

October 23, 2000

MEMORANDUM TO: Brian W. Sheron, Associate Director for  
Project Licensing and Technical Analysis  
Office of Nuclear Reactor Regulation

FROM: Scott F. Newberry, Chairman */RA/*  
Indian Point 2 Steam Generator Tube Failure  
Lessons-Learned Task Group

SUBJECT: INDIAN POINT 2 STEAM GENERATOR TUBE FAILURE  
LESSONS-LEARNED FINAL REPORT (TAC NO. MA9163)

This memorandum forwards the Final Report, dated October 23, 2000, of the Indian Point 2 Steam Generator Tube Failure Lessons-Learned Task Group. The objective of this effort was to conduct an evaluation of the NRC staff's technical and regulatory processes related to assuring steam generator tube integrity in order to identify and recommend areas for improvements applicable to the NRC and/or the industry. The recommended approach and Task Group Charter for this effort was provided in a memorandum from Samuel J. Collins to William D. Travers, dated May 24, 2000 (ADAMS Accession No. ML003717020).

Attachment: As stated

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November 1, 2000

MEMORANDUM TO: William D. Travers  
Executive Director for Operations

FROM: Samuel J. Collins, Director */ra/*  
Office of Nuclear Reactor Regulation

SUBJECT: TRANSMITTAL OF THE INDIAN POINT 2 STEAM GENERATOR TUBE  
FAILURE LESSONS-LEARNED REPORT

The purpose of this memorandum is to transmit the completed Indian Point 2 (IP2) Steam Generator (SG) Tube Failure Lessons-Learned Report, which is attached. As you are aware, this lessons-learned activity was described in my May 24, 2000 memorandum, "Indian Point Unit 2 Steam Generator Tube Failure Lessons-Learned Task Group and Charter," and the multi-office activity was initiated on June 19, 2000. In the May 24, 2000, memorandum, I committed to using the lessons-learned assessment to identify any generic technical or process elements that could be improved in the NRC's review and oversight of SG issues. NRR plans to study the group's recommendations and implement them, as appropriate.

I have directed my staff to develop an action plan that will include the disposition of the lessons-learned report in an integrated manner with other ongoing SG activities, such as the NEI 97-06 change package review, by November 17, 2000. In implementing the action plan, the staff will consider appropriate stakeholder involvement.

The lessons-learned charter stated that the objective of this effort was to conduct an evaluation of the staff's technical and regulatory processes related to assuring SG tube integrity in order to identify and recommend areas for improvement applicable to the NRC and/or the industry. In order to satisfy this objective, the lessons-learned task group reviewed many of the licensee and NRC staff documents associated with the SG examinations, inspections, and the root cause analysis. The task group also reviewed the Office of Nuclear Regulatory Research (RES) March 16, 2000, Technical Review and the Office of the Inspector General (OIG) August 29, 2000, Event Inquiry Report. In order to better understand the technical and regulatory issues, the task group interviewed selected NRC staff and contractors as well as some technical staff of the licensee, Consolidated Edison (Con Ed).

CONTACT: Louise Lund, EMCB/DE  
415-2786

## William D. Travers-2-

The attached lessons-learned report provides a number of generic technical and process recommendations that apply to the industry and the NRC. There is a recommendation directed to Con Ed which supports the conclusions of the August 31, 2000, NRC Special Inspection Report on the IP2 SG tube failure. The lessons-learned report reiterates the significant performance issues (as described in the August 31, 2000, NRC Special Inspection Report) related to how Con Ed implemented its SG inspection program during the 1997 plant outage. Principally, those performance issues were associated with the licensee not recognizing and taking appropriate corrective actions for significant conditions adverse to quality that affected the SG inspection program (e.g., not adequately accounting for conditions which adversely affected the detectability of, and increased the susceptibility to, tube flaws). The licensee specific deficiencies identified in the Special Inspection Report and any further interactions between NRC and Con Ed relative to those deficiencies are being addressed under the NRC's oversight process.

Based on our review of the lessons-learned report, we have concluded that there are no safety concerns that have been identified that require immediate action with respect to the industry. Several of the recommendations in the report support ongoing and planned activities by the NRC staff and the industry.

The NRC staff has been working to address the issues arising from the IP2 tube failure and has activities underway to strengthen SG programs in response to the IP2 SG tube failure. During the current fall outage season, for example, the NRC headquarters staff has had calls with certain licensees during their SG outages and has involved the NRC regional office staff in the phone calls. The staff has asked the licensees to explicitly discuss in the phone calls any steps that they have taken, or plan to take, in response to the industry lessons-learned (discussed below) from the IP2 tube failure. The staff is also preparing a Regulatory Issue Summary (RIS), drawing on issues in the staff's technical evaluation of the IP2 tube failure and the Arkansas Nuclear One, Unit 2 safety evaluation of the risk-informed amendment on the SG performance criteria. The RIS will be issued in the near future. Performance indicators related to maintaining tube integrity are also being developed which will be considered for incorporation into the revised reactor oversight program. The staff is also planning a stakeholder workshop by midyear 2001 to discuss recent SG operating experience and to solicit views from a broad range of stakeholders on the SG issues, including the NRC lessons-learned report.

With respect to the industry's response, by letter dated October 6, 2000, NEI provided the industry's lessons-learned report based on the IP2 tube failure. The industry is working on revising the Electric Power Research Institute guidelines that support the SG industry initiative framework (NEI 97-06) and change package based on their lessons-learned activity and input from the NRC staff. The industry discussed with the NRC staff their plan to provide interim guidance on data quality to assist licensees with fall 2000 outages that include SG examinations. On their own initiative, some of the plants used a high frequency eddy current probe during the spring and fall 2000 outages to improve the data quality in the small radius U-bend region of the tubes.

William D. Travers-3-

Many of these actions to improve the SG programs directly relate to the framework of the industry initiative, NEI 97-06, that has been the focus of industry and NRC staff efforts to improve the industry SG management programs during the past three years. This effort, which was deferred to allow the staff sufficient time to properly assess the issues arising from the tube failure, will recommence within the next two months.

