



# **OVERVIEW OF THE OPERATING REACTORS BUSINESS LINE**

**July 7, 2016**

**Michael Johnson**

**Deputy Executive Director for  
Reactor and Preparedness Programs**

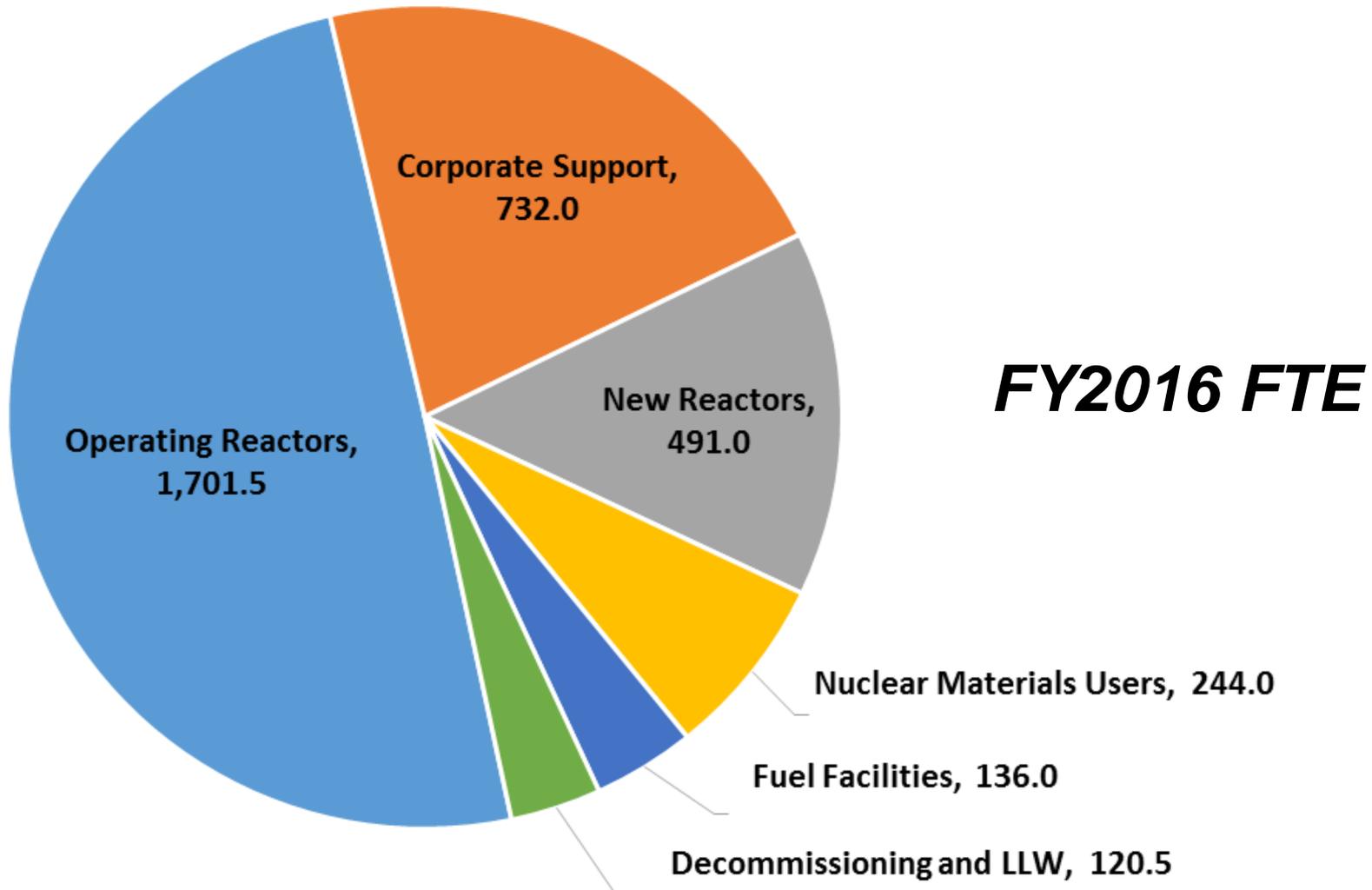
# **Program Overview**

**Bill Dean**

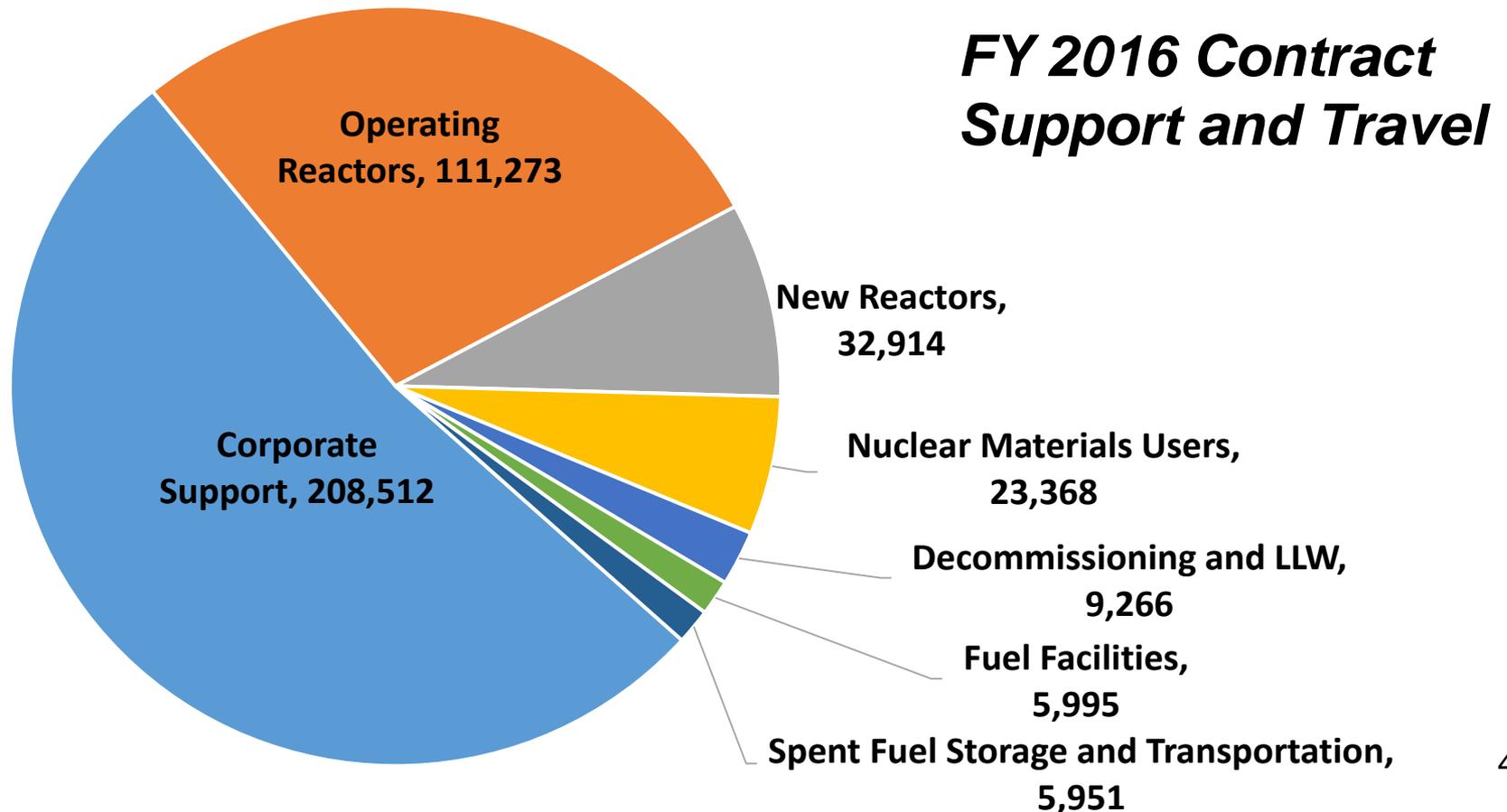
**Director**

**Office of Nuclear Reactor  
Regulation**

# About Half of the NRC Staff Works on Operating Reactors



# About a Quarter of the NRC's Budgeted CS&T Supports Operating Reactors



# **NRC Conducts Thorough and Responsive Oversight**

- **Conducted ~ 260,000 inspection hours**
- **Completed 564 LAs and 547 OLTs**
- **Conducted 5 SITs**
- **Completed 8 supplemental inspections**
- **Opened 231 and closed 243 allegation cases**

# **Activities that Enhance Safety and Extend Plant Life**

- **Compliance with Fukushima Orders – all 62 audits completed**
  - **Mitigating Strategies – 68 units**
  - **SFP Instrumentation – 89 units**
  - **TI-191 Inspections – 6 sites**
- **Renewed Licenses**
  - **Byron 1&2**
  - **Davis Besse**
  - **Braidwood 1&2**

