



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
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October 20, 2000

MEMORANDUM TO: Jack Strosnider, Director
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Office of Nuclear Reactor Regulation

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FROM: *[Signature]* John A. Grobe, Director
Division of Reactor Safety

SUBJECT: RECOMMENDED INSERVICE INSPECTION PROGRAM
CHANGES

REFERENCE: (1) Memorandum to Bruce Boger, Division of Inspection Program
Management from Jack Strosnider, Director Division of
Engineering dated February 14, 2000

The purpose of this memorandum is: (1) to recommend changes to the inservice inspection (ISI) program, and (2) to inform the Inspection Program Branch that the Region intends to use these changes as guidance in establishing the scope and focus for ISI inspections. These changes include a new Performance Indicator for steam generator (SG) tube integrity as proposed in Reference 1 and revision to the guidance contained in the existing ISI baseline inspection procedure IP 71111.08.

The proposed changes were developed from Regional staff assessments of information documented in NRC inspections and investigations related to the February 15, 2000, Indian Point Unit 2 SG tube rupture and discussions with NRR and the other Regions. Specifically, the Region reviewed and considered information documented in: the Augmented Inspection Team Report (IR 05000247/2000-02), the Special Inspection Report (IR 05000247/2000-10), the Lessons Learned Evaluation by Research dated March 20, 2000, and the Inspector General Investigation dated August 29, 2000.

Region III proposes the changes and guidance as described in Attachment A to formalize a graduated level of NRC engagement based on the potential risk. We will discuss with you, in advance, any plans to conduct a supplemental inspection pursuant to this guidance.

Attachment: Recommended Inservice Inspection Program Changes

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Recommended Inservice Inspection Program Changes

Steam Generator Tube Integrity Performance Indicator (PI)

Implement the PI for steam generator (SG) tube integrity identified in memorandum from J. Strosnider to B. Boger, dated February 14, 2000. In this memorandum, a new SG PI is proposed with the following risk thresholds:

White - More than 1 percent of tubes inspected found to need repair during the most recent inspection, or one tube does not meet 3 * normal operating pressure (NOP) or the plant is shutdown due to SG tube leakage less than the Technical Specification (TS) limit.

Yellow - More than one tube does not meet 3 * NOP, or one tube does not meet 3 * NOP in 2 out of 3 inspections or the plant is shutdown due to SG tube leakage exceeding the TS limit.

Red - A SG tube rupture event, or one tube cannot sustain plant design basis differential pressure for the main steam line break (MSLB) differential pressure (D/P) or one tube cannot sustain 1.2 * MSLB D/P in 2 out of 3 inspections, or more than one tube cannot sustain 1.2 *MSLB D/P.

Revised Inservice Inspection Procedure (IP 71111.08)

Change: Level of effort. For pressurized water reactors (PWRs) with active SG tube degradation as evidenced by a non-green SG tube PI, inspect each Unit (with a non-green SG PI) each outage. Reason - Need to have the appropriate level of inspection and active NRC management involvement for licensee's which are operating PWRs with degraded SG tubes.

Add: For each PWR site evaluate the licensee's basis for concluding that an active degradation mechanism does not exist in the SG tubes. If an active degradation mechanism has been identified for the first time at this Unit, particularly in a difficult to inspect area of the SG tubes (U-bends, expansion transitions, at dented support plates or above the top of the tube sheet in the sludge pile) obtain approval from the Branch Chief to implement a special inspection as authorized by the Regional Administrator under Appendix C to MC 2515 using the supplemental SG tube inspection guidance discussed herein.

Add: Supplemental Inspection Guidance
For non-green SG PI indicators, initiate a supplemental inspection (or special inspection as authorized by the Regional Administrator) which includes a detailed examination of the ET program as discussed below. Coordinate with the licensee program lead to determine the ISI data acquisition and analysis schedule and analysis location. If required, contact the vendor site and arrange access to the vendor facility.

Supplemental Inspection Guidance

- Add: Review the nondestructive examination (NDE) methods which identified the degraded SG tubes. This review will include evaluating the data collection techniques, data analysis, equipment calibration, and qualification of procedures (e.g., EPRI Appendix H qualified ET techniques). Specifically, review the calibration setup for each probe type used (e.g., have data analyst pull up a calibration run and confirm variables on data acquisition techniques sheets). Confirm that the probe types, equipment used and scope of inspection is consistent with licensee commitments to generic letters 95-03, 97-05, 97-06, and plant TS. Review a sample of ET data for tubes that had differing calls (I-code or non-quantifiable) between the primary and secondary data analysts. Review the eddy current data to confirm that the resolution analysts call was conservative. Confirm that the sizing of indications left in service is done using qualified probes with appropriate allowance for NDE uncertainty and is allowed by plant TS and commitments to NRC generic letters. Document areas and types of active tube degradation in the inspection report. Special emphasis will be placed on evaluating ET data for degraded tubes in difficult to inspect areas, such as U-bends, expansion transitions or dented locations. The licensee should have an adequate technical basis for the minimum signal to noise ratio, unacceptable ET probe wear, ET frequencies used, NDE uncertainty, and flaw growth rates. Perform an in-depth review of the licensee's condition monitoring¹ and operational assessments² to confirm integrity of the SG tubes for the previous and next cycle of plant operation. Review the scope and technical basis for the ET examinations conducted to confirm that the licensee's ET program, examinations and corrective actions are consistent with staff positions in DG 1074 "Steam Generator Tube Integrity" and NEI 97-06 "Steam Generator Program Guidelines."
- Delete: Step 02.02d - Review of radiographs and confirmation that radiographed welds reviewed meet Code.
Reason - This activity requires a very resource intensive effort to examine weld data records, procedure qualification records, weld procedure specifications, and welder qualification records to confirm that a single weld met Code requirements. Additionally, few new welds are being made in Class 1 or 2 systems. If such welds are made, the baseline inspection procedure for plant modifications (IP 71111.17) can be used to select the modified pressure boundary work for review. If this requirement stays as currently written, the Regions will often be examining original construction radiographs to meet the requirement.
- Delete: Step 02.02e - for review of ASME Code repairs.
Reason - This activity is covered under IP 71111.17 review of permanent plant modifications and is a duplication of effort.

Resource Estimate

Many of the PWRs in Region III (over the past five years) would have likely required an increased level of effort and supplemental inspections due to the number of degraded tubes repaired. Fortunately, many of the Region's PWR sites have replaced SGs which minimizes the potential for near term SG tube degradation. Currently, the PWR sites in Region III which are more likely to experience tube degradation and trip the SG PI threshold include Kewaunee (SG replacement is planned next outage), Prairie Island, Davis Besse, or Palisades. For these sites, an additional 40-80 hours of supplemental inspection with an appropriately trained inspector(s) or contractor(s) would achieve the supplemental inspection objective.

- 1 Condition monitoring assessment is defined in draft regulatory guide DG-1074 "Steam Generator Tube Integrity" as: "an assessment of the "as found" condition of the tubing with respect to the performance criteria. The "as found" condition refers to the condition of the tubing during an SG inspection outage, as determined from the inservice inspection results or by other means, prior to the plugging or repair of tubes."
- 2 Operational assessment is defined in draft regulatory guide DG-1074 "Steam Generator Tube Integrity" as: "an assessment to ensure that the tubes will continue to satisfy the performance criteria until the next scheduled inspection." Performance criteria "are criteria approved by the NRC that, if satisfied, provide reasonable assurance that tube integrity is being maintained consistent with the licensing basis."