

**Hitachi-GE Nuclear Energy, Ltd.**  
**UK ABWR GENERIC DESIGN ASSESSMENT**  
**Resolution Plan for RO-ABWR-0017**  
**(Nuclear Ventilation Codes and Standards)**

<b>RO TITLE:</b>	Nuclear Ventilation Codes and Standards	
<b>REVISION :</b>	1	
<b>Overall RO Closure Date (Planned):</b>	29 February 2016	
<b>REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION</b>		
<b>Regulatory Queries</b>	-	
<b>Linked ROs</b>	RO-ABWR-0036, RO-ABWR-0054	
<b>Other Documentation</b>	-	

<b>Scope of work :</b>
<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"> <li>- Environment Agency</li> <li>- Conventional safety</li> <li>- MSQA</li> <li>- Radiation protection</li> <li>- Internal hazards</li> <li>- Chemistry</li> <li>- Decommissioning and radioactive waste</li> <li>- Civil engineering and external hazards</li> </ul>

<b>Description of work:</b>
<p>The main actions to be undertaken to resolve the RO are described as follows.</p> <p><b>ACTION 1: Generation of the Resolution Plan</b></p> <p><u>Actions requested by the Regulator as stated in the RO:</u></p> <p>1. <i>generate a resolution plan that will:</i></p> <ul style="list-style-type: none"> <li>a. <i>present its detailed strategy to update each UK ABWR nuclear vent system design to align to UK RGP;</i></li> <li>b. <i>define and scope the planned activities;</i></li> </ul>

- c. *include a controlled programme identifying: planned activities; deliverables; milestones; timescales and resource requirements; and*
- d. *provide the audit trail to each revised system design.*

Hitachi-GE's actions:

Hitachi-GE agreed with the Regulator to deliver a draft Resolution Plan by the 15<sup>th</sup> of December 2014. Subsequently, Hitachi-GE and the Regulator revised this resolution plan and agreed the final resolution plan during Step 3 Second Technical Exchange Workshop from the 15<sup>th</sup> to the 20<sup>th</sup> of December 2014. The official issue of revision 0 of this resolution plan was made by 26<sup>th</sup> of December 2014. This final resolution plan revision 1 will be submitted by December 2015.

Deliverables:

- 1) Draft Resolution Plan: submitted by the 15<sup>th</sup> of December 2014
- 2) Final Resolution Plan Revision 0: submitted by the 26<sup>th</sup> of December 2014
- 3) Final Resolution Plan Revision 1: by December 2015

Impacted GDA and GEP Submissions: -

Resources: Hitachi-GE ME SME will prepare the resolution plan in coordination with all the affected counterparts.

**ACTION 2: Identification of all UK RGP codes, standards, guidance and legislation applicable to the UK ABWR nuclear ventilation systems;**

Actions requested by the Regulator as stated in the RO:

2. *identify all UK RGP codes, standards, guidance and legislation applicable to the UK ABWR nuclear ventilation systems;*

Hitachi-GE's actions:

Hitachi-GE is undertaking detailed reviews of NVF/DG001, ISO 17873:2004, ISO 26802:2010, Ionising Radiations Regulations 1999 etc. which is a preliminary list of UK RGP codes, standards, guidance and legislation as suggested by the Regulator and verified with suitably qualified and experienced UK consultants. All UK RGP codes, standards, guidance and legislation applicable to the UK ABWR nuclear ventilation systems is being identified and will finally be submitted in a List of applicable legislation and RGP to ME SSCs by February 2015.

Deliverables:

- 1) List of Applicable Legislation and RGP to ME SSCs Rev.0 (submitted in September 2014)
- 2) List of Applicable Legislation and RGP to ME SSCs Rev. 1 ( submitted in February 2015)

Impacted GDA and GEP Submissions: see action 4

Resources:

- 1) Hitachi-GE: ME SME team, systems engineering sections, equipment design sections
- 2) UK consultancy

**ACTION 3: Gap analysis of the UK RGP requirements against current design of ventilation systems;**

Actions requested by the Regulator as stated in the RO:

3. *undertake a gap analysis of the UK RGP requirements against its Step 2 submission;*

Hitachi-GE's actions:

Hitachi-GE undertook a gap analysis of NVF/DG001 against current design of ventilation system that is GDA Step 2 submission (Basis of Safety Cases Rev.0) and submitted the impact assessment report (Doc. ID GA91-9201-0003-00137 Rev.0) to the Regulator in August 2014.

Hitachi-GE has also undertook a gap analysis of the ISO 17873:2004, ISO 26802:2010 against GDA Step 2 submission (Basis of Safety Cases Rev.0) in cooperation with UK consultancy. The gap analysis has been submitted in February 2015 in accordance with the submission of revision 1 of the Basis of Safety Cases on HVAC, SGTS and OG. The report has been submitted as a design change list from the Basis of Safety Cases Rev.0.

