accidents, spent fuel storage pools may be potentially susceptible to fire and radiological release from intentional attacks if the NRC and licensees fail to take measures to protect against such attacks. National Research Council of the National Academies, *Safety and Security of Commercial Spent Nuclear Fuel Storage*: Public Report 17, 40 (2006). On September 11, 2001, terrorists hijacked four jet airliners and crashed three of them into their intended targets. The impact

[5] The report correctly states that "[m]uch new seismological information is available since their initial approvals in 1973 and 1975. Nevertheless, the U.S. Nuclear Regulatory Commission so far has not permitted any new information to be used or old information on which the original licenses were based to be contested in considering extensions of licenses." *Id.* at 1717.

of the fuel-laden planes caused explosions and large, long-lasting fires. Those explosions and fires destroyed a portion of the Pentagon in northern Virginia and caused the collapse of the World Trade Center towers and nearby buildings in New York City. *See* Nat'l Comm'n on Terrorist Attacks Upon the U.S. ("9/11 Commission"), *The 9/11 Commission Report* (2004).

Two of the hijacked planes flew near or over Indian Point, a nuclear power plant located on the Hudson River twenty-four miles north of New York City. *See id.* at 32. The wind direction at the time of the attacks was towards the southeast — that is, from Indian Point towards New York City. *See id.* at 285. Extrapolating from 2000 census information, more than seventeen million people live within fifty miles of the Indian Point reactors and spent fuel pools. *See* Edwin Lyman, *Chernobyl on the Hudson? The Health & Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant* 23 (2004).

The 9/11 Commission's report revealed that Khalid Sheikh Mohammad, the mastermind of the 9/11 attacks, originally planned to hijack additional aircraft to crash into targets on both coasts, including nuclear power plants. *The 9/11 Commission Report*, at 154. As late as July 2001, the terrorists were considering attacking a specific nuclear facility in New York, which one of the pilots "had seen during familiarization flights near New York." *Id.* at 245. This was most likely Indian Point.

In the years since 9/11, the federal government has repeatedly acknowledged that there is a credible threat of intentional attacks on nuclear power plants,

including the specific threat of an aircraft attack. For instance:

- On January 23, 2002, the NRC issued an alert to the nation's nuclear power plants warning of the potential for an attack by terrorists who planned to crash a hijacked airliner into a nuclear facility. Kenneth R. Bazinet & Richard Sisk, *Plant Attacks Feared*, N.Y. DAILY NEWS (Feb. 1, 2002), at 5, *available at* 2002 WL 3165383.

- In his 2002 State of the Union address, President Bush stated that "diagrams of American nuclear power plants" had been found in Afghanistan, suggesting that Al-Qaeda may have been planning attacks on those facilities. *The President's State of the Union Address* (Jan. 29, 2002), *available at* http://www.pbs.org/newshour/bb/white_house/sotu2002/sotu_text.html.

- On May 14, 2002, Gordon Johndroe, a spokesman for the Office of Homeland Security, noted that "we know that Al-Qaeda has been gathering information and looking at nuclear facilities and other critical infrastructure as potential targets." Bill Gertz, *Security Boosted at Nuke Facilities*, WASH. TIMES (May 14, 2002), *available at* http://www.ohiocitizen.org/campaigns/electric/pre2003/boosted.htm.

- On May 24, 2002, the NRC reported that the nation's nuclear power plants had been placed on heightened alert as a result of information gained by the intelligence community. *Wide-Ranging New Terror Alerts*, CBS News.com (May 26, 2002), *available at* http://www.cbsnews.com/stories/2002/05/24/attack/main510054.shtml.

- On November 15, 2002, the FBI sent a bulletin to law enforcement agencies, warning them that Al-Qaeda's "highest priority targets remain within the aviation, petroleum, and nuclear sectors." *Text of FBI Terror Warning*, CBSNews.com (Nov. 15, 2002), *available at* http://www.cbsnews.com/stories/2002/11/15/attack/main529501.shtml.

- On May 1, 2003, the FBI issued a Threat Communication warning the nuclear plant operators to remain vigilant about suspicious activity that could signal a potential terrorist attack. *FBI Warns of Nuke Plant Danger*, CBS News.com (May 1, 2003), *available at* http://www.cbsnews.com/stories/2003/09/04/attack/

main571556.shtml.

