

Hitachi-GE Nuclear Energy, Ltd.
UK ABWR GENERIC DESIGN ASSESSMENT
Resolution Plan for RO-ABWR-0047
(Mechanical Engineering – Wet Lifting Beams –
Material of Construction)

RO TITLE:	Mechanical Engineering – Wet Lifting Beams – Material of Construction	
REVISION :	0	
Overall RO Closure Date (Planned):	25 th December 2015	
REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION		
Regulatory Queries	RQ-ABWR-0259	
Linked ROs	-	
Other Documentation	-	

Scope of work :
<p>This Regulatory Observation (RO) has been raised because the arguments and rationale presented in the response to RQ-ABWR-0259 did not present sufficient justification for retaining carbon steel as the basis of the steam dryer and the separator module lifting beam. The objective of the RO is to ensure the engineering basis for selection of materials for the construction of lifting beams used in a wet environment.</p> <p>The Regulatory expectations are that each UK ABWR lifting beam used in a wet environment is reviewed and optioneered to:</p> <ol style="list-style-type: none"> a. Reduce the risks SFAIRP; a requirement of UK legislation (Health & Safety at Work etc. Act 1974); b. Minimise the volume and level of radioactive waste generated; and c. Minimise operator dose uptake (a requirement if the Ionising Radiations Regulations 1999). <p>This Resolution Plan describes Hitachi-GE's current plan to address the RO. It contains the detailed strategy, the planned activities, deliverables, milestones, timescales, resources assignment as well as reference to the audit trail.</p> <p>Apart from Mechanical Engineering, this resolution plan is related to the following technical areas:</p> <ul style="list-style-type: none"> - 10. Radiation Protection & (Level 3 PSA) - 15. Radwaste & Decommissioning

Description of work:

The main actions to be undertaken to resolve the RO are described as follows.

Action 1: Generation of the Resolution Plan

Actions requested by the Regulator as stated in the RO:

AI. generate a resolution plan that will:

- a. present its detailed strategy to demonstrate each UK ABWR lifting beam used in a wet environment is reviewed and optioneered to be ALARP;*
- b. define and scope the planned activities;*
- c. include a controlled programme identifying: planned activities; deliverables; milestones; timescales and resource requirements; and*
- d. provide the audit trail to demonstrate each UK ABWR wet lifting beam design risks have been reduced SFAIRP and to demonstrate the designs are ALARP*

Hitachi-GE's actions:

Hitachi-GE agreed with the Regulator to deliver a draft Resolution Plan by the 23th of April. Then, Hitachi-GE shared the final plan with the Regulator during the Technical Workshop on the 23th of April and the Step 3 Progress Meeting on the 4th of June. The official issue of the resolution plan will be no later than the 26th of June 2015.

Deliverables:

- 1) Draft Resolution Plan: by the 23th of April 2015
- 2) Final Resolution Plan: no later than 26th of June 2015

Impacted GDA Submissions: -

Resources: Hitachi-GE ME SME will prepare the resolution plan in coordination with all wet lifting beam engineering design sections.

Action 2 :Review all wet lifting beams materials and Optioneering study

Hitachi-GE's actions:

- (1) Review all wet lifting beams materials [Action 2-1]

Hitachi-GE will review all wet lifting beams materials. These results are due to be finalised by July 2015 and update on the progress will be provided during the regular progress meeting. Progress update will be given to the Regulator through the regular engagements.

- (2) Optioneering study [Action 2-2]

If carbon steel is applied to wet lifting beam from result of Action 2-1, Hitachi-GE will undertake the optioneering study regarding material selections. Each UK ABWR lifting beam used in a wet environment is reviewed and optioneered to:

- a. Reduce the risks SFAIRP;
- b. Minimise the volume and level of radioactive waste generated; and
- c. Minimise operator dose uptake

This detailed task includes;

- a) Consideration of the potential to contaminate the RPV(Reactor Pressure Vessel) or SFP(Spent fuel pool) with rust and/or paint debris
- b) Research operating experience
- c) EMIT issues
- d) Decontamination issues – including consideration of operator dose uptake and radioactive waste volume
- e) Structural integrity under loading conditions
- f) Manufacturing and equipment qualification

These results are due to be finalised by October 2015 and update on the progress will be provided during the regular progress meeting. Progress update will be given to the Regulator through the regular engagements.

Deliverables:

- 1) A List of all wet lifting beams and their materials of construction (by July 2015)
- 2) The Optioneering study report (by October 2015)
- 3) Final Report on the Conclusions and Recommendations from RO-ABWR-0047 (by December 2015)

Impacted GDA Submissions:

- 1) “Basis of Safety Cases on Fuel Handling Systems and Overhead Crane Systems”(GA91-9201-0002-00056 (MID-UK-0006) Rev.0)

Resources:

- 1) Hitachi-GE: ME SME team, all wet lifting beam engineering design sections, chemical system engineering section and Radwaste, Radiation Protection engineers.
- 2) Outsourcing: External equipment suppliers
- 3) UK Consultancy for specific areas as necessary

Action 3 : Progress updates

Actions requested by the Regulator as stated in the RO:

A2. Provide progress updates to ONR through the planned GDA engagements.

