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General Comment

See attached file(s)

Attachments

Vermont April 10 2014 Comments on Proposed Interim Guidance on Exemption Requests

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April 10, 2014

COMMENTS OF THE VERMONT DEPARTMENT OF PUBLIC SERVICE AND THE VERMONT DIVISION OF EMERGENCY MANAGEMENT AND HOMELAND SECURITY ON DRAFT INTERIM STAFF GUIDANCE (ISG) NSIR/DPR-ISG-02, "EMERGENCY PLANNING EXEMPTION REQUESTS FOR DECOMMISSIONING NUCLEAR POWER PLANTS"

Introduction

The proposed Interim Staff Guidance on Emergency Planning Exemption Requests For Decommissioning Nuclear Power Plants ("Proposal" or "Interim Guidance") is flawed both in terms of the fundamental concepts underlying it as well as the bases provided for the Proposal. The Proposal creates a process by which the owners of decommissioned nuclear facilities will be allowed to avoid their responsibilities to the communities and states where they are located. The Proposal also essentially eliminates any thorough or effective public participation. The Vermont Department of Public Service and the Vermont Division of Emergency Management and Homeland Security oppose the Interim Guidance and urge the Staff to withdraw the Proposal and initiate a process for full public participation and direct Commission involvement to explore the implications more thoroughly than is allowed through the current written comments process.

The State of Vermont has a particular interest in the Interim Guidance because it will allow substantial reductions in overall post-accident mitigation measures for reactors that are permanently shutdown and, as of the end of 2014, Vermont Yankee will be permanently shutdown. If this Interim Guidance is put into effect, Vermont and its citizens face the threat of inadequate post-accident emergency planning following plant shutdown.

The Proposal Undermines NRC Safety Regulations

A number of the responsibilities related to emergency planning were recently enacted after a full rulemaking proceeding. *See* 76 Fed. Reg. 72560 (November 23, 2011) ("The requirements enhance the ability of licensees in preparing to take and taking certain EP and protective measures in the event of a radiological emergency; address, in part, security issues identified after the terrorist events of September 11, 2001; clarify regulations to effect consistent emergency plan implementation among licensees; and modify certain EP requirements to be more effective and efficient"). The Interim Guidance, however, would allow a wide range of "exemptions" from NRC safety regulations that have been duly promulgated through procedures established under the Administrative Procedure Act and NRC regulations. *See* 10 C.F.R. §§ 50.47(b), 50.54(q), Part 50 Appendix E. What Staff proposes is to substitute these safety regulations with widespread ad hoc waivers of safety requirements in a process which does not permit meaningful public participation even though the result will be to seriously compromise public safety. *See Brodsky v. NRC*, 578 F.3d 175 (2d Cir. 2009). If the NRC believes that safety regulations need to be amended, it should propose those amendments through the normal process, not grant widespread exemptions.

The Proposal Relies On Faulty and Unsupported Assumptions

The Interim Guidance begins with the faulty premise that an accident involving a spent fuel pool is substantially less severe than a reactor accident and thus it is permissible to reduce emergency planning requirements when a reactor is shutdown permanently. This premise ignores NUREG/CR-6451, which noted a high estimate for a full pool release as an economic cost of $566 billion, not including health effects and 143,000 latent fatalities. Travis et al., *A Safety and Regulatory Assessment of Generic BWR and PWR Permanently Shutdown Nuclear*

Power Plants, NUREG/CR-6451 (1997) ("NUREG/CR-6451"), at 4-2. The high estimate in that study also found condemnation of 2,790 square miles of land—roughly a 50 mile by 50 mile square of total desolation. *Id.* The Draft Generic Environmental Impact Statement for Waste Confidence ("DGEIS") characterizes NUREG/CR-6451 as providing "reasonable bounding estimates for offsite consequences for the most severe accidents." DGEIS at B-11. Even the Consequence Study cited often in the Interim Guidance included possible spent fuel pool accidents with enormous economic and health impacts. *See* Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor (Oct. 2013) (ML13256A342). It found that an average area of 9,400 square miles would be rendered uninhabitable, with 4.1 million people being displaced over the long-term. Consequence Study at 162 (Table 33) and 232 (Table 62).

