

**HFE DAC-ITAAC**

# Purpose

- NRC has notified MHI that closure of the following HFE Program Elements should be identified as DAC-ITAACs
  - HSI Design
  - Task Analysis
  - Staffing Analysis
- This presentation provides the basis for the current US-APWR identification as ITAACs

# Background

- The identification for the closure of an HFE Program Element as ITAAC or DAC-ITAAC has no bearing on what MHI will do to complete that Program Element
  - The closure process is defined by the Implementation Plan
- The only impact of DAC-ITAAC or ITAAC identification is on the depth to which NRC will inspect the closure documentation
  - Words such as “100% inspection” have been used for DAC-ITAAC
- MHI does not believe a *higher level of inspection* is warranted for these Program Elements

# HSI Design

- There are two parts to the HSI Design
  - Basic HSI
  - HSI Inventory
- Basic HSI encompasses the methods for control, indication and alarm, and the physical configuration of the MCR
- HSI Inventory is the set of specific controls, indications and alarms required for the US-APWR plant systems/tasks

# HSI Design

- Basic HSI
  - NRC will issue an SER for the Basic HSI design with no open items
  - The design for the Basic HSI is complete for the US-APWR
- HSI Inventory
  - There are two parts to the HSI Inventory
    - Safety significant
    - Non-safety significant

# HSI Design

- HSI Inventory – Safety Significant
  - Ch. 18 Table 18.7-1 identifies the minimum inventory of spatially dedicated continuously visible (SDCV) information
    - SDCV promotes situation awareness and crew coordination
    - SDCV includes Bypassed or Inoperable Status Indication
  - Ch. 7 Table 7.5-3 identifies the minimum inventory of Class 1E indications
    - NRC has audited to confirm this inventory is sufficient to execute EOPs – Any findings will be resolved
  - Ch. 7 Table 7.5-5 identifies the minimum inventory of alarms to prompt manual actions credited in the Ch. 15 safety analysis
  - Ch. 7 Tables 7.2-6, 7.2-7, 7.3-5, 7.3-6 and 7.4-1 define the minimum inventory of controls for accident mitigation and safe shutdown, respectively
  - Ch. 7 Tables 7.8-2 and 7.8-5 identify the minimum inventory of Diverse HSI Panel controls, alarms and indications for accident coping with concurrent CCF
  - The minimum safety significant HSI Inventory is identified in Tier 2 for the US-APWR
- HSI Inventory – Non-Safety Significant
  - Everything else that is not already included in Ch. 7 or 18

# HSI Design

- HSI Inventory – Work remaining
  - Develop HSI Inventory – Non-safety Significant
  - Detailed design for specific graphic displays, which group specific HSI inventory in accordance with the Task Analysis, and in accordance with the Basic HSI (eg. Style Guide)
- This remaining work is exemplified for the US-APWR by the full scope simulator in Pittsburgh
  - Simulator is for a complete HSI Design, which employs the same Basic HSI design as US-APWR
  - Simulator is for a conventional 4-loop PWR, which is very similar to US-APWR; therefore, the complete HSI Inventory is very similar to US-APWR
  - NRC reviewers, commissioners and ACRS have witnessed demonstrations at this full scope simulator

# HSI Design

- ITAAC Basis
  - The safety significant HSI Inventory is identified in Tier 2
  - The remaining HSI Inventory is not safety significant
  - The remaining HSI inventory and the remaining detailed HSI design is exemplified by the PWR full scope simulator in Pittsburgh
- Therefore *a higher level of inspection* for the remaining work to complete the HSI Design program element is not warranted



# Task Analysis

- TA provides input to
  - The detailed design of the graphic displays for the safety significant HSI Inventory, which has already been defined in Tier 2
  - The development of the non-safety significant HSI Inventory and the detailed design of the graphic displays for that HSI Inventory
- TA has been completed for Risk Important Human Actions (RIHA)
  - Results summary report in MUAP-09019
- The remaining TA is generated concurrent with development of operating procedures (EOPs and NOPs)

# Task Analysis

- ITAAC Basis
  - The safety significant HSI Inventory is identified in Tier 2; this has been partially confirmed by the TA for RIHA
  - The remaining HSI Inventory is not safety significant, therefore the TA is not safety significant
  - The results of the complete TA process are exemplified by the HSI Inventory of the PWR full scope simulator in Pittsburgh
- Therefore *a higher level of inspection* for the remaining work to complete the Task Analysis program element is not warranted

# Staffing and Qualifications

- NUREG-0711 defines a process where the operator staffing is developed (after-the-fact) to fit the capabilities of the machine (ie. the machine design is fixed)
- An opposite approach has been taken for the US-APWR
  - For US-APWR the operator staffing is a constraint for the design of the machine
    - MCR: one RO, one SRO
    - Plant: one STA, one more SRO, no auxiliary operators
  - The machine has been designed to accommodate the staffing constraint
  - Phase 1 testing at the full scope simulator has demonstrated, with high confidence, that the machine has been designed to accommodate the staffing constraint
    - Final confirmation is through the V&V Program Element

# Staffing and Qualifications

- ITAAC Basis
  - The S&Q program element will not change the operator staffing
    - If necessary we will adjust the machine, not the staffing
  - The S&Q program element will establish staffing for other plant positions that are significantly less safety significant (eg. Maintenance, Engineers, Chemists, etc.)
  - Therefore *a higher level of inspection* for the remaining work to complete the Staffing and Qualifications program element is not warranted

# DAC-ITAAC Summary

- Since DAC or ITAAC does not change the work MHI must do to complete the HFE program elements, we have little objection to referring to these items as DAC-ITAAC
- This change will only increase NRC inspection burden
- Since these are not safety significant ITAACs, there is little value added for additional NRC inspection; this will just complicate and possibly delay ITAAC closure, and waste resources