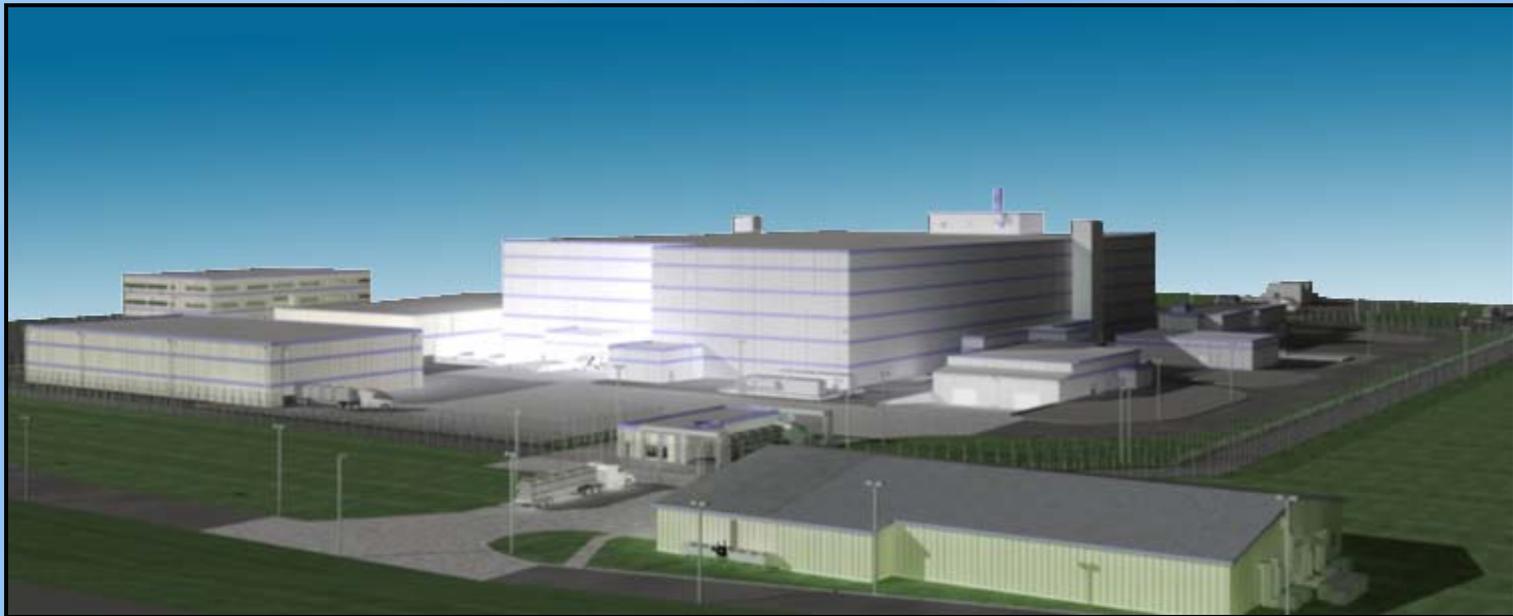


# DOE 2010 ISM Champions Workshop

## The Safety Component of Design for the MOX Fuel Fabrication Facility (MFFF)



ISA: Fire Safety at MFFF

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## Presenter

- Tom Henry is a nuclear engineer in the Nuclear Safety Group working on the MOX Project for Shaw AREVA MOX Services here at Savannah River Site (SRS). He is an employee of AREVA Federal Services. He has worked on the MOX Project since 1999.
- Mr. Henry has 35 years of experience in the nuclear field. Mr. Henry supports updates to the Integrated Safety Analysis, the License Application, and the Fire Nuclear Safety Evaluation for the MOX Fuel Fabrication Facility (MFFF) under construction at SRS. Mr. Henry has lived in Aiken and supported projects at SRS since 1989.

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# Overall Approach to Fire Safety Analysis: Two Paths

- Preliminary Hazards Analysis>  
Preliminary Accident Analysis>  
Dose Consequence Analysis>  
Fire Nuclear Safety Evaluation
- Fire Hazards Analysis>  
Fire Frequency Evaluation>  
Fire Nuclear Safety Evaluation

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## Fire NSE Preparation

- Preliminary Hazards Analysis used to identify hazards and fire events
- Preliminary Accident Analysis initially documented event scenario consequences for Safety Assessment of Design Basis
- Subsequent dose consequence calculation established maximum doses for fire events for ISA Phase

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## **Fire NSE Preparation (Cont'd)**

- Characterized safety strategy for fire events: prevention or mitigation
- Selected Items Relied on for Safety (IROFS) for fire events  
(active or passive engineered controls and administrative controls)
- Described the IROFS
- Demonstrated IROFS reliability

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# IROFS Reliability Demonstration

Qualitative methods are used to establish that the identified IROFS are of sufficient reliability to satisfy the performance requirements of 10 CFR §70.61.

All fire event sequences shall be made highly unlikely to exceed the criteria of 10 CFR §70.61 with the application of the cited IROFS.

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## **IROFS Reliability Demonstration** (Cont'd)

The following criteria form the basis for the IROFS reliability demonstration:

- Application of single failure criterion
- Application of industry codes and standards
- Application of the MOX Project Quality Assurance Program
- Application of management measures.

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# Fire Hazards Analysis

- Demonstrate multiple levels of fire protection
- Identify measures for prevention and mitigation
- Identify fire areas
- Demonstrate adequacy of fire barriers

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## FHA Supports the Fire NSE

- Demonstrates that the multiple levels of fire protection provided ensure adequate MFFF protection from fires
- Analyzes the potential fires at MFFF. This includes areas where measures have been taken to prevent fires from occurring (Aqueous Polishing (AP) process cells) and areas where fires can occur, but measures have been taken to mitigate their effects.
- Identifies the fire areas throughout the MFFF for limiting fire spread, protecting personnel, and limiting consequential damage.
- Demonstrates the adequacy of fire barrier walls, floors, and ceilings in concert with heating, ventilation, and air conditioning (HVAC) systems to confine design basis fires.

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## **FHA Supports the Fire NSE (Cont'd)**

- NSE Fire Events and FHA Fire Areas are Cross-referenced.
- Fire Frequencies for FHA Fire Areas are quantitatively assessed.
- FHA does not identify IROFS.
- FHA does note presence of IROFS in a Fire Area.

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## Summary

- The Fire NSE incorporates the results of the PHA and the FHA to demonstrate that the performance requirements of 10 CFR §70.61 are satisfied.
- This demonstration includes identifying the safety strategy for each fire event scenario and the IROFS required implementing the strategy.
- IROFS designation has impact on design.

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