



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 19, 1995

Docket  
File  
50-271

Mr. William K. Sherman  
Vermont State Nuclear Advisory Panel  
State of Vermont  
Department of Public Service  
120 State Street  
Montpelier, VT 05620-2601

Dear Mr. Sherman:

By letter dated July 17, 1995, you requested the U.S. Nuclear Regulatory Commission (NRC) to provide the Vermont State Nuclear Advisory Panel (VSNAP) with information regarding inspections of various boiling water reactor (BWR) internal components that have been identified as being susceptible to age-related cracking. Furthermore, you asked the NRC staff to comment on the advisability and need for a mid-cycle inspection of the Vermont Yankee (VY) core shroud. More specifically, you requested the following information from the NRC:

1. The regulatory requirement(s) for inspections for the core components identified as age cracking susceptible in either NUREG/CR-5754 or the list of Oyster Creek items provided by NIRS.
2. The safety implications for cracking in the core components identified as age cracking susceptible in either NUREG/CR-5754 or the list of Oyster Creek items provided by NIRS.
3. A comment on whether more accurate inspection methods are available than those which Vermont Yankee uses for these inspections, and the advisability of using more accurate techniques.
4. A comment of the advisability and need for a mid-cycle inspection of the Vermont Yankee core shroud.

You also enclosed letters that you had received from the Citizens Awareness Network and from Mr. Michael J. Daley. These letters provided a list of BWR internal components which are considered to be susceptible to age-related cracking. Mr. Daley's letter also indicated that the New England Coalition and the Citizens Awareness Network intended to request both a mid-cycle inspection of these components, and an NRC public meeting for the purpose of discussing the status of the VY core shroud and other reactor internal components.

In regard to your first item, 10 CFR 50.55a requires that nuclear licensees, including the Vermont Yankee Nuclear Power Corporation (VYNPC), implement in-service inspection (ISI) programs in accordance with the guidelines of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI. The scope regarding ISI programs for the reactor pressure vessel and its internal components is prescribed in the ASME Code, Section XI,

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Division 1 (Section XI), Subsections IWA, "General Requirements," and IWB, "Requirements for Class 1 Components of Light-Water Cooled Power Plants." ISI examinations of BWR core support structures (core shrouds) and safety-related interior attachments are required by ASME to be done in accordance with the Section XI rules for Category B-N-2 components. Furthermore, the Boiling Water Reactor Vessel and Internals Project (BWRVIP) has recommended that BWR licensees perform inspections of other BWR internal components, including visual examinations of top guides and core support structures, and perform more comprehensive inspections of the core support structure using either ultrasonic testing (UT) or enhanced visual testing (VT-1) techniques. The BWRVIP submitted the "BWR Core Shroud Inspection and Evaluation Guidelines," Revs. 0 and 1, to the NRC on September 2, 1994, and April 21, 1995. The NRC reviewed and accepted these guidelines as the bases for conducting its reviews of plant-specific core shroud inspection programs. The NRC issued its safety evaluations (SEs) regarding these guidelines on December 28, 1994, and June 16, 1995. However, these examinations are beyond the requirements of 10 CFR 50.55a and Section XI.

Regarding your second item, the results of the core shroud examinations performed at VY during refueling outage (RFO) #18 indicated the presence of extensive crack indications in the shroud's H5 weld. VYNPC performed a flaw evaluation of the core shroud in order to determine whether the shroud would be acceptable for further service in the "as found" condition. VYNPC's flaw evaluation of the shroud was submitted to the NRC for review prior to restart of VY. The NRC staff reviewed VYNPC's evaluations of the VY shroud and performed an independent structural analysis of the VY shroud. The NRC staff's analysis of the remaining structural ligaments in the VY shroud indicated that the shroud would satisfy the Section XI safety margin requirements for the operating cycle following RFO #18. The NRC staff therefore concurred with VYNPC's evaluation of the VY core shroud, and concluded that VY could be safely operated for one additional cycle. The NRC staff issued its SE regarding the "Core Shroud Inspection and Flaw Evaluation, Vermont Yankee Nuclear Power Station (TAC No. M92050)" on April 25, 1995.