# **Rule and Guidance Updates Focusing on Safety Issues**

- **15 Rulemaking Activities**
  - **2 Proposed Rules published**
  - **1 Advance Notice of Proposed Rulemaking published**
- **Generic Correspondence**
  - **9 Information Notices issued**
  - **13 Regulatory Information Summaries issued**
  - **1 Generic Letter issued**
  - **5 Regulatory Guides published**

# **The Staff Is Engaging the Commission on Policy Issues**

- **Fukushima Tier 2 and 3 Papers (SECY-15-0137, 16-0041, and 16-0074)**
- **Open Phase (SECY-16-0068)**
- **Digital I&C (SECY-16-0070)**
- **NRR/NRO Merger (SECY-16-0075)**

# **Major Licensing Accomplishments**

- **Licensing and safe startup of Watts Bar 2**
- **Issuing the SHINE construction permit**
- **Renewing licenses for 5 units**
- **Workload management**

# **Other Significant Accomplishments**

- **Completing draft of CNS National Report**
- **Improving the operator licensing program**
- **Enhancing the Reactor Oversight Process**
- **Closing generic issue on boiling water reactor emergency core cooling system suction (GI-193)**

# **Several Technical Challenges Face the Business Line**

- **Using risk insights in making decisions**
- **Enhancing safety focus of technical reviews**
- **Implementing Digital I&C Action Plan**
- **Completing remaining Fukushima activities**
- **Preparing for subsequent license renewal**

# **Additional Focus on Organizational Challenges**

- **Managing workload changes**
- **Restructuring NRR**
- **Potentially merging NRR and NRO**
- **Implementing enhancements to the  
Reactor Oversight Process**

