

U.S. Nuclear Regulation Emerging Issues



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Discussion Topics

- NRC and industry response to 9/11/01 event
- Key operational issues
 - ▶ Overall industry performance
 - ▶ Revised oversight program
 - ▶ CRDM nozzle circumferential cracking
- U.S. industry outlook
 - ▶ License renewal
 - ▶ Power uprates
 - ▶ New reactors
- High-level waste

NRC and Industry Response to 9/11/01 Event

Immediate Actions

- Activated Emergency Operations Center in headquarters and in all four regional offices
- Immediately advised licensees to go to the highest level of security, which all did promptly
- Established communications with FBI, DOE, FEMA and others
- Dispatched staff to FBI's Strategic Information Operations Center
- Established communications with nuclear regulators in Canada and Mexico

NRC and Industry Response to 9/11/01 Event

Long-Term Response

- No credible specific or general threats against NRC-licensed facilities
- Maintain heightened security posture as long as necessary
- Chairman tasked staff to re-evaluate security requirements and programs

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Key Operational Issues

Revised Oversight Program - Elements

- **Baseline inspections**
 - ▶ Indicative not diagnostic
 - ▶ Risk-informed
 - ▶ Minimum conducted at all reactor facilities
 - ▶ For areas (cornerstones) not completely covered by performance indicators
- **Supplemental inspections - Performed as a result of risk-significant performance issues that are identified by either performance indicators, baseline inspections, or event analysis**

Key Operational Issues

CRDM Nozzle Circumferential Cracks

- **Have observed circumferential cracks in CRDM nozzles at Oconee 2 & 3, and Crystal River 3**
- **Issued NRC Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles" August 3, 2001**
- **Received Bulletin responses September 4, 2001**
- **Actions expected of licensees depends on how similar operational history is to Oconee 3**

U.S. Industry Outlook

Industry Estimated Needs For New Electrical Generation

- **NEI estimates that 60,000MWe of new nuclear generation needed by 2020**
 - ▶ 10,000MWe from power uprates
 - ▶ 50,000MWe from new nuclear power plants

U.S. Industry Outlook

Power Uprates

- **Since 1977, have added about 2,600MWe through power uprates**
- **Currently reviewing uprates totalling about 1,200MWe**
- **NEI estimates another 10,000MWe in power uprates through 2020**
- **Three categories of power uprates**
 - ▶ Measurement uncertainty recapture: <2% increase
 - ▶ Stretch: <7% increase
 - ▶ Extended: up to about 20% (major plant mods)

U.S. Industry Outlook

Power Reactor License Renewal

- Original licenses issued for 40 years
- Renewal process includes technical and environmental reviews
- Technical review is focused on managing aging of long-lived structures, systems, and components
- Now expect almost all plants to renew licenses

- Insert graphic of impact on generating capacity if licenses renewed

U.S. Industry Outlook

Currently Certified Designs

- Advanced Boiling Water Reactor - GE Nuclear Energy Design Certification, effective June 11, 1997
- System 80+ Standard Plant Design - Westinghouse Design Certification, effective June 20, 1997
- AP600 Standard Plant Design - Westinghouse Design Certification, effective January 24, 2000

U.S. Industry Outlook

Designs Under Review or Proposed

- AP1000 Standard Plant Design - Westinghouse, pre-application review
- PBMR Pebble Bed Modular Reactor - Exelon, pre-application review
- GT-MHR Gas Turbine-Modular Helium Reactor, potential FY2002 pre-application
- IRIS International Reactor Innovative and Secure -Westinghouse, potential FY 2002 pre-application

U.S. Industry Outlook

NRC Efforts to Prepare for New Reactors

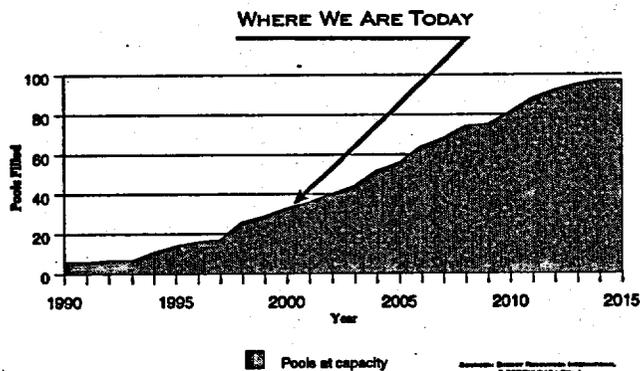
- New organizations created in RES & NRR
- Primarily in planning phases, estimating resource requirements to meet industry projected schedule
- Much work to be done
 - Regulatory framework - improvements to Part 52 and potentially new Part (risk-informed)
 - Many technical issues to resolve
 - New fuels (PBMR, GT-MHR)
 - Graphite structures (PBMR, GT-MHR)
 - Gas turbines (PBMR, GT-MHR)
 - Long fuel cycle (IRIS)
 - Integral RCS (IRIS)

U.S. Industry Outlook

Reactivation of Existing Sites

- WNP-1: Decision expected this year (\$4.2B est.)
- Watts Bar - 2
- Bellafonte - 1 & 2
- Browns Ferry - 1 (has OL)

High-Level Waste Projected Loss of Full Core Reserve



HLW-Geologic Repository Status

- EPA issued final generally applicable HLW standard in June 2001
- DOE potentially issues site recommendation to U.S. President in early 2002
- Events related to potential site recommendation
 - NRC issues sufficiency comments to DOE
 - DOE issues final environmental impact statement
 - DOE issues final siting guidelines
 - NRC issues final regulations consistent with EPA HLW standard
- If site recommended to President, DOE submits license application for HLW repository construction and authorization as early as 2003

Summary

- **Response to 9/11 event affecting organization in many areas over long term**
- **Tackling diverse issues in a rapidly changing environment**
- **Prepared for new plant orders**