At each planned GDA engagement an update will be provided to ONR identifying progress made in undertaking the work identified under Action 2 and in developing the deliverables.

Deliverables: -

Impacted GDA Submissions: -

Resources:

- 1) Hitachi-GE: ME SME team, all wet lifting beam engineering design sections, chemical system engineering section and Radwaste, Radiation Protection engineers.
- 2) Outsourcing: External equipment suppliers
- 3) UK Consultancy for specific areas as necessary

Action 4 : Deliverable to ONR

Actions requested by the Regulator as stated in the RO:

A3. *Make available to ONR activity deliverables, conclusions and recommendations.*

The deliverables identified above will be made available to ONR in accordance with the attached program.

Deliverables:

- 1) A List of all wet lifting beams and their materials of construction (by July 2015)
- 2) The Optioneering study report (by October 2015)
- 3) Final Report on the Conclusions and Recommendations from RO-ABWR-0047 (by December 2015)

Action 5: Design change and Report on the conclusions and recommendations

Actions requested by the Regulator as stated in the RO:

A4. *if appropriate:*

a. raise design changes; and

b. update the UK ABWR safety case, system designs and substantiation.

A5. *Make available any appropriate updated documents and substantiation for ONR assessment.*

Hitachi-GE's actions:

In accordance with Action 2,3,4 to meet the stated regulatory expectations, Hitachi-GE will raise design changes and update the safety case, system designs and substantiation if necessary, which will be implemented along with the review and finalised by December 2015.

This task is due to be finalised by December 2015 and update on the progress will be provided during the regular progress meeting.

The conclusions and recommendations from the all the actions of the regulatory observation, including the results of Action 2,3,4, will be described in a final report which will be submitted to ONR by December 2015.

Deliverables:

- 1) Final Report on the Conclusions and Recommendations from RO-ABWR-0047 (by December 2015)

Impacted GDA Submissions:

- 1) "Basis of Safety Cases on Fuel Handling Systems and Overhead Crane Systems"(GA91-9201-0002-00056 (M1D-UK-0006) Rev.0)

Resources:

- 1) Hitachi-GE: ME SME team, all wet lifting beam engineering design sections, chemical system engineering section and Radwaste, Radiation Protection engineers.
- 2) UK Consultancy for specific areas as necessary
- 3) Outsourcing: External equipment suppliers

Summary of impact on GDA submissions:

This work will have an impact on “Basis of Safety Cases on Fuel Handling Systems and Overhead Crane Systems”(GA91-9201-0002-00056 (MID-UK-0006) Rev.0).

Programme Milestones/ Schedule:

Refer to the attached Gantt-chart for the programmed activities and the schedule for the resolution of the RO.

Reference:

Ref.	Document Title	Document ID	Rev.
1	Detailed Gantt Chart for UK ABWR Resolution Plan (Corresponding to RO-ABWR-0047)	GA91-9201-0005-00049	1

Table 1 RO-ABWR-0047 Gantt Chart

M2E-UK-0009 Resolution Plan for RO-ABWR-0047 Rev.1				2015																																											
				March			April			May			June			July			August			September			October			November			December																
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
1	Regulator's issue of RO	6-Mar-15	6-Mar-15	█																																											
1.1	ONR Issue RO	6-May-15	6-May-15										█																																		
1.2	Hitachi-GE acknowledge RO	10-Apr-15	10-Apr-15																																												
1.3	Hitachi-GE submission of draft Resolution Plan	6-Mar-15	22-Apr-15	█	█	█	█	█	█	█	█	█																																			
1.4	Regulator's assessment of the draft Resolution Plan	23-Apr-15	23-Apr-15																																												
1.5	Discussion of the Resolution Plan with the Regulator	23-Apr-15	23-Apr-15																																												
1.6	Hitachi-GE update and submission of official Resolution Plan	11-May-15	26-Jun-15														█	█	█	█	█	█	█	█																							
1.7	Regulator's publish RO and Resolution Plan	TBD	TBD																																												
2	Preparation of Submissions and Closure of RO Actions	6-Mar-15	25-Dec-15	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█			
2.1	RO Action 1: Resolution Plan	6-Mar-15	26-Jun-15	█	█	█	█	█	█	█	█	█																																			
2.2	RO Action 2-1: Review all wet lifting beams materials	1-Jul-15	31-Jul-15																																												
2.3	RO Action 2-2: Optioneering study	3-Aug-15	30-Oct-15																																												
2.4	RO Action 3: Progress updates	26-Jun-15	25-Dec-15																																												
2.5	RO Action 4: Deliverables to ONR (See 2.1.2.2)	31-Jul-15	30-Oct-15																																												
2.6	RO Action 5: Design change and Report on the conclusions and recommendations	2-Nov-15	25-Dec-15																																												
3	Regulator's Closure of RO	26-Jun-15	25-Dec-15																																												
3.1	Regulator's Assessment	23-Apr-15	25-Dec-15																																												
3.2	Regulator's publication of RO closure letter	TBD	TBD																																												