

April 5, 2006

The Honorable James M. Jeffords  
United States Senate  
Washington, DC 20515

Dear Senator Jeffords:

On behalf of the Nuclear Regulatory Commission (NRC), I am writing in response to your letter of March 8, 2006, in which you requested information pertaining to implementation of the extended power uprate (EPU) at the Vermont Yankee Nuclear Power Station (Vermont Yankee).

Your letter expressed concern regarding reports in the news media that the "NRC staff took action to halt power ascension at Vermont Yankee" and that you were not informed of this information directly by the NRC. Vermont Yankee suspended the power ascension process after the first 5 percent increase in power, when certain plant data reached an administrative limit specified in the Vermont Yankee steam dryer monitoring plan. The decision to suspend further power ascension was made by Entergy Nuclear Operations, Inc. (Entergy), consistent with requirements in the Vermont Yankee plan, and was not imposed by the NRC. As you requested, we will provide you with periodic updates regarding implementation of the EPU at Vermont Yankee in the future.

Your letter inquired whether the NRC staff took an action that is outside the scope of the approved uprate monitoring plan (i.e., steam dryer monitoring plan). As noted above, Entergy made the decision to suspend further power ascension in accordance with the provisions in the Vermont Yankee plan. The actions taken by Entergy in response to exceeding the administrative limit were consistent with the required actions specified in the plan. The administrative limit is set based on a value that is # 80 percent of the allowable stress value specified in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. Further details regarding the specific requirements in the plan and the power ascension process (e.g., power level increments and time frames for each hold point) are included in the enclosure to this letter.

Your letter requested that the NRC clarify whether the detected vibration has a potential impact on the safe and reliable operation of the plant. The administrative limit that was reached, after the first 5 percent increase in power, relates to acoustic pressure fluctuations that were measured by instrumentation (strain gages) on the main steam lines. The acoustic pressure fluctuations (similar to sound waves) are generated by steam flowing through the main steam line piping past branch line connections. Other instrumentation on the main steam lines (accelerometers) are provided to measure vibration. The data from the accelerometers demonstrated that vibration levels were within the acceptance criteria specified in the Vermont Yankee power ascension test procedure. The NRC staff has evaluated the associated plant data from both the strain gages and accelerometers and has concluded that continued plant operation at this power level is safe. The NRC staff will continue to review plant data throughout the power ascension process to evaluate if there are any safety concerns with

further power ascension. Entergy docketed their evaluation justifying further power ascension to the NRC on March 27. The NRC staff evaluated the data and did not identify any concerns; therefore, Entergy began the second 5 percent power increase and provided the data to the NRC on April 1. The NRC staff has evaluated this data and notified the licensee that the staff did not identify any concerns on April 5, 2006. Entergy plans to continue power ascension on April 6, 2006. As documented in the NRC staff's Safety Evaluation for the EPU, Entergy has formally committed not to increase power above the applicable hold points if any safety concerns are identified during the NRC staff review of the power ascension data.

With respect to the impact of these matters on the reliable operation of the plant, the NRC understands your concerns about the reliability of Vermont Yankee following an increase in power level, especially in light of operational issues that have occurred at some other plants that have recently implemented EPU's. The NRC recognizes that there may be some synergy between safe operation of the plant and plant reliability; however, the NRC's statutory authority does not extend to regulating the reliability of the plant's electrical power generation, it is focused on assuring the protection of public health and safety.

Your letter noted that the NRC's Atomic and Safety and Licensing Board (ASLB) granted a hearing related to the Vermont Yankee EPU, and that you had requested that the ASLB set a hearing schedule immediately. The ASLB issued a preliminary hearing schedule in February 2005, which establishes various milestones (e.g., the identification of witnesses and the filing of expert testimony) to commence within a specified number of days following publication of the NRC staff's Safety Evaluation. The staff issued its Safety Evaluation on March 2, 2006, and further litigation of admitted contentions is now in progress. The ASLB held a pre-hearing conference call on March 10, 2006, with all parties involved in the hearing. During this call, possible dates for the hearing were discussed based on the availability of the parties, and taking into consideration the events that must occur prior to the hearing. On March 14, 2006, the ASLB issued a supplemental scheduling order which established an evidentiary hearing time frame for September and October of this year.

The NRC will continue to closely monitor the Vermont Yankee power ascension process and will take actions appropriate for continued protection of public health and safety. I trust that this letter addresses your concerns.

