

November 16, 2000

MEMORANDUM TO: Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

FROM: Brian W. Sheron, Associate Director */ra/*
for Project, Licensing and Technical Analysis

Jon Johnson, Associate Director */ra/*
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THRU: Roy P. Zimmerman, Deputy Director */ra/*
Office of Nuclear Reactor Regulation

SUBJECT: STEAM GENERATOR ACTION PLAN

Steam generator tube integrity issues continue to arise. As a result, many organizations within the NRC have evaluated portions of the regulatory process associated with steam generator tube integrity and have made some insightful observations and/or recommendations. To ensure safety from a steam generator tube integrity standpoint is maintained, that public confidence in the steam generator tube integrity area is improved, and the NRC and stakeholder resources are effectively and efficiently utilized, the attached steam generator action plan was developed. The action plan is intended to direct and monitor the NRC's effort in this area and to ensure the issues are appropriately tracked and dispositioned. The action plan is also intended to ensure the NRC's efforts result in an integrated steam generator regulatory framework (license review, inspection and oversight, research, etc.) which is effective and efficient. To this end, periodic "integration" meetings will be held as needed.

As indicated above, this plan consolidates numerous activities related to steam generators including: 1) the NRC's review of the industry initiative related to steam generator tube integrity (i.e., NEI 97-06); 2) GSI-163 (Multiple Steam Generator Tube Leakage); 3) the NRC's Indian Point 2 (IP2) Lessons Learned Task Group recommendations; 4) the Office of the Inspector General report on the IP2 steam generator tube failure event; and 5) the differing professional opinion (DPO) on steam generator issues. The plan does not address plant-specific reviews or industry proposed modifications to the Generic Letter 95-05 (voltage-based tube repair criteria) methodology. For those issues which the NRC's IP2 Lessons Learned Task Group recommended the industry take action (as indicated in the IP2 lessons learned task group report), the NRC will discuss these items with the industry, report the industry's status on these items, and consider these issues in its review of NEI 97-06.

As can be inferred from the action plan milestones in Attachments 1 and 2, many milestones in the plan represent a grouping of various recommendations and observations made in the source documents discussed above. Attachment 1 contains steam generator tube integrity related milestones and Attachment 2 contains milestones that have broader implications than steam generators but arose out of recent steam generator related activities (e.g., guidance for communications between resident inspectors and local officials). The recommendations from the NRC's Indian Point 2 Lessons Learned Task Group are contained in Attachment 3.

CONTACT: R. Ennis, DLPM/LPD1
415-1420

Completing the milestones in Attachments 1 and 2 may result in revisions to the steam generator portions of the baseline and supplemental inspection programs, may include development of a standard review plan for certain steam generator reports/amendments, and/or the approval of a generic technical specification change package for steam generator tube integrity. Existing processes will be followed for these types of activities.

To ensure adequate documentation is maintained and for promoting public confidence, the final product for each major milestone will be a memorandum/report provided by the lead division to the associate directors in the Office of Nuclear Reactor Regulation documenting the disposition of each of the milestones in Attachments 1 and 2. The documentation of the disposition of Attachments 1 and 2 milestones shall also address how each of the applicable recommendations in Attachment 3 were addressed. Periodic updates and correspondence relative to this action plan will be made available via a public NRC web page. Additional public meetings will be held, as appropriate.

Many of the items in the action plan are presently being addressed; however, for those items which are new, one of the first steps of this plan is to meet with the industry and other stakeholders to discuss those aspects of the action plan and address any concerns/comments they may have. Following this meeting, the NRR staff will identify key technical and management personnel responsible for completing the milestones and estimate the resources for completing the milestone (including any revision to the target completion date based on stakeholder involvement). Once the leads are determined and the resources estimated, the information will be provided to the NRR leadership team for processing the "new work" according to the planning, budgeting, and performance management (PBPM) process. The resources and technical leads are not provided in this memorandum since we believe more realistic estimates of resources can be made after initial discussions with the stakeholders. Subsequent to these efforts, the NRC staff will update the action plan to identify lead responsibilities and resource estimates.

In addition to working with external stakeholders, we will also be working with internal stakeholders on these issues. For example, any changes to the inspection program will be coordinated with the regions, and we will work with the Office of Nuclear Regulatory Research to ensure our decisions are consistent with research results and to incorporate their insights on these issues into the regulatory framework.

Consistent with current practice, it is our intent to update the action plan milestones on a quarterly basis and publish the results in the Director's Quarterly Status Report. Since there currently exists an action plan for the staff review of NEI 97-06 in the Director's Quarterly Status Report, the NRR staff will take the pertinent information from this memorandum and replace/update the information in that action plan (e.g., background, regulatory assessment, etc.), as appropriate. The overall management of this plan will be the responsibility of NRR's Division of Licensing Project Management (DLPM).

