

### 3.4.2 The NRC Failed to Provide Adequate Reactor Oversight Process Guidance

#### 3.4.2.1 Detailed Discussion

The team concluded that the NRC failed to provide adequate reactor oversight guidance following the evaluation of numerous light-water reactor inspection program documents, and the performance of interviews with NRC personnel directly involved in the inspection and oversight of Davis-Besse.

NRC inspection procedures were not consistently maintained and implemented at each operating facility. Inspection procedure 62001, Boric Acid Corrosion Prevention Program, was issued August 1, 1991, and subsequently canceled on January 17, 2001. This inspection procedure ensured that the licensee had a program in place to assess leakage from systems containing boric acid. The inspection resources section of procedure 62001 stated that implementation would require 8 hours of direct inspection effort; however, the team did not identify any inspection performed at Davis-Besse using inspection procedure 62001. In addition, some staff members indicated that they felt that there were not enough hours allocated for complete boric acid program inspections.

The LLTF found that the staff was having difficulty characterizing the significance of the Davis-Besse event. This difficulty appeared to stem from technical limitations of risk assessments and SDPs in that pressure boundary integrity does not appear to be treated explicitly in PRAs. As a result, the type and extent of wastage of the RCS pressure boundary encountered at Davis-Besse appeared to be more within the scope of traditional deterministic analyses than in a risk-informed framework. In fact, as of the time of the LLTF review, the SDP for this event had been in progress for 5 months, with no resolution. Members of the NRC staff expressed the opinion that, in the transition to the ROP, the agency has placed an over-reliance on risk information as opposed to deterministic methods.

The structure of the reactor oversight process (ROP) doesn't allow the implementation of non-baseline inspections unless a greater than green finding is identified. Prior to this event, all ROP Performance Indicators were green, indicating a lack of risk-significant issues at Davis-Besse. Following the event, the NRC staff has taken several months to characterize the significance determination process (SDP) risk significance of this Davis-Besse condition. Subsequent to the identification of the Davis-Besse head degradation, Region III invoked Manual Chapter 0350, Oversight of Operating Reactor Facilities in a Shutdown Condition with Performance Problems, without meeting the prerequisites. Specifically, Davis-Besse performance was not degraded into the multiple/repetitive degraded cornerstone, or the unacceptable performance columns of the action matrix. The team concluded that timeliness of completion of risk assessments and the procedural inability to consider a significant issue independent of the recent plant risk history, provided an environment such that this issue could be viewed as significant from a deterministic perspective, yet staff would have limited procedural guidance for further NRC action.

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Limited experience, coupled with the structured nature of the Reactor Oversight Program (ROP), and several Davis-Besse events during 1998, may have led the inspectors to focus on issues and inspection items that they determined to be of greater significance than the symptoms that Davis-Besse was experiencing. Interviews indicated that a significant focus was placed on managing the ROP effort at the site. The inspectors used self-developed programs to monitor both baseline hours and the number of activities sampled. During the 2000 outage, the resident inspector was not yet qualified to perform independent inspections, the senior resident inspector indicated that the training of his resident inspector suffered due to his focus on ROP implementation and the large number of activities that needed to be followed. One of the inspectors conveyed that many things could not be done because the ROP would not allow it. The team concluded that more experience may have allowed the inspectors to recognize the significance of some items such that they could be folded into the ROP for inspection and keep implementation of the ROP during the outage from becoming a distraction.

One of the inspectors conveyed that the ROP limited his ability to spend much time in containment. For two of the interviewed resident inspectors, Davis-Besse was the only reactor containment structure that they had experience inspecting. The team considered their lack of breadth of experience in this area to be a detriment to their ability to make an experience-based judgement or comparison of the equipment condition in the Davis-Besse reactor containment.

ROP Manual Chapter Attachment 71111.20, Refueling and Other Outage Activities, does not specifically require nor recommend a containment structure closeout inspection. This non-routine inspection would be performed as an added component of Manual Chapter 2515, Appendix D, Plant Status, under the Plant Tours section, increasing the number of hours expended for implementation of Plant Status, a non-direct inspection effort, while not reducing the burden of the additionally required 70-100 hours of 71111.20 outage inspection that impacts the resident staff during a scheduled refueling outage. The team concluded that the implementation of the ROP hours and sample sizes, during high activity times, may be a challenge with limited resources.

