U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

US-APWR
Standard Design Certification
Gas Turbine Generator
Public Meeting

By:

U.S. Nuclear Regulatory Commission

Monday, September 28, 2009

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NRC Questions

- MHI issued MUAP-07024-P, Revision 0, "Qualification and Test Plan of Class 1E Gas Turbine Generator System," on December 2007.
- Section 6.0, "Seismic Analysis," documents an evaluation of the GTGs for a set of "shock" loads.
- However, the GTGs need to be qualified to the seismic loads in the DCD (or site-specific seismic loads) using the methodology documented in IEEE 344-1987.

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NRC RAI Question

- RAI 1749, Question 3.10-9
- *In Section 6, Seismic Analysis, of the December 2007 Mitsubishi Report, MUAP-07024-P (R0), "Qualification and Test Plan of Class 1E Gas Turbine Generator (GTG) System," the seismic analysis includes the power section (Gas Turbine Engine Assembly), and the Reduction Gearbox. The seismic capability of the GP6000-type Gas Turbine (including the power section and Reduction Gearbox) was evaluated using 1g shock loads in the axial and radial directions of the shaft. However, shock loading tests are not the same as the loading subject to the RRS input motions at the GTG system location.*
- *The applicant is requested to provide adequate detail of the seismic qualification of Class 1E GTG system in accordance with the criteria and procedures delineated in DCD Section 3.10.*

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

MHI Response

The purpose of Technical Report MUAP-07024-P (RO), "Qualification and Test Plan of Class **1E** Gas Turbine Generator (GTG) System" is to present general information that shows that the GTG system is highly reliable and dependable and very well suited to perform its safety functions as required by US codes and standards. Section 6, Seismic Analysis merely presents some considerations for the seismic analysis of a commercial product (GTG system), in order to get a general understanding on feasibility of the GTG system for nuclear applications. These preliminary seismic analysis data indicates inherent margin such that the GTG has enough seismic capability. The GTGs are required to be procured and qualified (seismically and environmentally) in accordance with the requirements of the US-APWR DCD and the US-APWR EQ Program, in the same manner that emergency diesel generators would be procured and qualified. The seismic qualification process is to include consideration of the loading induced by the appropriate RRS input motions for the GTG system, as required by the US-APWR DCD and EQ Program. The seismic qualification of the Class 1E GTG will be performed as part of the Class 1E GTG dedication process, which is projected to continue through 2010, and is based on the RRS input motions established for the GTG system location.

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NRC Requests

- Staff requests MHI to follow up its response to RAI 1749, Question 3.10-9 by documenting a detailed seismic qualification plan for the GTGs in MUAP-07024-P.
- Staff requests MHI to incorporate MUAP-07024-P into the DCD section 3.10 by reference.