



US-APWR HFE Design Certification

Topical Report & Design Control Document Review

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Objective

- Communicate status of HFE Topical Report review
- Reach common understanding on level of detail in Implementation plans



HFE Topical Report

- Part 4: determination of acceptability pending resolution of RAIs; includes application to operating plants which will require NRR approval
- Part 5: insufficient detail to support SER; acceptable to reference in DCD but must be evaluated within DCD SER



Design Certification – Implementation Plans

NUREG-0800 section 18 part III, review procedures

For a DC application there is some variability in the number and type of reviews conducted depending on the completion status of the HFE. A key determining factor for the review is the applicant's desired approval status for each of the 12 HFE elements in Section II.A previously cited. The elements could be approved at a programmatic level, at an implementation plan level, or at a completed element level.



Design Certification – Implementation Plans

- Programmatic level submittals are not being accepted because of DAC – ITAAC and downstream effects
- Implementation plans needed for completion of DCD SER
- Results summary reports needed longer term to address ITAAC



Design Certification – Implementation Plans

NUREG-0711 section 1.2.1(3)

In general, applicants are expected to submit two reports for NRC review:

- An implementation plan gives the applicant's proposed methodology for meeting the acceptance criteria of the element.
- A results summary report gives the results of the applicant's efforts related to each element.

Which documents did MHI submit with the intent to address the implementation plan level?



Design Certification – Implementation Plans

- See attachments for examples of Implementation detail.



US-APWR HFE Design Certification

Human Reliability Analysis Implementation Plan

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Validation and Verification Implementation Plan

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HRA Review Included

- DCD does not reference technical documents.
 - The roadmap indicates they contain relevant information



HRA Review

- NUREG-0711 18.7.3.1 (2):
 - Risk-important HAs should be addressed in FA, TA, HSI design, Procedure development and training, to show that tasks meet performance time and workload requirement.
- Staff are not looking for how to perform HRA but how MHI will utilize the HAs in FA, TA, HSI design, etc.



HRA Review

- NUREG-0711 7.4 (3): ... **how** are risk-important HAs addressed ... to minimize the likelihood of operator error and provide for error detection and recovery capability.
- No description of how this will be done?
 - HAs will be entered into the HED database for tracking but further information was not found



V&V Review

- NUREG-0711 –
 - “V&V” is a FINAL comprehensive test of the design
 - ensure the design conforms to HFE design principles
 - HSI enables plant personnel to successfully perform their tasks to achieve plant safety and other operational goals.
- MHI uses the term, “V&V” in two ways.
 - A series of iterative, man-in-the-loop or rapid prototyping exercises and tests to derive US APWR from the Japanese and Basic plant HSIs
 - “Final US APWR V&V” is used (perhaps) consistently with the usage in NUREG-0711.



V&V Review

- MHI stated that the methods presented in documentation will be used in the Final US APWR V&V
 - The available documentation does not describe the final US APWR V&V to the level described in NUREG-0711
 - Methodology and NUREG 0711 criteria must still be addressed
 - Acceptance criteria, scenario, methods



Challenges in the review

- When a single report is submitted it still must identify the methodology as well as the results.
- MHI combines both the results with some procedures into a single report
 - Challenge: Staff must tease out the implementation used from the results