



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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May 30, 2003

MEMORANDUM TO: File

FROM: Arthur T. Howell III, Director */RA/*
Division of Reactor Projects

SUBJECT: BRIEFING SLIDES FOR JUNE 5-6, 2003 IAEA/OECD-NEA
WORKSHOP

The attached briefing material will be provided as a handout during a June 5-6, 2003 International Atomic Energy Agency (IAEA) sponsored workshop, which will be held in the IAEA's headquarters office in Vienna, Austria. The focus of the workshop will be on the nuclear safety management and safety culture implications of a number of recent events involving both domestic and foreign facilities. I will use the attachment to provide a presentation on the NRC's Davis-Besse Reactor Vessel Head Degradation Lessons-Learned Task Force Final Report, dated September 30, 2003.

Attachment: As stated

ADAMS: ☒ **Yes** ☐ No Initials: **ATH**
☐ ☒ **Publicly Available** ☐ Non-Publicly Available ☐ Sensitive ☐ ☒ **Non-Sensitive**

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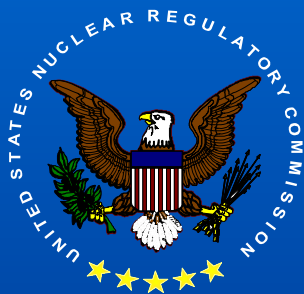
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United States Nuclear Regulatory Commission

Davis-Besse Nuclear Power Station (DBNPS) Reactor Vessel Head Degradation Lessons-Learned

**Presentation
at the**

**Nuclear Safety Management and Safety Culture
Lessons-Learned from Recent Events
IAEA /OECD-NEA Workshop**

June 5-6, 2003

Overview

NRC Lessons-Learned Task Force Background

- NRC has taken the initiative to conduct lessons-learned reviews for significant issues
 - ▶ Self-critical
 - ▶ Improvements made
 - ▶ Examples
 - Indian Point 2 steam generator tube failure (2000)
 - NRC inspections at the South Texas Project (1995)

Overview

Task Force Objectives and Scope

- Perform independent evaluation
- Review
 - ▶ Reactor oversight process
 - ▶ Regulatory processes
 - ▶ Research activities
 - ▶ International practices
 - ▶ Generic issues program
- Identify and recommend improvements

Results

Overall Conclusions

- NRC and U.S. industry recognized potential for this type of condition more than 10 years ago
- Initial conclusion, in the early 1990s, was that vessel head penetration nozzle cracking was not an immediate safety concern
- NRC and DBNPS failed to learn key lessons from past boric acid-induced corrosion events

Results

Overall Conclusions (continued)

- Contributing causes for the lack of prevention
 - ▶ DBNPS failed to assure that plant safety issues would receive appropriate attention
 - ▶ The NRC, DBNPS, and the U.S. nuclear industry failed to adequately review, assess, and follow up on relevant operating experience
 - ▶ The NRC failed to integrate known or available information into its assessments of DBNPS's safety performance

Results

NRC Task Force Assessment of DBNPS

- Nuclear safety management and safety culture implications
 - ▶ Staffing levels
 - ▶ Production emphasis
 - ▶ Symptom-based problem solving
 - ▶ Long-standing equipment problems
 - ▶ Management involvement
 - ▶ Questioning attitude
 - ▶ Engineering rigor

Results

NRC Task Force Assessment of DBNPS

- Nuclear safety management and safety culture implications (continued)
 - ▶ Operating experience awareness
 - ▶ Corrective action program
 - ▶ Employee concerns program (Ombudsman program)
 - ▶ Self-assessments
 - ▶ Procedural compliance
 - ▶ Internal and external communications

Results

NRC Lessons

- Technical and programmatic issues
 - ▶ Significant operating experience involving boric acid leakage and corrosion
 - ▶ Generic communication program implementation
 - ▶ Generic issues program implementation
 - ▶ International operating experience involving pressurized water reactor plants