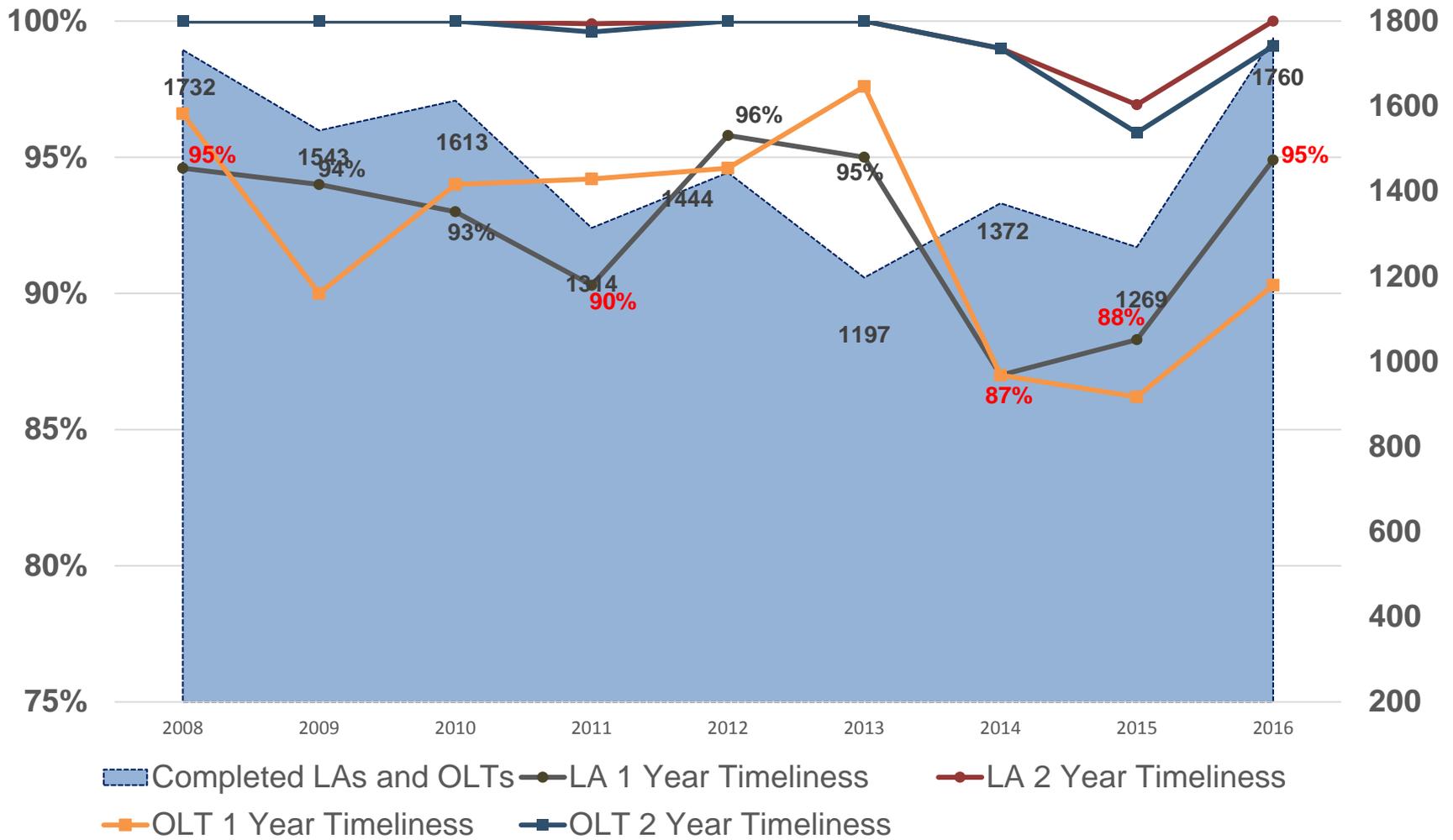
# **Licensing Topics**

**Anne Boland, Director**  
**Division of Operating Reactor**  
**Licensing**  
**Office of Nuclear Reactor**  
**Regulation**

# **Significant Reactor Licensing Accomplishments**

- **Seamless transfer of Vermont Yankee, Crystal River, and SONGS to Decommissioning and Low Level Waste Business Line**
- **Completion of complex licensing actions (e.g., NFPA-805)**
- **Reduction of licensing actions > 12 months old**

# Substantial Progress in Licensing Timeliness and Completions



# **Strengthened Workload Management**

- **Applied additional resources**
- **Greater management oversight on workflow process**
  - **Periodic status meetings**
  - **Lessons learned on specific licensing actions**
  - **Review of licensing and acceptance review processes**

# **Updating Data Management and Tools**

- **Replacement Reactor Program System (RRPS)**
- **Procedure revision**
- **Workload forecasting - RIS 2015-16**

# **Revised Expectations to Staff**

- **Re-emphasized process adherence and incorporated lessons learned**
- **Clarified process for requests for additional information**
  - **Draft SE prior to RAI issuance**
  - **Consideration of alternatives**
  - **Enhanced management involvement**
  - **Review of responses for scope changes**

# **Rebaselining – Efficiency Efforts in Progress**

- **Eliminated commitment audits and UFSAR Reviews**
- **2.206 process enhancements**
- **Implementing electronic correspondence and concurrence**
- **Streamlined briefing packages**

# **Changing Environment Creates New Opportunities**

- **Aligning the organization for future work**
- **Continuing to identify licensing process efficiencies in order to sustain performance**
- **Harmonizing processes and procedures between operating and new reactors**
- **Integrating greater use of risk insights into processes and procedures**
- **Maintaining focus on safety, security, and preparedness**

# **A Risk-Informed Approach for Addressing Low Risk Compliance Issues**

**Rob Elliott**

**Division of Safety Systems**

**Office of Nuclear Reactor  
Regulation**

