

Reactor Oversight Process Enhancement Project Baseline Inspection Program Inspection Area – Refueling and Other Outage Activities

Background

Inspection Procedure (IP) 71111.20, “Refueling and Other Outage Activities,” addresses the Initiating Events, Mitigating Systems, and Barrier Integrity Reactor Oversight Process (ROP) cornerstones and is intended to evaluate licensee outage activities to verify that licensees consider risk in developing outage schedules; adhere to administrative risk reduction methodologies they develop to control plant configuration; develop work schedules to manage fatigue; develop mitigation strategies for losses of key safety functions; and adhere to operating license and technical specification requirements that ensure defense-in-depth. Additionally, IP 71111.20 is intended to ensure areas not accessible during at-power operations are inspected to verify that safety-related and risk significant systems, structures, and components are maintained in an operable condition as well as to evaluate licensee activities during reduced inventory and mid-loop conditions to ensure that they appropriately manage risk using the commitments in their response to Generic Letter (GL) 88-17, “Loss of Decay Heat Removal.”

In November of 2009, IP 71111.20 was updated to provide guidance regarding (1) managing fatigue (IP 93002), (2) containment walkthroughs, and (3) inspection resources in accordance with the 2009 ROP realignment.

Analysis

The regional, resident and headquarters inspectors and subject matter experts provided feedback on suggested changes to the baseline inspection procedure with intent to enhance flexibility, increase inspection efficiency, and adjust inspection requirements to emphasize increased focus of inspection on the more risk significant activities versus routine activities. Also, special consideration was given to value added inspector field observations that did not result in a finding but where there was an observed safety impact. The inspection procedure owner’s assessment and ROP feedback forms were reviewed as part of the analysis.

Recommendations

1. Removal/reduction/modification of inspection requirements
 - a. Remove or reduce the requirement to review worker schedules during the outage. It may also be appropriate to review the actual worker schedules after the outage is over, instead of during, to allow the inspectors to focus on more risk significant outage activities and to identify errors/violations that did occur during the outage.

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- b. Change the requirement for the containment closeout inspection from assuring that all debris be removed from containment to verifying the licensee has implemented proper controls for verifying the operability of containment and the sumps.

2. Reference to other applicable inspection procedures

- a. Clearance activities can be reviewed during system walkdowns (IP 71111.04, "Equipment Alignment") or during risk assessment reviews (IP 71111.13, "Maintenance, Risk Assessments, and Emergent Work Control") and specify a sample size for verifying clearance tags.
- b. Control room observation of cooldown and startup activities can be reviewed using IP 71111.11, "Licensed Operator Requalification Program and Licensed Operator Performance."
- c. Reactor physics testing can be reviewed using IP 71111.22, "Surveillance Testing."

3. Clarification of inspection requirements

- a. Clarify the requirement for inspection of Boiling Water Reactors suppression pool strainers, and clarify whether a suppression chamber (torus or suppression pool) closeout inspection is also required prior to startup (Reference Information Notice (IN) 88-82, "Torus Shells With Corrosion and Degraded Coatings in BWR Containments," GL 98-04, "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material Containment," IN 2011-15, "Steel Containment Degradation and Associated License Renewal Aging Management Issues," and IN 2006-01, "Torus Cracking in a BWR Mark I Containment").
- b. Clarify the definition of Operations with the Potential to Drain the Reactor Vessel (reference Enforcement Guidance Memorandum 11-03, "Revision 1 to Dispositioning Boiling Water Reactor Licensee Noncompliance with Technical Specification Containment Requirements During Operations with a Potential for Draining the Reactor Vessel," and Regulatory Information Summary 2012-11, "NRC Staff Position On Dispositioning Boiling-Water Reactor Licensee Noncompliance With Technical Specification Requirements During Operations With A Potential For Draining The Reactor Vessel").
- c. Clarify purpose of containment entry following shutdown is to identify previous, possibly misclassified leakage, and the purpose of the walkdown prior to startup is for containment cleanliness and the effects on the emergency core cooling system recirculation capabilities.
- d. Expand on the guidance for heavy load lifts. This guidance should include ensuring the licensee's heavy lift plan is in accordance with the licensee's commitments to NUREG-0612, "Control of Heavy Loads at Nuclear Power

Plants: Resolution of Generic Technical Activity A-36.” The risk to plant equipment due to a heavy load drop should be included in the licensee’s evaluation of risk as required by Title 10 of the *Code of Federal Regulations* Section 50.65(a)(4), “Requirement for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.”

4. Editorial changes

- a. Make fatigue rule assessment its own section.
- b. Group risk assessment shutdown risk indicators (c. Electrical Power, d. Decay Heat Removal, e. Spent Fuel Pool Cooling, f. Inventory Control, g. Reactivity Control, h. Containment Closure) as a single section entitled “shutdown risk assessment”, with subsections for each item.
- c. Under other inspectable areas in parentheses change “maintenance work prioritization and control” to “risk assessments and emergent work control,” and consider adding “equipment alignment” and “surveillance testing.”
- d. Add Regulatory Guide 1.160 “Monitoring the Effectiveness of Maintenance at Nuclear Power Plants” to list of references for the IP.

5. Addition/reduction in hours estimate

- a. Clarify that the resource estimate could vary significantly based on length of the outage and how many forced outages may have been required during the inspection cycle. Maximum and minimum hours should reflect this understanding, rather than making the inspectors try to fit required reviews into a certain number of total hours.