Review of Manual Chapter 2515, Appendix D, Plant Status, evidenced a lack of specific guidance on the level of detailed review expected for the corrective action documents routinely initiated by the licensee. A senior resident inspector assigned to Davis-Besse indicated in an interview that he was not aware of reactor head boric acid issues; however, a specific Davis-Besse corrective action document (PCAQ 98-0767), which described several fist-sized clumps of boric acid on the head, was written during his tenure. The team concluded that the daily senior resident inspector focus on the licensee's corrective action program was not adequate to ensure that this significant plant issue was identified for review by the inspection program.

NRC enforcement focus was shifted by the risk-impact of the issue and enforcement actions were not implemented consistently due to differing staff views. Enforcement (EA 97-414) was issued citing the Maintenance Rule (10 CFR 50.65) involving Inconel Alloy 600 RCS instrument nozzle

cracking at SONGS 2 and 3 due to a lack of staff support for enforcement against the licensee's Technical Specification for reactor coolant pressure boundary leakage. In addition, the staff issued the citation as a Severity Level IV, versus a Severity Level III when the staff could not come to full agreement. The licensee presented an argument that was focused on nozzle ejection stemming from catastrophic failure rather than from boric acid wastage.

Risk information may be misapplied in various activities. Risk informed regulation of NRC licensed commercial nuclear facilities includes decisions on allocation of inspections, assessment of the risk significance of occurrences, and the assessment of the severity of regulatory violations. Based on interviews with the staff, the team was concerned that risk models do not appropriately account for degradation of passive components. Some of the staff perceived that the NRC has become risk-based as opposed to risk-informed, that issues cannot be pursued without having a risk number attached to them, and that deterministic safety requirements have been discounted.

Lessons learned weren't learned from previous lessons learned reviews (Millstone, IP2, South Texas).

PI&R? No OBF...Bob?

### 3.4.2.2 Recommendations

#### 3.4.2.2.1

#### Recommendations for NRC

The NRC staff should review the risk-informed regulatory framework , clearly define which activities should be addressed by risk-informed methods and which should be addressed by deterministic methods, and establish a means to evaluate the deterministic methods.

Re-evaluation of the implementation of the ROP hours, sample sizes, and resources during high activity times is appropriate.

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PI&R guidance should be strengthened: Handoff of issues to the team; Selection of issues; Review of lic binning

With aging plants, do more inspection hours on passive components

Review inspection expectations during refueling outages...are inspectors spending adequate time in containment

Assess need for improvements in Plant Status inspection module 2515 App D

Provide inspection guidance to address selected industry operational experience

Resurrect 90700

Establish boundaries for use of risk information

Establish basis for using deterministic SDPs

Discussion threshold for mid-cycle/end of cycle  
 review assessment  
 Have 'good practices' in the old inspection  
 program been lost? Go back..  
 Is barrier integrity cornerstone inspection  
 adequate?  
 Develop usable barrier integrity Pis  
 Inspection guidance for outage influences on  
 work scope  
 Fix ROP guidance to not focus solely on "high  
 risk" systems/components  
 More review of containment components -  
 walkdowns  
 Should have independent identification reviewed  
 as part of problems as part of PI&R inspections  
 Do more inside containment inspections as part  
 of License Renewals  
 More discretionary inspection hours in ROP  
 Defibrillate 62001  
 NRC insp guidance for head inspections (similar  
 to Sgs)  
 Consider allowing open items for followup  
 inspections in ROP  
 Initiate GC-specific inspection procedures  
 Incorporate GC references in inspection  
 procedures  
 Revisit the policy of not aggregating risk  
 issues/subparts  
 Use traditional enforcement/deterministic SDP for  
 all cross-cutting issues  
 Assess potential predictive PIs and inspections  
 Implement inspection of ECPs for SCWE  
 Inspection guidance for reviewing entry into  
 LCOs  
 Assess ROP to allow inspection of Tmods,  
 workarounds, etc. even if not on list  
 Review of deferred mods  
 Should review mode restraints  
 Develop guidance to focus on repetitive multiple  
 tasks for significance (ALARA)  
 Focus more inspections on outage periods  
 Inspection guidance to sample licensing requests  
 to understand the basis  
 Followup on cited NOVs  
 Inspection guidance to sample all electronic  
 media (videos, etc)  
 Review ROP guidance for inspecting plant  
 hardware  
 Incorporate guidance for threshold of sensitivity  
 to RCS leakage....absolute value and change  
 trend  
 Review long-term fixes and their basis  
 Inspect commitments and closure (sample  
 commitments)

Document requirements for video/visual exams  
(location, etc.)  
Develop NRC criteria for inspection of industry  
initiatives

3.4.2.2.2

Recommendations for Industry  
None.