# **Continued Progress Integrating Risk-Informed Decision-making**

- **Current risk-informed programs:**
  - **Reactor Oversight Program**
  - **Risk-informed completion time and surveillance frequency control programs**
  - **Notices of enforcement discretion**
- **Some licensing basis design issues are not immediate safety concerns**
- **TS-driven urgency to resolve these issues may not result in best solution or use of staff and licensee resources**

# Applying Risk-Informed Solutions

- **Tornado Missile Protection:**
  - **Generic problem identified**
  - **Low probability event**
  - **Significantly lower probability of loss of safety function**
  - **Timely compliance concerns drove plant and NRC response actions**
- **Solution:**
  - **Enforcement Guidance Memorandum (EGM) 2015-002**
  - **Risk informed to allow appropriate time to take corrective actions**



# **A New Risk-Informed Regulatory Tool is Under Consideration**

- **Applying TS completion times to low risk, low safety-significant design issues can lead to unnecessary regulatory burden**
- **Working group with staff from NRR, OGC, OE, and the Regions**
- **Considering a new plant-specific process:**
  - **Evaluation of risk, defense-in-depth, safety margins, compensatory measures and risk management actions**
  - **Potential for enforcement discretion**
- **Stakeholder involvement during process development**

# Potential Benefits

- **Implement timely corrective action commensurate with safety significance**
- **Ensure continued safe operation**
- **Focus resources on safety significant issues**
- **Complementary to existing regulatory processes**
- **Consistent with existing Enforcement Policy**

# Next Steps

- **Continue consideration of a new risk-informed process that:**
  - **addresses low risk/low safety significance design issues affecting operability**
  - **potentially utilizes enforcement discretion**
  - **ensures safe operation while the licensee implements corrective action**
- **Continued stakeholder engagement**
- **Keep Commission informed**

