

Hitachi-GE Nuclear Energy, Ltd.
UK ABWR GENERIC DESIGN ASSESSMENT
Resolution Plan for RO-ABWR-0019
UK ABWR Reactor Chemistry Safety Case: Strategy, Plan and Delivery

RO TITLE:	UK ABWR Reactor Chemistry Safety Case: Strategy, Plan and Delivery	
REVISION :	0	
Overall RO Closure Date (Planned):	31 October 2015	
REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION		
Regulatory Queries	RQ-ABWR-0085	
Linked ROs	RO-ABWR-0006 RO-ABWR-0022	
Other Documentation	-	

Scope of work :
<p>Background The Reactor Chemistry Water Regime has been outlined in the PCSR Rev A, which was submitted at the end of Step 2. This water regime will be developed further during Step 3 and will be incorporated into the PCSR Rev B submission in August 2015.</p> <p>When comparing the ONR requirements and expectations to the current position of Hitachi-GE, it is necessary for Hitachi-GE to develop a suitable and sufficient safety case for Reactor Chemistry. The Safety Case should be in accordance with a detailed plan outlining the specific safety case tasks which must be completed and provide clear clarity on and the timings for the deliverables.</p> <p>They can be summarised as:</p> <ol style="list-style-type: none"> 1. To demonstrate the Reactor Chemistry Safety Case objectives, strategy and scope will be developed in accordance with International Standards and good practice; 2. To demonstrate the hierarchy of submissions that constitutes the Reactor Chemistry Safety Case; 3. To demonstrate that the structure of the submissions is fully considered; 4. To demonstrate how the identified submissions will develop the overall Reactor Chemistry Safety Case; and 5. To demonstrate how any Reactor Chemistry supporting documents produced will be used to support the PCSR. <p>This Resolution Plan is prepared to respond the RO-ABWR-0019 on Project Plan and Delivery for Reactor Chemistry Safety Case.</p> <p>Scope of Work This Resolution Plan demonstrates how the safety strategy and revised submission plan will be developed. This includes the milestones for Project Plan and development of UK ABWR Reactor Chemistry Safety Case.</p> <p>The scope for the Reactor Chemistry Safety Case is:</p> <ul style="list-style-type: none"> • all operational modes for the UK ABWR (commissioning, hot functional testing, start-up, at power operations, shutdown and decommissioning) • all the chemistry plant and processes in direct control of the Reactor Chemistry technical team; • the plant and process safety cases being developed by other technical teams which affect Reactor Chemistry.

The Reactor Chemistry Safety Case production will be carried out in accordance with Hitachi-GE procedures. Any changes to the reactor chemistry safety case will be documented through the generic Design Assessment (GDA Design Change Control) process. This will result in any changes to the Reactor Chemistry Safety Case being communicated to other technical areas for incorporation in other chapters of the PCSR Rev B and C (plus any subsequent revisions). The same process will be followed to enable changes to the safety case in other technical areas which impacts reactor chemistry be incorporated into the Reactor Chemistry Safety Case.

The Reactor Chemistry Safety Case will be produced by Hitachi-GE in line with NT-TAST-GD-051.

Description of work:

ACTION RO-ABWR-0019.A1 - *Hitachi-GE to provide their strategy for development of the Reactor Chemistry elements of the UK ABWR Safety Case*

Hitachi-GE will provide the strategy for development of the Reactor Chemistry elements of the UK ABWR Safety Case. The safety Case strategy will demonstrate the links between:

- Generic GDA Pre-construction Safety Report (PCSR);
- PCSR Rev A;
- Draft PCSR Rev B;
- ALARP/ BAT justification report;
- Topic reports and other supporting documentation;
- Content of the responses to Regulatory Queries and Observations;
- GDA Design Change Control process within reactor chemistry and with other technical areas.
- Documented procedures for the production of the safety case
- Steering Committee for cross cutting topic areas and any other decision making meetings.

The Safety Case strategy will achieve the following:

- Define the objective of the safety case;
- Define the level and type of information needed;
- Produced in accordance with ONR documentation (NS-TAST-GD-051) and international standards/ good practice;
- Explain how claims made in step 2 in steps 3 and 4 will be substantiated in the PCSR;
- Define important interdependencies between technical areas;
- Identify other GDA technical areas which impact on Reactor Chemistry e.g. material selection;
- Define the operating regimes to be considered in the PCSR;
- Outline the procedure for the inclusion of comments on the Preliminary Safety Report (PSR) and PCSR Rev A into PCSR Rev B;
- Identify any clarifications required on the Reactor Water Chemistry regime in documentation already produced and submitted.

Hitachi-GE understand the PCSR will develop throughout the project and the PCSR Strategy will commit to identification of all the impacted safety and environmental submission documents that will be affected by reactor chemistry eg. PCSR, GEP, Master Document Submission List, Design Change Documentation, DRP, etc and implement changes in accordance with its Commitments Capture Procedure when it updates its documentation throughout GDA.