As indicated in your November 1, 2000, memoranda (Collins to Travers, "Transmittal of the Indian Point 2 Steam Generator Failure Lessons-Learned Report"), there are no safety concerns that have been identified that require immediate action with respect to the industry. On-going staff and industry activities in this area, such as those discussed in a memorandum

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from William D. Travers to the Commission dated November 3, 2000, "Staff Review of OIG Report on the NRC's Response to the Steam Generator Tube Failure at Indian Point 2 and Related Issues," provide reasonable assurance that safety will continue to be maintained while the activities in this plan are pursued.

If you need any additional information or would like to be briefed on this matter, please contact Mr. Rick Ennis of the staff at (301) 415-1420.

Attachments: As stated

Approved: */s/ Ira b RPZimmerman for/* 11/17/00
Samuel J. Collins Date

Samuel J. Collins

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Samuel J. Collins Date

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STEAM GENERATOR ACTION PLAN MILESTONES^{1,2,3}

Item #	Milestone	Completion Date	Lead
1	Issue Regulatory Information Summary on SG Lessons Learned (TG: 8; page 2 of Ref. 2)	11/00	DE
2	Discuss steam generator action plan and IP2 lessons learned with industry and other external stakeholders (TG: 2a-2o, 3a, 3b, 4a, 4b , 4c, 8)	12/00	DE
3	Subsequent to item 2, identify technical and management leads for each item and develop initial resource estimates	12/00	DLPM (DE, IIPB support)
4	Brief management on resource estimates and invoke PBPM process as appropriate	12/00	DLPM (DE, IIPB support)
5	Staff review of ACRS recommendations on DPO and develop detailed milestones and evaluate impact on other action plan milestones (GSI-163 and DPO)	01/01	DE
6	Determine GSI-163 resolution strategy and revise steam generator action plan milestones, as appropriate (GSI-163)	01/01	DE
7	Determine need to incorporate new steam generator performance indicators into Reactor Oversight process (page 2 of Ref. 2; TG: 5e, 5f)	01/01	DE/IIPB/ DSSA
8	Recommence work on NEI 97-06 (page 3 of Ref. 2; TG: 7)	01/01	DE
9	Review NRC inspection program and, if necessary, revise guidance to inspectors on overseeing facilities with known steam generator tube leakage. (Attachment 3 to Ref. 1)	02/01	IIPB (DE and DSSA support)
10	Reassess the NRC treatment of licensee steam generator inspection results summary reports and conference calls during outages. Evaluate need for review guidance. (Attachment 3 to Ref. 1; TG: 5d, 6c; page 4 and 5 (top and bottom) of Ref. 1)	02/01	DE (IIPB support)

11	Review the NRC inspection program and, if necessary, revise guidance to inspectors on overseeing facility eddy current inspection of steam generators. (Attachment 3 to Ref. 1; TG: 5a, 5b, 5c)	02/01	IIPB (DE support)
12	Determine need for formal written guidance for technical reviewers to utilize in performing steam generator tube integrity license amendment reviews (TG: 6a)	04/01	DE
13	Staff provides EDO with update on status of action plan (page 8 of Ref. 1)	5/01	DLPM
14	Staff completes review and draft safety evaluation of NEI 97-06 including addressing issues raised in OIG report and IP2 lessons learned report (NEI 97-06, TG: 2, 3, 4, 7)	05/01	DE
15	Hold steam generator workshop with stakeholders (page 2 of Ref. 1; page 2 of Ref. 2)	06/01	DE
16	Staff briefs CRGR on NEI 97-06 (NEI 97-06)	07/01	DE
17	Publish SE on NEI 97-06 in FR for public comment (NEI 97-06)	07/01	DE
18	ACRS review of NEI 97-06 (NEI 97-06)	08/01	DE
19	Issue generic communication related to steam generator operating experience and status of steam generator issues	09/01	DE
20	Staff briefs Commission on endorsing NEI 97-06 (NEI 97-06, and WITS Item 199400048)	10/01	DE
21	Staff issues endorsement package on NEI 97-06 (Regulatory Issue Summary and safety evaluation including the approval of the generic technical specification change	10/01	DE

¹Notes contained within parentheses in the above table indicate the source for the milestone. For example "TG" identifies the IP2 lessons learned task group's recommendation number as identified in Attachment 3. NEI 97-06 indicates it is a milestone associated with the review of NEI 97-06. Similarly "GSI-163" and "DPO" indicate they are milestones associated with resolving these issues.