Attachment: As stated

William D. Travers-3-

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**Other (describe):**

**SUBJECT:** TRANSMITTAL OF THE INDIAN POINT 2 STEAM GENERATOR  
TUBE FAILURE LESSONS-LEARNED REPORT

**AUTHOR:** Louise Lund, 415-2786

**SECRETARY:** Rene Cesaro, 415-2795

**DATE:** November 1, 2000

**\*\*\* ROUTING \*\*\***

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9. Samuel Collins	_____

November 1, 2000

MEMORANDUM TO: Chairman Meserve  
Commissioner Dicus  
Commissioner Diaz  
Commissioner McGaffigan  
Commissioner Merrifield

FROM: William D. Travers */RA by Carl J. Paperiello Acting For/*  
Executive Director for Operations

SUBJECT: TRANSMITTAL OF THE INDIAN POINT 2 STEAM GENERATOR TUBE  
FAILURE LESSONS LEARNED REPORT

In June 2000, I provided a copy of the charter for the staff's Indian Point 2 Steam Generator Tube Failure Lesson's Learned Task Group to the Commission offices for information. The task group has completed its review and forwarded its report to senior management in the Office of Nuclear Reactor Regulation (NRR). Attached is a memorandum from the Director of NRR which forwards the task group report to me and which also describes his plans to address the recommendations of the task group. In addition to the Lessons Learned Task Group Report, in the near future I expect to forward the staff's response to the August 29, 2000, Office of the Inspector General report regarding the Indian Point 2 steam generator tube failure.

As forwarded to you, both the Lessons Learned Report and the upcoming response to the OIG report are internal documents. The staff has developed a communication plan with which it is prepared to provide the reports to key stakeholders and the general public. However, although I recommend consideration be given to near term public release of the document, the staff believes it is appropriate to await until the Commission has had sufficient time to review the reports before releasing them.

Attachment: As stated

cc: SECY  
OCA  
OGC  
OPA  
CIO  
CFO

MEMORANDUM TO: Chairman Meserve November 1, 2000

Commissioner Dicus  
 Commissioner Diaz  
 Commissioner McGaffigan  
 Commissioner Merrifield

FROM: William D. Travers */RA by Carl J. Paperiello Acting For/*  
 Executive Director for Operations

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November 3, 2000

MEMORANDUM TO: Chairman Meserve  
Commissioner Dicus  
Commissioner Diaz  
Commissioner McGaffigan  
Commissioner Merrifield

FROM: William D. Travers, Executive Director for Operations */RA by  
Carl J. Paperiello Acting for/*

SUBJECT: STAFF REVIEW OF OIG REPORT ON THE NRC'S RESPONSE TO  
THE STEAM GENERATOR TUBE FAILURE AT INDIAN POINT 2 AND  
RELATED ISSUES

By memorandum dated August 30, 2000, Chairman Meserve directed a review and analysis of the issues raised in the report from the Office of the Inspector General (OIG) titled "NRC's Response to the February 15, 2000, Steam Generator (SG) Tube Rupture at Indian Point Unit 2 Power Plant," dated August 29, 2000. The Chairman also requested that the staff provide recommendations for improving NRC processes, as may be warranted, and provide a schedule for implementing them.

This memorandum provides the results of our review and analysis and the recommendations we plan to pursue to improve our processes. Additional staff initiatives beyond the scope of the OIG report are also being undertaken in the area of oversight of SG issues. These initiatives will be documented in an integrated SG action plan which will be developed by November 17, 2000. The action plan will contain ongoing and planned SG activities, and, for completeness, some actions related to Indian Point 2 (IP2) event not directly related to SG issues.

#### Background

The NRC staff initiated actions to assess the licensee's response to the IP2 event and to reevaluate our processes including our review of SG issues shortly after the tube failure.

1. In February 2000, an augmented inspection team performed an assessment of the licensee's actions. (IR 05000247/2000-002)
2. In a February 28, 2000, memorandum, the Office of Nuclear Reactor Regulation (NRR) asked the Office of Nuclear Regulatory Research (RES) to review two safety evaluations regarding the IP2 SGs. In its memorandum of March 16, 2000, responding to the NRR request, RES raised several issues related to NRR's evaluations.

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3. A lessons-learned task group was formed in June 2000, to assess the staff's technical and regulatory processes related to assuring SG tube integrity in order to identify and recommend areas in which the Nuclear Regulatory Commission (NRC) and/or the industry could improve. This review included the issues raised by the RES review. The Lessons Learned Task Group's report is given in Attachment 1 to this memorandum.

These initiatives, particularly the Lessons-Learned Task Group, identified many of the issues raised in the OIG report as well as additional areas where the staff believes improvements can be made. The Lessons-Learned Task Group reviewed the OIG report and considered the OIG findings that were within the scope of the Task Group's charter.

The scope of the Lessons-Learned Task Group review did not include emergency preparedness (EP) issues. The staff has been evaluating IP2 EP issues on an ongoing basis using the NRC inspection process. Attachment 2 contains the results of our review and analysis of the EP issues identified in the OIG report.

Based on the staff's review of the OIG report, the conclusions and recommendations of the Lessons-Learned Task Group and the staff review of EP issues, we have identified a number of areas for improvement in NRC processes. The areas identified for improvement are listed in Attachment 3 along with a schedule for completing these improvements.

The staff has issued numerous generic letters and information notices, has conducted many studies on generic issues related to SG tube integrity, and has had an active SG research program. The staff has also had an active interface with the industry and recently has been reviewing the industry's SG initiative described in the latest revision to Nuclear Energy Institute (NEI) 97-06. This initiative, as it relates to a possible revision of the regulatory framework for SG tube integrity, is discussed in SECY-98-248. One significant enhancement contained in this initiative is that licensees perform condition monitoring and operational assessments to ensure tube integrity performance criteria are being met. Under the proposed revision of the regulatory framework, these assessments would be required by technical specifications.