Deliverables:

- 1) Basis of Safety Cases Rev. 1 (submitted in February 2015)

Impacted GDA and GEP Submissions: see action 4

Resources:

- 1) Hitachi-GE: ME SME team, systems engineering sections, equipment design sections
- 2) UK consultancy

**ACTION 4: Design Changes and Update of Safety Case Documents**

Actions requested by the Regulator as stated in the RO:

4. *evaluate the gap analysis and where necessary:*
  - a. *raise and implement design changes; and*
  - b. *update the UK ABWR safety case, system designs and substantiation;*
5. *provide progress updates to ONR through the planned GDA engagements; and*
6. *make available appropriate updated documents and substantiation for ONR assessment.*

Hitachi-GE's actions:

The results of the gap analysis may lead to design changes that will be implemented and finalised by the end of GDA. The results, including the design changes, of the gap analysis will be reflected in the UK ABWR safety case documentation (substantiation) which will clearly show the claims, arguments and evidence. The updated UK ABWR safety case documents will be submitted to the Regulator for assessment during 2015 as indicated in the deliverables below.

The progress will be provided during all the regular progress meeting, video conferences, workshops already agreed and reflected in the ME Gantt-chart and additional meetings when necessary. Where substantiation or qualification needs to be extended or repeated, as a result of the review, the timescales to achieve this will be defined. If revised qualification is not possible within GDA timeframes, the proposed method and timescales for qualification will be presented during GDA.

Deliverables:

- 1) Basis of Safety Cases Rev. 1 (submitted in February 2015)
- 2) Basis of Safety Cases Rev. 2 (by January 2016)
- 3) Support Evidence Documents for ventilation systems (from the start of Step 4)

Impacted GDA and GEP Submissions:

- 1) Generic PCSR Sub-chapters (changes reflected in Rev. B):
- 2) Basis of Safety Case Documents
- 3) Support Documents: TBD

Resources:

- 1) ME SME team, systems engineering sections, equipment design sections
- 2) UK consultancy

**ACTION 5: Report on the Conclusions and Recommendations**

Hitachi-GE's actions:

The conclusions and recommendations from the all actions of the regulatory observation, including the results of the gap analysis, will be described in a final report which will be submitted to ONR after the conclusion of the process by February 2016.

Deliverables:

- 1) Final Report on the Design Review of Ventilation Systems (by February 2016)

Impacted GDA and GEP Submissions: -

Resources: Hitachi-GE ME SME team in coordination with all the sections involved.

Note: In this report Hitachi-GE will show the resolution plan for the HVAC as a representative for nuclear ventilation system. Actions for other nuclear ventilation systems such as OG, SGTS, AC and FCVS are undertaking and these progress schedules will be described in the Final Report on the Design Review of Ventilation Systems.

**ACTION 6: Actions outside the GDA Scope**

Hitachi-GE's actions:

Depending on the results of the design reviews, the fabrication process, the qualification tasks, the installation and tests during commissioning, the EMIT tasks during operation and the decommissioning tasks might be affected. Therefore, these tasks will have to be undertaken in accordance with the policy described in Hitachi-GE's Strategy on the Design Life of ME SSCs as well as the design documents (supporting documents of safety case + the whole suite of documents outside GDA scope) containing the results from the design reviews.

After the conclusion of the GDA, those design documents outside of its scope will be generated with the results from the design reviews of this regulatory observation reflected on them. In addition, the design documents already generated before will be updated as necessary. These documents will be applied to perform all the stages of the plant life and thus, the safety case will be implemented into the plant life cycle.

Finally, Hitachi-GE will update its general policy on ME SSCs design life described in Hitachi-GE's Strategy on the Design Life of ME SSCs as necessary to reflect the progress during the plant life cycle.

Deliverables: -

Impacted GDA and GEP Submissions: -

Resources:

- 1) Hitachi-GE ME SME team in coordination with all the sections involved
- 2) Horizon Nuclear Power

- 3) Equipment Suppliers
- 4) Sub-contractors
- Etc.

**Summary of impact on GDA submissions:**

The GDA submissions that will 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 (Document No.)</u>	<u>Submission Date to the Regulators</u>
ROA2, 3, 4	Basis of Safety Cases on Heating Ventilating and Air Conditioning System	GA91-9201-0002-00041 (HPE-GD-H006)	29-Jan-2015 (Rev.2)
ROA2, 3, 4	Basis of Safety Cases on Standby Gas Treatment System	GA91-9201-0002-00019 (SE-GD-0043)	29-Jan-2015 (Rev.2)

**Programme Milestones/ Schedule:**

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

**Reference:**

Document Title	Document ID	Rev.