²In performing the next quarterly update on the status of the current Steam Generator Action Plan contained in the Director's Quarterly Status Report, the staff will update the description, historical background, proposed actions, originating documents, regulatory assessment, schedule and milestones, priority, resource requirements, contacts, references and status sections to incorporate the information contained within this document.

³DLPM = Division of Licensing Project Management; DE = Division of Engineering; DSSA = Division of Systems Safety and Analysis; IIPB = Inspection Program Branch; ACRS = Advisory Committee on Reactor Safeguards

References:

1. Memorandum from William D. Travers, Executive Director for Operations to the Commission dated November 3, 2000, "Staff Review of OIG Report on the NRC's Response to the Steam Generator Tube Failure at Indian Point 2 and Related Issues"
2. Memorandum from Samuel J. Collins, Director, NRR to William D. Travers, Executive Director for Operations dated November 1, 2000, "Transmittal of the Indian Point 2 Steam Generator Failure Lessons-Learned Report"

NON-STEAM GENERATOR RELATED ACTION PLAN MILESTONES^{1,2,3}

Item #	Milestone	Completion Date	Lead
1	Evaluate the need for a new communication protocol with the US Secret Service that would cover emergency situations at all NRC licensed facilities (Attachment 3 of Ref. 1)	11/00	IRO
2	Establish NRC web site for Steam Generator Action Plan	01/01	DLPM
3	Review and revise, as appropriate, the policy for project manager involvement with the morning call between the resident inspectors and the region. (Attachments 3 and 4 of Ref. 1)	03/01	DLPM
4	Review program requirements for routine communications between the resident inspectors and local officials based on public interest. Based on weighing current resident inspector responsibilities (e.g., inspection requirements, following up on plant events) against this review, revise program requirements if needed. (Attachment 3 of Ref. 1)	03/01	IIPB
5	Develop, revise, and implement, as appropriate, a process for the timely dissemination of technical information to inspectors for inclusion in the inspection program (TG: 5g)	04/01	IIPB
6	Incorporate experience gained from the IP2 event and the SDP process into planned initiatives on risk communication and outreach to the public (TG: 9)	05/01	DE
7	Investigate possibility of establishing protocol with OIG regarding review of draft reports for factual/contextual errors (page 8 of Ref. 1)	06/01	DLPM
8	Review and revise, as appropriate, the amendment review process, including concurrence responsibilities, supervisory oversight, and second-round requests for additional information. (Attachment 3 of Ref. 1; TG: 6b, 6d, 6e; page 6 of Ref. 1)	06/01	DLPM

¹Notes contained within parentheses in the above table indicate the source for the milestone. For example "TG" identifies the IP2 lessons learned task group's recommendation number as identified in Attachment 3.

²In performing the next quarterly update on the status of the current Steam Generator Action Plan contained in the Director's Quarterly Status Report, the staff will update the description, historical background, proposed actions, originating documents, regulatory assessment, schedule and milestones, priority, resource requirements, contacts, references and status sections to incorporate the information contained within this document.

³DLPM = Division of Licensing Project Management; IIPB = Inspection Program Branch; IRO = Incident Response Organization; DRIP = Division of Regulatory Improvement Programs

References:

1. Memorandum from William D. Travers, Executive Director for Operations to the Commission dated November 3, 2000, "Staff Review of OIG Report on the NRC's Response to the Steam Generator Tube Failure at Indian Point 2 and Related Issues"
2. Memorandum from Samuel J. Collins, Director, NRR to William D. Travers, Executive Director for Operations dated November 1, 2000, "Transmittal of the Indian Point 2 Steam Generator Failure Lessons-Learned Report"

IP2 TASK GROUP RECOMMENDATIONS

No.	Recommendation	Action For	Report Reference	
			Section	No.
1	Con Ed must correct the deficiencies in its SG tube integrity program that led to the degraded SG condition during IP2 cycle 14. Otherwise, the long-term risk of SGTR at IP2 could be affected.	Con Ed	5.4	1
2	The EPRI guidelines and the licensees implementation of the guidelines should be improved based on lessons-learned from the IP2 experience. Specific recommendations are listed below as items 2(a) through 2(o).			
2a	Industry should update the EPRI SG Examination Guidelines to incorporate data quality criteria. Guidelines should explicitly discuss how to identify excessive noise in the data, how to identify the source of the noise, and what to do about the noise after the source is identified.	Industry EPRI	6.1.4 6.4.4	1 1
2b	Industry should consider the issue of noise in newer tubes in the revision to the EPRI SG examination guidelines.	Industry EPRI	6.4.4	4
2c	The EPRI guidelines should address the use of noise minimization techniques such as filtering algorithms.	Industry EPRI	6.4.4	5
2d	Licensees should review generic industry guidelines carefully to ensure that the conditions/assumptions supporting the guidelines apply to their plant-specific situation (for example, site-specific performance demonstrations for examination techniques).	Industry EPRI	6.1.4	2
2e	Industry should update the EPRI SG Examination Guidelines to incorporate guidance on how to evaluate flow slots for hour-glassing and the impact of hour-glassing on PWSCC in low row U-bends.	Industry EPRI	6.1.4	3
2f	The licensee and NRC staff should agree on a measurable definition of “significant” for hour-glassing.	Industry NRC	6.3.4	2