The Interim Guidance also assumes that following a spent fuel pool there will be ample time to do emergency planning as the accident is unfolding. This assumption is problematic for two reasons. First, it ignores the real possibility that the accident may have been triggered by a destabilizing event such as an earthquake—the sole accident initiator analyzed in the Consequence Study—or a malevolent act, either of which would likely create a chaotic post-accident environment.

Second, while it may be reasonable to assume that there will be adequate time to respond to an accident involving dry cask storage of nuclear fuel, it is not reasonable to make that assumption for decommissioned plants where fuel is still stored in pools. The Interim Guidance assumes that spent fuel pools can be repaired and refilled within 10 hours of an incident. But if, as noted above, the triggering event is an earthquake or a malevolent act, it could well take much longer than 10 hours to repair and refill a pool. This at the very least requires delaying any

exemptions from emergency planning requirements until after a decommissioned reactor has moved all of its fuel from its spent fuel pool into dry cask storage.

The Proposal also assumes, by implication, that there will be a robust and effective NRC oversight and enforcement program that will assure that any unforeseen problems will be dealt with adequately should they arise. But this assumption is refuted by a long history of failures to manage and control nuclear wastes. In addition to the most obvious example of Fukushima, there are even more recent examples of the breakdown in safety involving nuclear wastes at the Hanford Reservation in Hanford, Washington and at the Waste Isolation Pilot Project ("WIPP") in New Mexico. These recent events, discussed in detail below, demonstrate why the Interim Guidance should not assume that NRC regulations will avoid significant problems in the future or will ensure that any problems are addressed appropriately.

The Proposal Ignores Important Additional Considerations

The Proposal is written as though spent fuel will remain at a reactor site for only a relatively brief time. However, as the ongoing Waste Confidence proceeding finally acknowledges, and as the United States Court of Appeals for the District of Columbia Circuit has ruled (*New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)), NRC has no basis for such an assumption and must consider the real possibility that wastes will remain at reactor sites indefinitely. That reality requires NRC to evaluate this Proposal—to allow reactor owners to substantially dismantle their programs for off-site emergency planning—in light of a potential for decades upon decades or longer of spent fuel storage at reactor sites. While the spent fuel may be less vulnerable to fire, it is actually more vulnerable to leakage from its storage containers, as the history of radiation releases from high level waste facilities demonstrates.

In the last few months, there have been breakdowns in safety involving nuclear wastes at

Hanford and at WIPP. Both of these facilities have taken steps in recent years to "assure" that nuclear waste stored there was safe and secure and that releases of such waste would not occur. Both were operated under the watchful eye of the Department of Energy, which has a robust and dedicated staff devoted to the utmost nuclear safety. Nonetheless, just in 2014, information has come to light that demonstrates that even the best intentions and best regulations and the best people cannot assure that serious problems will not occur.

On March 21, 2014, the Washington Department of Ecology issued an Administrative Order in Docket 10156 against the United States Department of Energy because of serious leaks of radioactive materials from storage at the Hanford facility. The Administrative Order found the following violations:

> **Violation 1 - Failure to stop the flow of hazardous waste into secondary containment.**
> *40 CFR 265.196(a) requires the owner or operator of the tank to immediately stop the flow of hazardous waste into the secondary containment system.*
> As of the date of this Order, USDOE and WRPS have not stopped the flow of waste into the secondary containment of 241-AY-102.
>
> **Violation 2 - Failure to inspect the tank to determine the cause of the release.**
> *40 CFR 265.196(a) requires the owner or operator of the tank to inspect the tank to determine the cause of the release.*
> As of the date of this Order, USDOE and WRPS have not inspected the tank to determine the cause of the release. USDOE states in the revised Pumping Plan that Tank 241-AY-102 will have to be emptied to determine the cause of the release. USDOE has not emptied the tank and has submitted a plan according to which waste removal will not be authorized, nor a removal schedule determined, before March 4, 2016. The revised plan does not demonstrate that an initial pumping date sometime after March 4, 2016 is the earliest practicable time to begin waste removal.
>
> **Violation 3 - Failure to remove, at the earliest practicable time, as much of the waste as is necessary to prevent further release of hazardous waste to the environment and to allow inspection and repair of the tank to be performed.**
> *Where the release is from the tank system, as it is here, 40 CFR 265.196(b) provides that "the owner or operator must, within 24 hours after detection of the leak or, if the owner or operator demonstrates that that is not possible, at the earliest practicable time remove as much of the waste as is necessary to prevent further release of hazardous waste to the environment and to allow inspection and*