# **Regional Perspective**

**Len Wert, Deputy Regional  
Administrator for Operations  
Region II**

# Regional Focus on Safety

- **Maintaining Vigilance**
- **Identifying Issues**



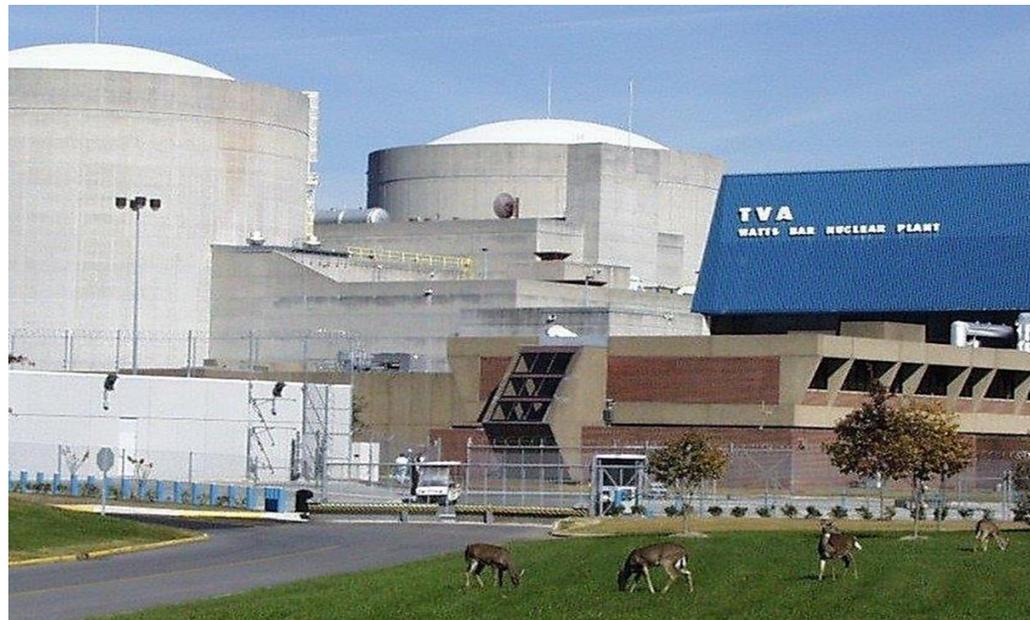
# ROP Provides Framework for Assuring Safety



- **Effective Oversight**
- **Program Refinement**
- **Reliability/ Consistency**

# Regional Sites with Special Focus

- **Units in Column 4**
- **Watts Bar 2**



# **Regional Implementation of Specialized Inspections**

- **Fukushima**
  - **14 TI 191 inspections planned or completed**
  
- **Cyber Inspections**
  - **Milestone 8 inspections 2017**

# **Our Employees: Vital to Success**



- **Maintaining Capacity and Expertise**
- **Resource Sharing**
- **Enhancing Flexibility**

# Effectively Managing Change

- **Changes:**
  - **Activities**
  - **Staffing and Organization**
- **Employee Engagement**

