From: Joseph Hoch
To: Laurence.Becker@state.vt.us
Date: 2/20/2007 5:01:58 PM
Subject: Seismic and Flood Questions from ANR

Dear Mr. Becker,

Thank you for the questions regarding Seismic and Flood issues at Vermont Yankee. I have been asked by Jim Shea to provide you a response.

Enclosed are your original questions and the response to those questions.

Thanks again,

Joseph A. Hoch
Physical Scientist
U.S. Nuclear Regulatory Commission
NRR/DORL/LPL1-2
301-415-3635
jah6@nrc.gov

<Note: This information does not convey a formal NRC staff position.>

CC: Harold Chernoff; James Kim; James Shea

Mail Envelope Properties (45DB6FD6.BE6 : 2 : 9798)

Subject:	Seismic and Flood Questions from ANR
Creation Date	2/20/2007 5:01:58 PM
From:	Joseph Hoch
Created By:	JAH6@nrc.gov

Recipients	**Action**	**Date & Time**
nrc.gov		
OWGWPO03.HQGWDO01	Delivered	2/20/2007 5:02:04 PM
HKC CC (Harold Chernoff)	Opened	2/21/2007 6:38:46 AM
nrc.gov		
OWGWPO04.HQGWDO01	Delivered	2/20/2007 5:01:59 PM
JSK CC (James Kim)	Retracted	2/21/2007 6:54:16 AM
nrc.gov		
TWGWPO02.HQGWDO01	Delivered	2/20/2007 5:02:05 PM
JJS CC (James Shea)	Opened	2/20/2007 6:19:54 PM
state.vt.us	Transferred	2/20/2007 5:02:35 PM
Laurence.Becker (Laurence.Becker@state.vt.us)	Retract Requested	

Post Office	**Delivered**	**Route**
OWGWPO03.HQGWDO01	2/20/2007 5:02:04 PM	nrc.gov
OWGWPO04.HQGWDO01	2/20/2007 5:01:59 PM	nrc.gov
TWGWPO02.HQGWDO01	2/20/2007 5:02:05 PM	nrc.gov
		state.vt.us

Files	**Size**	**Date & Time**
MESSAGE	1334	2/20/2007 5:01:58 PM
NRCQuestionsFlood.doc	24576	1/30/2007 2:07:56 PM
NRCQuestionsSeismic.doc	28672	1/30/2007 2:07:56 PM
VYresponse.doc	32256	2/20/2007 4:58:36 PM

Options

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To Be Delivered:	Immediate
Status Tracking:	Delivered & Opened

Agency of Natural Resources
Department of Environmental Conservation

MEMORANDUM

Date: November 8, 2006
Subject: Entergy-Vermont Yankee – Flood Questions

The purpose of this memorandum is to set forth a brief outline of ANR questions regarding flood issues and the Entergy Vermont Yankee Nuclear Power Plant.

- The Design Basis for External Events (DB) relating to floods is a Probable Maximum Flood (PMF) of 480,100 cfs. How was this PMF calculated? What assumptions were made to calculate the PMF for this plant? What NRC standards and/or methodologies were used to arrive at this PMF?

- Does the DB analysis for External Events consider the impacts of inundation related to changes in the river channel including sedimentation, debris deposition and catastrophic erosion potential? If not, why not?

- What is the proper standard of design basis protection for extending the license of a nuclear power plant?

- Has NRC evaluated whether the age and current physical condition of the facility make it any more susceptible to External Events, including Design Basis External Events, such as, Flood and Earthquake?

Agency of Natural Resources
Department of Environmental Conservation

MEMORANDUM

Date: November 8, 2006
Subject: Entergy-Vermont Yankee – Seismic Questions

The purpose of this memorandum is to set forth a brief outline of ANR questions regarding seismic issues and the Entergy Vermont Yankee Nuclear Power Plant.

VY received a license to operate in 1972 and is designed for operation to conform to Atomic Energy Commission requirements of April 1968. The maximum ground accelerations at the site are specified as a 0.14g (14% of the acceleration of gravity) Safe Shutdown Earthquake (SSE) and a 0.07g (7% of the acceleration of gravity) Operating Basis Earthquake (OBE).

- What return interval, spectra, and accelerations were employed to predict shaking at the site?

- How were these calculations used to determine accelerations as a percent of gravity for an Operating Basis Earthquake (OBE) and the Safe Shutdown Earthquake (SSE)? Please show the calculations for both the OBE and SSE determinations. From the above calculations how were the OBE and SSE established for the design basis? Please be specific about the NRC criteria used to establish these design basis parameters.

- In the late 1990's, the core shroud repair design utilized a USNRC Regulatory Guide 1.60 rev.1 (1973) response spectrum input for the repair seismic analysis. How does the overall 1973 guidance compare with the late 1960's design basis criteria? If there is a difference, please be specific about the difference? If there is a difference are the 1973 criteria going to be applied to the design basis analysis for re-licensing?

