



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 8, 2009

Site Vice President
Entergy Nuclear Operations, Inc.
Vermont Yankee Nuclear Power Station
P.O. Box 250
Governor Hunt Road
Vernon, VT 05354

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION - SAFETY EVALUATION
RE: UPDATE TO SPENT FUEL MANAGEMENT PROGRAM (TAC NO. ME1152)

Dear Sir or Madam:

The Nuclear Regulatory Commission (NRC) staff has completed its review of Vermont Yankee Nuclear Power Station's (VY) submittal dated April 1, 2009, titled "Update to Vermont Yankee Spent Fuel Management Plan," and supplemental submittal dated August 18, 2009.

The enclosed safety evaluation documents the basis for the NRC staff's preliminary approval of spent fuel management program.

If you have any questions regarding this letter, please contact me at 301-415-4125.

Sincerely,

A handwritten signature in black ink that reads "James Kim".

James Kim, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO SPENT FUEL MANAGEMENT PROGRAM

ENTERGY NUCLEAR OPERATIONS, INC.

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 INTRODUCTION

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.54(bb), nuclear power plants that are within 5 years of expiration of their operating license must submit a spent fuel management and funding program to the Nuclear Regulatory Commission (NRC) for review and preliminary approval. The program should discuss the means by which the licensee intends to manage and provide funding for the management of spent fuel until the fuel is transferred to the Department of Energy (DOE) for permanent disposal.

By letter dated April 1, 2009, Entergy Nuclear Operations, Inc. (ENO) submitted their "Update to the Vermont Yankee Spent Fuel Management Plan," (Agencywide Access and Management System (ADAMS) Accession No. ML091040287), and on August 18, 2009, submitted their "VY Spent Fuel Management Plan - RAI [Request for Additional Information] Response," (ADAMS Accession No. ML092370298). The following sections document the NRC staff's findings resulting from the review of these submittals.

2.0 BACKGROUND

Vermont Yankee (VY) is a single unit facility located near the town of Vernon, Vermont. The site is located in Windham County on the western shore of the Connecticut River, immediately upstream of the Vernon Hydroelectric Station. The boiling-water reactor (BWR) and supporting facilities are owned by Entergy Vermont Yankee and operated by Entergy Nuclear Operations, Inc.

The station is comprised of a single BWR, designed and fabricated by General Electric, producing steam for direct use in the steam turbine.

The reactor vessel and the recirculation system are contained within the drywell of a pressure suppression system housed within the reactor building. The system consists of a drywell, a pressure suppression chamber that stores a large volume of water, and a connecting submerged vent system between the drywell and water pool, isolation valves, containment cooling systems, and other service equipment. The reactor building encloses the pressure suppression primary containment thereby providing a secondary containment.

Enclosure

In September 2003, Entergy VY requested an amendment to its facility operating license to increase the maximum authorized power level from 1593 Megawatts-thermal (MWt) to 1912 MWt. The request was subsequently approved and the unit is operating at the higher level.

3.0 REGULATORY REQUIREMENTS AND CRITERIA

3.1 Regulatory Requirement (10 CFR 50.54(bb))

Pursuant to 10 CFR 50.54(bb), "For nuclear power reactors licensed by the NRC, the licensee shall, within 2 years following permanent cessation of operation of the reactor or 5 years before expiration of the reactor operating license, whichever occurs first, submit written notification to the Commission for its review and preliminary approval of the program by which the licensee intends to manage and provide funding for the management of all irradiated fuel at the reactor following permanent cessation of operation of the reactor until title to the irradiated fuel and possession of the fuel is transferred to the Secretary of Energy for its ultimate disposal in a repository."

