

## US-APWRRRAIsPEm Resource

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**From:** Buckberg, Perry  
**Sent:** Wednesday, November 06, 2013 9:25 AM  
**To:** 'us-apwr-rai@mhi.co.jp'; US-APWRRRAIsPEm Resource  
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**Subject:** US-APWR Design Certification Application RAI 1057-7200 (Section 01.05)  
**Attachments:** US-APWR DC RAI 1057 SPCV 7200.pdf

MHI,

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form on September 6, 2013 resulting in a clarification discussion. Your licensing review schedule assumes technically correct and complete responses within 45 days of receipt of RAIs.

Please submit your RAI response to the NRC Document Control Desk.

Thanks,

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U.S. Nuclear Regulatory Commission

Office of New Reactors

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## REQUEST FOR ADDITIONAL INFORMATION 1057-7200

Issue Date: 11/06/2013

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

Operating Company: Mitsubishi Heavy Industries

Docket No. 52-021

Review Section: 01.05 - Other Regulatory Considerations

Application Section: 1.9.5.2

### QUESTION:

#### 01.05-11

On March 12, 2012, NRC issued Order EA-12-049 (ML12054A735). This Order was issued to current reactor licensees and requires provisions for mitigation strategies for beyond-design-basis external events. The requirements of the Order were effective immediately and are expected to remain in place until superseded by Order or rule. As new reactors are licensed, they will receive the Order.

In response to the Order and anticipating the issuance of the Order to future licensees of the US-APWR design, the applicant issued its report, "US-APWR Evaluation and Design Enhancement to Incorporate Lessons Learned from TEPCO's Fukushima Dai-ichi Nuclear Power Stations Accident", (MUAP-13002, revision 1). As stated in its abstract, "This report summarizes strategies and design enhancements of US-APWR to incorporate lessons learned from the accidents at TEPCO's Fukushima Dai-ichi Nuclear Power Stations after the Great Tohoku Earthquake and the Tsunami which hit the station on March 11, 2011 and the requirements/recommendations issued after the disaster by the US NRC." NRC staff has reviewed this report needs a response to the following question in order to complete its review.

In the report MUAP-13002 (R1), the applicant does not address the issue of Main Control Room (MCR) environment during Phase 1 (i.e. 0 – 8 hours) of an extended loss of ac power (ELAP) station blackout (SBO) when the MCR air-handling units would be unavailable to maintain temperature control.

The staff notes that at a steady-state condition of 110°F, the environmental conditions within the main control room would remain at the uppermost habitability temperature limit defined in the accepted standard, NUMARC 87-00, for efficient human performance. NUMARC 87-00 provides the technical basis for this habitability standard as MIL-STD-1472C, which concludes that 110°F is tolerable for light work for a 4 hour period while dressed in conventional clothing with a relative humidity of ~30%. The NRC staff agrees that if it can be demonstrated that the temperature is maintained below 110°F, additional measures are not required. However, staff has determined that the applicant has supplied insufficient information to conclude that the habitability limits of the control room will be maintained during Phase 1 of an ELAP.

The applicant is requested to supply a summary of the analysis it performed that demonstrates the acceptability of continued habitability of the main control room under the postulated conditions. The applicant does not need to provide detailed calculations. This analysis should include a discussion of: (1) the initial conditions, including the postulated inside and outside air temperatures and humidity, (2) the heat loads from

## **REQUEST FOR ADDITIONAL INFORMATION 1057-7200**

personnel in the MCR, (3) any additional relief efforts for the MCR staff (e.g. short stay time cycles, use of ice vests/packs, supplies of bottled water, etc.). (4) a description of the MCR temperature and humidity from time-zero to time equal eight hours. (5) a sensitivity study with up to double the number of MCR occupants and any effects on necessary equipment.

In particular: (1) What are the expected worst case temperatures (hot and cold) and humidity within the MCR after eight hours from the onset of an ELAP SBO? (2) What are the limiting temperature and humidity conditions for the population of MCR instrumentation and controls depended upon in this beyond design basis external event?

The applicant is requested to update the report MUAP-13002 to include a summary of these conditions.