Indian Point 2 (IP2) Steam Generator (SG) Tube Failure
Lessons-Learned Task Group
(TAC No. MA9163)

Task Group Notes - Discussion with members of the Region I Office - 08/01/00

Attendees: Scott Newberry, Alan Rubin; Louise Lund; and Jimi Yerokun

Wayne Lanning, Director, DRS - 10:00 A.M.

Regulations:
Mr. Lanning thinks that part of the problem is that the requirements for S/Gs examinations are left to the licensees and their guidelines. There are no stringent requirements on S/Gs other than the Technical Specifications.

Reactor Oversight Program
He acknowledged that the new program could allow us to not look at S/Gs. The baseline inspection procedure (IP 71111.08) does not require that the S/Gs be looked at. Even if selected, the review is minimal.

He feels that in considering the impact of S/G tube failure on risk, the core condition should be an important input. For example, if a reactor with a leaky fuel had a steam generator tube failure, it would be more risk significant. Therefore, the examination of the steam generator tubes in a unit with leaking fuel would be crucial. He felt that the new program should consider other implications along with a tube failure as the bases for the baseline inspection.

He strongly feels that the region implements what the program office directs. Headquarters needs to provide more guidance to the regions on what to inspect based on their specific knowledge of steam generators at different sites.

He thinks the 1999 NRR SER for the extension was not the first deficient SER that NRR had written. It's only a big deal now because of the IP2 event.

Mr. Lanning felt that both the region and NRR knew before the event that IP2 was a weak performing site and that Con Ed was weak in their S/G knowledge. The NRC did not need inspections to establish that. IP2 should have received more NRC oversight. He did note, however, that Con Ed had Westinghouse as a contractor. Westinghouse had SG expertise.

The new inspection procedure (71111.08) needs to be tested to see what it really takes to get a good insight at the sites. But 32 hours does not appear to be enough. Wayne was not sure what could be considered to be enough. He wasn't sure how the program inspection activities were being supported by the division of engineering.

Inspections:
Wayne feels that the ISI inspector should be qualified in ISI techniques. The inspector should be a specialist and should posses project engineering expertise. Need NRR input for ISI inspections based on NRR's knowledge of steam generators.

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IP2 Event:
Wayne feels that the IP2 event was **not** significant. The event was a low risk event that could be a precursor. He considered that IP2 is being handled differently because the new program was underway and IP2 provided a good opportunity to address Steam Generators. It has provided a good opportunity to increase the margin between tube leaks and tube failures. We should analyze it, learn from it, and improve the margin to failure.

He feels that while IP2 is responsible for their current problems, the issue really goes beyond IP2 alone. For example, Westinghouse conducted the examination.

Wayne felt that the NRC needs better guidance than currently exists. We need to understand how the Eddy Current Examination Program fits into the bigger picture, management and performance wise?

NRR/Licensee Outage Phone Calls:
Wayne regarded the NRR/Licensee outage phone calls as being positive, but should include the region as well.

OUTCOME: The issue is an industry issue. They have the expertise and the capability. NEI, INPO and others should be asking themselves why they did not anticipate this type of an event. Improved S/G inspection guidance from NRR would help.

Joseph Carrasco, Reactor Engineer, DRS - 11:30 A.M.

Joe conducted the NRC's inspection of IP2's S/G eddy current examinations in 1997. He indicated that prior to that inspection, he had assisted in NRC's NDE inspections at other reactor sites. He then was able to conduct individual inspections at the sites. He indicated that when the NRC had the Mobile Laboratory, the region had some people with the expertise. There were also plans to create opportunities for hands on experience for the inspectors.

Joe received training before being assigned to conduct the inspection at IP2 in 1997. The inspection was conducted using NRC Inspection Procedure 73753, Inservice Inspection. He indicated that during the preparation for the inspection, his supervisor told him to focus on the S/G with emphasis on Eddy Current Examination activities. During the inspection, he looked at the scope of IP2's inspections and focused on data collection. He spent about 25% of his time on other issues that were not related to Eddy Current Examination. Joe indicated that in 1997, IP2 had a third party, independent level III NDE person who was not a direct employee of Westinghouse or Con Ed. His onsite inspection lasted only for four days. At the end of his on site inspection week, the licensee's tube examination was still ongoing. He later followed his inspection with a phone call to the license involving NRC headquarters personnel (Ted Sullivan et al) on June 29, 1997. The phone call was to discuss the licensee's examination results. Among the topics discussed were IP2's use of the Cecco-5 probe, and the identification of outside diameter initiated stress corrosion cracking (ODSCC). Joe did not review the inspection report that Con Ed subsequently sent to the NRC in July 1997 following the S/G inspection. Since he was assigned to other inspections not related to S/Gs.

Joe feels that the regional inspector training drastically lags the industry in experience and training.
COMMUNICATION GAP: He does not feel that new industry and generic information (such as Information Notices, Generic Letters, etc.) get to the regional inspectors in time enough to be factored into their inspection activities.

Joe provided the Lessons Learned Task Group a copy of the memorandum (dated February 24, 2000) that he wrote to his division director describing his 1997 inspection activities.

James Wiggins, Deputy Regional Administrator - 1:30 P.M.

Regulations:
In general, Jim feels that there is a weak regulatory structure for Steam Generators. What the NRC expects licensees to do differs from their technical specifications (i.e. NRC staff expects licensees to do more than meet minimal requirements). This looseness has an effect on what inspectors can do. However, when Headquarters gets on a licensee's case, such as with the phone calls, good reviews occur.

