

# NEAC Subcommittee on NE Nuclear Operations and Management

***Presented to the Nuclear Energy Advisory  
Committee***

Dennis Miotla,  
Office of Nuclear Energy Deployment  
Office of Nuclear Energy

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# Request to Establish a Standing Subcommittee

## Subcommittee on Office of Nuclear Energy (NE) Nuclear Operations and Management

- Provide independent review and recommendation on NE's nuclear operations and facility program management activities
- Advisory activities may include the following;
  - Evaluation of program development strategies
  - Evaluation sub-elements (LEP, NSUF, SMI, MFC Upgrades)
  - Review of specific facility and equipment projects



## First Task - Review Ongoing Advanced Test Reactor (ATR) Improvement Initiatives

- Review the Idaho National Laboratory (INL) ATR Life Extension Project (LEP) and Safety Margin Improvement (SMI) initiatives
  - LEP; return the ATR plant and supporting systems, and documentation to its originally intended conditions
  - SMI; make the ATR more contemporary with commercial nuclear safety practices



## Why the Current Attention on the ATR?

- ATR is a critical nuclear R&D capability
- ATR is aging and NE needs to be correctly focusing resources on maintaining this capability
- Customer base and demand for services is increasing and reaching capacity
  - National Scientific User Facility (NSUF)
  - Nuclear Energy R&D increasing



## Expected Outcome (s) of LEP and SMI Review

- Asses and comment on LEP and SMI Programs
- Suggest additional needs or opportunities
- Familiarization with current state of ATR and recommendations for additional advisory reviews

# LEP Background and Status

## Key LEP Accomplishments: FY 2006 thru FY 2008

- **Design Basis Reconstitution: assessment completed 3/2008**
  - Identified 136 GAPS
  - Developed 23 technical and functional requirement documents
- **Material Condition Assessment: assessment completed 9/2008**
  - Developed 84 maintenance recommendations to augment current ATR maintenance and update programs (Material Condition and Aging Management Program)
  - Established primary coolant system baseline material condition
  - Inspected primary/secondary sides of 3 of 5 primary coolant system heat exchangers
- **Seismic Assessment: completed 9/2008**
  - 1 ATR outage to correct identified deficiency
  - 22 remaining issues of lower significance
- **Probabilistic Risk Assessment Upgrade Project: on-going thru FY 2011**

## LEP FY 2009 thru FY 2015

- Close remaining 68 design basis reconstitution Gaps
- Address 84 MCA recommendations- replace unsupported equipment and systems (vendors no longer available)
  - Instrument and Control Systems
  - Electrical Distribution Systems
  - Mechanical Components
- Qualify safety related equipment to the accident environment
- Qualify remaining seismic category 1 structures, systems, and components (SSCs) to current standards
- Establish a ASME compliant, risk-informed in-service inspection program

# SMI Background and Status

- BEA established the ATR Advisory Review Panel (AARP) to review the current safety basis of the ATR and develop recommendations for improvements to the ATR
- Report published in March 2006 performed a comparison of the current safety basis of the ATR against more contemporary standards resulted in recommended improvements to the ATR:
  - Improved emergency core cooling capability
  - Provide appropriate containment/confinement and ventilation system
  - Provide control room habitability during postulated accidents
  - Improve overall response during loss of coolant accident (LOCA) and loss of flow accidents (LOFA)



# SMI Background and Status

- Review Panel re-convened in February and December 2008 to review the status of LEP work performed to-date addressing prior Panel recommendations for upgrade of the ATR
  - **Important progress has been made in defining the technical basis for analyses supporting functional and performance requirements for the primary cooling system**
    - ◆ **Primary cooling system baseline material condition**
    - ◆ **Development of leak-before break and transition break size methodology**
  - **Newly revised source term analyses for the maximum hypothetical accident suggest alternative approaches to achieving improved containment/confinement performance and to ensuring a habitable control room during the response to design basis events**
- Current emphasis on development of a fully integrated Life Extension Project scope including safety margin improvement
- Results and Analyses are being integrated with LEP scope as predecessor activities