repair of the tank system to be performed."
As of the date of this Order, USDOE and WRPS have failed to remove, or take any actions to begin removing, as much of the waste as is necessary to prevent further release to the environment and to allow for inspection and repair of the tank system to be performed. USDOE states in its revised Pumping Plan that removing the contents of the tank will not be authorized before March 4, 2016. USDOE has not demonstrated that March 4, 2016, or later would be the "earliest practicable time" to begin removing the waste.

Violation 4 - Failure to remove all released materials from the secondary containment system within 24 hours or in as timely a manner as is possible to prevent harm to human health and the environment.
40 CFR 40 CFR 265.196(b)(2) requires that, if the release was to a secondary containment system, all released materials must be removed within 24 hours or in as timely a manner as is possible to prevent harm to human health and the environment.
As of the date of this Order, USDOE and WRPS have failed to remove any of the released materials from the secondary containment. The revised plan indicates that the released materials will be removed only after waste is removed from the primary tank.

Administrative Order at 6-7 (emphasis in original).

The problems at Hanford are not new and these are just the latest failures of the Hanford facility to contain the high level waste stored there. *See, e.g.*, R. Alvarez, *Reducing the Risks of High-Level Radioactive Wastes at Hanford* (Science and Global Security 2005) at 13:43–86. The Interim Guidance does not address either the previous or current failures of Hanford or use that experience as a cautionary tale regarding predictions about how well nuclear waste will remain contained at reactor sites for decades upon decades or longer. Rather, it asserts and assumes that because NRC regulates the storage and handling of such wastes, no serious problems will arise that will require full compliance with emergency planning requirements.

A second recent example of a failure of nuclear waste handling even though great efforts were made to assure that nothing would go wrong is the release of radiation from WIPP only 15 years after it began operations. The EPA has reported the following about a February 2014 release of radiation from the WIPP facility :

> According to the U.S. Department of Energy (DOE), at about 11:30 p.m. (MT) on February 14, 2014, airborne radiation was detected by an underground air monitor at the DOE's Waste Isolation Pilot Plant (WIPP). The source of the radiation is believed to be one or more radioactive waste containers that were breached by an undetermined event that occurred in the underground repository. However, an investigation in the underground is necessary and currently underway to determine the true cause of the release.

EPA, *Radiological Event at the WIPP*, http://www.epa.gov/rpdweb00/news/wipp-news.html#wippradevent; *see also* Jeff Tollefson, *Radiation Levels Fall after Nuclear Waste Leak in New Mexico* (Feb. 26, 2014), http://www.scientificamerican.com/article/radiation-levels-fall-after-nuclear-waste-leak-in-new-mexico. This currently unexplained radiation leak underscores the inherent uncertainties in handling high level nuclear wastes.

Related to implications of long term spent fuel storage being ignored in the Interim Guidance is the additional complexity created by the increasing use of high-burnup fuel. When that fuel is spent, it presents special problems that significantly increase the chance of radiation releases from spent fuel storage and make the movement of high-burnup spent fuel from container to container much more dangerous.

The Interim Guidance essentially ignores the potential environmental impacts of the use of high-burnup fuel and its storage in spent fuel pools. Recent studies and analyses demonstrate that the potential magnitude of the incremental impact of storage of spent high-burnup fuel in spent fuel pools is much greater than the Proposal assumes.

For example, the danger of a criticality accident in a spent fuel pool is dismissed because NRC regulations require plant operators to maintain adequate boron levels to absorb neutrons and prevent criticality:

> Licensees are required to demonstrate that some margin to criticality is maintained for a variety of abnormal conditions, including fuel-handling accidents involving a dropped fuel assembly. The environmental impacts are small, therefore, because criticality accidents in spent fuel pools are prevented.