The looseness with the regulations does not help the inspection process. Regional inspectors could be provided better guidance on what should be inspected. The current guidance on ISI for S/Gs is too general.

Reactor Oversight Program:
Jim had several questions about the inspection program. Such as who in NRR owns the inspection procedures? Do they look at the procedures? Does the division of engineering look at the ISI procedure? Were they involved in the development of the procedures? Jim feels that NRR, in coordination with RES, should provide good information to the regions to tell inspectors what to look at.

Inspection:
Jim felt that Region I was probably better with inspector training than the other regions since, although inspectors did not have to take the eddy current course, some inspectors from Region I attended the Zetec training. Jim said Joe Carrasco did not take the Zetec course.

The regional diversion of efforts into Licensing and Design basis in the mid nineties following Millstone, diluted the efforts being put on S/Gs. To have been able to identify the issue in 1997, the region needed training in eddy current analysis and also close interaction with NRR reviewers.

The regions should be more involved with the NRR/Licensee phone calls.

Communication:
Dissemination of information to the regional offices and others should be looked at. It appears to be rather slow and sometimes lacking. For example, good NUREG reports are available on S/Gs but apparently, the region was not aware of them. How is the screening of generic information such as Information Notices, addressed? Should the inspection guidance be subjected to periodic changes based on accumulated generic information?

However, we do not need to overwhelm the regions with information.

The way the MOV Program oversight was handled could be viewed as a good communication model.

NDE Mobile lab:
The lab was not involved in Eddy Current Examination. There was a drive to obtain equipment to incorporate an eddy current analysis into the Van activities just prior to the end of the program. Since it had little ECT capabilities at the time, the lab would not have helped at IP2. The van was useful during the construction of the facilities.

1997 Inspection:
Regarding the NRC's 1997 inspection at IP2 (Inspection Report 97-07), Jim thought it was, in general, a good writeup. The report was accurate, but the inspector did not get into data analysis. It was not required per the regional inspector training (MC 1245). The inspector's findings and the report were in accordance with his training. However, there were some other issues that could have been brought back.

In 1997, IP2 did not fit in the EPRI technique. Also, they did the calibration incorrectly. There are some valid questions on the 1997 examinations. For example, what did Con Ed do upon finding the U-bend apex crack in a row 2 tube?

Lessons Learned:
NRC should improve how Information Notices and Operating experience get factored into regional inspection guidance. The phone calls with NRR and Licensees, including the regions, should continue. There should be closer interactions and sharing information between Headquarters and the regions.

Generic industry guidance, even if improved, can not fit every plant situation. Each plant must make sure industry guidance applies to their plant. Con Ed had the responsibility to do that at IP2.

There's obviously a big safety or economic incentive for the licensees to conduct thorough examinations.

The NRC needs to focus on data analysis rather than on data collection. For example, in 2000, we were still able to find what happened from the reviews of the 1997 examination.

Michael Modes, Senior Reactor Engineer, DRS - 3:00 P.M.

Michael Modes had been a branch chief in charge of ISI and the NRC mobile lab.

Michael said that the initial regional focus in the ISI area was on construction-related NDE space. He indicated that he tried steering the program towards Eddy Current Examination. He requested a Steam Generator Mockup that could be used with the NDE mobile lab as part of the NRC's inspection process. His intent was to ask licensee vendors to use their probes on the mock-up prior to conducting their examinations. The NRC did approve the use of the mock-up. Eventually, the mobile lab was terminated.

Michael indicated that when he was a branch chief, he enhanced procedure 73753, Inservice Inspection, in the area of Eddy Current Testing. He also was instrumental in deciding that the Zetec training be included as part of the inspector training process. He developed a S/G history and kept a file on each of the PWR sites. He made the information required reading for each inspector. He also gave pertinent inspection notices to the inspectors. The files included pertinent new information from the program offices. Subsequently, the files were abandoned when others took over as the ISI branch chief.

Michael strongly feels that the qualification of the Eddy Current Testing for industry is a sham in general. He felt that the industry has been able to work out the S/G requirements into industry guidelines etc. He regarded the Appendix H qualification requirements of the EPRI Guidelines as inadequate. He believes that the industry is weak in this area and he would like to see an ASME Section XI App. VIII system applied to eddy current. There have been no

issues only because the S/Gs are well designed and are forgiving despite the industry's weak S/G examination capabilities.

He said that he would have expected a good inspector to identify the IP2 issue.

Regarding the Con Ed/ Westinghouse interaction, he indicated that the use of the Cecco probe was "qualified." It was a good quality probe at the best speed. He expects more issues at this level of inspection. He thinks Westinghouse probably did what was asked of them.

He thinks that both the old and new NRC inspection procedures are inadequate. The new procedure is more of a bean count. It does not allow for any type of inspector follow up. But given the nature of the inspection program, we are not really striving for zero events. The inspection procedure for S/G, 50002, is more than needed (e.g. 200 hours). The NRC should have more specialists doing ISI inspections as opposed to generalists. Steam generators are important. The inspector training and inspection guidance need to be improved. He questioned why the Steam Generator counterpart meetings and phone calls were stopped? He feels that the NRR/Licensee phone calls are useful but the regions do not participate on a regular basis.