Moreover, the staff has incorporated lessons-learned from the IP2 SG tube failure into its review and inspection activities. Both the NRC staff and the industry have been addressing issues associated with the IP2 tube failure and have activities underway to strengthen SG programs as follows:

1. The staff is preparing a Regulatory Issue Summary discussing SG inspections issues, including those identified from the IP2 tube failure.
2. To foster communication with the industry on generic SG inspection issues identified from the IP2 tube failure, the NRC staff met with the industry on July 26, 2000. Another meeting to discuss the industry and the NRC lessons-learned studies is being scheduled, and the staff is planning a workshop in 2001 to discuss SG issues.
3. Lessons-learned from the IP2 tube failure were discussed at a counterpart conference call between NRR and the regional inspectors on September 12, 2000.
4. The NRC staff has continued to conduct phone calls with select licensees to discuss

their SG inspections and now requests licensees to address any steps that they have taken, or plan to take, in response to the industry lessons-learned from the IP2 tube failure.

The industry has also taken additional actions following the IP2 tube failure.

1. Some of the plants with older SGs used a high frequency eddy current probe during inspections conducted subsequent to the IP2 tube failure to help improve the inspections of the U-bend region of the tubes.
2. The industry has identified a number of lessons-learned based on the IP2 tube failure and provided their lessons-learned in a letter dated October 6, 2000.
3. The industry is working on revising the Electric Power Research Institute guidelines that support the framework of the SG industry initiative (NEI 97-06) based on their lessons-learned and input from the NRC staff.

The Lessons-Learned Task Group assessed the staff's technical and regulatory processes to identify and recommend improvements. Many of the recommendations address the importance of industry guidelines and these recommendations will be included in the Integrated SG Action Plan that the staff intends to develop by November 17, 2000.

Although the industry guidelines could be improved, licensees are subject to the requirements contained in NRC regulations (10 CFR Appendix B) for timely and effective corrective actions for conditions adverse to quality, regardless of the quality of the industry guidelines. With regard to specific issues at IP2, the staff has identified an apparent violation and has conducted a regulatory conference to discuss the issue. The NRC is following up on licensee performance issues under the NRC oversight process. The apparent violation in the IP2 case effectively affirms that existing regulations apply to steam generator inspections. It indicates that failure to take basic steps to account for conditions which significantly impede flaw detection, particularly in areas that are susceptible to degradation, as occurred in the IP2 case, is inconsistent with fundamental corrective action requirements.

#### OIG Findings

The first finding in the OIG report is titled "NRC's Oversight of Events Leading Up to the February 15, 2000, SG Tube Rupture at IP2." Two issues are involved: (1) the NRC did not conduct a technical review of the licensee's IP2 SG inspection report dated July 29, 1997, at the time it was submitted because the staff is not required to conduct such a review; and (2) the NRR review of the licensee's 1999 amendment request to extend the SG inspection interval was not adequate. Our review and analysis of these two issues are discussed below.

#### NRC's Review of 1997 IP2 SG Inspection Report

Licensees' technical specifications typically require that reports summarizing the results of their steam generator inspections be provided to the NRC within 12 months of completing the SG inspections (the IP2 technical specifications require them to be submitted within 45 days). These reports typically provide a summary of inspection scope and techniques in addition to tables of tubes plugged and the reasons for plugging. The 1997 IP2 summary report did not

contain an assessment of tube integrity, as industry summary reports do not usually contain this information. These reports provide information that is of limited value because when they are submitted, the outage is complete and the plant is operating. The staff previously concluded that more real-time assessment of the licensee's SG inspections is preferable to reviewing the post-inspection summary reports. This real-time assessment is being accomplished via phone calls between the NRC staff and certain licensees during the inspection outage. Regarding IP2, the staff held conference calls on May 27, June 2, June 3, and June 29, 1997, with the licensee during their 1997 steam generator inspection outage. There is no indication that the licensee informed the staff during these calls that U-bend cracking had been found. In fact, as documented in Section 8.2.2 of Attachment 1, some NRC staff members interviewed by the IP2 Lessons-Learned Task Group indicated that they had specifically asked during the phone calls if any U-bend degradation had been identified. Although a U-bend defect was ultimately detected by the licensee and the associated tube plugged during the 1997 outage, the timing of these discussions relative to detection of this defect is not clear. For the reasons previously stated, the staff normally does not review the SG summary reports, and as indicated in the OIG report, the staff did not review the IP2 summary report for the 1997 SG inspections. As indicated in Attachment 3, the staff plans to reassess the need for the summary inspection report and conference calls during the outages to determine the most effective approach for providing NRC oversight of SG inspections.

A significant finding in the OIG report states that "had the NRC staff or contractor's with technical expertise evaluated the 1997 results of the IP2 steam generator inspection, the NRC could have identified the flaw in the U-bend of row 2, column 5, in steam generator number 24 that was indicated in the inspection report. This flaw, which was recently determined to be nearly 100 percent through the tube wall in 1997, was the cause of the February 15, 2000, IP2 steam generator tube rupture". We disagree. The results of the licensee's 1997 steam generator inspections were provided to the staff in an inspection summary report from the licensee dated July 29, 1997, and as stated above, the NRC did not review this report for the reasons discussed previously. However, this summary report did not provide information identifying the flaw in the U-bend of the row 2, column 5 tube in SG 24 because the licensee's inspections did not identify the subject defect in 1997. The existence of the flaw that led to the tube failure was only discovered after the February 2000 tube failure when a detailed re-review of the 1997 eddy current test data, which was not previously submitted to the NRC, was performed at the location at which the failure occurred. The 1997 summary inspection report did identify a U-bend defect in a different tube in steam generator 24 and this tube was plugged. However, in 1997 the licensee was not aware of the flaw that led to the tube failure, and the staff could not have identified the flaw in the U-bend of the row 2, column 5 tube in SG 24 based on the information provided by the licensee in 1997.

Looking beyond the steam generator inspection summary report provided to the NRC by the licensee in 1997, there has been some discussion as to whether or not specially trained NRC staff or contractors could have identified the flaw that led to the February 2000 tube failure if they had reviewed and interpreted the actual or "raw" eddy-current test data taken by the licensee during the 1997 inspection. Any conclusions in this regard must be recognized as purely speculative. The "raw" eddy current data consists of huge amounts of digitized electronic data. These data are not submitted to NRC; they are maintained on the licensee's site. Review of this data during a steam generator inspection requires a large number (a dozen or more) of highly specialized analysts working on the order of person-weeks, depending upon the scope and complexity of the inspection. In addition, there are usually many plants

performing steam generator inspections at the same time during plant refueling outages which are normally conducted during the spring and fall time periods when demand for electrical power is relatively low. The NRC provides training on the review and interpretation of eddy-current data to the NRC staff involved in steam generator activities and maintains specialized contractor support in this area. This training and contractor support allows for selected, sampling reviews of steam generator inspection data, and as part of our lessons-learned from the IP2 tube failure, we plan to reassess the best approach to applying NRC resources in this area. However, it is not practical for the NRC staff to perform comprehensive data reviews. The responsibility for performing effective steam generator inspections is, and should remain, the licensee's.