Results

NRC Lessons

- Technical and programmatic issues (continued)
 - ▶ Assessment and verification of industry technical information
 - ▶ NRC operating experience review and assessment capability
 - ▶ Reactor coolant system leakage assessment
 - ▶ Inspection program implementation

Results

NRC Lessons

- Technical and programmatic issues (continued)
 - ▶ Integration and assessment of performance data
 - ▶ Guidance and requirements
 - ▶ Staffing and resources
 - ▶ Licensing process guidance and implementation

Inspection and Assessment

Indirect Methods

- NRC inspection, assessment and monitoring
 - ▶ Pre-event/condition
 - Problem identification and resolution inspections
 - Safety conscience work environment and employee concerns program inspections
 - Human performance inspections
 - Industry evaluation monitoring
 - Allegation follow up inspections and investigations

Inspection and Assessment

Indirect Methods

- ▶ Post-event/condition
 - Reactive inspections of events and abnormal conditions
 - Supplemental inspections
 - Accident and incident investigations
 - Lessons-learned reviews
 - Oversight of plants in extended shutdowns (Manual Chapter 0350 panel)
 - Enforcement process

Actions

Current and Ongoing Activities

- Actions stemming from DBNPS experience
 - ▶ Assess Davis-Besse corrective actions by means of an oversight panel (Manual Chapter 0350), including DBNPS's actions to improve and assess its safety culture
 - Internal review process
 - External review process
 - Long-term review process

Actions

Current and Ongoing Activities

- Actions stemming from DBNPS experience (continued)
 - ▶ Assess current condition of DBNPS's
 - Employee concerns program
 - Safety conscious work environment
 - Safety conscious work environment review team

ACTIONS

Current and Ongoing Activities

- Actions stemming from DBNPS experience (continued)
 - ▶ Enhance inspection guidance, including providing additional focus on potential influences and indicators
 - ▶ Monitor industry assessment initiatives implemented in response to the DBNPS condition
 - ▶ Monitor international efforts to measure and regulate safety culture, particularly the development of objective measures

Other Actions

Technical and Programmatic Actions to Address Lessons-Learned Task Force Recommendations

- Approximately 50 recommendations are being addressed by four action plans
 - ▶ Stress corrosion cracking
 - ▶ Operating experience
 - ▶ Inspection, assessment, and project management guidance
 - ▶ Barrier integrity requirements

Other Actions

Technical and Programmatic Actions to Address Lessons-Learned Task Force Recommendations

■ Short-term actions

- ▶ Conduct enhanced inspections of reactor vessel head penetrations, including increased NRC inspection oversight
- ▶ Conduct an assessment of operating experience programs
- ▶ Assess a sample of licensee actions in response to other operating experience

Other Actions

Technical and Programmatic Actions to Address Lessons-Learned Task Force Recommendations

- Short-term actions (continued)
 - ▶ Conduct a survey of reactor coolant system leakage detection methods and leakage rates
 - ▶ Enhance inspection and project management guidance
 - ▶ Revise currently planned actions, as appropriate, on the basis of the implications of the South Texas Project bottom mounted instrumentation nozzle cracking

Other Actions

Technical and Programmatic Actions to Address Lessons-Learned Task Force Recommendations

■ Long-term actions

- ▶ Revise requirements for inspection of pressure boundary components
- ▶ Conduct research activities
- ▶ Evaluate state-of-the-art systems capable of detecting leaks and cracks
- ▶ Assess leakage rate requirements
- ▶ Review and improve barrier integrity performance indicators

Closing Remarks

Summary

- The NRC conducted a comprehensive, self-critical assessment of its regulatory processes as a result of the DBNPS degraded reactor vessel head
- Nuclear safety management and safety culture implications stemming from DBNPS condition are being addressed
 - ▶ NRC Manual Chapter 0350 oversight panel assessments
 - ▶ U.S. industry assessment initiatives
 - ▶ NRC inspection guidance enhancements (indirect)