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USNRC

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Entergy

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

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September 17, 2007
Docket No. 50-271
BVY 07-066
TAC No. MC 9668

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

Reference: Letter, Entergy to USNRC, "Vermont Yankee Nuclear Power Station, License No. DPR-28, License Renewal Application," BVY 06-009, dated January 25, 2006.

Subject: **Vermont Yankee Nuclear Power Station
License No. DPR-28 (Docket No. 50-271)
License Renewal Application, Amendment 31**

Dear Sir or Madam,

On January 25, 2006, Entergy Nuclear Operations, Inc. and Entergy Nuclear Vermont Yankee, LLC (Entergy) submitted the License Renewal Application (LRA) for the Vermont Yankee Nuclear Power Station (VYNPS) as indicated by Reference 1. This letter provides clarification for commitments made to the NRC regarding Environmentally Assisted Fatigue.

Should you have any questions concerning this letter, please contact Mr. Dave Mannai at (802) 258-5422.

I declare under penalty of perjury that the foregoing is true and correct, executed on September 17, 2007.

Sincerely,


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

U.S. NUCLEAR REGULATORY COMMISSION

In the Matter of Entergy Nuclear Vermont Yankee

Docket No. 50-271-LR Official Exhibit No. 22

OFFERED by: Applicant/Licensee Intervenor _____

NRC Staff _____ Other _____

IDENTIFIED on 7/21/08 Witness/Panel Fair

Action Taken: ADMITTED REJECTED WITHDRAWN

Reporter/Clerk MAC

cc: See next page
enc: Attachment 1

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cc: Mr. James Dyer, Director
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BVY 07-066
Docket No. 50-271

Attachment 1

Vermont Yankee Nuclear Power Station

License Renewal Application

Amendment 31

**VERMONT YANKEE NUCLEAR POWER STATION
LICENSE RENEWAL APPLICATION SUPPLEMENT
ATTACHMENT 1**

Supplemental Information for Environmentally Assisted Fatigue

Vermont Yankee Nuclear Power Station (VYNPS) provides the following information in response to license renewal Commitment 27. The commitment specified addressing environmentally assisted fatigue by refining fatigue analyses to include the effects of reactor water environment to verify that the cumulative usage factors (CUFs) are less than 1. Entergy has completed refinement of the fatigue analyses as specified in Commitment 27 in accordance with the clarifying details provided in the letter of July 30, 2007. The results indicate that the CUFs of the most fatigue sensitive locations will be less than 1.0 through the period of extended operation, considering both mechanical and environmental effects.

The following results of the refined fatigue analyses are the environmentally adjusted CUF values for 60 years of operation for the locations specified in NUREG/CR-6260.

**VYNPS Cumulative Usage Factors for
NUREG/CR-6260 Limiting Locations**

	NUREG-6260 Location	Material	Overall* Environmental Multiplier (F_{en})	Environmentally Adjusted CUF
1	RPV vessel shell/ bottom head	Low alloy steel	9.51	0.08
2	RPV shell at shroud support	Low alloy steel	9.51	0.74
3	Feedwater nozzle forging blend radius	Low alloy steel	10.05	0.64
4	RR Class 1 piping (return tee)	Stainless steel	12.62	0.74
5	RR inlet nozzle forging	Low alloy steel	7.74	0.50
6	RR inlet nozzle safe end	Stainless steel	11.64	0.02
7	RR outlet nozzle forging	Low alloy steel	7.74	0.08
8	Core spray nozzle forging blend radius	Low alloy steel	10.05	0.04
9	Feedwater piping riser to RPV nozzle	Carbon steel	1.74	0.29

* Effective multiplier for past and projected operating history, power level, and water chemistry.

The Fatigue Monitoring Program (FMP) tracks actual plant transients and evaluates these against the design transients. Per license renewal Commitment 5, the FMP will ensure that the numbers of transient cycles experienced by the plant remain within the analyzed numbers of cycles and hence, the component CUFs remain below the values calculated in the fatigue evaluations. The LRA and subsequent amendments treated the actions specified under license renewal Commitment 27 as separate from the VYNPS FMP and took exception to the consideration of reactor water environment in the program. The transients assumed in the refined fatigue analyses will be added to the FMP and tracked to ensure ongoing validity of the inputs to the refined analyses. Consequently, the FMP will include assessment of the impact of reactor water environment on critical components. The program will also include periodic review of accumulated transient cycles and associated updates of fatigue usage calculations, if necessary. Therefore, the exceptions identified in the LRA for the FMP are no longer appropriate. Removal of these exceptions makes the FMP, upon implementation of the enhancements identified in the LRA, consistent with the program described in NUREG-1801 Section X.M1, Metal Fatigue of Reactor Coolant Pressure Boundary. By tracking the number of cycles analyzed in the refined fatigue analyses, the Fatigue Monitoring

**VERMONT YANKEE NUCLEAR POWER STATION
LICENSE RENEWAL APPLICATION SUPPLEMENT
ATTACHMENT 1**

Program will manage the effects of environmentally assisted fatigue on reactor coolant system components through the period of extended operation in accordance with 10 CFR 54.21(c)(1)(iii).

LRA Section A.2.2.2.3 revisions (strikeouts=deletions, underline=additions)

The effects of reactor water environment on fatigue were evaluated for license renewal. Projected cumulative usage factors (CUFs) were calculated for the limiting locations identified in NUREG/CR-6260 with no. ~~Several~~ may exceed a CUF of 1.0 with consideration of environmental effects during the period of extended operation. ~~For these locations, prior to the period of extended operation, VYNPS will (1) refine the fatigue analysis to lower the predicted CUF to less than 1.0; (2) manage fatigue at the affected locations with an inspection program that has been reviewed and approved by the NRC (e.g., periodic non-destructive examination of the affected locations at inspection intervals to be determined by a method acceptable to the NRC); or (3) repair or replace the affected locations.~~