### Review of the Licensee's 1999 Amendment Request

The OIG report found that NRR's review of the licensee's 1999 amendment request to extend the SG inspection interval was not adequate. Although the NRC review could have been more thorough, we disagree that the review was inadequate because the scope and depth of the review conformed to staff guidance and was commensurate with the level of technical complexity and safety significance of the licensee's request. The purpose of the amendment request submitted by the licensee was to reschedule their upcoming SG inspection to a later date to take credit for the fact that the plant had been shut down for an extended period of time (approximately 10 months). During that shut down period the SGs had been placed in a "lay-up" condition. Under this "lay-up" condition the atmosphere inside the SGs was inerted i.e., filled with a cover gas so that the tubes are not exposed to oxygen, and the steam generators were at a low temperature. Operating experience has shown and it is well accepted technically that the SG tubes will not degrade under these conditions. In addition to crediting the period of time that the plant was shut down, the revised inspection schedule from the licensee also proposed to extend the actual period of SG operation at power by about 2 months. In its review, the staff did request additional information from the licensee regarding the potential impact on tube integrity of the additional operating time, but, given the extended period of shutdown with the SGs in "lay-up" condition and the relatively short extension in operating time for the SGs, the amendment request was not considered to represent a new or complex type of review. The scope and depth of the review conformed to the guidance in NRR Office Letter No. 803, and was commensurate with the level of technical complexity and safety significance for the short extension in operating time that was requested. In addition, it is important to recognize that approving the amendment to extend the steam generator inspection schedule did not contribute to the tube failure event in February 2000 because the tube failure occurred prior to the 2 months of extra operating time that was approved and would, therefore, have likely occurred had the licensee operated as originally planned without the extended shutdown.

Nonetheless, we have also concluded that, in hindsight, had the specific subject of U-bend tube degradation been pursued further (i.e., via clarification phone call with licensee or second RAI), the NRC staff may have found inadequacies in the licensee's 1997 steam generator inspections and operational assessment directly related to the eventual tube failure. However, because of the detailed and complex nature of the causal factors that led to the tube failure, it is not clear whether follow-up by the NRR staff would have had a different outcome (e.g., denial of the amendment request). The Lessons-Learned Task Group's evaluation of the OIG findings of NRR's amendment review also concludes that the scope and depth of staff review was consistent with the guidance provided in Office Letter No. 803 (Section 8.1.2 of the Task

Group's report). As part of the Integrated SG Action Plan the staff will be assessing the steam generator review guidance for improvements.

The OIG also raised several issues related to the responsibilities of the staff involved in the review and the NRR process for requests for additional information (RAIs). Specifically, the OIG raised issues related to the depth of the technical review that should be conducted by supervisors and project managers as part of the concurrence process, e.g., review of the staff SER vs source documents, and concerns regarding NRC staff perception that they are limited to only one round of RAIs when conducting a review. NRR has prepared an office wide memorandum to clarify management expectations regarding additional rounds of RAIs and the fact that a second round of RAIs is not prohibited by NRR Office Letter No. 803. Also, to clarify NRR management expectations regarding the amendment review process, we intend to review and revise, if necessary, NRR Office Letter No. 803, "License Amendment Review Procedures," or provide additional clarification to the staff, as appropriate, to address issues including concurrence responsibilities, supervisory oversight, additional rounds of RAIs, and the lessons-learned from the Lessons-Learned Task Group's review.

### Emergency Preparedness Findings

The OIG report's second finding was titled "NRC Oversight of IP2 Emergency Preparedness Issues." Three EP issues are involved. The first OIG issue in the EP area stated the NRC decided that allowing IP2 time to correct its deficiencies outweighed the benefit of increasing NRC oversight. This conclusion appears to have been taken out of context from the notes of the 1998 senior management meeting (SMM) (page 12 of OIG report). The SMM notes referred to agency actions on overall IP2 deficiencies, not to EP specifically. The NRC increased oversight in the EP area as a result of inspection findings as early as 1998. As noted in the OIG report on page 25, supplemental NRC actions were taken in response to the 1998 full participation exercise.

A five-person team evaluated the September 1999 off-year exercise to followup on issues identified in July 1998 and August 1999 inspections. Although performance weaknesses were noted, the August 1999 and the September 1999 team inspections considered EP at IP2 to be adequate to protect public health and safety. The subsequent February 2000 event response at IP2 showed some continuing deficiencies. The February event augmented inspection team (AIT) concluded that the IP2 emergency response organization (ERO) took the necessary steps to protect public health and safety, however, the team identified several emergency plan and implementation problems. As noted in the June 2000 inspection report, these problems included: 1) untimely augmentation by the ERO, 2) untimely accountability of onsite emergency workers, and 3) inconsistent dissemination of information to the media and a local official during the event. These problems were subsequently determined to be violations of NRC requirements with low to moderate safety significance and were cited. Six additional EP violations were identified that were not cited because their safety significance was very low and they were placed in the licensee's corrective action program. The continuing deficiencies in EP and other areas, as described in these inspection reports, were important factors in the designation of IP2 as an agency focus plant at the May 2000 SMM.

