

**COMMENTS AND DECLARATIONS OF THE VERMONT DEPARTMENT OF
PUBLIC SERVICE REGARDING VERMONT YANKEE PERMANENTLY DEFUELED
EMERGENCY PLAN AND EMERGENCY ACTION LEVEL SCHEME
LICENSE AMENDMENT REQUEST BVY 14-033**

February 9, 2015

The Vermont Department of Public Service (Department or DPS), by and through Anthony Leshinskie, Vermont State Nuclear Engineer and Decommissioning Coordinator, (curriculum vitae attached) submits the following comments and declarations with respect to the license amendment request filed by Entergy Nuclear Operations, Inc. (Entergy) regarding the Vermont Yankee Permanently Defueled Emergency Plan and Emergency Action Level Scheme on June 12, 2014. *See Letter from Chris Wamser, Entergy Site Vice President, to NRC Document Control Desk, June 12, 2014 (BVY 14-033) (NRC Agencywide Document Access Management System [ADAMS] Accession No. ML14168A302).*

The License Amendment Request (LAR) generally raises significant concerns to the Department, both because of the flawed assumptions used by Entergy in assessing threat scenarios, and because of Entergy's reliance on outdated NRC guidance as support for the LAR.

The representations made by Entergy in the LAR do not contemplate the full scope of possible threat scenarios impacted by the proposed license amendments. Analysis of certain credible Beyond Design Basis events is not properly presented, preventing the Department (and the NRC) from adequately evaluating the impact of the proposed license amendments.

For example, the LAR fails to analyze Potential Hostile Actions such as aircraft assault. Entergy states throughout the Permanently Defueled Emergency Plan (PDEP) / Emergency Action Level (EAL) scheme filing that the remaining Design Basis Accidents and credible Beyond Design Basis events will progress slowly. This assertion is used to justify extending the required emergency level notification time from 15 to 60 minutes, and in part to justify the

elimination of Site Area Emergency and General Emergency EALs currently used in Vermont Yankee Emergency Planning. The PDEP and its EALs rely on a definition of Hostile Action described in NEI-99, Rev. 6 Sections 3.1.3 & 3.1.4. Potential Hostile Actions include aircraft assault, which—based on the discussion in the PDEP—can occur with little or no advanced warning. The lack of advanced warning for this type of Hostile Action contradicts the slow progression assumption.

Additionally, the Fuel Assembly Heat Up / Zirconium Fire probability event discussed in the PDEP / EAL scheme (but submitted as part of a separate License Exemption Request, *see Entergy Request for Exemptions from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E, March 14, 2014 (BVY 14-009) (ADAMS Accession No. ML14080A141)*) lacks adequate analysis. It ignores the conclusion of the U.S. General Accounting Office in August 2012 that “it is difficult to quantify the probability” of a spent fuel pool fire. *See* GAO 12-797 at 27. While it attempts to work around the conclusion by assuming that a fire will occur once a 900 °C fuel temperature is reached, there is no NRC defined criteria to determine whether this is an acceptable evaluation method. It also does not discuss the possibility of chemical accelerants being used to reduce the time to reach the 900°C fuel temperature defined as the onset of a Zirconium Fire, even though such an accelerant was considered in a recent Vermont Yankee Hostile Action Emergency Drill. One potential accelerant would be jet fuel from an aircraft intentionally crashed into the spent fuel pool (which could conceivably fuel a fire regardless of the water level in the Spent Fuel Pool) causing a fuel assembly fire well before the 10 hour “heat-up time” determined by the Zirconium Fire analysis. The possibility of a much more rapid heat-up time contradicts the slow progression assumption of the PDEP / EAL scheme, and could require an EAL beyond Alert to properly address.

The Department also has significant concerns about the quality of the NRC guidance Entergy used in developing the PDEP / EAL scheme. A significant portion of the guidance used to develop the PDEP / EAL scheme is derived from plant decommissioning information that the NRC has compiled in SECY-00-145, well before the September 11, 2001 attacks. By the NRC's own admission, the SECY-00-145 guidance has not been updated since then because plant security concerns raised by the September 11, 2001 attacks were given higher priority. As such, the SECY-00-145 guidance has not been reevaluated while considering post-9/11 plant security concerns. The Department believes that, once the SECY-00-145 guidance has been considered, ideas such as reducing the Emergency Planning Zone (EPZ) to the Vermont Yankee fence line and relying on "ad hoc" offsite emergency planning (rather than continued offsite radiological emergency planning support) will be found to be imprudent and unwarranted.