- On September 4, 2003, the United States General Accounting Office ("GAO") issued a report noting that the nation's commercial nuclear power plants are possible terrorist targets and criticizing the NRC's oversight and regulation of nuclear power plant security. GAO, *Nuclear Regulatory Commission: Oversight of Security at Commercial Nuclear Power Plants Needs to Be Strengthened*, GAO-03-752 (2003); *see also* GAO, Testimony Before the Subcomm. on Nat'l Security, Emerging Threats, & Int'l Relations, House Comm. on Gov't Reform, *Nuclear Power Plants Have Upgraded Security, But the NRC Needs to Improve Its Process for Revising the DBT*, GAO-06-555T, at 1 (2006)(stating that, "[a]ccording to the [NRC] . . . , there continues to be a general credible threat of a terrorist attack on the nation's commercial nuclear power plants, in particular by al Qaeda and like-minded Islamic terrorist groups").

- On July 1, 2004, the FBI issued a bulletin to 18,000 law enforcement agencies nationwide warning that recent intelligence continued to show al-Qaeda's interest in attacking a range of facilities, including nuclear plants. *FBI's 4th Warning*, CBSNews.com (July 2, 2004), *available at* http://www.cbsnews.com/stories/2004/07/08/national/printable628204.shtml.

- On July 11, 2007, the NRC amended the operating license for Indian Point Unit 3 to require the licensee to address large fires and explosions including those caused by planes. Indian Point Unit 3 Operating License, DPR-64, Condition AC, Mitigation Strategy License Condition (July 11, 2007), ML052720273, at 8.

In 2005, the National Academy of Sciences released a report from a study it conducted at the request of Congress, with the sponsorship of the NRC and the Department of Homeland Security, of the security risks posed by the storage of spent fuel at nuclear plant sites. *See* Nat'l Acad. of Scis., *Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report* (2006). Based upon information provided by the NRC, the National Academy of Sciences judged that

"attacks with civilian aircraft remain a credible threat." *Id.* at 30. It noted that terrorists might choose to attack spent fuel pools because they are "less well protected structurally than reactor cores" and "typically contain inventories of medium- and long-lived radionuclides that are several times greater than those contained in individual reactor cores." *Id.* at 36. The National Academy of Sciences concluded that the storage pools are susceptible to fire and radiological release from a wide range of conditions, including intentional attacks with large civilian aircraft. *Id.* at 49, 57. Similarly, the German Reactor Safety Organization, a scientific-technical research group that works primarily for nuclear regulators in Germany, found that large jetliners crashing into nuclear facilities under a variety of scenarios could cause uncontrollable situations and the release of radiation. German Reactor Safety Org., *Protection of German Nuclear Power Plants Against the Backgroud of the Terrorist Attacks in the U.S. on Sept. 11, 2001* (Nov. 27, 2002), *translation available at* http://www.greenpeace.org/raw/content/international/press/reports/protection-of-german-nuclear-p.2.pdf.

Nuclear power plants in the United States, all of which were designed and built between the 1950s and 1980s, were not intended to withstand the impact of aircraft crashes or explosive forces. *See* 2/22/06 Comments of Nuclear Energy Institute to NRC in RIN 3150-AH60, at Enclosure 2, p. 10; *NRC: Nuclear Power Plants Not Protected Against Air Crashes*, ASSOCIATED PRESS (Mar. 28, 2002); Director's Decision Under 10 CFR 2.206, at 12, *In the Matter of All Nuclear Power Reactor Licensees*, DD-02-04 (Nov. 1, 2002), *available at* http://www.nrc.gov/reading-

rm/doc-collections/petitions-2-206/ directors-decision/2002/ml022890031.pdf.

The NRC does not currently require existing nuclear power plants to develop protections against airborne attacks prior to the events of September 11, 2001. The NRC previously found the risks acceptable because of the low probability that an aircraft would *accidentally* hit a nuclear power plant. *See, e.g.,* Power Authority of the State of New York and Consolidated Edison Company, *Indian Point Probabilistic Safety Study* (1982) at 7.6-6 (concluding that the probability of an accidental crash was sufficiently low as to "present no significant hazard"). The NRC did not consider – or considered it extremely unlikely – that anyone would deliberately crash an airplane into a nuclear power plant.