The second OIG EP issue is that NRC inspectors had concerns about licensee onsite performance during EP exercises since 1998, and that recurring uncorrected weaknesses appeared to play a role in IP2's emergency response performance during the February 15, 2000, event. We agree with the OIG conclusion. As discussed above, IP2's EP program has



been subject to additional NRC inspection due to performance issues during recent years. OIG's conclusions overall are consistent with the staff's views and inspection results. The third OIG EP issue involved two communications concerns. The first was that communication between the county emergency operation centers (EOCs) and the NRC was nonexistent. The second communications concern was that disjointed and misinformation from IP2 during the event adversely impacted the offsite EP process. Regarding communication between the EOCs and the NRC, the primary communications during an event are from the utility (licensee) to the State and county EOCs. The NRC normally communicates directly with State officials in the State EOC. The NRC does not normally communicate with the local (county) EOC, but relies on the State as the single point of contact. During the February event, the NRC gave State officials in the State EOC in Albany information on plant conditions and event response actions and updated the information as it became available from the licensee. NRC communications during the event were in accordance with the NRC Incident Response Plan (NUREG-0728) and consistent with the NRC's incident response procedures as well as the State of New York and county emergency response plans.

Regarding the second communication concern, inconsistent dissemination of information to the media and a local official during the event was cited by the NRC as a violation of NRC requirements, as discussed previously. OIG's conclusions are consistent with the staff's views and inspection results regarding this concern. Although NRC inspections noted EP performance deficiencies over the 2-year period referenced by the OIG, both NRC and FEMA continue to sustain their findings that the onsite and offsite EP programs provided reasonable assurance that the public health and safety would be protected in a significant event. As directed by the new inspection program, the staff will conduct followup inspections in this area to verify licensee corrective actions.

While the OIG report focuses on issues related to the steam generator tube failure and EP issues associated with that event, the NRC has had an appropriately strong regulatory posture with respect to the Indian Point facility for the past several years. The NRC has been effective in bringing to light broad performance problems that have existed at the facility needing corrective action. Continued heightened attention will be given to these issues.

#### Clarification Items

OIG activities, such as their report on the Indian Point 2 SG tube rupture, have implications relative to NRC achieving its performance goals to maintain safety, protection of the environment, and the common defense and security; increase public confidence; make NRC activities and decisions more effective, efficient, and realistic; and reduce unnecessary regulatory burden on stakeholders as stated in the agency's strategic plan. We take OIG findings seriously, and we will expend resources and take appropriate actions to address their findings to assure that we achieve our performance goals. Also, external stakeholders will judge the agency's performance based, in part, on the findings in the OIG report. Given their impact on the agency, it is important to assure that the OIG findings are factually correct and complete. As discussed in this memorandum, the staff has identified some areas where we believe the OIG findings in the subject report are not factually correct or are presented without complete context that may be misinterpreted. Although providing further context could result in improved perspective in the issues in the report, the staff has elected to limit its response to what we believe are factual misstatements and to significant issues requiring clarification. Our responses to issues that we considered to need clarification are given in Attachment 4. We

recognize the need for independence of the OIG's oversight; however, we believe that an acceptable protocol could be developed to provide an opportunity for the NRC staff to comment on the factual nature and completeness of future OIG reports.

### Conclusion

In conclusion, we believe the staff was proactive in its efforts to understand the lessons-learned from the IP2 SG tube failure, and has undertaken a number of activities to improve NRC processes in this area. It should be noted that the February 15, 2000 SG tube failure at IP2 did not result in any adverse consequences to the health and safety of the public. Nonetheless, the staff is pursuing areas for improvement in its SG review and inspection activities, and will also address licensee performance issues via the NRC oversight program, and the need for generic actions by the industry. Although a number of issues have increased NRC's attention to IP2's EP performance, licensee performance has been adequate to maintain reasonable assurance that appropriate measures would be taken to protect the public during emergencies. The licensee has recently achieved some improvement in this area, and the staff will continue to monitor the licensee's efforts to further improve EP. The staff intends to inform me within 6 months of the status of our ongoing actions listed in the Integrated SG Action Plan.

Attachments:\* 1. NRR to EDO memorandum with IP2 Lessons-Learned Task Group Report Memo (ML003764561) Report (ML003762242)  
2. Response to Emergency Preparedness Issues  
3. Recommendations for Improving NRC Processes and Proposed Schedule  
4. Clarifications of Items in the OIG Report

cc: SECY  
OGC  
OCA  
OPA  
OIG

\*Attachment 1 previously provided to the Commission, SECY, OGC, OCA, and OPA by November 1, 2000 EDO memo.

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In conclusion, we believe the staff was proactive in its efforts to understand the lessons-learned from the IP2 SG tube failure, and has undertaken a number of activities to improve NRC processes in this area. It should be noted that the February 15, 2000 SG tube failure at IP2 did not result in any adverse consequences to the health and safety of the public. Nonetheless, the staff is pursuing areas for improvement in its SG review and inspection activities, and will also address licensee performance issues via the NRC oversight program, and the need for generic actions by the industry. Although a number of issues have increased NRC's attention to IP2's EP performance, licensee performance has been adequate to maintain reasonable assurance that appropriate measures would be taken to protect the public during emergencies. The licensee has recently achieved some improvement in this area, and the staff will continue to monitor the licensee's efforts to further improve EP. The staff intends to inform me within 6 months of the status of our ongoing actions listed in the Integrated SG Action Plan.

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*This correspondence addresses policy issues previously resolved by the Commission, transmits factual information, or restates Commission policy.*

ACCESSION NUMBER: ML003753067

\*See previous concurrence

OFFICE	PDI-2\PM	PDI-1\LA	PDI-1\SC*	PDID*	TechEd*	D\DE*
NAME	RCroteau	SLittle	MGambero	EAdensam	PKleene	JStrosnider
DATE	11/1/00	11/1/00	10/16/00	10/16/00	9/27/00	10/5/00
OFFICE	RA\Region I	IRO*	DD\DIPM*	IIPB*	DD\DLPM*	D\DLPM*
NAME	HMiller*	CMiller for FCongel	FGillespie	BDean	SBlack	JZwolinski
DATE	10/16/00	10/11/00	10/3/00	9/29/00	10/19/00	10/18/00
OFFICE	ADPT\NRR*	D\NRR*	EDO	OCM		
NAME	BSheron	SCollins	WTravers			
DATE	10/23/00	10/31/00	11/03/00			

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E. Weinstein

## RESPONSE TO EMERGENCY PREPAREDNESS ISSUES

The OIG review of the Indian Point 2 (IP2) Steam Generator (SG) tube failure event raised a number of concerns with Emergency Preparedness (EP). The EP concerns raise issues with NRC processes and a number of other concerns that the staff determined were appropriate for followup.