The LAR is also deficient because it fails to properly analyze the risks of an accident while transferring fuel from the spent fuel pool to dry casks. This risk is heightened at Vermont Yankee because of the existence of high-burnup fuel at the site. The NRC has recognized that the use of high-burnup fuel causes special problems, including a greater chance of accidents and an increased chance of structural failure of the fuel rods such that transfer to dry casks is more difficult, more dangerous, and more expensive. *See* NUREG-1738 at ix, 3-1; *see also, e.g.*, National Research Council, Board on Radioactive Waste Management, Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, National Academies Press (2006) at 101, *available at* http://www.nap.edu/openbook.php?record_id=11263&page=101 (noting that high-burnup fuel "results in an increase in the decay-heat power of the spent fuel assembly by the time it is put into the spent fuel pool"); R. Alvarez, *The Storage and Disposal Challenges of High Burnup Spent Power Reactor Fuel* (Jan. 3, 2014) at 9-11 (noting that new evidence shows

that when high-burnup fuels are placed in the spent fuel pools at certain reactors, it can create special problems that interfere with Spent Fuel Pool systems integrity); 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) (ADAMS Accession No. ML13056A516) (recognizing that further studies are needed on the long-term structural integrity and safety of storing and transferring high-burnup fuel).

In addition:

Section 5.1.2: The Fuel Assembly Heat Up / Zirconium Fire event discussed as part of the PDEP / EAL scheme has been submitted as part of a separate License Exemption Request (BVY 14-009), but that exemption has not been granted or even noticed for public comment yet. Further, Entergy's zirconium fire analysis ignores the NRC's conclusion in NUREG-1738 that "fuel assembly geometry and rack configuration . . . are subject to *unpredictable* changes after an earthquake or cask drop that drains the pool." NUREG-1738 at x, 5-2 (emphasis added).

Section 5.1.3.1: Additional information supporting the discussion of the Loss of Spent Fuel Pool Cooling event is required, but the submittal does not provide a reference supporting the stated results. Please indicate where the analysis supporting the stated results can be found.

Section 5.5.3: While it is stated that Entergy will discuss the implementation of the PDEP / EAL scheme with Vermont State and Local officials subsequent to NRC approval, such discussions should occur prior to NRC approval to allow for modification of Entergy's action prior to regulatory approval.

Section 6.2: The cited examples of decommissioning plants extending their required emergency level notification time from 15 to 60 minutes were all granted prior to the September

11, 2001 attacks. Once post-9/11 plant security concerns are considered, the Department believes that permitting this increase in emergency level notification time will be found to be imprudent and unwarranted.

Section 6.3: The Department disagrees with the conclusion that no reduction in safety margin would occur with the implementation of the proposed PDEP / EAL scheme. Elimination of the Site Area Emergency and General Emergency EALs indicates that significant changes in plant operations during emergency conditions will occur, which bears on safety.

Attachment 1, Sections 3.3 & 7.7: These sections discuss notifying the NRC of Emergency Conditions via a system called the Emergency Notification System (ENS). Under the terms of the Site Access MOU between Entergy and DPS, Entergy is required to send the Department Designee all notifications made to the NRC. The LAR should reflect this arrangement.

Attachment 1, Section 6.1: This section notes that the safety of on-site Vermont Yankee staff during an on-going security event or Hostile Action could result in the suspension of Emergency Response Organization activation. The Emergency Operation Facility (EOF) in the proposed PDEP / EAL scheme is the on-site Vermont Yankee Control Room. In the current emergency plan, the EOF is located off-site. The LAR contains no assurances that EOF activation will be restored in sufficient time for the Emergency Response Organization to respond within the emergency response times discussed throughout the proposed PDEP / EAL scheme. The Department believes that Entergy should include an alternate, off-site EOF, such as the current Vermont Yankee EOF, in the proposed PDEP / EAL scheme.

Attachment 1, Section 7.0: The proposed PDEP / EAL scheme makes no mention of the Entergy / State of Vermont communication channel via the DPS Designee (typically the State

Nuclear Engineer) that exists during emergency conditions. This communication means should be described as part of the proposed PDEP / EAL scheme.

Attachment 1, Section 9.9.2: The noted evacuation of on-site plant contractors during an Alert condition could impede the DPS Designee (typically the State Nuclear Engineer) from reaching the EOF (the Vermont Yankee Control Room) in the proposed PDEP / EAL scheme. Measures to mitigate this potential impediment should be made either in the PDEP / EAL scheme or in a related implementation procedure.

Conclusion

Based on these and other reasons, the LAR lacks the requisite analysis and supporting evidence and should be denied. The Department respectfully recommends that the NRC conduct a thorough examination of the LAR's impacts on a full range of Beyond Design Basis events, as well as the PDEP / EAL scheme assumptions in the post-9/11 world.