Operating Experience Smart Sample (OpESS) FY 2007-02
FLOODING VULNERABILITIES DUE TO INADEQUATE DESIGN AND CONDUIT / HYDROSTATIC SEAL BARRIER CONCERNS

Note: Highlighted hyperlinked documents should be active if clicked.

SOURCE DOCUMENTS:

NRC Information Notice (IN) 2005-30, "Safe Shutdown Potentially Challenged by Unanalyzed Internal Flooding Events and Inadequate Design. The IN addresses operating experience from the Kewaunee Power Station event.

NRC IN 2007-01: Recent Operating Experience Concerning Hydrostatic Barriers.

CORNERSTONES: INITIATING EVENTS (40%) / MITIGATING SYSTEMS (60%)

APPLICABILITY: This OpESS applies for inspectors of all operating commercial nuclear reactors.

OBJECTIVE: To enable NRC inspector review of licensee's actions, as appropriate, related to internal flooding events and recently identified hydrostatic seal concerns that could affect flood protection, to avoid similar problems as discussed in NRC IN 2005-30 and IN 2007-01.

This OpESS may be selected to determine any licensee corrective actions as a result of issuance of INs 2005-30 / 2007-01 or, if applicable, planned and programmatically controlled by the licensee's corrective action program. If no actions are deemed necessary, inspectors should review licensee justification for not taking any actions (e.g. previously inspected and documented).

This OpESS also provides information related to conduit seal issues identified in 2006 that may warrant inspector review. The intent of this OpESS is for inspectors to review these flooding issues to verify similar concerns do not exist at the site being inspected.

INSPECTION GUIDANCE

- IP 71111.06 "Flood Protection Measures"
- IP 71152 "Identification and Resolution of Problems"
- IP 71111.21 "Component Design Bases Inspection"
- IP 71111.15 "Operability Evaluations"

1) Review the source documents.

2) Determine if the licensee has received INs 2005-30 / 2007-01 and entered it into their operating experience program or corrective active program for review.

3) Determine if the licensee has reviewed INs 2005-30 / 2007-01 and captured any actions in the corrective action program.

4) For hydrostatic barriers (such as conduit seals), review licensee inspection or maintenance processes which ensure hydrostatic seals are installed and maintained as designed. Verify proper implementation of these processes. Also, review whether hydrostatic seals are within scope and being tracked by the Maintenance Rule. Place special emphasis on any current or past events in which liquid was spilled, and how that leakage could affect equipment operability should hydrostatic seals be degraded or non-existent. Consider observing licensee inspections in manholes to confirm that conduits appear properly sealed. Review plant work history and corrective action programs documentation associated with conduit/hydrostatic seal issues.

5) Review actions taken by the licensee to ensure similar concerns do not exist at the site being inspected as described in the subject INs, as applicable.

6) Any concerns related to licensee actions should be directed to the respective DRP/DRS Branch Chief for further guidance.

BACKGROUND INFORMATION

The Kewaunee event was discussed in NRC IN 2005-30. The event illustrated a physical building arrangement in which safety-related systems essential to achieve safe-shutdown were vulnerable to flooding originating from failures of non-safety related systems located in the turbine building. This NRC-identified condition revealed an ineffective application of operating experience to address safety-significant flooding-design vulnerabilities. This was based, in part, on Kewaunee's misunderstanding of their licensing basis related to plant flooding analysis and design, and an erroneous assumption regarding the ability of control room operators to mitigate certain flooding events. The event resulted in a Yellow finding discussed in NRC Inspection Report 2005-018 for Kewaunee.

There were at least three events in 2006, attributed to deficient hydrostatic seal barriers, that resulted in water intrusion into areas containing safety-related equipment. The barriers were either missing, degraded or composed of non-watertight material. In one event, the licensee declared an emergency diesel generator inoperable, and in another event (circa 1988) water intrusion caused a pilot operated relief valve (PORV) to lift. Findings attributed to these events have been issued by inspectors against Criterion III (Design Control), Criterion XVI (Corrective Actions), and RG 1.33 for inadequate procedures. Review NRC IN 2007-01.

REPORTING INSPECTION RESULTS / TIME CHARGES / ADDITIONAL ISSUES

Document any inspection result findings, as applicable, in an integrated inspection report (i.e., quarterly inspection report or CDBI report) and reference the title / OpESS number (example: "Review of Operating Experience Smart Sample (OpESS) FY2007-02, related to INs 2005-30 / 2007-01 and issues associated with conduit/hydrostatic seal issues." Otherwise, list the item as an inspection sample including the "OpESS number / title" under the applicable inspection attachment (i.e., 1R06) with no findings of significance identified.

The inspection results from this Operating Experience issue and OpESS FY2007-02 documentation will allow the NRC (NRR/IOEB) to verify the status of licensee response to IN 2005-30 / IN 2007-01, and to determine if the condition warrants further agency action, such as issuance of a Generic Letter or development of a Temporary Instruction for sites that have not responded to INs 2005-30 / 2007-01.

Inspection time for this OpESS is to be charged to the normal baseline procedure under which it is being documented (along with any routine preparation and documentation charge times).