No.	Recommendation	Action For	Report Reference	
			Section	No.
2g	Site validation of techniques should be used for each detection technique, focusing on the most challenging areas of degradation.	Industry EPRI	6.2.4	1
2h	Licensees should use a conservative approach to screening tubes for in-situ testing, and should include tubes with new forms of degradation even if the screening threshold is not met. Industry should modify guidelines on the screening criteria to include new forms of degradation.	Industry EPRI	6.2.4	2
2i	Industry guidelines should caution licensees not to rely heavily on assessments based on sizing techniques that are not qualified.	Industry EPRI	6.2.4	3
2j	Licensees should consider the effect of the threshold of detection and sizing accuracy on the growth rate assumptions.	Industry EPRI	6.2.4	4
2k	Industry should update the EPRI SG Examination Guidelines to incorporate guidelines on prudent measures to be followed when evaluating the first occurrence of a new type of degradation for SG tubes.	Industry EPRI	6.4.4	2
2l	Licensees should recognize the potential for new forms of degradation and use robust techniques to look for problems that may exist, and not focus solely on degradation that has been found in the past. When a new type of SG tube degradation occurs for the first time, licensees should determine the implications on SG condition monitoring and operational assessment (e.g., potential for the tube to rupture before leaking, such as at the apex of a small radius U-bend).	Industry EPRI	6.2.4 7.4	5 1
2m	The EPRI Steam Generator Integrity Assessment Guidelines should be revised to address that care should be taken in relying on predictive models for PWSCC, and that licensees should maintain an aggressive approach in evaluating inconsistencies with predicted and observed SG degradation behavior.	Industry EPRI	6.4.4	3
2n	In addition to using two human analysts for the primary and secondary analysts, industry should consider developing guidelines for using computers to screen the test data.	Industry EPRI	6.4.4	6

No.	Recommendation	Action For	Report Reference	
			Section	No.
2o	The Task Group notes that its recommendations on eddy current testing and tube inspection guidelines were focused on a particular situation that existed at IP2 (i.e., a specific type of degradation and location within the SG). While incorporation of the IP2 lessons into industry guidelines is important, further development of industry guidelines should also address all SG tube degradation modes and degradation locations in order to be generally applicable.	Industry EPRI	6.5.4	3
3	The PWR TSs should be improved based on lessons-learned from the IP2 experience. Specific recommendations are listed below as items 3(a) and 3(b).			
3a	PWR TSs (or the regulatory framework currently being developed via the industry initiative) should ensure the technical requirements are strengthened to reflect the current knowledge of the SG degradation mechanisms, examination techniques, and methodology.	Industry NEI	6.3.4	1
3b	The industry should assess the adequacy of the TS regarding operational leakage limits.	Industry NEI	6.3.4	4
4	The NEI 97-06 initiative should be improved based on lessons-learned from the IP2 experience. Specific recommendations are listed below as items 4(a) through 4(c).			
4a	The licensees should ensure that contractors supporting the SG examination perform in an acceptable manner. The industry initiative should provide reasonable assurance of contractor oversight by licensees.	Industry NEI	6.3.4	5
4b	In the near term, industry should ensure that lessons-learned from the IP2 experience are being used to ensure that effective SG tube integrity programs are being implemented by licensees. NEI should provide feedback to the NRC on the status of licensee implementation of IP2 lessons-learned.	Industry NEI	6.5.4	1
4c	In the longer term, industry should also use lessons-learned from the IP2 experience to strengthen the NEI initiative. NEI should provide feedback to the NRC on the specific changes planned to the 97-06 initiative based on the IP2 experience, including a schedule for implementation of the changes.	Industry NEI	6.5.4	2