### Routine communications between local officials and NRC/resident inspectors

The OIG report indicated that local officials desire increased interaction with the NRC, including the resident inspector. Local officials recommended routine briefings on the status of IP2, and discussions of plant activities. Many of these local officials believe NRC should serve as an independent source of information regarding onsite conditions.

The staff intends to review reactor oversight program requirements for routine communications between the regional offices and local officials based on public interest. Weighing current regional office responsibilities (e.g., inspection requirements, following up on plant events) against this review, the staff will revise program requirements if needed. The target date is March 2001.

### Communication between County Emergency Operations Center (EOC) and NRC during events

The OIG report stated that communication between county EOCs and the NRC was non-existent during the event. The report further implies that NRC documents indicate NRC should have direct communication with county EOCs. Many of these local officials believe NRC should serve as an independent source of information regarding onsite conditions.

The primary communications during an event are those from the utility (licensee) to the State and county EOCs who are charged with the assessment of this information and in determining what action, if any, is warranted to protect the public. The utility is the source of first-hand, real-time plant status information and has the major responsibility to provide this information along with any recommendations to State and county decision-makers. In the State of New York (SNY) this information is provided by any of several means, including the SNY Radiological Emergency Communication System phone lines to the State and county EOCs. In contrast, the NRC information flow to the State is supplemental in nature, and is intended to aid in the clarification and assessment of information received, and to provide agency perspective on the event.

Once the NRC entered the Standby Response Mode and staffed the NRC Headquarters Operations Center and the Region I Incident Response Center, continuous communications among the licensee, NRC Headquarters, and NRC Region I were established and maintained throughout the duration of this event. During the event, NRC staff provided State officials in the State EOC in Albany with information on plant conditions and event response actions and updated information as it became available.

## ATTACHMENT 2

During an emergency event, NRC officials normally communicate directly with State officials in the State EOC. NRC officials do not normally communicate with the local (county) EOC/command centers but rely on the State as a single point of contact. This Federal/State interaction is consistent with both the SNY and county radiological response plans. Under SNY law, the affected counties bear the primary responsibility to implement protective actions (such as evacuation of the local population) as necessary to protect their citizens. The State is responsible for supporting county officials in evaluating the event, making protective action decisions, and supporting county actions in implementing the response. The State is also responsible for requesting and coordinating Federal resources in response to the event. The governor, through the Disaster Preparedness Commission, retains authority to direct offsite actions to protect the public upon declaration of a State Declaration of Disaster Emergency.

The NRC staff relies primarily on state officials to interact with county officials at their EOCs, as they would during other kinds of emergencies. However, county EOC officials may periodically directly contact the NRC, as an additional source of information concerning the event, including updates on plant conditions and the current status of the response to the emergency. We expect to continue to follow this approach in the future, providing communications primarily with State EOCs. However, if county EOC officials directly contact the NRC during an event, we would respond to the request and inform the State EOC of the county request. Any continuing communication with the county would be predicated on discussions among the State, county, and the NRC.

The staff's communications during this event were consistent with the NRC Incident Response Plan (NUREG-0728) and the NRC Response Coordination Manual (NUREG/BR-0230). The Response Coordination Manual (RCM) specifically describes the concept for State and Local Liaison in Section Q, Concept of Operations. The NRC uses the RCM as a training tool in the Incident Response Organization's (IRO's) State Outreach Program in this regard. No further action in the EP area on this item is needed.

#### Communication with US Secret Service

The OIG report indicated that the U.S. Secret Service was not advised of the SG tube failure.

When the NRC enters the Standby Response Mode and staffs the NRC Headquarters Operations Center to respond to a declared emergency at a nuclear facility, Operations Center personnel notify other Federal agencies of the emergency condition and provide followup information. At 10:58 p.m., EST, on February 15, 2000, a Status Summary of the leaking SG tube emergency condition at IP2 was transmitted by facsimile to (and received by) the White House Situation Room. NRC relies on White House Situation Room personnel to relay this information as necessary, and does not currently inform U.S. Secret Service personnel directly.

However, due to the proximity of the Clinton residence to IP2, the NRC is considering the need for a new protocol with the U.S. Secret Service to specifically address events involving the IP2 facility. The NRC is also exploring the need for a new communication protocol with the U.S. Secret Service that would cover emergency situations at all NRC licensed facilities.

The need for a new protocol will be discussed with the U.S. Secret Service in November 2000.

#### Knowledge of SG leakage

The OIG report indicates that local EOC officials were not notified of known leakage of the SGs. Although not required, IP2 had notified local officials of less significant events in the past, and this caused them to question IP2's notification practices. The NRC intends to request additional information from the licensee regarding this issue by January 2001, and will evaluate the response to determine if further action is warranted.

#### Timely release of information

The OIG report indicates that in one EOC official's opinion, IP2's intent was to time the release of information to avoid the late evening news. The NRC intends to request additional information from the licensee regarding this issue by January 2001, and will evaluate the response to determine if further action is warranted.

#### Technical representatives at the EOCs

The OIG report indicates a concern with a delay in the arrival of the licensee's technical representatives at the State and county EOCs. A review of the licensee's emergency plan and implementing procedures revealed that there are no technical representative positions in the emergency response organization. Despite the lack of procedural guidance, IP2 was aware of the expectation that they would send technical representatives to the State and county EOCs during an emergency. Discussions with the IP2 EP manager indicate that IP2 has revised their Emergency Operation Facility (EOF) procedure to indicate that technical representatives are to be sent to the offsite EOCs. The EP manager stated that the technical representative positions will be added to the licensee's emergency plan once staffing and qualifications considerations are addressed.

The delay in staffing the EOCs stemmed from the overall delay in the activation of the licensee's Emergency Response Organization (ERO). Once licensee ERO positions were filled on February 15, 2000, extra personnel were dispatched to the EOCs to meet the expectation of offsite agencies. Licensee corrective actions to ensure the timely activation of the ERO will ensure a more timely dispatch of technical representatives to the State and county EOCs.

