

Central File
March 19, 1997

Carl Terry, BWRVIP Vice-Chairman
Niagara Mohawk Power Company
Post Office Box 63
Lycoming, NY 13093

SUBJECT: QUESTIONS FOR TELEPHONE CONFERENCE CALL WITH BWR VESSEL AND
INTERNALS PROJECT (BWRVIP) REGARDING RECENT OCCURRENCES OF
UNEXPECTED DEGRADATION OF BWR INTERNALS

Dear Mr. Terry:

Several instances of degradation of BWR internals have occurred in recent months, in particular the cracking of the vertical shroud welds and the degradation of the shroud tie rod spring at Nine Mile Point, Unit 1 (NMP1). The NRC staff has determined that a discussion with the BWRVIP Executive Oversight Committee (EOC), regarding the BWR Owners-Group's generic activities addressing these issues, should be held at the earliest opportunity. Specifically, we would like the BWRVIP to address the safety significance of the observations at NMP1, and the actions the BWRVIP intends to take to address this issue generically.

Therefore, as previously discussed with you by my staff, there will be a telephone conference call with you and other members of the BWRVIP EOC on Thursday, March 20, 1997, at 1:00 p.m. EST. Please call (301) 415-7605, and, at the tone, enter 4321789.

To ensure that the discussion will be productive, attached are an initial list of questions regarding the NRC staff's generic concerns on the recent core shroud cracking and other generic internals degradation concerns. The NRC staff does not expect that you will be able to answer all of the questions during the conference call, but that it will set the direction for the discussion.

If you have any questions, please contact C. E. (Gene) Carpenter, Jr., of my staff, at (301) 415-2169.

Sincerely,

Ashock C. Thadani, Associate Director
for Technical Review
Office of Nuclear Reactor Regulation

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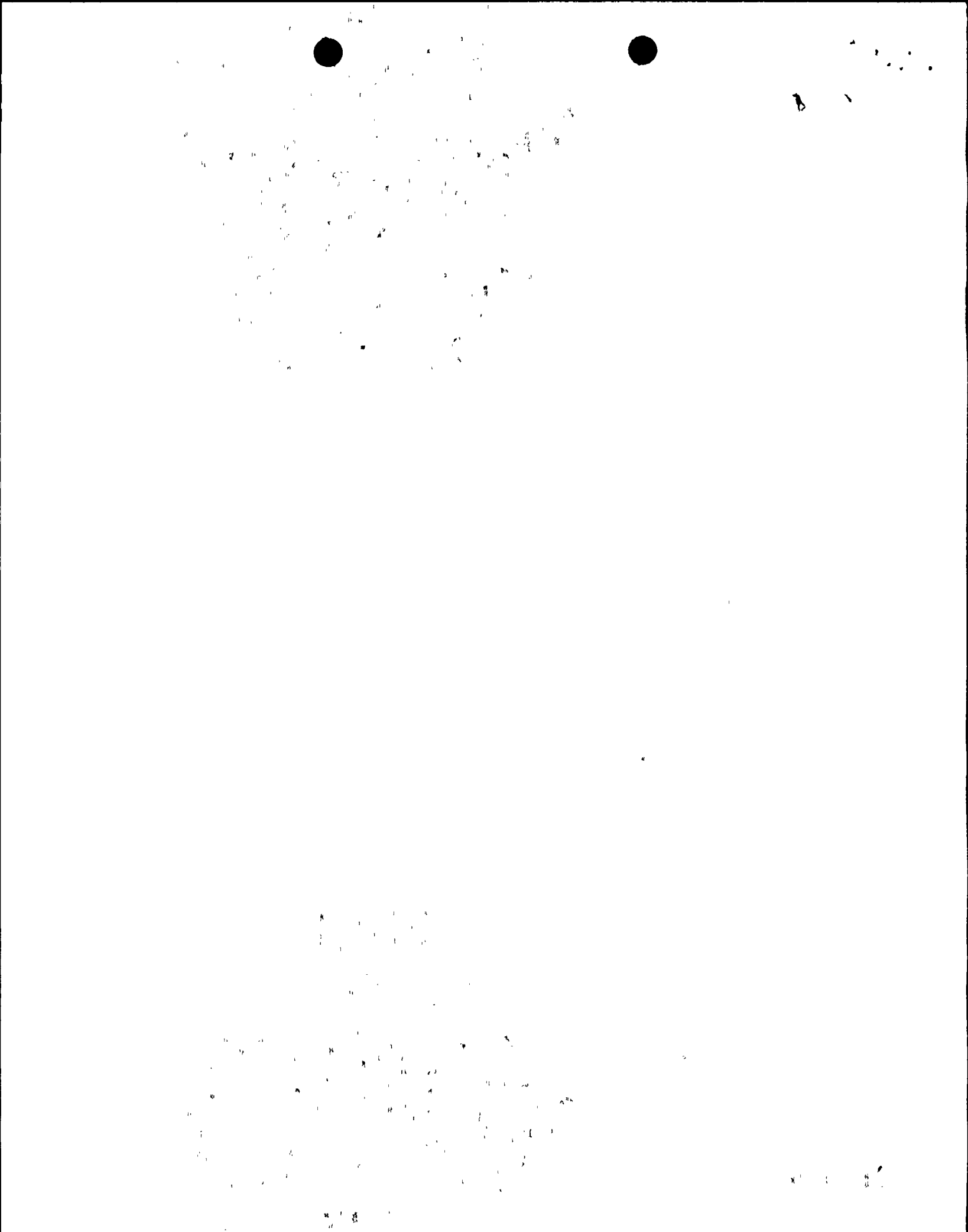
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Therefore, as previously discussed with you by my staff, there will be a telephone conference call with you and other members of the BWRVIP EOC on Thursday, March 20, 1997, at 1:00 p.m. EST. Please call (301) 415-7605, and, at the tone, enter 4321789.

