

Hitachi-GE Nuclear Energy, Ltd.
UK ABWR GENERIC DESIGN ASSESSMENT
Resolution Plan for RO-ABWR-0040
UK ABWR Probabilistic Safety Analysis Identification of Applicable
Internal Hazards

RO TITLE:	UK ABWR Probabilistic Safety Analysis Identification of Applicable Internal Hazards	
REVISION :	2	
Overall RO Closure Date (Planned):	31 January, 2016	
REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION		
Regulatory Queries	-	
Linked ROs	-	
Other Documentation	-	

Scope of work :
<p>Background Hitachi-GE has developed the identification of internal hazards for design consistent with international good practice, e.g. IAEA SSR-2/1, IAEA NS-G-1.7, WENRA Reactor Safety Reference Levels, European Utility Requirements for LWR Nuclear Power Plants as well as ONR Safety Assessment Principles (SAPs), ONR Technical Assessment Guide (TAG). ONR has identified shortfalls related to the identification of internal hazards for PSA and raised RO-ABWR-0040 to state ONR's expectations and request Hitachi-GE to respond to the shortfalls.</p> <p>Scope of Work The objective of this resolution plan is to introduce Hitachi-GE's current plan for performing the actions required in the RO-ABWR-0040. The actions cover review/justification of existing analysis, additional investigation/analysis and revised/additional documentation.</p>

Description of work:

ACTION 1 – Identification process and initial list of Internal Hazards for the PSA

Hitachi-GE will provide an identification process and initial list of possible internal hazards consistent with international good practice. The initial list includes the potential individual internal hazards without any prioritisation. This list will be reviewed and the prioritised hazard will be summarized in Action 2. This list will include “Spurious or required actuation of fire protection water systems” and “Spurious or required actuation of Halon or CO₂ fire protection systems”.

ACTION 2 – Prioritisation of Internal Hazards for the PSA

Hitachi-GE will develop a prioritisation of internal hazards in terms of:

- Magnitude of the hazard vs. the design basis.
- Impact on plant, systems and containment.

ACTION 3 – Combinations of Hazards

ACTION 3.1 – Prioritisation of Combination Hazards for the PSA

Hitachi-GE will develop a prioritisation of combination hazards for the PSA.

ACTION 3.2 – Technical basis and the criteria for prioritisation of combination hazards

Hitachi-GE will provide the technical basis for assessment of combination hazards and the criteria used to prioritise hazard combinations for the PSA.

ACTION 4 – Scope of the hazards analyses

ACTION 4.1 – Other conditions

Hitachi-GE will expand the scope of the internal hazards analysis to the following conditions:

- Low power conditions (start-up) with the containment deinerted.
- Refuel/outage conditions with the containment open and heavy load movements occurring with multiple equipment unavailable due to maintenance.
- Other relevant condition.

The scope will be justified.

ACTION 4.2 – Other sources

Hitachi-GE will provide an analysis of the impact of hazards on other on-site radionuclide sources (e.g., SFP) that could result in releases.

ACTION 5 – Hazard Impacts

Hitachi-GE will provide an auditable internal hazard impact analysis with measuring the damage to systems, structures, and components (SSCs), human interface degradation and containment. Action 5 will provide one of the bases for Action 2. Thus, Action 5 will proceed with Action 2 in parallel.

ACTION 6 – Hazard PSA programme

Hitachi-GE will review and as needed revise the hazards PSA programme to include all the hazards for which a more detailed probabilistic evaluation needs to be undertaken in Step 4 in line with the results of the hazards prioritisation developed in Action 2. Hitachi-GE will also review and as needed revise the hazards PSA programme to address the hazards impact on other radioactivity sources and plant conditions.

Summary of impact on GDA submissions:

The GDA submissions that may be affected by the actions to resolve this RO are summarised below. These documents will be originated and/or revised in accordance with the corresponding actions.

<u>Related RO Actions</u>	<u>GDA Submission Document Title</u>	<u>Document ID</u> (Document No.)	<u>Submission Date to the Regulators</u>
ROA1, 2, 3, 4, 5	Internal hazard identification for PSA	-	12-Oct-2015
ROA6	PSA programme	GA91-9210-0001-00121 (AE-GD-0150)	12-Oct-2015

Programme Milestones/ Schedule:

See attached Gantt Chart (Table 1).

Reference:

N/A

Table 1 RO-ABWR-0040 Gantt Chart

Probabilistic Safety Analysis (PSA) UK ABWR Probabilistic Safety Analysis: Identification of Applicable Internal Hazards Resolution Plan for RO-ABWR-0040				March			April			May			June			July			August			September			October			November			December			January																	
Level	Action Title	Start	Finish	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	7	14	21	28
1	Regulator's Issue of RO																																																		
1.1	ONR Issue RO	1-Mar-15	16-Mar-15																																																
1.2	Hitachi-GE acknowledge RO & issue Resolution Plan	17-Mar-15	14-Apr-16																																																
1.3	Regulator's confirm credibility of Resolution Plan	15-Apr-15	30-Jun-15																																																
1.4	Regulator's publish RO and Resolution Plan	1-Jul-15	17-Jul-15																																																
2	Preparation of Submissions and Closure of RO Actions																																																		
2.1	RO Action 1: Identification of Internal Hazards for the PSA	20-Apr-15	31-Jul-15																																																
2.2	RO Action 2: Prioritisation of Internal Hazards for the PSA	20-Apr-15	31-Jul-15																																																
2.3	RO Action 3: Combinations of Hazards	20-Apr-15	12-Oct-15																																																
2.4	RO Action 4: Scope of the hazards analyses																																																		
2.5	RO Action 5: Hazard Impacts	20-Apr-15	12-Oct-15																																																
2.6	RO Action 6: Hazard PSA programme	1-Sep-15	12-Oct-15																																																
3	Regulator's Closure of RO																																																		
3.1	Regulator's Assessment	13-Oct-15	31-Dec-15																																																
3.2	Regulator's publication of RO closure letter	1-Jan-16	31-Jan-16																																																