Supplemental NRC inspection in the EP area is planned.

#### Difficult communications between EOC and Licensee

The OIG report indicates that there was difficulty with communication between the State EOC and licensee subsequent to the SG failure. The report also finds that disjointed information and misinformation from IP2 during the tube failure adversely impacted the offsite EP process.

During the February 15, 2000, event and the June 1, 2000 exercise, State representatives had indicated that they had difficulties in getting information about the event/scenario in calls to the utility. In both instances, the State was put on hold or told that someone would get back to them, then no call-backs were made for one-half hour or more. The licensee for IP2 recognizes the problem and has placed it into their corrective action program. Planned corrective actions

include emphasis in continued training of the importance of communications with offsite agencies.

Confusion arose during the February 15, 2000, SG event regarding the type of event that was occurring and whether a release had occurred. Offsite officials, using a simplified document to explain the various emergency action levels (EALs), had concluded that a large break LOCA was in progress instead of a steam generator tube failure. Despite the initial confusion regarding the event, the emergency classification by the licensee was appropriate. Offsite agencies are trained annually on the EALs and the correlation between the classification levels and the potential impact on the public. The licensee and the State of New York are working on corrective actions to improve the flow of information during an event including the descriptive material used to explain the EALs.

During the February 15, 2000, event, the notifications through the established emergency communication link ("RECS" line) to the State and counties met the 15-minute time requirement specified in NRC regulations. Other interfaces between the licensee and offsite agencies occurred at the EOF and the news center. In some cases, these communications could be characterized as "weak or poor warranting corrective actions" as evidenced from the February 15, 2000, event response, and "in need of improvement" as evidenced by the exercise of June 1, 2000. NRC Inspection Reports 2000-002 and 006 document, among other issues, the information problems at the news center. Another evaluation of the news center performance will occur following the completion of corrective actions in this area.

Inconsistent dissemination of information to the media and a local official during the event was cited by the NRC as a violation of NRC requirements. The licensee is addressing communication problems through its corrective action program. The NRC will monitor the licensee's effectiveness in addressing these issues. The licensee's EP program also includes periodic FEMA evaluated exercises in which communication links between the onsite and offsite EROs are evaluated.

#### Licensee allowed time to correct deficiencies

The OIG report finds that the NRC decided that allowing IP2 time to correct its deficiencies outweighed the benefits of increasing NRC oversight. This conclusion appears to have been taken out of context from the notes of the 1998 Senior Management Meeting (SMM) (page 12 of OIG report). The statement in the SMM notes referred to overall agency actions on overall IP2 deficiencies, not specifically pointed to EP. As noted in the OIG report on page 25, supplemental NRC actions were taken in response to the 1998 full participation exercise. Further, as noted in the OIG report, the NRC senior managers determined at the July 1998 meeting that allowing the licensee a period of time to address a broad range of performance issues at the station through its performance improvement initiative was the appropriate agency action for IP2 at that time.

The NRC had a five-person team evaluate the September 1999 off-year exercise to followup on issues identified in July 1998 and August 1999 inspections. Although performance weaknesses were noted, the August 1999 and the September 1999 team inspections considered EP at IP2 to be adequate. The subsequent February 2000 event response at IP2 showed some continuing deficiencies. The February event Augmented Inspection Team (AIT) concluded that the IP2 ERO took the necessary steps to protect public health and safety, however, the team identified several emergency plan and implementation problems. As noted in the June 2000



inspection report, these problems include: 1) untimely augmentation by the ERO, 2) untimely accountability of onsite emergency workers, and 3) inconsistent dissemination of information to the media and a local official during the event, which were subsequently determined to be violations of NRC requirements. In addition, the NRC identified six additional EP findings of very low safety significance involving failures to implement regulatory requirements. The continuing EP deficiencies and performance deficiencies in other areas, as described in these reports, were important factors in the designation of IP2 as an agency focus plant at the May 2000 SMM. As directed by the new inspection program, the staff will conduct followup inspection in this area to verify licensee corrective actions.

#### Licensee under-staffed in EP area

The OIG report indicates that the licensee may be under-staffed in the area of EP. There are no criteria for staffing of licensees' EP departments. The licensee had hired contractors in response to the issues identified during the September 22, 1999, exercise; and they plan to hire additional personnel to address the performance issues found thus far in the year 2000. They now have more staff than they have had in previous years.

The inspection program assesses performance as a result of the actions of the emergency planning department. The amount of staff needed depends on the licensee's internal affairs such as administrative control processes and the number and nature of the performance issues needing resolution. As directed by the new inspection program, the staff will conduct followup inspection in this area to verify licensee corrective actions.

#### Recurring weakness hampered response

The OIG report finds that NRC inspectors had concerns about licensee on-site performance during EP exercises from 1998 to present. Recurring weaknesses played a role in the emergency response performance during the tube failure event. The NRC agrees with OIG's conclusion. IP2's EP program has been subjected to additional NRC inspection due to performance issues during recent years. OIG's conclusions overall are consistent with staff's views and inspection results. While NRC inspections noted EP performance deficiencies over the 2-year period referenced by the OIG, both NRC and FEMA continue to sustain their findings that the onsite and offsite EP programs provided reasonable assurance that public health and safety would be protected in the event of a significant event.

As noted in the OIG report, two Region I EP inspectors expressed their concern in March 2000 about the readiness of IP2's EP program. The OIG report further documented that the NRC concluded a review of the EP program in June 2000, including an onsite EP exercise, and determined that although some weaknesses continued there was overall improvement, and EP at IP2 continued to be adequate. The two NRC inspectors referred to by the OIG report were intimately involved in this inspection work and its conclusions. As directed by the new inspection program, we plan a followup inspection to verify that the significant inspection findings have been corrected.

### Evacuation route integrity and language barriers

The OIG report indicates concerns with communications with certain sectors of the Emergency Planning Zone (EPZ) where English is spoken as a second language. The report also indicates concerns that due to population density and road conditions, any failure to maintain the integrity of the evacuation routes would bring the "plan" to a complete stop.

The ability to maintain the integrity of evacuation routes and the adequacy of communications capability for EPZ population are concerns which are evaluated by FEMA. Accordingly, by letter dated September 21, 2000, these two concerns were forwarded to FEMA for their review.