Under current storage practices, the indefinite storage of spent nuclear fuel at power reactor sites long after the reactors have ceased power generation poses significant potential hazards. For example, in terms of volume there will be more spent fuel present after the end of power generation operations than during such power generation when such waste is still being generated and accumulating. Thus, the volume of any release of spent fuel could conceivably be greater during a post-operation phase. Also, by postponing the removal of waste from power reactor sites, NRC's proposed action essentially will extend the duration of the existence of such potential hazard at reactor sites.

In the aftermath of the September 11 attacks and other new and significant information, the NRC's outdated conclusion – that fuel pool storage risks are insignificant – is no longer defensible.

## III. Given That the Premise Upon Which the Original Waste Confidence Finding Four Was Based Has Not Been Substantiated, Site-Specific Environmental Review for Each Reactor is Required

In light of the above information, the Commenting States objects to the NRC's generic finding of safety in relation to temporary storage of nuclear waste. Instead, the Commenting States submit that site-by-site analysis of the potential for environmental impacts is appropriate, and required by the National Environmental Policy Act, given different security risks, seismic conditions, population densities, licensing periods, and differing histories of leaks at each of the nation's facilities. Moreover, the Commenting States submit that consideration of the quantity of waste generated in the renewed licensing term should be considered at license renewal, and urges the NRC to undertake a revision of 10 C.F.R. § 51.23(b) to implement this change. License renewals should consider – if not hinge upon – the facility's ability to store, for the indefinite period of time NRC foresees, all of the facility's spent nuclear fuel.

## IV. The NRC's Proposed Rule Fails to Comply With NEPA and the AEA

NEPA, 42 U.S.C. §§ 4321-4347, and the implementing regulations adopted by the Council on Environmental Quality ("CEQ"), 40 C.F.R. Parts 1500-1508, place upon the NRC the obligation to consider every significant aspect of the environmental impact of a proposed action and ensures that the Commission will inform the public that it has indeed considered environmental concerns in its decisionmaking process. *Baltimore Gas & Elec. Co. v. Natural Res. Def. Counsel, Inc.*, 462 U.S. 87, 97 (1983). The NRC's Waste Confidence Decision Update, like its

1984 and 1990 predecessors, fails to comply with NEPA and the AEA.

Following NEPA's passage, CEQ promulgated regulations for Environmental Assessments, which are developed during a preliminary step in the environmental review process. *See* 40 C.F.R. § 1508.9. Environmental Assessments should "[b]riefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact," (40 C.F.R. § 1508.9(a)(1)) and identify alternatives to the proposed action (40 C.F.R. § 1508.9(b)). The NRC never published, and does not publish here, an Environmental Assessment of any kind.

Similarly, NRC has failed to meet CEQ's requirements for making a finding of no significant impact. 40 C.F.R. § 1508.13 defines a finding of no significant impact as

> a document by a Federal agency briefly presenting the reasons why an action ... will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared. It shall include the environmental assessment or a summary of it and shall note any other environmental documents related to it. If the assessment is included, the finding need not repeat any of the discussion in the assessment but may incorporate it by reference.

40 C.F.R. § 1508.13. NRC never published a proper finding of no significant impact despite attempting, in Finding Four, to propose a finding of no significant impact that spent fuel can be stored for at least 30 years beyond the expiration of that reactor's operating license at that reactor's spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations, but it does so without giving any evidence or analysis whatsoever for that finding. To the contrary, the

Commenting States presents here evidence that there may indeed be significant environmental impacts from long term spent fuel storage either onsite or offsite. NRC's Waste Confidence Decision update fails to comply with NEPA.

