Hitachi-GE Nuclear Energy, Ltd.
UK ABWR GENERIC DESIGN ASSESSMENT
Resolution Plan for RO-ABWR-0068
Civil Engineering Step 3 GDA Observation on Seismic Analysis Methodology

RO TITLE:	Civil Engineering Step 3 GDA Observation on Seismic Analysis Methodology	
ACTION:	ROA-RO-ABWR-0068.A1	
REVISION:	First Issue	
Overall RO Closure Date (Planned):		25/11/2016
REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION		
Regulatory Queries	RQ-ABWR-0847, 0848, 0849 and 0915	
Linked ROs	None	
Other Documentation	See Schedule / Programme Milestones	

Scope of work :

Background

The Regulatory Observation states the following:

The ONR has assessed the civil engineering safety case documents submitted by Hitachi-GE during Step 3 of the UK ABWR GDA. As would be expected, the assessment raised a number of comments and queries that were discussed by ONR and Hitachi-GE at Level 4 meetings where it was agreed that the comments and queries would be resolved by Hitachi-GE during Step 4 of GDA. In line with GDA process, the comments and queries are recorded on Regulatory Queries and their resolution will be progressed at Level 4 meetings, and the outcome will be recorded.

A number of the comments and queries relate to the Hitachi-GE methodology to determine the response of the civil structures to seismic action. In particular, there are a number of comments and queries that relate to the use of lumped mass beam models to determine the influence of soil structure interaction on the detailed seismic responses in some areas of the civil structures. There are other comments and queries that relate to the calculation of the seismic response of the civil structures.

It is the ONR expectation that Hitachi-GE use UK relevant good practice in this work and is not yet clear to the ONR that the use of lumped mass beam models represents relevant good practice. As such, there is a need for Hitachi-GE to demonstrate to the ONR that their proposed approach does represent relevant good practice for calculating accurate detailed seismic responses in all areas of the civil structures, during Step 4 GDA.

Scope of Work

In response to this RO and RO Action A1, Hitachi-GE will demonstrate that it has revised its approach to seismic modelling and that this revised approach represents relevant good

practice in calculating appropriately accurate and detailed seismic responses in all areas of the civil structures and supported plant.

Description of work:

ACTION A1 – Demonstrate Approach to Modelling represents relevant good practice

During Step 4 Hitachi-GE will review its approach to seismic modelling and will identify a solution for the UK ABWR that takes into account finite element modelling (FEM) and that meets UK relevant good practice. This will be described in

- Seismic Design Methodology Report (JE-GD-0160)
- Seismic Design Validation Report (JE-GD-0161)

ONR agreement on the content of the reference reports constitutes completion of this Resolution Plan. The final analysis results documents will be submitted as part of the Step 4 civil engineering justification submissions.

Summary of Impact on GDA submissions :

The following documents will be provided in response to this RO and RO Action A1.

GDA Document	**Submission Date to ONR**
1) Seismic Design Methodology Report (JE-GD-0160)	11th Oct. 2016
2) Seismic Design Validation Report (JE-GD-0161)	11th Oct. 2016

Hitachi-GE will identify the impacted safety and environmental submission documents that will be affected by the RO e.g. PCSR, GEP, Master Document Submission List, Design Change Documentation, Design Reference etc and implement the changes in accordance with its Commitments Capture Procedure when it updates its documentation.

Table 1 RO-ABWR-0068 Resolution Plan - Gantt Chart

See attached Gantt chart

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UK ABWR Resolution Plan for RO-ABWR-0068			
Observation Title: Civil Engineering Step 3 Observation on Seismic Analysis Methodology			
Level	Action Title	Start (plan)	Finish (plan)
1	Regulator's Issue of RO		
1.1	ONR Issue RO		3-Jun-16
1.2	Hitachi-GE Acknowledge		24-Jun-16
1.3	Hitachi-GE Issue Resolution Plan		1-Jul-16
1.4	Regulator confirm credibility of RP	8-Jul-16	15-Jul-16
1.5	Regulator publishes RO and RP	12-Jul-16	30-Sep-16
2	Preparation of Submissions and Closure of RO Action		
2.1	Action A1		
2.1.1	Presentation of methodology at Level 4 Meeting		9-Jun-16
2.1.2	Prepare Seismic Design Methodology Report	6-Jun-16	11-Oct-16
	(JE-GD-0160)		
2.1.3	Prepare Seismic Design Validation Report	6-Jun-16	11-Oct-16
	(JE-GD-0161)		
2.1.4	Presentation of draft JE-GD-0160 and 0161 at Level 4		20-Jul-16
2.1.5	Presentation of JE-GD-0160 and 0161 at Level 4 Meeting		1-Sep-16
	Presentation of JE-GD-0160 and 0161 at Level 4 Meeting		29-Sep-16
2.1.6	Issue JE-GD-0160		11-Oct-16
2.1.7	Issue JE-GD-0161		11-Oct-16
3	Regulator's Closure of RO		
3.1	Regulator's initial assessment	13-Jun-16	1-Sep-16
3.2	Regulator's Assessment for closing RO	1-Sep-16	21-Nov-16
3.3	Regulator's publication of RO closure letter	########	25-Nov-16