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Brian W. Sheron, Director
 Division of Engineering
 Office of Nuclear Reactor Regulation

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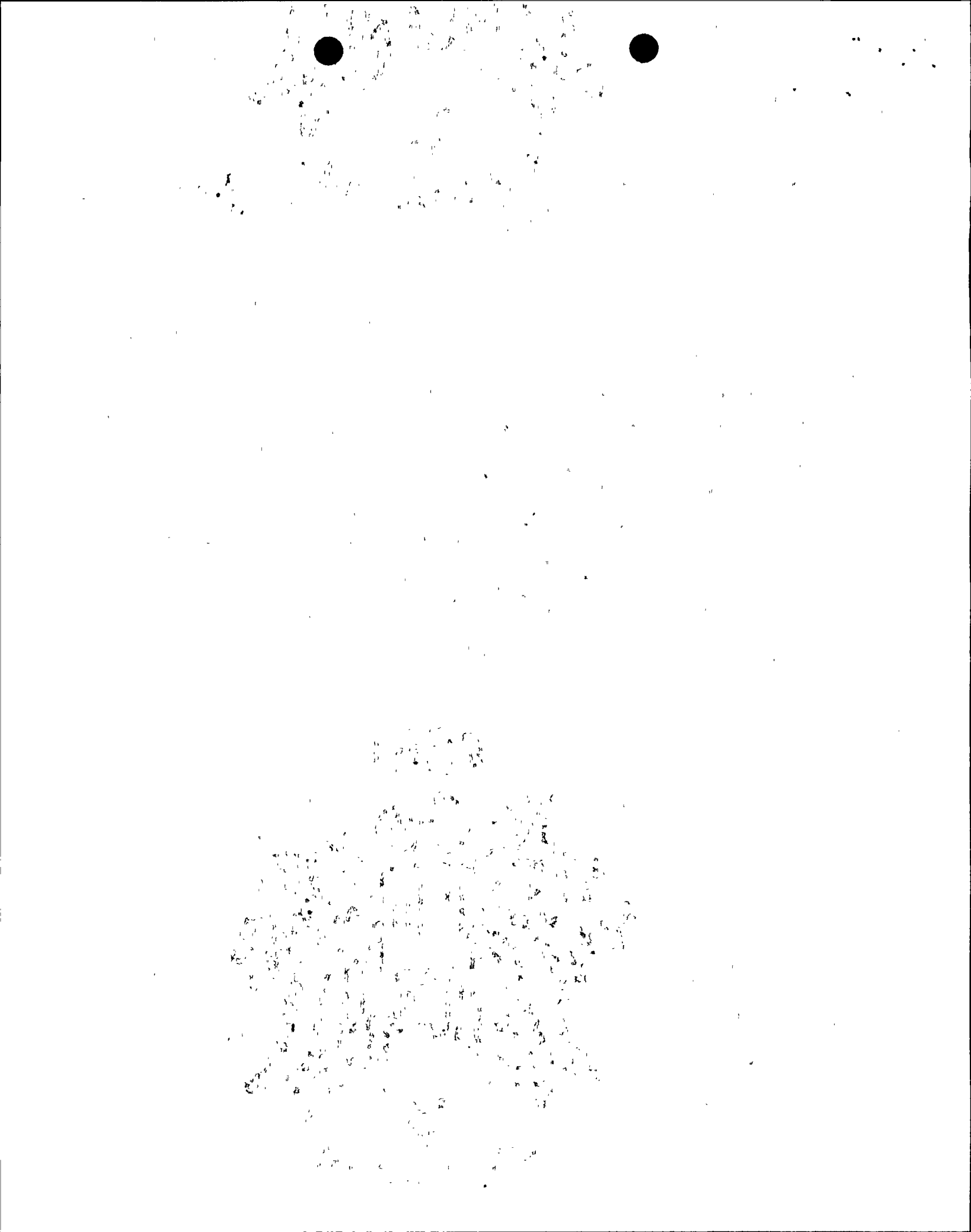
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BWRVIP Generic Concerns