The NRC has consistently declined to review the environmental impacts, or potential environmental impacts, of spent fuel storage consistent with NEPA, the APA, and the AEA. Indeed, despite being titled "Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation," this proposed rule essentially evades meaningful environmental review of this important issue. The State of New York and the Commonwealth of Massachusetts have also challenged the NRC's refusal to undertake meaningful environmental review of spent fuel storage administratively and in federal court as well. *See State of New York, v. Nuclear Reg. Comm'n*, 08-3903-ag (2d Cir., Aug. 8, 2008); *Commonwealth of Massachusetts v. United States Nuclear Reg. Comm'n and United States of America*, 08-5571-ag (1st Cir. 2008); *see also Massachusetts v. NRC*, 522 F.2d 115 (1st Cir. 2008); August 13, 2007 State of New York Comments, PRM 51-13, Re: Proposed Amendment to 10 C.F.R. Part 51 rescinding finding that environmental impacts of pool storage of spent nuclear fuel are insignificant.

The proposed rule fails to satisfy the requirements of the AEA as well as NEPA because any generic decision to allow for the storage of additional spent reactor fuel and other radioactive waste must be accompanied by (1) thorough, supported, and well-documented safety findings, and (2) an EIS that fully assesses the environmental impacts of the uranium cycle, including health and

environmental impacts and costs; and that examines a reasonable array of alternatives, including the alternative of not producing any additional radioactive waste. *See State of Minnesota v. NRC*, 602 F.2d 412. The NRC 's proposed waste confidence decision update and this rulemaking, which rely on speculation instead of science, do not comply with these requirements.

### A. Neither Table S-3, Nor Any Other NRC Analysis, Properly Evaluates the Environmental Impact of Turning Reactor Locations Around the Country Into High Level Waste Repositories

In the 1970s the NRC decided that licensing boards should assume, for purposes of NEPA, that the permanent storage of certain nuclear wastes would have no significant environmental impact (the so-called "zero-release" assumption) and thus should not affect the decision whether to license a particular nuclear power plant. In 1979, the NRC published its final Table S-3 rule. 44 Fed. Reg. 45362 *et seq.* (1979). Table S-3 is a numerical compilation of the NRC's estimates of resources used and effluents released by fuel cycle activities supporting a year's operation of a typical light-water reactor. The State of New York and the Natural Resources Defense Council challenged Table S-3 as violating NEPA and the APA in combined proceedings which were ultimately appealed to the United States Supreme Court. *See Baltimore Gas & Elec.* 462 U.S. 87. As the Supreme Court explained, the NRC in its Final S-3 Rule "summarized the major uncertainties of long-term storage of nuclear wastes, noted that the probability of intrusion was small, and found the evidence 'tentative but favorable' that an appropriate storage

site could be found." *Id.* at 94. The NRC adhered to the zero-release assumption in its final rule, confident that the solidified waste would not escape and harm the environment once the repository was sealed. The NRC acknowledged that this assumption was uncertain because of the "remote" possibility that water might enter the repository, which was then projected to be in a bedded-salt environment, dissolve the radioactive materials, and transport them to the biosphere. *Id.*

The Commenting States submit that some of the crucial bases upon which Table S-3 was created, and upheld by the Supreme Court – namely, that a repository location was certain and ascertainable, and that transuranic and high level nuclear waste would end up in the federal repository – have been eroded or abolished by subsequent developments. Specifically, (1) no site has been established, even twenty-five years after the Supreme Court considered and upheld Table S-3; (2) the NRC is currently evaluating only one repository location, which is not bedded-salt; and (3) the NRC is now seeking approval to store nuclear waste on-site – in perpetuity – as opposed to in a repository. In light of the lack of confidence in a repository nearly fifty years after the process began, and twenty-five years after *Baltimore Gas and Electric,* the NRC must now analyze what is actually happening: 104 reactor sites around the country are poised to become long-term high level waste repositories.

### B. The 30-Year-Old Table S-3 Can No Longer Support the Commission's Current Policy Preference

Additionally, the Commenting States submit that in light of the foregoing,

Table S-3, and the bases upon which it was upheld by the Court, are obsolete and that the Table should be re-designed to take into account current conditions.

