

US-APWRRRAIsPEm Resource

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Request for Additional Information 1099

Issue Date: 03/19/2018

Application Title: US-APWR Design Certification - Docket Number 52-021

Operating Company: Mitsubishi Heavy Industries

Docket No. 52-021

Review Section: TR MHI Advanced Accumulator, Rev. 6

Application Section:

QUESTIONS

TR MHI Advanced Accumulator, Rev. 6-2

General Design Criterion (GDC) 35, "Emergency Core Cooling," requires, in part, that a system that would provide abundant emergency core cooling to satisfy the ECCS safety function of transferring heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts.

10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," requires, in part, that ECCS must be designed so that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth in paragraph (b) of 10 CFR 50.46. 10 CFR 50.46 also requires that for the realistic analysis of the ECCS cooling performance, the uncertainties in the analysis method and input must be identified and assessed so that the uncertainty in the calculated results can be estimated and accounted for.

In order to make a safety finding on the APWR advanced accumulators (ACCs) Topical Report, Revision 6 submittal (part of the US-APWR ECCS design) to meet GDC 35 and 50.46, the staff needs the following additional information.

1. In Section 5.1.2 of the topical report, it is stated: "The total error of a measured value was evaluated according to GUM ISO/IEC Guide 98-3 (Ref. 5-3) ..." This approach and reference is introduced in Revision 6 of the TR and no explanation and justification is provided for the change from the Revision 5 approach where ANSI/ASME PTC19.1-1985 is used. Explain the difference and the reason for the change. In addition, discuss the overall impact of the full scale test on the estimation of uncertainty of the characteristics equations of flow rates.
2. For random errors, your presentation of the dispersion data in Rev 6, Table 5.1-1 is different from Rev 5 of the topical report. Explain the difference in approach and the resulting dispersion data.
3. For instrument uncertainties, your presentation of the results in Rev 6, Table 5.1-2 is different from Rev 5 of the topical report. Explain the difference in approach and the resulting instrument uncertainty associated with flow rate coefficient.