

<b>REGULATORY OBSERVATION</b>	
<b>REGULATOR TO COMPLETE</b>	
<b>RO unique no.:</b>	RO-ABWR-0068
<b>Date sent:</b>	3rd June 2016
<b>Acknowledgement required by:</b>	24th June 2016
<b>Agreement of Resolution Plan Required by:</b>	<i>To be determined by Hitachi-GE Resolution Plan</i>
<b>Resolution of Regulatory Observation required by:</b>	<i>To be determined by Hitachi-GE Resolution Plan</i>
<b>TRIM Ref.:</b>	2016/174537
<b>Related RQ / RO No. and TRIM Ref. (if any):</b>	RQ-ABWR-0847 (TRIM Ref: 2016/155388) RQ-ABWR-0848 (TRIM Ref: 2016/155406) RQ-ABWR-0849 (TRIM Ref: 2016/155436) RQ-ABWR-0915 (TRIM Ref: 2016/207966)
<b>Observation title:</b>	Civil Engineering Step 3 GDA Observation on Seismic Analysis Methodology
<b>Technical area(s)</b> 2. Civil Engineering 3. External Hazards	<b>Related technical area(s)</b> 1. Internal Hazards 4. PSA 5. Fault Studies 11. Mechanical Engineering 12. Structural Integrity
<b><i>Regulatory Observation</i></b>	
<b>Background:</b>	
<p>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.</p> <p>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.</p>	
<b>Observation:</b>	
<p>It is the ONR expectation that Hitachi-GE use 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.</p>	

**Regulatory Observation Actions**

**RO-ABWR-0068.A1**

*During Step 4 Hitachi-GE is required to demonstrate that its approach to modelling represents relevant good practice in calculating accurate and detailed seismic responses in all areas of the civil structures and supported plant. Comparisons with other appropriate modern analysis methods are required. Hitachi-GE may propose a series of discrete activities to facilitate the progress monitoring of this action, to closure. It is also important that Hitachi-GE demonstrate that any proposed activities form part of a robust and appropriate strategy to establish the adequacy of the analysis methodology.*

*The progress of work that relates to this RO will be discussed at level 4 meetings and this RO will be closed out when all related comments and queries have been addressed and the outcome agreed with the ONR.*

**Resolution required by: To be determined by Hitachi-GE Resolution Plan**

**REQUESTING PARTY TO COMPLETE**

**Actual Acknowledgement date:**

**RP stated Resolution Plan agreement date:**