Now that it is apparent that there is little or no basis for NRC or the public to have confidence about the future of high level waste disposal, and that the NRC may force high level nuclear waste to remain at reactor sites indefinitely, there is no technical or scientific basis for using the generic approach in Table S-3 to address those impacts that are site specific and arise as a result of these changed circumstances. In particular, each nuclear power reactor site could now face the potential for a radiation release due to leakage or failure of on-site storage systems whose useful lives will have to go well-beyond the initially-envisioned 30-year window beyond the reactor's shutdown. Thus, the NRC must perform a Design Basis Threat ("DBT") Analysis and Severe Accident Mitigation Analysis ("SAMA"), and must analyze all potential impacts and alternatives for each nuclear plant. Similarly, off-site land impacts will now have to be considered for each plant with the focus on lost economic development potential and lost tax base increases caused by the indefinite storage of high level nuclear waste sites that will adversely impact land values. Finally, now that it is known that the bases upon which the initial waste confidence findings were made have not proven true, the NRC must prepare a supplemental environmental impact statement for every operating nuclear power plant, as well as for all plants seeking to increase their initial projected nuclear waste production, to include the site specific evaluations of impacts not previously considered. In short, NRC should no longer rely on the 30-year-old Table S-3 to

support its current waste disposal policy.

## V. Comments on the Proposed Alternative Approach: The NRC's Confidence in Indefinite Storage is Unwarranted

In its Waste Confidence Decision Update, the NRC seeks specific comments on an alternative approach, revising Finding Two without a reference to a timeframe for the availability of a repository (73 Fed. Reg. at 59561), although the proposed Finding Two revision states reasonable assurance that repository capacity can reasonably be expected to be available within 50-60 years of the licensed life of a reactor. 73 Fed. Reg. at 59551. Yet in this rulemaking, the NRC deletes reference to a 50-60 year time period, and instead seeks to promulgate changes to 10 C.F.R. § 51.23 as though the alternative finding in the Waste Confidence Decision update already has public and industry support. This approach is premature and inappropriate until public comment has been received on the main proposed change to Finding Two and on its alternative.

Moreover, and most significantly, *neither* time period has any grounding in science or technology. The NRC has admitted that its original thirty-year time estimation was based on no scientific or technical facts, but instead on the period of time in which it expected a repository to be available. *See* 55 Fed. Reg. 38472. The NRC's reasoning – that because no problems significant in the NRC's eyes have occurred in the first licensing term of the first fleet of American nuclear reactors, no problems will occur no matter how long spent fuel remains on reactor sites – is antithetical to science, the laws of time, and common sense. For example, over an

indefinite period of storage the probability of a severe earthquake increases. Stated differently, the longer the waste is stored on-site, the greater the likelihood a site may experience an earthquake. This is but one example of the increasing risks and hazards posed by indefinite on-site storage. The NRC's alternative approach, which the NRC admits is unsubstantiated by science or technology, is arbitrary. Not only is there no basis for such unconditional confidence in the indefinite on-site or off-site storage of waste, but NRC must not "permanently postpone" an objective review of the environmental consequences of waste disposal.

## VI. Conclusion

The Commenting States do not support proposed regulatory changes to 10 C.F.R. § 51.23 which are grounded neither in science nor law, contrary to the National Environmental Policy Act, the Atomic Energy Act, and the Administrative Procedure Act, and which ignore numerous instances of environmental harm from leaking spent fuel pools around the country. The Commenting States urge the NRC to require and perform a site-specific evaluation of the environmental impacts of spent fuel pool storage at each reactor location across the country, taking into account environmental factors including population density, water resources, seismicity, and subsurface geology.

Dated: February 6, 2009

Respectfully submitted,

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## Rulemaking Comments

**From:** Janice Dean [Janice.Dean@oag.state.ny.us]
**Sent:** Friday, February 06, 2009 4:57 PM
**To:** Rulemaking Comments
**Cc:** matthew.brock@ago.state.ma.us; Bill Griffin; John Sipos
**Subject:** Docket Nos. 2008-0404 and 2008-0482, Joint Comments, States of NY and VT and Commonwealth of MA
**Attachments:** 2009.02.06 Joint Comments NY VT MA waste confid.pdf; 2009.02.06 Joint Comments NY VT MA temp storage.pdf

Dear Secretary and Rulemakings and Adjudication Staff,

Attached please find the joint comments of the States of New York and Vermont and the Commonwealth of Massachusetts on the NRC's Proposed Waste Confidence Decision Update (Docket No. 2008-0482), and on the NRC's Proposed Rulemaking Concerning Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation.

Hard copies will follow by mail.

Thank you very much.

Janice Dean

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