Sincerely,

*/RA/*

Luis A. Reyes  
Executive Director  
for Operations

Enclosure: As stated

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*Identical letters sent to Patrick Leahy and Bernard Sanders*

Package: ML060730145; Incoming: ML060690087; Response: ML060730085

\*Concurrence via email

\*\*Concurrence via phone

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DATE	3/16/06	3/15/06	3/21/06	03/29/06		04/05/06

Identical letters sent to:

The Honorable James M. Jeffords  
United States Senate  
Washington, D.C. 20510

The Honorable Patrick Leahy  
United States Senate  
Washington, D.C. 20510

The Honorable Bernard Sanders  
United States House of Representatives  
Washington, D.C. 20515

April 5, 2006

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United States Senate  
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Executive Director  
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## Vermont Yankee Extended Power Uprate Power Ascension Process

### Related to the Steam Dryer Monitoring Plan

The Vermont Yankee Nuclear Power Station (Vermont Yankee) extended power uprate (EPU) amendment included a license condition that provides for monitoring, evaluating, and taking prompt action in response to potential adverse flow effects as a result of power uprate operation on structures, systems, and components (including verifying the continued structural integrity of the steam dryer). The license condition is implemented through the procedural steps, performance criteria, and required actions specified in the Vermont Yankee steam dryer monitoring plan and power ascension test procedure.

The license condition requires, in part, that Entergy Nuclear Operations, Inc. (Entergy) hold the plant at 105%, 110%, and 115% of the original licensed thermal power level to collect plant data, conduct plant walkdowns, and evaluate steam dryer and plant performance. The license condition also requires that an evaluation of the data collected be provided to the Nuclear Regulatory Commission (NRC) and that the plant remain at the respective hold point for 96 hours to allow time for NRC staff review of this information.

In accordance with Vermont Yankee's power ascension test procedure, Entergy collects data from main steam line instrumentation (strain gages) to monitor pressure fluctuations within the steam flow as input into an acoustic analysis to calculate the pressure loads on the steam dryer and the resulting stress on the steam dryer components. During power ascension to the new EPU power level, Entergy monitors the data hourly to identify if there are any resonant frequencies within the main steam lines. If the amplitude of the acoustic signal is significantly high, the resultant acoustic pressure loads could cause stress levels that challenge the structural integrity of the steam dryer or other main steam system components.

Entergy's steam dryer monitoring plan for Vermont Yankee, dated February 26, 2006, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML060610206) specifies performance criteria and actions to be taken if the performance criteria are exceeded. The plan separates the criteria into "Level 2" criteria and "Level 1" criteria. If any of the Level 2 criteria are exceeded, Entergy must promptly suspend reactor power ascension until an engineering evaluation concludes that further power ascension is justified. If any of the Level 1 criteria are exceeded, Entergy must promptly initiate a reactor power reduction and achieve a previously-acceptable power level, unless an engineering evaluation concludes that continued power operation or power ascension is acceptable. The parameters included as performance criteria (moisture carryover and main steam line pressure data) provide measures to assess acceptable performance of the steam dryer.

The steam dryer monitoring plan establishes the Level 2 criterion, for main steam line pressure data, based on maintaining # 80% of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) allowable alternating stress value at  $10^{11}$  cycles on the steam dryer components. The Level 2 criterion is a conservative administrative action level for further evaluation because fatigue stress failures are not postulated at these stress levels. The Level 1 criterion, for main steam line pressure data, is based on maintaining the ASME Code allowable alternating stress value at  $10^{11}$  cycles on the steam dryer components. In that the

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Level 1 criterion relates to fatigue stress (and not ultimate stress), it would take an extended period of time for a component to fail at these loading levels. The Level 1 limit was chosen such that long-term safe plant operation will be reasonably assured when the steam dryer component stresses are maintained below this limit.

The NRC approved the EPU amendment for Vermont Yankee on March 2, 2006. On March 4, 2006, Entergy began slowly increasing reactor power at Vermont Yankee with hourly monitoring of main steam line pressure data. Upon reaching the first hold point specified in the license condition (i.e., 105% of the original licensed power level), Entergy began the data collection, walkdowns, and evaluation required by the license condition. The completed evaluation was provided to the NRC staff on March 5, 2006. (Note: 105% of the original licensed thermal power level is approximately equal to 87.5% of the EPU licensed power level.)

Entergy's evaluation identified data from the Vermont Yankee "A" main steam line with a single resonant peak at a frequency of 137 Hz that reached the steam dryer monitoring plan Level 2 acceptance criteria. In accordance with the plan, Entergy initiated an engineering evaluation to determine if further power increases could be justified. Entergy's evaluation of the data concluded that it is safe to maintain operation at the 105% power level while the engineering evaluation (supporting further power ascension) is performed. The NRC staff has independently evaluated the 105% power level data and has also concluded that continued plant operation at this power level is safe.

The 96-hour hold period for the 105% power level expired on March 9, 2006. However, the plant remained at the 105% power level until Entergy complete, and the NRC headquarters staff reviewed, the engineering evaluation justifying further power ascension. As documented in the NRC staff's Safety Evaluation for the EPU, Entergy has formally committed to not increase power above the applicable hold point, if any safety concerns are identified during the NRC staff review of the power ascension data. The NRC resident inspectors will continue their onsite monitoring of plant activities.