No.	Recommendation	Action For	Report Reference	
			Section	No.
5	Over the long-term, the NRC should improve the oversight of licensee SG tube integrity programs based on the generic character of some of the lessons-learned from the IP2 experience. In addition, improvements should be made to the inspection process. Specific recommendations are listed below as items 5(a) through 5(g).	NRC	5.4	2
5a	The staff should develop additional guidance on when and how much of its inspection of licensees' SG tube examination should be completed in the NRC baseline inspection program.	NRC	8.2.4	1
5b	The staff should review the training requirements for NRC inspectors for the SG baseline inspection program. The review should include the guidance contained in the SG inspection procedure to determine the required training for NRC inspectors to successfully complete the objectives of the NRC inspection program.	NRC	8.2.4	2
5c	The NRC should take steps to ensure that SG expertise is available to support the objective of the NRC's licensing and inspection programs. This could be done through formal training and/or transferring knowledge from in-house SG experts to other staff through written guidance documents or a mentoring program.	NRC	7.4	2
5d	The technical interaction between the licensees and NRR (outage phone calls) during the licensees' SG tube examinations can be effective and should be factored into the inspection program. The phone calls should involve the regional inspectors and should be used as part of the preparation for NRC inspections. This will afford NRR the opportunity to help focus the inspections on the appropriate issues.	NRC	8.2.4	3
5e	The staff should assess how the baseline inspection program and/or performance indicators (PIs) could be revised to adequately identify adverse trends in primary-to-secondary leakage during power operation, which could indicate a degradation of the SG tube integrity. The staff should ensure that any PI reporting requirements for primary-to-secondary leakage take into account potential differences in license requirements to ensure that all licensees would be required to report primary-to-secondary leakage for both normal and failed SG conditions.	NRC	8.2.4	5

No.	Recommendation	Action For	Report Reference	
			Section	No.
5f	The staff should establish risk-informed thresholds, either through the PIs or the significance determination process (SDP), that can be applied to the results of the periodic SG inspections to identify SG tube degradation that warrants increased NRC attention.	NRC	8.2.4	6
5g	The staff should develop, revise, and implement, as appropriate, the process for timely dissemination of technical information to the inspectors to ensure that relevant technical information is reviewed and considered for inclusion in the inspection program.	NRC	8.2.4	4
6	The NRC should make improvements in the licensing review process. Specific recommendations are listed below as items 6(a) through 6(e).			
6a	The NRC staff should develop formal written guidance for technical reviewers to utilize in performing license amendment reviews related to SG tube integrity. The guidance should provide specific criteria to identify when the staff should review previous licensee SG inspection reports.	NRC	8.1.4	3
6b	The NRC staff safety evaluations should be specific as to what information is relied on to form the basis for its conclusions (i.e., basis for approving the amendment). In addition, if the NRC staff is aware of significant information in the licensee's application that is incorrect, these issues should be discussed in the staff's SE even if the information was not relied upon to form a staff conclusion. This will help to identify those issues not otherwise addressed in the SE that later could be misinterpreted to imply that the staff concurred with the licensee's analysis/conclusions. OL No. 803 should be revised accordingly.	NRC	8.1.4	1
6c	The staff should assess the need for, and the process for the staff review of, the TS required reports that document the results of licensee's SG tube examinations. If the staff determines that such reports should be required, then the staff should also determine the information to be included in such reports, and the timing for submittal of the reports to the NRC. The staff should also develop a well-defined process to review such reports, and the specific purposes and objectives of such reviews. The revised reactor oversight process, including the SDP and the telephone calls with the licensee during an outage, should be considered in the process.	NRC	6.3.4	3

No.	Recommendation	Action For	Report Reference	
			Section	No.
6d	The NRC staff should revise OL No. 803 to add a discussion regarding interface between NRR and Regional staff during SE development. The discussion should state that in limited cases it may be of value to get input from the Region (e.g., if the NRR SE relies heavily on a statement from the licensee on a risk-significant issue, NRR could request that the Region perform an inspection to verify the statement).	NRC	8.1.4	2
6e	When NRR requests that RES perform an independent technical review of a staff's SE, NRR and RES should develop a process for handling the request and response.	NRC	7.4	3
7	The NRC should assign a high priority to its review of the NEI SG initiative and the associated EPRI guidelines. The NRC should use the SECY-00-0116 process, once approved, to expedite the review of the NEI 97-06 initiative.	NRC	8.3.4	1
8	In the interim, the NRC should issue a generic communication to clarify the current NRC position on industry guidance and to highlight SG tube integrity program weaknesses manifested by the IP2 experience that could exist at other plants.	NRC	8.3.4	2
9	The NRC should incorporate experience gained from the IP2 event and the SDP process into planned initiatives on risk communication and outreach to the public.	NRC	5.4	3