

Hitachi-GE Nuclear Energy, Ltd.
UK ABWR GENERIC DESIGN ASSESSMENT
Resolution Plan for RO-ABWR-0022
UK ABWR Reactor Chemistry Safety Case: Demonstration that the
Primary Cooling System Operating Chemistry reduces risks SFAIRP

RO TITLE:	UK ABWR Reactor Chemistry Safety Case: Demonstration that the Primary Cooling System Operating Chemistry reduces risks SFAIRP	
REVISION :	0	
Overall RO Closure Date (Planned):	24 March 2015	
REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION		
Regulatory Queries	-	
Linked ROs	RO-ABWR-0006 RO-ABWR-0019	
Other Documentation	-	

Scope of work :

Background

Chemistry control of the primary cooling system can be particularly important given the potential risks posed by its inadequate execution on the integrity of fuel and structural materials and the generation and transport of radioactivity, amongst others. In addition to the reactor chemistry topic, the decision on the primary cooling system, operating chemistry will have impacts on many other areas of the UK ABWR safety case (for example fuel, structural integrity, radiation protection and radwaste) and submissions already provided or scheduled to be submitted to ONR.

The ONR expect the ALARP/ BAT justification to demonstrate that:

- The chosen option reduces risks SFAIRP
- A process of optimisation has been followed and this can be demonstrated to the ONR in a transparent manner and form part of the Safety Case for UK ABWR.

The ALARP/ BAT justification must demonstrate:

- What the risks are that are being mitigated, including likelihood and consequence;
- What measures are in place to mitigate these risks, including the adoption of relevant good practice measures;
- What options, or range of options, could be applied to further mitigate these risks (maybe outside of the area of Reactor Chemistry); and
- A demonstration of whether these options are reasonably practicable to implement or not.

This Resolution Plan is prepared to respond to the RO-ABWR-0022: Demonstration that the Primary Cooling System Operating Chemistry reduces risks SFAIRP.

Scope of Work

This Resolution Plan demonstrates how the ALARP justification will be developed for the UK ABWR Reactor Chemistry Safety Case. The ALARP / BAT justification will be developed in alignment with the Safety Case Strategy developed in response to RO-ABWR-0019. The ALARP/ BAT justification will have a direct impact on RO-ABWR-0006 with determining the Common Source term.

The ALARP justification will cover the “At Power Operations” mode of operation. Further ALARP justifications

will be produced in Step 3 and 4 to cover the remaining modes of operation.

Description of work:

ACTION 1 - *Hitachi-GE to provide a robust demonstration to show that the primary cooling system operating chemistry reduces risks SFAIRP.*

Hitachi-GE will produce an ALARP/ BAT justification for the Primary Cooling System Operating Chemistry which reduces risks SFAIRP. To achieve this the ALARP/ BAT justification will:

- Be produced in accordance with HSE & ONR documentation and international standards/ good practice including “The Application of ALARP to radiological risk: A nuclear Industry Good Practice Guide”;
- Be produced using BAT Best Practice methodology and relevant UK/ EU legislation;
- Be produced using Worldwide Relevant Good Practice;
- Include the Optioneering process, balance of all risks and a demonstration of the optimised solution for ALARP justification and BAT;
- Define the methodology used to produce the ALARP/ BAT justification
- Include any relevant Operating Experience Feedback and any known problems;
- Provide a precautionary approach using sound engineering and operational practice;
- Include uncertainties, claims and assumptions made during the conclusions of the ALARP/ BAT justification;
- Include sensitivity studies for quantitative data used in the arguments within the ALARP/ BAT justification; and
- Identify any omissions in data availability and the timescales for when the data will be available.

The outcome from the ALARP / BAT justification process will be an optimised solution for reactor chemistry safety case and the BAT assessment.

Summary of impact on GDA submissions:

The outcome of the ALARP/ BAT justification will be incorporated into the source term assessment work (RO-ABWR-0006). During the development of PCSR Rev B the optimised solution will be incorporated into fuel, structural integrity, radiation protection and radwaste topics.

Programme Milestones/ Schedule:

See attached Gantt Chart (Table 1)

Reference:

None

Table 1 RO-ABWR-0022 Gantt Chart

Resolution Plan for RO-ABWR-0022		«Legend»		2014				2015			
		■ ... Plan	←→ ... Actual	9	10	11	12	1	2	3	4
Level	Action Title	Start(Plan)	Finish(Plan)								
1	Regulator's issue of RO	01-Oct-14	02-Dec-14		█						
1.1	ONR Issue RO	01-Oct-14	10-Oct-14		█						
1.2	Hitachi-GE Acknowledge RO & Issue Resolution Plan	11-Oct-14	07-Nov-14		█						
1.1	Regulator's confirm credibility of Resolution Plan	10-Nov-14	17-Nov-14			█					
1.2	Regulator's publish RO and Resolution Plan	18-Nov-14	02-Dec-14			█					
2	Preparation of Submissions and Closure of RO Action	04-Nov-14	24-Mar-15			█					
2.1	RO Action 1	04-Nov-14	24-Mar-15			█					
3	Regulator's Closure of RO										
3.1	Regulator's publication of RO closure letter	24-Mar-15	24-Mar-15							█	