1. During the January 16, 1997, meeting between the BWRVIP EOC and the NRC staff, the NRC staff questioned the BWRVIP as to whether individual licensees will commit to follow BWRVIP guidelines once the NRC staff has evaluated and approved the various submittals. The BWRVIP executives committed to inform the NRC staff by April 1997 if the BWRVIP will coordinate individual licensees commitments to follow approved BWRVIP submittals. Please confirm that the BWRVIP will respond on the agreed upon schedule.
2. Have all vertical welds at all BWRs had a baseline inspection performed?
 - a. If so, what methods were used? If inspected previously, can estimates be made for crack growth rates?
 - b. If not, what is the technical basis for not inspecting?
3. During a March 1996 meeting, the BWRVIP agreed to collect and provide to the NRC staff additional information related to the scope and results of inspections. It was agreed that this information would be provided immediately following the end of the outage season (approximately June and December). To date, this information has not been provided to the NRC staff. The NRC staff requests that the BWRVIP expedite providing this information. Please ensure that the provided information reports whether any other plants have performed any axial weld examinations, and if so, the results of the inspections?
4. As a result of recent degradations, the NRC staff requests the BWRVIP re-evaluate the scope and schedule of internals inspections it has proposed. Provide a technical justification to the NRC staff why the proposed schedule does not need to be accelerated and the scope of inspections currently being conducted does not need to be expanded.
5. The NRC staff's review and approval of the preemptive core shroud modifications was based on the assumption that all vertical welds would maintain structural integrity. Provide justification to demonstrate that the design of these modifications would not be affected by the presence of cracked vertical welds, both in terms of leakage and structural integrity. Also address multiple cracking of the vertical welds.
6. What is considered to be the primary driving force for cracking the vertical welds?
7. The stabilizer assemblies will be thermally preloaded during normal operating conditions. The tensile load in the tie rod results from the thermal expansion coefficient for the new stabilizer hardware being less than the thermal expansion coefficient of the shroud. What is the effect of this thermal preload on the potential for crack growth in the vertical welds?
8. What is the minimum length of the vertical welds needed to maintain the structural integrity of the shroud and repair assembly assuming that the



horizontal welds H-2, H-3, H-6A, H-6B, H-6, and H-8 have cracks of the maximum size allowed by the BWRVIP guidelines?

9. During a combined steamline break and design-basis earthquake event, the tie rod load has been determined to be in excess of 300,000 lbs. Provide calculations to demonstrate that the existing cracks in the vertical welds V-9 and V-10 will not fishmouth during such an event, and that any potential leakage would remain small.
10. "BWR Core Shroud Inspection and Evaluation Guidelines," dated September 2, 1994, and Revision 1 dated March 1995, states the following:

"There are other welds and welded components attached to the shroud, such as vertical welds, ring segment welds, and attachment welds for core spray piping, LPCI piping, lugs and other cases where welded attachments may have been removed, such as alignment supports for installation and vibration test equipment fixtures. Core spray piping is already covered by inspection requirements intended to detect SCC. For other welded shroud attachments, the welded region is small enough that even if through wall SCC were to develop, the safety consequences due to leakage from the core region into the shroud annulus region would be considerably less significant than the scenarios evaluated for circumferential welds. There would be no significant safety concerns resulting from cracking of these welds for any operating condition, given that the structural margins of the circumferential welds are maintained. Therefore, inspection of these welds is not currently required."

Based on current vertical weld cracking experience, are the safety consequences still significantly less than circumferential weld cracking?

11. By letter dated September 21, 1994, the BWROG issued specific operator guidance for the detection of shroud cracking of sufficient magnitude to cause separation of the shroud along the crack during normal operations. The intent of the letter was identification of horizontal weld cracking of the shroud. By letter dated December 28, 1994, the NRC staff transmitted its safety evaluation of the August 5, 1994, BWR shroud cracking generic safety evaluation, Revision 1. The safety evaluation stated, in Section 4.6, that "[s]ince the limiting crack size is in excess of the weld length it is not possible for a critical flaw to develop from a vertical weld unless such a crack propagates into an adjoining plate. This situation is highly unlikely because there is no driving force to support flaw penetration into the adjacent unstressed material." Confirm that the conclusion provided by the August 1994 document remains valid. If not, would the vertical weld cracking be sufficient to separate, and would it be detectable during normal operations?
12. The BWRVIP should provide a date regarding when the inspection of other shroud support assemblies and attachment welds will be addressed. Also include any on-going development program or program to be implemented in facilitating such an inspection.



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13. During the installation of core shrouds, how much ovality was allowed by design, and how much was actually measured in the field measurements? Was this accounted for in the stress calculations?
14. The NRC staff has expressed a concern during several meetings that the BWRVIP has not completed a review into the effects of possible multiple failures caused by any single failure. What assurance does implementation of the BWRVIP guidelines, and actual inspections performed to date, give that cracking of internals will not lead to coincidental failures of internal components with unacceptable consequences?
15. The core shroud lower wedge support is held in place by a spring latch device which attaches it to the tie rod lower spring assembly. This spring latch device was found to have failed at one location and degraded at other locations at Nine Mile Point Unit 1 during a recent inspection after just one fuel cycle of operation. In light of this failure, what assurance is there that other plants that have installed tie rod repairs also do not have failed spring assemblies? What design modifications and/or other measures are being considered to prevent similar failures at other installations? In light of this failure, what assurance is there that similar degradation does not exist in other plants, and, if so, what is the safety significance?



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