Steam Generator Action Plan

Discussion of Action Plan Milestones
Related to
Differing Professional Opinion

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ENCLOSURE 6

SG Action Plan - Purpose

- The purpose of the action plan is to:
  - Direct and monitor the NRC's efforts in the steam generator (SG) tube integrity area;
  - Ensure that the associated issues are appropriately tracked and dispositioned;
  - Ensure the NRC's efforts result in an integrated SG regulatory framework (e.g., licensing, inspection, research).

SG Action Plan - Scope

- The action plan consolidates numerous activities related to SGs including:
  - Evaluation and implementation of recommendations from the NRC's Indian Point Unit 2 (IP2) SG Tube Failure Lessons-Learned report;
  - Evaluation and implementation of recommendations from the NRC staff's review of the Office of the Inspector General's (OIG) report related to the NRC's response to the IP2 SG tube failure;
  - NRC review of industry initiative NEI 97-06, "Steam Generator Program Guidelines," Generic License Change Package;
  - Resolution of NRC Generic Safety Issue (GSI) 163, "Multiple Steam Generator Tube Leakage"; and
  - Evaluation and implementation of recommendations from the NRC's Advisory Committee on Reactor Safeguards (ACRS) Ad Hoc Subcommittee report related to Dr. Hopenfeld's Differing Professional Opinion (DPO) on SG issues.
- Action plan will be revised to add resolution of GSI 188, "Steam Generator Tube Leaks/Ruptures Concurrent with Containment Bypass, From Breach of Main Steam or Feedwater Line."

SG Action Plan Organization

- The action plan currently has 40 major milestones that are organized as follows:
  - Milestones 1.1 - 1.21 (SG-related items)
  - Milestones 2.1 - 2.8 (non-SG related items, e.g., Emergency Planning issues from OIG report on IP2)
  - Milestones 3.1 - 3.11 (SG DPO-related items)

SG DPO-Related Milestones

- Milestone 3.1 - Develops better understanding from a risk perspective of potential for damage progression of multiple SG tubes due to SG depressurization (e.g., MSLB). Includes evaluation of effects due to tube support movement during depressurization.
- Milestone 3.2 - Evaluates damage progression via jet cutting adjacent tubes.
- Milestone 3.3 - Develops better model of natural mitigation of radionuclide release that could occur in secondary side of SGs during SG tube rupture severe accidents.

SG DPO-Related Milestones

- Milestone 3.4 - Develops better understanding from a risk perspective of SG tube integrity under severe accident conditions in which reactor coolant system remains pressurized.
- Milestone 3.5 - Develops better methods for assessing risk associated with SG tubes under design basis accident conditions. Includes impact of operator actions and appropriate treatment of uncertainty.
- Milestone 3.6 - Prepares topical report to document research results of SG mock-up eddy current tests (addresses issues concerning probability of detection for flaws in SG tubes).

SG DPO-Related Milestones

- Milestone 3.7 - Assesses need for better leakage correlations as a function of voltage for 7/8" SG tubes.
- Milestone 3.8 - Develops a program to monitor the prediction of flaw growth for systematic deviations from expectations (relates to licensee condition monitoring programs).
- Milestone 3.9 - Develops more technically defensible position on treatment of radionuclide release to be used in the safety analyses of design basis events (relates to iodine spiking issue).

SG DPO-Related Milestones

- Milestone 3.10 - Develops better understanding of stress corrosion cracking initiation, evolution, and growth in order to better predict SG tube behavior in an operating environment.
- Milestone 3.11 - Develops detailed milestones to close out GSI-163 (multiple SG tube leakage).

SG Action Plan Webpage and Schedule Information

- Information about the SG Action Plan and the SG DPO issues can be found on the NRC's SG Action Plan webpage. The webpage contains news, correspondence, meeting information, and references related to action plan activities. The webpage is located at:

  http://www.nrc.gov/NRC/REACTOR/SGAP/index.html

- The action plan milestones associated with the SG DPO (i.e., milestones 3.1 -3.11), presently contain approximately 45 sub-tasks with the last sub-task scheduled to be completed by 12/31/06. For specific schedule and sub-task descriptions see the revision of the SG Action Plan dated May 11, 2001 at:

  http://www.nrc.gov/NRC/REACTOR/SGAP/ml011300073.pdf

ACRS Comments Regarding Urgency of Completing SG DPO-related Items

- In a Commission meeting with the ACRS on 5/11/01, in response to a question from Chairman Meserve regarding whether there are any serious issues related to SG integrity that require immediate actions beyond those now being undertaken by the NRC, the ACRS Ad Hoc Subcommittee Chairman, Dr. Powers, stated that staff has responded appropriately and consistently with the expectations of the ACRS by formulating research on the issues. He also stated that the ACRS had not identified anything particularly urgent for the staff to undertake. Similar views were expressed in a letter from the ACRS Chairman, G. Apostolakis, to Chairman Meserve dated 6/14/01.
- The 6/14/01 letter also stated that the ACRS encourages the staff to determine promptly whether the effects of forces associated with depressurization during a main steam line break constitute a generic safety issue and, if so, to resolve this issue expeditiously. In a memo dated 5/21/01, the staff has determined that these issues should be classified as a generic safety issue (GSI-188). GSI-188 will be incorporated into the action plan.

Plant Operation

- **The NRC believes it is safe for pressurized water reactors (PWRs) to continue to operate while work continues on the SG DPO-related issues because:**
  - Plants are designed and operated with defense-in-depth;
  - Licensees follow tube inspection and maintenance procedures intended to ensure that safety margins against tube burst and leakage are maintained;
  - Licensees continually monitor primary-to-secondary leakage to ensure that plants with significant leakage are shut down;
  - Inspections and monitoring cannot guarantee that a tube will not fail, however, plants are designed with safety systems and procedures to bring reactors to a safe shutdown should a SG tube failure occur;
  - Operational experience and technical analyses indicate that plants are safe to continue operation;
  - ACRS report did not identify any issues of immediate significance to public health and safety.