Hitachi-GE Nuclear Energy, Ltd.
UK ABWR GENERIC DESIGN ASSESSMENT
Resolution Plan for RO-ABWR-RO-0050
(Mechanical Engineering – Crane control measures)

RO TITLE:	Mechanical Engineering – Crane control measures	
REVISION :	1	
Overall RO Closure Date (Planned):		31 March 2016
REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION		
Regulatory Queries	RQ-ABWR-0259	
Linked ROs	RO-ABWR-0049	
Other Documentation	Basis of Safety Cases on Fuel Handling Systems and Overhead Crane Systems, GA91-9201-0002-00056	

Scope of work :

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 operator control in preference to the provision of an engineered means of controlling the elevation of the steam dryer/separator during lifting. The objective of the RO is to ensure the designs of the UK ABWR cranes and Fuel Handling Machine (FHM) incorporate an adequate level of engineered control for lifts important to safety.

The regulatory expectations are that the cranes and FHM incorporate positional engineering control means for all lifts important to safety to:

a. Reduce the risks So Far As Is Reasonably Practicable (SFAIRP), which is a requirement of UK legislation (Health & Safety at Work etc. Act 1974)
b. Meet the expectations of UK relevant good practice
c. Meet the expectations of ONR's SAPs

As well as the Mechanical Engineering discipline, this RO is also relevant to:

- Control and instrumentation
- Internal hazards
- Radiation protection
- SFIS
- Human factors

This Resolution Plan describes Hitachi-GE's current plan to address the RO. However as the work develops an alternative means to addressing the RO may be adopted, if appropriate.

Description of work:

The actions to be undertaken to resolve the RO are as follows:

ACTION 1: Generation of a Resolution Plan

Actions requested by the Regulator as stated in the RO:

1. *Generate a resolution plan that will:*
    a. *Present its detailed strategy to demonstrate the UK ABWR EOTC and fuel handling machine 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 the UK ABWR EOTC and fuel handling machine design risks have been reduced SFAIRP and demonstrate the designs are ALARP.*

Hitachi-GE's actions

Hitachi-GE agreed with the Regulator to deliver a draft Resolution Plan by 23rd April. Then, Hitachi-GE revised resolution plan and agreed the final plan during the Technical Workshop on 23rd of April. The official issue of the resolution plan is no later than 28th May 2015.

Deliverables:

1) Final Resolution Plan: no later than 28th May 2015

Impacted GDA Submissions: -

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

ACTION 2: Developing lifting schedule, identification of design principles and their application

Hitachi-GE's actions

1) The lifting schedule for Dryer and Separator will be produced to identify the risk related to the lift. This action is related to the action of RO-ABWR-0049 Dropped load countermeasures.
2) The design principles used for controlling the movement of loads within safe limits during nuclear safety related lifting operations will be identified
3) The application of these principles will be reviewed, and any necessary changes to the design and safety case will be identified

The following deliverables will be produced:

Deliverables:

1) A report documenting the Hitachi-GE Design Principles for controlling the movement of loads within safe limits during nuclear safety related lifting operations and the application of the Design Principles to the control of the height of lifting of the separator.
2) A report documenting the application of the Design Principles to the control of the movement for the other lifts.

Impacted GDA Submissions:

1) Basis of Safety Cases on Fuel Handling Systems and Overhead Crane Systems

Resources:

1) Hitachi-GE ME SME team, the engineering and design sections involved.
2) UK Consultancy for specific areas

ACTION 3: Progress updates

Action requested by the Regulator as stated in the RO:

2. *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, the engineering and design sections involved.
2) UK Consultancy for specific areas

ACTION 4: Deliverables to ONR

Action requested by the Regulator as stated in the RO:

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

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

ACTION 5: Design changes and updated documentation

Actions requested by the Regulator as stated in the RO:

4. *If appropriate:*
   a. *raise design changes; and*
   b. *update the UK ABWR safety case, system designs and substantiation.*
5. *Make available any appropriate updated documents and substantiation for ONR assessment*

It is recognised that the application of the Design Principles identified under Action 2 may result in changes being required to the lifting equipment designs. Where this is the case, the requirement for the design change will be fully documented and the design and safety case documentation required to be updated will be identified in order that the required updates can be planned and implemented.

Impacted GDA Submissions:

1) Basis of Safety Cases on Fuel Handling Systems and Overhead Crane Systems

Resources:

1) Hitachi-GE ME SME team, the engineering and design sections involved.
2) UK Consultancy for specific areas

Summary of impact on GDA submissions:

This work will have an impact on Generic PCSR Chapter 19 and the Basis of Safety Cases on Fuel Handling Systems and Overhead Crane Systems. PCSR Chapter 19 will make reference to this BSC which will be updated where it is affected by activities undertaken in response to this RO.

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-0050)	GA91-9201-0005-00042	1

Table 1 RO-ABWR-0050 Gantt Chart