DGEIS at 4-70. New evidence shows that when high-burnup fuels are used and placed in the spent fuel pools at certain reactors, it can create special problems that interfere with boron control. R. Alvarez, *The Storage and Disposal Challenges of High Burnup Spent Power Reactor Fuel* (Jan. 3, 2014) ("Alvarez 2014") at 9-11. As the NRC has acknowledged, high-burnup fuel is likely to remain in spent fuel pools for much longer than the 5 years of normal fuel and possibly as long as 20 years. DGEIS at 2-25. However, that extended time in the pool—combined with the much larger inventory of radionuclides in the high-burnup fuel—places additional demands that require the use of neutron-absorbing panels in the spent fuel pools. Alvarez 2014 at 6-11. Those panels are subject to deterioration causing a loss of neutron absorption ability and the release of particles into the spent fuel pool. *Id.* at 10. While one can attempt to address this by adding more boron to the water in the spent fuel pool at pressurized water reactors, the boron reacts with the concrete used for the walls of the pools and causes it to be more susceptible to leaks. *Id.* at 11. High-burnup fuel thus requires enhanced chemistry controls and more neutron-absorbing panels. *Id.* But the pools are already densely packed, and the additional equipment in the pools restricts water and air circulation, making the pools more vulnerable to systemic failures from an inability to remove the increased decay heat from high-burnup fuels. *Id.*

NRC contractors, the Electric Power Research Institute, and the National Academy of Scientists have all raised concerns about high-burnup fuel. Alvarez 2014 at 2-3. The NRC itself has also recognized that there is inadequate information on the structural integrity of high-burnup fuels after 20 years. *See* NRC Division of Spent Fuel Storage and Transportation Interim Staff Guidance-24, Revision 0 (Issue: The Use of a Demonstration Program as Confirmation of Integrity for Continued Storage of High Burnup Fuel Beyond 20 Years) (ML13056A516).

The proposed Interim Guidance never discusses the lack of critical knowledge about high-burnup fuel that is essential for determining whether its presence in spent fuel pools creates problems substantially more serious than normal spent fuel. It never considers that high-burnup fuel continues to be generated and placed in spent fuel pools even though the work to determine whether it can ever be safely removed from the pools has yet to be completed. These uncertainties make the current proposal to increase the opportunity for exemption from emergency planning requirements premature at best. Such a proposal should at least include a bounding calculation that considers the consequences if the ongoing research confirms the worst concerns about high-burnup fuel. The Technical Study of Spent Nuclear Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants, NUREG–1738 (2001) (ML010430066), is used by Staff as the primary reference for the conclusion regarding spent fuel pool fires during the 60 years following the operating life of the reactor. DGEIS at xxix and F-14. (The DGEIS relies on, and essentially incorporates, this 2001 study for its analysis of the risk and consequences of a spent fuel pool fire.) New evidence, which post-dates the 2001 NUREG-1738 study that Staff cites, demonstrates that this 60 year period could include more than 20 years of high-burnup fuel storage in the spent fuel pool, by which time deterioration of fuel cladding could occur and movement of the high-burnup spent fuel from the pool to dry casks could be problematic.

The Proposal Will Result In Reducing Safety Margins

The Interim Guidance seeks to remove emergency planning even though the impact of emergency planning on accident consequences from spent fuel was a significant consideration in the Consequence Study. *See* Consequence Study at Appendix A (providing an extended discussion of the Staff's reliance on emergency planning to justify lower post-accident consequences in the event of spent fuel pool failure). Moreover, as noted above, the Interim

Guidance ignores that the triggering event for a radiological release could well create a chaotic post-accident environment that would substantially disable a quick and effective response.

Conclusion

The proposed Interim Guidance is a poorly justified and premature effort to allow owners of shutdown reactors to avoid maintaining a high level of emergency preparedness to mitigate the consequences of the severe risks created by the continued presence of spent nuclear fuel at reactor sites. It is particularly problematic that the Interim Guidance does not address the common sense idea of refusing to grant exemptions from emergency planning requirements until after a decommissioned reactor has moved all of its fuel from its spent fuel pool into dry cask storage. Staff should withdraw the Proposal, engage fully with all interested stakeholders in a real dialogue—not just a notice and comment period—and develop a record that fully explores all of the implications of leaving spent fuel at reactor sites. The Staff should make particular efforts to reach out to local communities and host states, such as Vermont, before exempting decommissioned reactors from otherwise applicable regulations. This is especially important in light of the enormous financial burdens that will be placed on local communities and states for emergency planning that should be provided by the companies that are creating the risks.

Respectfully,

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