

H-Canyon Documented Safety Analysis (DSA)

David Welliver

Nuclear Material Disposition Nuclear & Criticality Safety Area Project Manager
Savannah River Nuclear Solutions, LLC
September 28, 2010

SRS Citizen's Advisory Board
Charleston, SC

Purpose

- As requested by SRS CAB Recommendation #259 -- provide an update on H-Canyon's Documented Safety Analysis (DSA) Upgrade status

Background

- DOE directed SRNS, on July 2, 2008, to upgrade the H-Canyon safety analysis to be consistent with DOE-STD-3009 format and content to support H-Canyon operating schedule

Timeline

- SRNS submitted the upgraded DSA to DOE in March 2009
- DOE comments received in September 2009
- Comments incorporated and revised DSA submitted to DOE in April 2010
- DOE approved DSA on May 28, 2010
- Implementation of DSA scheduled for September 30, 2010

Development of DSA

- Supporting documentation developed using latest methodologies
 - New hazard analysis developed
 - New accident analyses developed for all credible accidents
 - New criticality analysis developed

Technical Safety Requirement (TSR) Controls

- **TSR controls selected using preferred hierarchy**
 - Engineered controls vs. administrative controls
 - Passive controls vs. active controls
 - Preventive controls vs. mitigative controls
- **All accidents prevented or mitigated such that the facility can be operated without undue risk to the public, workers, and the environment**

Examples of Control Improvements

- **Safety-Class Evaporator interlocks**
 - Prevent red oil reactions with redundant systems
- **Vessel air purge system**
 - Prevent hydrogen explosions in process vessels
- **Seismic air purge system**
 - Prevent hydrogen explosions following seismic event
- **H-Canyon exhaust ventilation modifications**
 - Ensures adequate ventilation following seismic event

DOE Review/Approval Process

- DOE assembled a review team of 25 scientists and engineers to review the DSA and TSR
- DOE performed an in-depth review of the accident analysis and the control sets developed to prevent and mitigate the accidents
- No DOE comments called into question the validity of the underlying hazard and accident analysis or control selection
- Comments primarily focused on:
 - Level of detail in Chapter 2, 4 & TSR Bases
 - Linkage between hazard analyses, DSA and TSRs
- Established joint DOE/SRNS reviews to facilitate completion

Activities Analyzed by DSA

- Processing of used fuel
- Processing of unirradiated uranium materials
- Processing of plutonium materials
- Processing of uranium, plutonium, and neptunium solutions
- Processing of laboratory sample returns from SRS analytical laboratories
- Repackaging of transuranic (TRU) waste containers (ARRA)

Key Implementation Activities

- Modifications to plant systems and equipment to support DSA and new TSR controls
- Training of operators, engineering, support personnel
 - On-the-job training, briefings, classroom training
- Procedure revisions
 - Over 400 procedures revised to implement new DSA
- Implementation plan and activities coordinated by senior SRNS manager

Assessment of Readiness

- **Eighteen functional areas assessed**
- **Three independent assessment teams:**
 - Management self-assessment - Complete
 - Facility self-assessment - Complete
 - Readiness assessment – Started September 18, 2010
- **Assessment lines of inquiry included:**
 - Technical information
 - Facility systems
 - Level of knowledge
- **Goal is to declare readiness by September 30, 2010**

Assessment Functional Areas

- Design
- Construction
- Training & Qualification
- Safety Documentation
- Environmental Protection
- Quality Assurance
- Maintenance
- Radiation Protection
- Fire Protection
- Emergency Preparedness
- Review, Assessment & Oversight
- Nuclear Criticality Safety
- Testing
- Safeguards & Security
- Packaging & Transportation
- Occupational Safety & Health
- Conduct of Operations
- Waste Management