Further actions will be determined pending the results of FEMA's review.

## RECOMMENDATIONS FOR IMPROVING NRC PROCESSES AND PROPOSED SCHEDULE\*

Issue	Target Date	Lead
Review and revise, as appropriate, the amendment review process including concurrence responsibilities, supervisory oversight, and second-round requests for additional information.	6/01	DLPM
Review NRC inspection program and, if necessary, revise guidance to inspectors on overseeing facilities with known steam generator tube leakage.	2/01	IIPB (with DE assist)
Reassess the NRC treatment of licensee steam generator inspection results summary reports and conference calls during outages.	2/01	DE
Review and revise, as appropriate, the policy for project manager involvement with the morning call between the resident inspectors and the region.	3/01	DLPM
Review the NRC inspection program and, if necessary, revise guidance to inspectors on overseeing facility eddy current inspection of steam generators.	2/01	IIPB (with DE assist)
Review program requirements for routine communications between the regional offices and local officials based on public interest. Based on weighing current region responsibilities (e.g., inspection requirements, following up on plant events) against this review, revise program requirements if needed.	3/01	IIPB
Evaluate the need for a new communication protocol with the US Secret Service that would cover emergency situations at all NRC licensed facilities.	11/00	IRO

\*Footnote: This list includes those recommendations for improving NRC processes that are in common with issues raised in the OIG report and is not an inclusive list of all actions that the staff is taking in response to the IP2 SG tube failure. These actions will be integrated into the Integrated SG Action Plan being developed by the staff. The Integrated SG Action Plan will include some actions related to the Indian Point 2 event that are not directly related to SG issues.

ATTACHMENT 3

#### Attachment 4 Clarifications of Items in the OIG Report

This attachment provides clarifications to items in the OIG report that were not discussed elsewhere in this memorandum.

Page 22 of the OIG report discusses a project manager's (PM's) lack of involvement in the daily call with the region and resident inspectors. The PM handbook states that the resident inspector (RI) and the PM hold periodic phone calls to discuss topics such as facility modifications, significant events, significant noncompliance, enforcement actions and allegations. One form of this periodic call may be participation in the morning call between the resident inspectors and their regional manager regarding the status of the facility. The primary purpose of this morning call, however, is to provide a means of communication between the regional manager and the resident inspectors, not the resident inspectors and the PM. Subsequent to this call, regional management and regional staff conduct a meeting to discuss plant status and issues regarding all plants in the region with NRR management involved via telephone. This is the primary means of communication between the region and NRR regarding issues which may require NRC actions. These calls were conducted during the time period addressed by the OIG report. The PMs and resident inspectors discuss issues on a routine basis outside of the daily call with the region discussed on page 22 of the OIG report. The decision of the IP2 PM to not listen to the daily call with the region and resident inspectors did not contribute to the SG tube failure at IP2. The IP2 PM's actions were consistent with NRC management's expectations, however, NRR is reviewing the policy for PM involvement with the morning call between the resident inspectors and the region and will revise the guidance to PMs, if necessary.

Page 13 of the OIG report refers to a June 3, 1997, discussion between the NRC staff and the IP2 licensee in which IP2 informed the NRC that testing had identified a new degradation mechanism of stress corrosion cracking of the outside diameter (ODSCC) of SG tubes. This statement is true, however, it should be clarified that IP2 was referring to detection of ODSCC in the sludge pile for the first time in 1997 and is unrelated to the tube failure that occurred in 2000. This information is documented in the licensee's letter of May 12, 1999 to the NRC.

Page 22 of the OIG report indicates that the RI stated that the NRC oversight practice for SG leaks is to "provide guidance" and ensure the licensee monitors any changes in leakage and they "instructed" IP2 operators to do this. It is not NRC policy or practice to provide guidance or instruct operators. NRC management is not aware of any instance when either of these occurred at IP2 during the time period of reference. However, it appears that portions of the resident's discussions with the OIG, taken out of context, have led to this misperception. The following two paragraphs provide the context of those discussions and the related portions are underlined.

The resident inspectors actively reviewed licensee actions in response to the identification of increased SG tube leakage, particularly after the main steam line nitrogen-16 radiation monitor for the #24 steam generator came on-scale and into alarm in February 2000. The resident inspector confirmed that licensee procedures reflected the industry guidance on steam generator tube leakage endorsed by the NRC staff, and that they were following that guidance

ATTACHMENT 4

to assure actions would be taken to shut down the plant prior to the onset of leak rates indicative of rapidly degrading tube conditions. Per the industry guidance, leak rates in the range of 50 gallons per day (gpd) would be indicative of rapidly degrading conditions and the plant would be shut down well below the TS limit of 432 gpd.

After consultation with Region I management and engineering, the residents established 5 gpd as an action level (well below the industry limits) at which NRC would: 1) become further engaged with licensee engineering regarding conditions in SG#24; and, 2) discuss with ConEd management their plans, including criteria for shutting down the plant. In the event that leak rate was reached during weekends or back shifts when residents were not on site, the Senior Resident Inspector requested that plant management call the residents when the leak rate reached that value. The licensee put an entry in the Night Orders Book directing the operators to call the residents when the leak rate reached 5 gpd.

Page 11 of the OIG report discusses regional views of the IP2 steam generators:

The statement attributed in the report to the Regional Administrator that "the Region did not view steam generators as significant in the overall oversight and regulation of IP2" is likely to be misleading without better context regarding NRC oversight activities during the 1997/1998 time frame. This is particularly important as, in the findings, the report indicates reviews were limited "because steam generator issues at IP2 were not viewed as significant to NRC's oversight and regulation of the plant." Steam generator issues were never viewed as insignificant by the staff, as may be inferred from the report. The Region had identified numerous performance issues at the station during the 1997/1998 time frame that the NRC staff was monitoring. These included issues associated with plant equipment, personnel performance, technical support and corrective action programs. The nature and extent of these issues required significant commitment of Regional resources and attention, particularly during the plant outages. In this context, issues other than steam generators were appropriately receiving greater attention. Licensee steam generator examinations were inspected as part of normal inspection procedures.