3.2 Criteria to Support 10 CFR 50.54(bb) Review

For the NRC to evaluate and provide preliminary approval of the spent fuel management and funding program, the submittal should include:

- Estimated cost to isolate the spent fuel pool (SFP) and fuel handling systems, or the cost to construct an Independent Spent Fuel Storage Installation (ISFSI) or a combination of wet/dry storage;
- Estimated annual cost for the operation of the selected option (wet or dry storage or a combination of the two) until DOE takes possession of the fuel;
- Estimated cost for the preparation, packaging, and shipping the fuel to DOE;
- Estimated cost to decommission the spent fuel storage facility; and
- A brief discussion of each of the areas identified and the estimated time for these activities.

4.0 EVALUATION

4.1 Evaluation of the Program to Manage and Provide Funding of all Irradiated Fuel

ENO estimated the total costs associated with the long-term management of spent fuel at \$235.3 million expressed in 2008 dollars. The long-term management of the spent fuel for VY is divided in an initial storage of the fresh core as well as the most recent fuel cycles for estimated 5.0 years following shutdown to 2017 to provide the cooling for the final core and transfer to an ISFSI. After shut down, the initial period will be used for preparation of placing the plant and fuel into long-term storage. During the period 2015 to 2017, the fuel will be transferred to the ISFSI. At the end of this period, the fuel will be stored in the ISFSI until the fuel is transferred to DOE and the licensee's estimated completion of the fuel transfer to DOE in 2045. Following transfer of the fuel to DOE, decommissioning preparation will begin in 2067 and completed in 2072 and the license terminated. The NRC staff documented this in their safety evaluation (ADAMS Accession No. ML083390193) issued on February 3, 2009.

The \$235.3 million estimate includes an estimated cost to isolate the SFP and supporting fuel-handling system. The ISFSI estimated expenditures includes the cost of the dormancy period, 2012 - 2024, the capital cost for ISFSI construction, cost of multipurpose storage containers, packaging, handling and transfer from the pool to the ISFSI and transfer of the fuel from the ISFSI to DOE. In addition, the cost of maintaining the fuel in ISFSI for the period from 2018 to 2042 is approximately \$2.5 - \$3.0 million per year. The licensee has also stated that the decommissioning of the ISFSI will take place along with the nuclear plant.

ENO reaffirmed the commitment to seek license renewal for VY. If VY ceases operation in 2012, ENO has committed to comply with existing NRC's licensing requirements, including the operation and maintenance of the systems and structures needed to support continued operation of the SFP. VY costs include the cost of constructing an ISFSI that has the storage capacity to store all of the spent fuel.

The NRC staff finds the spent fuel management program estimates to be reasonable based on a cost comparison with similar decommissioning reactors, while acknowledging the large uncertainties and potential site-specific variances.

Currently, the licensee has \$405.5 million in the decommissioning trust fund (DTF) as of December 31, 2008. ENO applied a real rate of return of 2.0 percent identified in their August 18, 2009, submittal. The DTF currently provides sufficient funding to cover the cost of decommissioning and spent fuel management with the licensee's cash contribution of \$127.0 million in 2026. In ENO submittal dated October 14, 2008, submittal, ENO acknowledged the necessity for an exemption in accordance with 10 CFR 50.12, from the requirements of 10 CFR 50.82(a)(8)(i)(A) in order to use the decommissioning trust funds for spent fuel management expenses, since the rule allows withdrawals only for decommissioning as defined in 10 CFR 50.2. The NRC staff finds that the licensee's spent fuel program addresses the principal areas related to the management and funding of the spent fuel and preliminary approves the update to ENO's spent fuel management program conditioned upon the filing and granting of an exemption.

5.0 CONCLUSION

The NRC staff finds that ENO's program for the long-term storage of spent fuel for VY is adequate and provides sufficient detail associated with the funding mechanisms. The NRC staff, therefore, concludes that the VY's spent fuel management program complies with 10 CFR 50.54(bb) and approves the program on a preliminary basis.

Principal Contributor: Clayton Pittiglio

Date: October 8, 2009

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/RA/

James Kim, Project Manager
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Accession No.: ML092740238

*See memo dated September 28, 2009

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