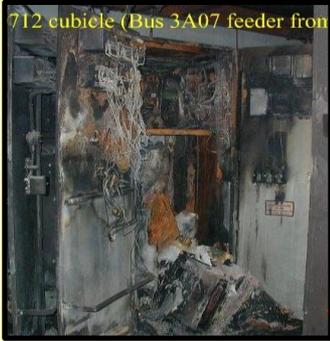


# **Ensuring Safety Through Research**

**David L. Rudland, Branch Chief  
Division of Engineering  
Office of Nuclear Regulatory  
Research**

# Research Confirms Safety

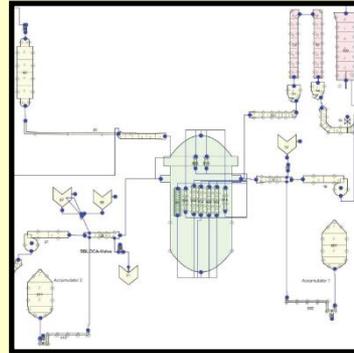
712 cubicle (Bus 3A07 feeder from



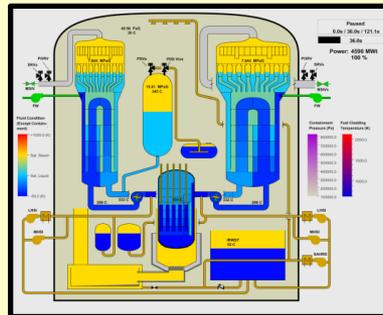
## High Energy Arc Faults



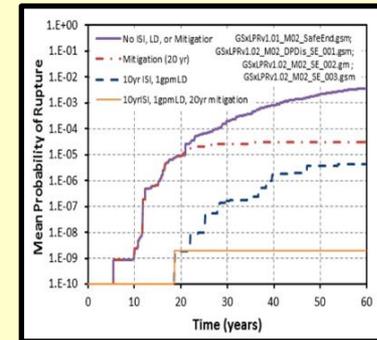
## Flooding



## Thermal Hydraulic Analyses



## Severe Accident Analyses



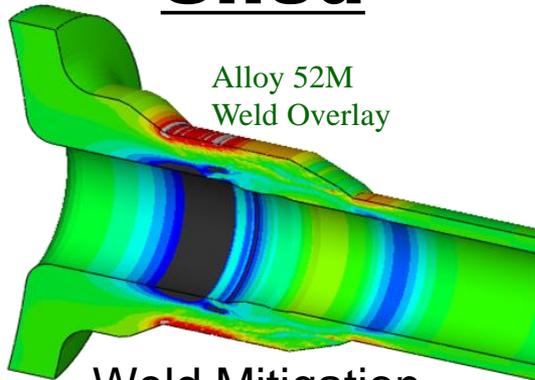
## Integrity Analysis Tools



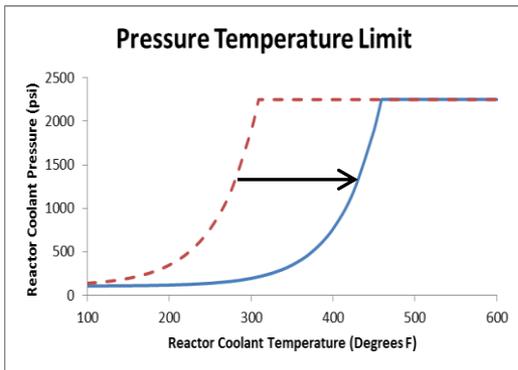
## Digital I&C

# Implementing Re-Baselining

## Shed



Weld Mitigation  
Technical Basis



Part 50  
Appendix G  
Technical Basis

## Impact

Reduced analyses  
for evaluating new  
techniques

Forgo plans to  
update Appendix G

## Path Forward

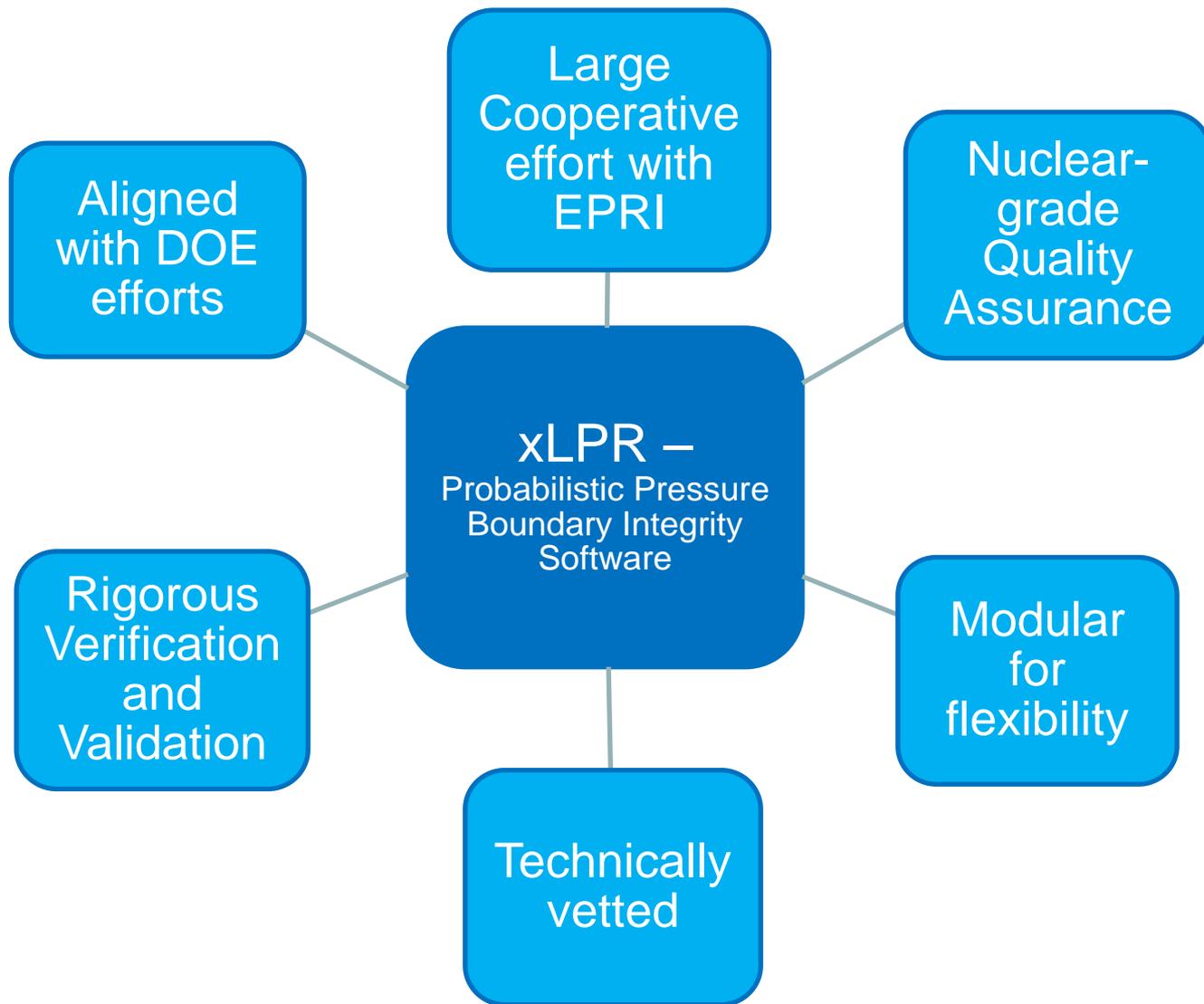
Evaluate using  
existing expertise  
and experience