ACTION RO-ABWR-0019.A2 - *Hitachi-GE to provide a project plan for delivery of the Reactor Chemistry elements of the UK ABWR Safety Case*

Hitachi-GE are requested to provide the safety case plan for delivery of the Reactor Chemistry elements of the UK ABWR Safety Case to define in detail how the strategy identified in ROA1, will be enacted. This will include the following:

- Definition of the Reactor Chemistry Safety Case tasks required to be completed during GDA (including any tasks already completed or ongoing).

- Identification of the various reports (e.g. PCSR, topic reports, basis of safety case, etc) which will be produced with clear identification of their hierarchy and interfaces.
- The timeline for production of the deliverables, including their submission date to ONR.
- Specific constraints or assumptions which may impact on the plan
- Interfaces with other technical areas or topics

This plan will identify the documentation being produced for the GDA Safety Case which has a relevance to the Reactor Chemistry Safety Case. The programme of submission is a sub-set of the overall safety case plan.

ACTION RO-ABWR-0019.A3 - *Hitachi GE to allocate Suitably Qualified and Experienced Resources to develop the UK ABWR Reactor Chemistry Safety Case*

The individual responsible for the production of the Reactor Chemistry Safety Case is the Reactor Chemistry Subject Matter Expert. The Reactor Chemistry Safety Case will be developed by a number of Suitably Qualified and Experienced (SQEP) person within Hitachi-GE will be supported by individuals within Horizon Nuclear Power with UK Safety Case experience.

Hitachi-GE will provide the details of their Suitably Qualified and Experienced Resources to develop the UK ABWR Reactor Chemistry Safety case. The details will identify who is assisting in the production of the different sections of the Reactor Chemistry Safety Case.

ACTION RO-ABWR-0019.A4 – *Hitachi-GE to provide the identified Reactor Chemistry Safety Case deliverables*

The deliverables identified in the submission plan will be submitted to ONR as per the programme schedule. The submission plan has been aligned with the topic/system areas identified in RQ-ABWR-0085 with more clearly defined linkages between the topic reports and other documentation. A number of new topic reports have been identified and will be included in the revised plan.

The proposed closure date for this action is 31 October 2015. To achieve the closure of RO-ABWR-0019.A4 will require acceptance by the ONR of the Safety Case strategy and the safety case plan and agreement of a list of Step 4 deliverables.

As noted in Action 1 Hitachi-GE understands the PCSR will develop throughout the project and the PCSR Strategy will commit to identification of all the impacted safety and environmental submission documents that will be affected by reactor chemistry eg. PCSR, GEP, Master Document Submission List, Design Change Documentation, DRP, etc and implement changes in accordance with its Commitments Capture Procedure when it updates its documentation throughout GDA.

Summary of impact on GDA submissions:

GDA Submission Documents	C/U	Related GDA RO Actions(s)	Submission Date to ONR/EA temporary
PCSR Rev.B Structural Integrity Chapter	U	N/A	Aug. 2015
PCSR Rev.B Radioactive Waste Management Chapter	U	N/A	Aug. 2015
PCSR Rev.B Radiation Protection Chapter	U	N/A	Aug. 2015
PCSR Rev.B Design basis analysis Chapter	U	N/A	Aug. 2015
PCSR Rev.B Decommissioning Chapter	U	N/A	Aug. 2015
GEP E4b Radioactive Waste Management Arrangements	U	N/A	Aug. 2015
GEP E5b Demonstration of BAT	U	N/A	Aug. 2015
GEP E7b Quantification of Discharges and Limits	U	N/A	Aug. 2015
GEP E8b Prospective Dose Modelling	U	N/A	Aug. 2015

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Programme Milestones/ Schedule:
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See attached Gantt Chart (Table 1)

Reference:

None

Table 1 RO-ABWR-0019 Gantt Chart

Resolution Plan for RO-ABWR-0019		«Legend»		2014					2015												
		■ ... Plan	←→ ... Actual	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Level	Action Title	Start(Plan)	Finish(Plan)																		
1	Regulator's issue of RO	11-Aug-14	24-Nov-14	█																	
1.1	ONR Issue RO	11-Aug-14	19-Sep-14	█																	
1.2	Hitachi-GE Acknowledge RO & Issue Resolution Plan	20-Sep-14	10-Nov-14		█																
1.1	Regulator's confirm credibility of Resolution Plan	11-Nov-14	17-Nov-14				█														
1.2	Regulator's publish RO and Resolution Plan	18-Nov-14	01-Dec-14				█														
2	Preparation of Submissions and Closure of RO Actions	04-Nov-14	30-Oct-15				█														
2.1	RO Action 1	04-Nov-14	28-Nov-14				█														
2.2	RO Action 2	04-Nov-14	28-Nov-14				█														
2.3	RO Action 3	04-Nov-14	28-Nov-14				█														
2.4	RO Action 4	04-Nov-14	30-Sep-15				█														
2.5	Regulator's assesment of submissions	01-Dec-14	30-Oct-15				█														
3	Regulator's Closure of RO																				
3.1	Regulator's publication of RO closure letter	30-Oct-15	30-Oct-15																	█	