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July 6, 2006  
BVY 06-060

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

- References:
- (1) NUREG-1433, Revision 3, "Standard Technical Specifications General Electric Plants, BWR/4," dated March 2004.
  - (2) Letter, R.F. Janacek (BWROG) to R.W. Starostecki (USNRC), BWROG-8754, "BWR Owners' Group Revised Reactivity Control System Technical Specifications," dated September 17, 1987.
  - (3) Letter, Entergy to USNRC, "Technical Specification Proposed Change No. 266 – Revision to Control Rod Operability Scram Time Testing and Control Rod Accumulators," BVY 04-60, dated December 15, 2004.
  - (4) Letter, USNRC to Entergy, "Second Request for Additional Information Regarding TS Changes to Revise Control Rod Operability, Scram Time and Control Rod Accumulator Surveillance Testing (TAC No. MC5488)," NRY 06-070, dated June 9, 2006.

**Subject: Vermont Yankee Nuclear Power Station  
License Number DPR-28 (Docket No. 50-271)  
Technical Specification Proposed Change No. 266  
Revision to Control Rod Operability, Scram Time Testing  
and Control Rod Accumulators, Supplement No. 2  
Response to Request for Additional Information (RAI)**

This letter responds to NRC's request for additional information (RAI) of June 9, 2006 (Reference 4) regarding the application by Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (Entergy) for a license amendment (Reference 3). Prior to receipt of the formal RAI a telecom was held with NRC staff to further clarify the questions and proposed answers. Attachment 1 to this letter contains a marked up copy of a revised Technical Specification page previously provided in Reference 3, and a re-typed copy of the same page, as proposed to be revised by this submittal.

The RAI questions and our answers are provided below:

**1) Based upon your response to RAI #2 (Reference 2), the staff infers that you are operating under Option B but if during scram time testing any control rods are declared "slow" or if the cycle specific analytical scram reactivity curve requires faster scram times than what is in TS 3.3.C you will impose the use of higher minimum critical power ratio (MCPR) limits (Option A). Please verify if this is correct.**

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VY does operate under the Option A/B method for adjusting the Operating Limit MCPR (OLMCPR) value. The OLMCPR adjustment method is given in the Core Operating Limits Report. This method allows for favorable OLMCPR adjustment when measured scram times are faster than Technical Specification requirements. Option B scram time is faster than the equivalent Technical Specification requirement and is not affected by this amendment request. Option A scram time is equivalent to the analytical scram time and it does account directly for the potential presence of "slow" rods because it uses the average of all scram time tests performed in a given cycle.

The proposed change to the Vermont Yankee Technical Specification adopts the Standard Technical Specification structure for scram time requirements, that is, an individual rather than average performance basis. The presence of a small number of "slow" control rods is compensated by requiring the remaining rods to scram at speeds slightly faster than the assumed analytical scram time. This is the basis for the scram time requirements in Reference 1 (NUREG-1433 Rev.3) and it is explained in detail in Section 3.3.5.2 of Reference 2 (Janacek), which is a reference in the Bases to Section 3.1.4 in Reference 1.

***Otherwise, please address the following:***

- a. Please explain how control rods scrambling 0.017 seconds faster until notch 46 can account for the scram reactivity worth of up to 6 control rods which can be allowed to scram up to 3.581 seconds slower at a fully withdrawn position?***

While researching this question and reviewing our amendment request, it is clear that the scram times in proposed Table 4.3.C-1, see Reference 3 (BVY 04-60), do not account for "slow" rods in a manner consistent with Reference 2. Attachment 1 to this letter provides a markup of a revised Table 4.3.C-1 with scram times (fast insertion time from Table 3-4 of Reference 2) that provide margin at each surveillance notch position to account for "slow" rods.

These proposed values are taken directly from Reference 2 and are the same as those used for the FitzPatrick plant which has similar control rod drives. The proposed times include a scram time relaxation at notch position 46 consistent with Reference 2. This relaxation provides added margin for the typically limiting surveillance position while not significantly affecting overall scram performance as measured by relative OLMCPR.

- b. You state in response to RAI #2 that the scram reactivity curve used in the anticipated operational occurrence (AOO) analysis is cycle specific. What happens if during a subsequent cycle the scram reactivity curve requires scram times faster than those specified in the TSs? How is the NRC staff assured that Entergy will amend the VY TSs to coincide with the scram reactivity curve used in each cycle specific AOO analysis?***

Each cycle VY confirms to the fuel vendor a set of inputs to be used for transient analysis that includes the analytical scram time assumption. It is highly unlikely that scram performance would be considered an adjustable variable in that analysis precisely because the assumption is linked to the Technical Specification requirement. Additionally, VY scram performance has been consistently fast enough to allow

operation under Option B as described above, and there is little margin to improve scram performance compared with Option B requirements.

The term "scram reactivity curve" as used above may have been interpreted differently by VY than was meant by the reviewer asking the question. VY input to the fuel vendor is scram time performance which is constant over time, but the reactivity change as a function of position or time depends on the cycle specific core design under consideration.

There are no new regulatory commitments contained in this submittal.

If you have any further questions or require additional information, please contact Mr. James M. DeVincentis at (802) 258-4236.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on July 6<sup>th</sup>, 2006

Sincerely,

A handwritten signature in black ink, appearing to read "Ted A. Sullivan", is written over a horizontal line.

Ted A. Sullivan  
Site Vice President  
Vermont Yankee Nuclear Power Station

Attachment 1

cc list: (next page)

cc: Mr. Samuel J. Collins  
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Docket No. 50-271  
BVY 06-060

## Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification No. 266  
Response to Request for Additional Information  
Marked-up and Re-typed Technical Specification Page

### 3.3 LIMITING CONDITIONS FOR OPERATION

VYNPS

### 4.3 SURVEILLANCE REQUIREMENTS

Table 4.3.C-1  
Control Rod Scram Times

NOTES:

1. OPERABLE control rods with scram times not within the limits of this Table are considered "slow."
2. Follow the Required Actions of LCO 3.3.C.4 for control rods with scram times > 7 seconds to notch position 04. These control rods are inoperable, in accordance with SR 4.3.C.2, and are not considered "slow."

NOTCH POSITION	SCRAM TIMES (a) (b)	
	(seconds)	
	WHEN REACTOR STEAM DOME PRESSURE $\geq 800$ psig	
46	0.358	
36	1.096	
26	1.860	
06	3.419	

- (a) Maximum scram time from fully withdrawn position, based on de-energization of scram pilot valve solenoids at time zero.
- (b) Scram times as a function of reactor steam dome pressure, when < 800 psig, are within established limits.

2. The maximum scram insertion time to notch position 04 of any OPERABLE control rod shall not exceed 7.00 seconds.

2. In accordance with SR's 4.3.C.1.a,b,c & d above, verify each control rod scram time from fully withdrawn to notch position 04 is  $\leq 7$  seconds.

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NOTCH POSITION	SCRAM TIMES (a)(b) (seconds)
	WHEN REACTOR STEAM DOME PRESSURE ≥ 800 psig
46	0.44
36	1.08
26	1.83
06	3.35

- (a) Maximum scram time from fully withdrawn position, based on de-energization of scram pilot valve solenoids at time zero.
- (b) Scram times as a function of reactor steam dome pressure, when < 800 psig, are within established limits.

2. In accordance with SR's 4.3.C.1.a,b,c & d above, verify each control rod scram time from fully withdrawn to notch position 04 is ≤ 7 seconds.