Continue to  
Implement existing  
requirements

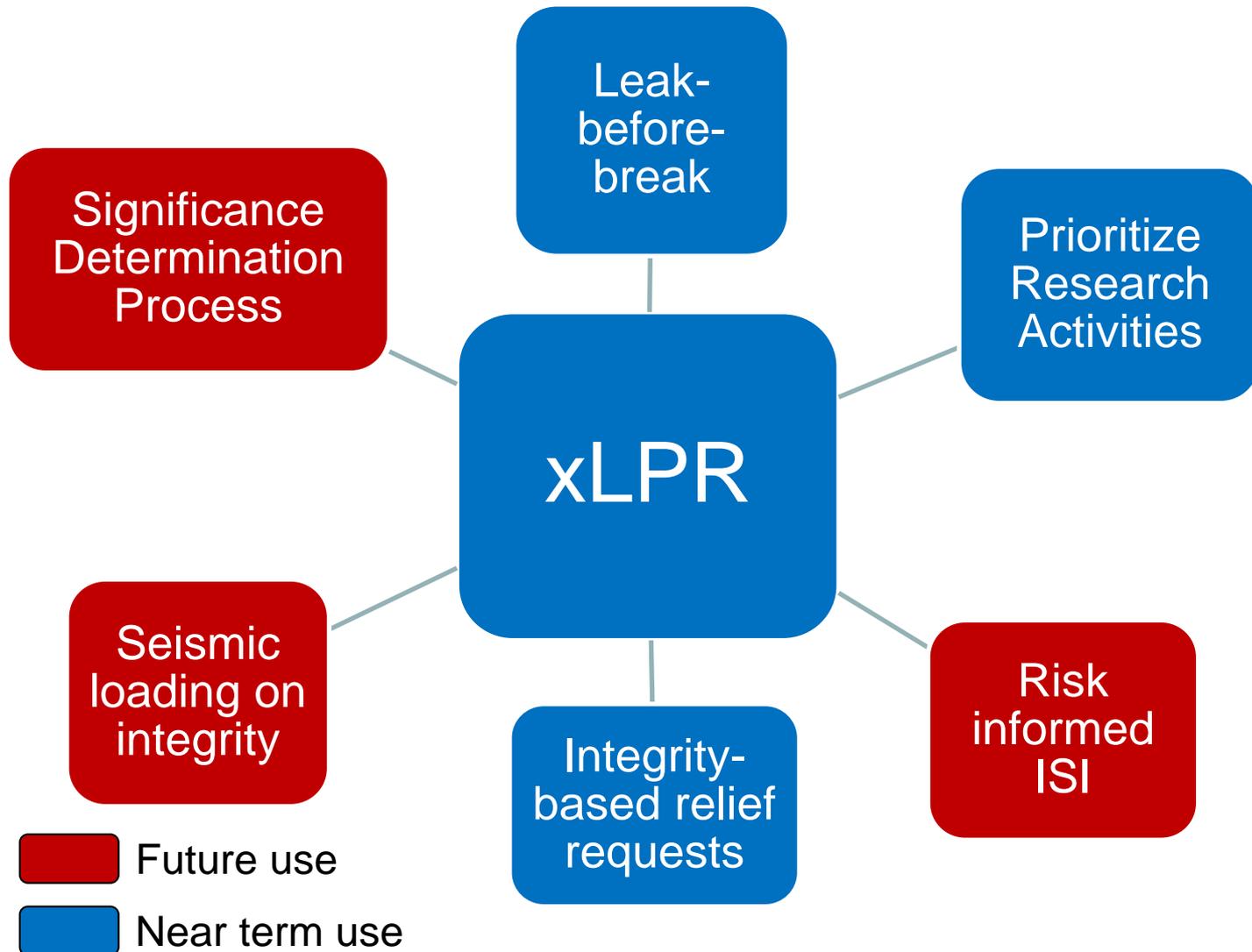
# **Ensuring Piping Integrity**

- **PFM analyses not standardized**
  - **Computer codes written for case specific application**
- **10 CFR 50, App A, GDC 4**
  - **No active material degradation**
  - **Leak-before-break (LBB)**
  - **No quantitative probabilistic solution available**

# Developing Robust Analysis Tools



# Using xLPR to Ensure Safety



# **Rolling Out xLPR Soon**

- **Production version (2.0) to be released in Aug 2016**
  - **Currently undergoing verification and validation**
- **xLPR maintenance program under development**
  - **Establishing a Users Group**
- **Future Plans**
  - **LBB Sensitivity studies in 2017**
  - **Regulatory guidance in 2018**

# **Security and Incident Response Activities in Support of the Business Line**

**James Andersen, Director  
Cyber Security Directorate  
Office of Nuclear Security and  
Incident Response**

# **Cyber Security Regulatory Structure Has Been Enhanced**

- **Staff has endorsed Nuclear Energy Institute (NEI) guidance document, NEI 13-10, Revision 4**
- **Industry has implemented Milestones 1-7 of their cyber security plans**
- **Addressing generic inspection issues**

# **Additional Cyber Security Enhancements Will Be Implemented**

- **Preparing for Milestone 8, full implementation of the cyber requirements**
- **Engaging stakeholders to improve consistency of implementation**
- **Issued cyber security notification rule and guidance**

# **Improving Emergency Preparedness Licensing Effectiveness**

- **Working with NRR and the industry**
- **Maintaining licensing action submittal plan as a living document**
- **Identifying problem areas and the need for additional guidance**

# Summary

- **Executing a business line with has large breadth and scope**
- **Responding to challenging environment with creativity and dedication**
- **Ensuring safety and security for the future**

# **List of Acronyms**

- **CFR – Code of Federal Regulations**
- **CNS – Convention on Nuclear Safety**
- **CS&T – Contract support and travel**
- **DOE – Department of Energy**
- **EPRI – Electric Power Research Institute**

# **List of Acronyms (cont'd)**

- **FTE – Full Time Equivalent**
- **FY – Fiscal Year**
- **GDC – General Design Criteria**
- **I&C - Instrumentation and Control**
- **ISI – In-service Inspection**

# **List of Acronyms (cont'd)**

- **LA – Licensing Action**
- **LBB – Leak Before Break**
- **LOCA – Loss of Coolant Accident**
- **MBDBE – Mitigation of Beyond Design Basis Event**
- **NFPA – National Fire Protection Association**

# **List of Acronyms (cont'd)**

- **NRO – Office of New Reactors**
- **NRR – Office of Nuclear Reactor Regulation**
- **OE – Office of Enforcement**
- **OGC – Office of General Counsel**
- **OLT – Other Licensing Task**

# **List of Acronyms (cont'd)**

- **PFM – Probabilistic Fracture Mechanics**
- **PWSCC – Primary Water Stress Corrosion Cracking**
- **RAI – Request for Additional Information**
- **RIS – Regulatory Issue Summary**

# **List of Acronyms (cont'd)**

- **ROP – Reactor Oversight Process**
- **SE – Safety Evaluation**
- **SFP – Spent Fuel Pool**
- **SIT – Special Inspection Team**
- **SONGS – San Onofre Nuclear Generating Station**

# **List of Acronyms (cont'd)**

- **TI – Temporary Instruction**
- **TS – Technical Specifications**
- **UFSAR – Updated Final Safety Analysis Report**
- **xLPR – Extremely Low Probability of Rupture**