Criticality Safety Engineer Training at Savannah River Nuclear Solutions LLC

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Nuclear & Criticality Safety Engineering
Savannah River Nuclear Solutions, LLC
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Outline

• History/Background

• SRNS Criticality Safety Engineer (CSE) Training & Qualification (T&Q) Program Overview
  – Qualification Levels and Flow Path
  – Qualification Level Requirements
  – Program Administration
  – Maintaining Qualification

• Lessons Learned
History/Background

- SRNS New M&O Contractor at SRS August 2008
- Criticality Function Brought Back Onsite
- Need for SRNS Criticality Safety Engineer (CSE) Training & Qualification (T&Q) Program
- Reliance on Previous Contractor CSE T&Q Program until SRNS Program Developed and Implemented
SRNS CSE T&Q Program Overview

- SRNS Criticality Safety Engineer Training and Qualification Program Description document Approved March 2009
- Compliance with ANSI/ANS-8.26-2007
- Qualification Consists of Combination of the Following:
  - Formal Education
  - Required Reading
  - On The Job Training
  - Continuing Training
  - Professional Development
Facility Options (at least one):
- F/H LAB
- H-Canyon
- HB-Line
- K-Area
- L-Area
- SRNL
- SW Handling
- LWO
- P&T
- General

Qualification Levels and Flow Path

Associate CS Engineer
CS Calculation Specialist
CS Officer
CS Engineer
AND
Senior CS Engineer
Associate Criticality Safety Engineer

• **Required Reading**
  – DOE Orders and Standards
  – ANSI/ANS Standards
  – Guides
  – Other Criticality References
  – Site Specific Information

• **Tour Facility**
• Read 3 Assigned NCSEs

• Classes/Competencies
  – Fission Process, Radiation Interaction with Matter, and Neutron Absorbers
  – Nondestructive Assay (NDA) and Accountability Practices
  – Hand Calculation Method
  – NCSEs and Functional Classification
  – Site Technical Engineering Staff Classes

• Written Exam or Oral Board
Criticality Safety Officer

• **Required Reading**
  – DOE Orders and Standards
  – ANSI/ANS Standards
  – Guides
  – Other Criticality References
  – Site Specific Information

• **Tour of Facility**
Criticality Safety Officer (cont.)

• **Classes/Competencies**
  – Radiological Worker Training
  – Functional Classification
  – Hazards Analysis
  – Site Specific Information

• **Multiple Facilities**
  – Minimum Time in Facility
  – Minimum Number of Walkdowns

• **Oral Board**
Criticality Safety Engineer

• Required Reading
  – DOE Orders and Standards
  – ANSI/ANS Standards
  – Guides
  – Other Criticality References
  – Site Specific Information

• Attend Hands-On Experimental Class (LLNL)
Criticality Safety Engineer (cont.)

• **Classes/Competencies**
  – Read DSA/SAR (specific chapters)
  – Write 3 NCSEs (mentored by qualified CSE)
  – Hazards Analysis
  – Frequency Analysis
  – Validation Overview
  – Functional Classification

• **Complete Associate Criticality Safety Engineer and Calculation Specialist**

• **1 Year in Criticality**

• **Written Exam or Oral Board**
Senior Criticality Safety Engineer

• **Required Reading**
  – DOE Orders and Standards
  – ANSI/ANS Standards
  – Other Criticality References
  – Site Specific Information

• **Classes/Competencies**
  – Review 3 NCSEs (mentored by qualified Senior CSE)

• **Complete Both Criticality Safety Engineer and Criticality Safety Officer Qualifications**

• **3 Years in Criticality**

• **Written Exam or Oral Board**
Program Administration

• Retention Matrix

• Training Organization
  – Tracks Individual’s Qualification
  – Automated Qualification Matrix (AQM)
  – Training Records And Information Network (TRAIN)
Maintaining Qualification

• Facility Specific Training
• NCSE Development
• NCSE Technical Reviews (Senior CSE)
• CSOs
• Professional Development/Continuing Training
  – Attend Onsite Criticality Safety Training Sessions/Seminars Annually
  – Attend Criticality Safety Related Workshop/Conference every 5 Years
  – Other Activities
Lessons Learned

• **Hardest Implementation**
  – Obtaining qualification on both CSE and CSO (facility) to qualify as Senior Criticality Safety Engineer

• **Greatest Timesaver**
  – Establishing an organizational homepage containing required reading or links to required reading

• **Most Useful**
  – Videotaping the classes
  – Establishing a Required Reading Database