During RFO #18, VYNPC completed ISI examinations which covered the first period of the third 10-year ISI interval for VY. These examinations included the examinations that are required for Section XI, Category B-N-2 components. VYNPC also indicated that the following additional ISI examinations were conducted during RFO #18 which relate to the list of 25 components in NUREG/CR-5754: control rod drive housing, core spray internal piping and spargers, feedwater spargers, and core shroud. With the exception of the VY core shroud, the inspection results from RFO #18 did not reveal any significant indications of age-related deterioration of the VY reactor internals. Therefore, based on the results of the flaw evaluation of the VY core shroud and on the results of inspections performed on the other reactor internal components during RFO #18, the NRC does not have any immediate safety concerns with regard to the internal components at VY.

Regarding your third item, on December 14, 1994, VYNPC provided the NRC with its scope for performing inspections of the VY core shroud. VYNPC informed the NRC that the VY core shroud inspection scope included a proposal for use of a new UT inspection technology. In March 1995, VYNPC met with members of the NRC staff at the Electric Power Research Institute (EPRI) Non-destructive Examination Center in order to demonstrate the factors which qualified this UT inspection technology as an appropriate method of performing core shroud inspections. The NRC staff concluded on April 17, 1995, that EPRI's demonstration of the technology's capabilities qualified the new UT technology as an appropriate method of performing the VY core shroud inspections, and that the new UT inspection technology was acceptable for use at VY during RFO #18. It should be noted that eddy current testing (ECT) has not yet been qualified or endorsed as an acceptable method of examining BWR internals, although EPRI is currently researching the use of ECT as an inspection technique for BWRs.

Regarding your fourth item, as stated previously, with the exception of the VY core shroud, the inspection results from RFO #18 did not reveal any significant indications of age-related deterioration of the VY reactor internals. Based on the results of the flaw evaluation of the VY core shroud, and on the results of inspections performed on the other reactor internal components during RFO #18, the NRC staff concludes that VYNPC has provided adequate assurance that these components will perform their safety functions during the remainder of the current operating cycle. The NRC has not received any additional information since re-start of VY which would cause the NRC to change its conclusions in the SE of April 25, 1995. Therefore, the NRC will not require a mid-cycle inspection of the VY core shroud during the current operating cycle. The NRC will continue to take regulatory action on a plant-specific or generic basis as may be appropriate when age related degradation issues are identified.

As you requested, the NRC staff plans to support the VSNAP meeting on these matters this fall. If you have any questions, please contact Mr. Daniel Dorman of my staff at (301) 415-1429.

Sincerely,

Original signed by:

Phillip F. McKee, Director  
 Project Directorate I-3  
 Division of Reactor Projects I/II  
 Office of Nuclear Reactor Regulation

cc: See next page

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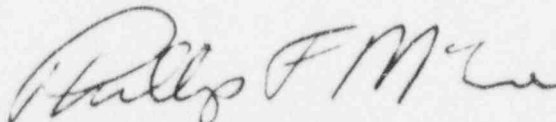
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Regarding your fourth item, as stated previously, with the exception of the VY core shroud, the inspection results from RFO #18 did not reveal any significant indications of age-related deterioration of the VY reactor internals. Based on the results of the flaw evaluation of the VY core shroud, and on the results of inspections performed on the other reactor internal components during RFO #18, the NRC staff concludes that VYNPC has provided adequate assurance that these components will perform their safety functions during the remainder of the current operating cycle. The NRC has not received any additional information since re-start of VY which would cause the NRC to change its conclusions in the SE of April 25, 1995. Therefore, the NRC will not require a mid-cycle inspection of the VY core shroud during the current operating cycle. The NRC will continue to take regulatory action on a plant-specific or generic basis as may be appropriate when age related degradation issues are identified.

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Sincerely,



Philip F. McKee, Director  
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