



Safety Classification and TSR Application of CAAS (Criticality Accident Alarm System)

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Discussion

- Issue – Y12 Initiative ?
- Summary of Paper
- Status of Improvement Initiative
- Feedback – Technical backlash
- NRC Approach
- STD 3007
- Recommendations



DOE Historical Approach

- CAAS Operability defined as LCO
 - Action statements for detection & audibility
 - Compensatory measures defined
 - Surveillances
 - Bases - define system design details
 - CAAS is major part of TSR
- CAAS defined as Safety Significant SSC



Observations -

- CAAS does not flow from accident analysis
- Consequence mitigation not defined
- Criticality Prevention Controls not approved by DOE
 - Not defined in SAR or TSR
- DOE & Contractor attention to CAAS disproportionately High



Background

- 1979 – 1990 Licensing – HTGR - NRC
 - Reactor Engineering
- 1990 – 2002 - SAR / TSR - DOE
 - Criticality Safety
- 2002 – 2004 - ISA - Fuel Process. - NRC
- 2004 – 2007 - Criticality Safety - DOE
- Y12 – CAAS Classification Downgrade
 - Improvement initiative



Major Points

- Criticality Accident consequence to Worker is High – requires prevention
- TSR attention to CAAS as LCO is very intensive – DOE & Contractor time
 - Does not mitigate accident to acceptable threshold -
- Detracts from Prevention of accident
- Need to emphasize Prevention Controls



Summary - Paper

- CAAS has limited dose mitigation function for facilities with single pulse type criticality scenarios
- Criticality prevention controls must be relied upon to protect worker - CAAS does not change acceptability
- Stress importance of CAAS emergency response function & following ANSI/ANS Standards
- Result
 - Take CAAS out of TSR as LCO
 - Identify CAAS in AC section
 - Ensure Prevention Controls are defined and relied upon

Other Considerations



- Technical arguments
 - Single Pulse Credibility ?
 - Multiple pulse results in Safety Significant SSC
 - DOE Acceptance of approach – Defense Board?
- NRC Approach
 - IROFS - includes double contingency controls
 - CAAS Required by 10 CFR 70.24 – ANSI/ANS
- DOE STD 3007
 - Elevate Prevention Controls

DOE SAR / TSR Process

v.s. NRC

- **Criticality Accident worker dose is above threshold – Prevention Controls Required**
 - CAAS does not mitigate initial dose – still unacceptable
 - Multiple pulse scenario mitigation not well defined
 - CAAS can still be credited based on AC Requirement and ANSI Standards
- **Safety Significant definition – DOE-STD-3009-94**
 - Failure results in prompt worker fatality or serious injury
- **DOE SAR/TSR process does not result in CAAS being Safety Significant or TSR LCO**
- **NRC Approach emphasizes prevention controls and achieves CAAS reliability**



Emphasizing Criticality Prevention Controls

- STD 3007 Approach - ??
- Elevating controls to TSR can be costly and untimely to change – STD
- Define controls in SAR – DOE approval
- Define USQ process for reviewing changes or additions
- Only positive USQs require DOE approval prior to implementation



Recommendation

- Use defined DOE SAR / TSR process
- Define CAAS as AC requirement
 - Commit to following ANSI/ANS Standards
- Define Prevention controls in SAR
- Define Configuration Control Process
- Define USQ process for changes
- Take CAAS LCO and Criticality Safety Design Features out of TSR