- On June 28, 1991, NRC issued Generic Letter 88-20, Supplement 4, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities, 10 CFR 50.54(f), and NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities. A Seismic Margins Assessment (SMA) was conducted at Vermont Yankee subsequent to these NRC releases also in conjunction with document EPRI NP-6041 guidance. ANR understands that the guidance employed a 0.30g review level earthquake for the plant examination. How does this 0.30g review level compare to the 0.14g SSE level? If this is a higher standard is it going to be employed in the design basis review for re-licensing?

- What is the proper standard of design basis protection for extending the license of a nuclear power plant?

- Has NRC evaluated whether the age and current physical condition of the facility make it any more susceptible to External Events, including Design Basis External Events, such as, Earthquake and Flood?

Mr. Larry Becker
Vermont State Geologist and Director
103 South Main Street
Waterbury, VT 05671-2420

Dear Mr. Becker:

Thank you for bringing your concerns to the Nuclear Regulatory Commission (NRC). Your email dated November 7, 2006, to James Shea, NRC Project Manager for Vermont Yankee, has been referred to me for response. For your information, James Kim is the current acting Project Manager for Vermont Yankee. In your email, you presented questions regarding flooding and seismic issues at the Vermont Yankee Nuclear Power Plant in Vernon, Vermont.

Several of your questions pertain to how the licensee derived the Design Basis for External Events relating to floods and earthquakes. Nuclear facilities are designed and built in accordance with NRC regulations to protect against design basis natural phenomena. Design basis natural phenomena are events, such as earthquakes and or floods, that a nuclear facility is designed to withstand without functional loss of systems, structures, and components necessary to safely shutdown the plant and stay in a safe shutdown condition to ensure public health and safety. The methods used by the licensee, and accepted by the staff, pursuant to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," are documented in the licensee's Updated Final Safety Evaluation (UFSAR) Revision 21. Section 2.4.3.4 of the UFSAR pertains to floods and Section 2.5.3 of the UFSAR pertains to seismology. NRC's guidance on determining design basis flood and seismic characteristics for currently operating facilities is provided in Regulatory Guide 1.59 (ML003740388), "Design Basis Floods for Nuclear Power Plants," and Regulatory Guide 1.60 (ML003740207), "Design Response Spectra for Seismic Design of Nuclear Power Plants," respectively. These guides contain the technical details that should address the issues you raised.

Many of your other questions pertain to the license renewal process. The NRC has established a timely license renewal process and clear requirements, codified in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and 10 CFR Part 54, "Requirements for Renewal of Operating Licenses For Nuclear Power Plants," that are needed to assure safe plant operation for extended plant life. Before submission of a renewal application, an applicant should have analyzed the management of aging effects in sufficient detail to conclude that the plant can be operated safely during the period of extended operation. The renewal application is the principal document in which the applicant provides the information needed to understand the basis upon which this conclusion has been reached, and includes general information and technical information in compliance with 10 CFR Part 54. The license renewal application contains technical information and evaluations about the different types of plant aging that might be encountered in the specific plant and how the licensee will manage, or mitigate, those aging effects. The NRC staff performs a safety review of the information provided in the application, requesting additional information from the applicant as necessary, and draws conclusions about whether the plant can be operated during the period of extended operation without undue risk to health and safety of the public. Additional information on the license renewal process can be found on the NRC website at:
http://www.nrc.gov/reactors/operating/licensing/renewal.html.

I would also like to draw your attention to an Atomic Safety and Licensing Board (ASLB) ruling issued on November 22, 2004 (ML043280053) regarding the following contention during the Vermont Yankee Extended Power Uprate (EPU) license amendment process:

Because Applicant is Voluntarily Seeking a Change In Design or Licensing Basis, It Should Comply With Current, More Restrictive Practices Which Relate to the Proposed Design or Licensing Basis Change in Order to Demonstrate That it Will Provide Adequate Protection to the Health and Safety of the Public as Required By 42 U.S.C. § 2232(a).

The ASLB ruled that this contention was not admissible under the backfit rule, 10 CFR 50.109, "Backfitting." This regulation states that the NRC is prohibited from imposing new or amended licensing standards on existing licensees except under limited circumstances, such as where the NRC does a "systematic and documented analysis" and determines "that there is a substantial increase in overall protection of the public health and safety or the common defense and security to be derived from the backfit and that the direct and indirect costs of the implementation for that facility are justified." The ASLB concluded, with regard to seismic issues raised, that "the Vermont Yankee plant is already subject to stringent seismic and structural standards and the State has offered nothing to suggest an incompatibility between them and the proposed license amendment."

Thank you for bringing your questions to the NRC. The NRC's mission is to regulate the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, to promote the common defense and security, and to protect the environment. I hope that the information provided is useful and addresses your questions.

Sincerely,

Joseph A. Hoch, Physical Scientist
Plant Licensing Branch I-2 (LPL1-2)
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation