REGULATORY OBSERVATION

REGULATOR TO COMPLETE

RO unique no.:	RO-ABWR-0038
Date sent:	20th January 2015
Acknowledgement required by:	13th February 2015
Agreement of Resolution Plan Required by:	6th March 2015
Resolution of Regulatory Observation required by:	27th March 2015
TRIM Ref.:	2015/22246
Related RQ / RO No. and TRIM Ref. (if any)**:**	
Observation title:	Additional electrical power source
Technical area(s) 7. Electrical Power Supply	**Related technical area(s)** 4. PSA 5. Fault Studies 11. Mechanical Engineering

Regulatory Observation

Summary

The Step 3 assessment activities on the electrical system require the development of safety claims assessing the capability of the electrical system to provide power supplies to operate safety functions, submission of documents describing the electrical protection and interlocking systems and the undertaking of computer based system studies assessing the performance of the electrical system in response to internal and external electrical disturbances. These activities should be based on a final version of the electrical system architecture as changes to the system architecture can have a significant effect on the design submissions.

Hitachi-GE have advised that safety analysis is being conducted of possible requirement for an additional power source to support the emergency diesel generators. The adoption of this additional power source would impact on the electrical system architecture and result in changes to the design submissions.

Background

Hitachi-GE have modified the design of the electrical system so that the back-up building diesel generators are diverse from the reactor building. The back-up building diesel generators operate at 690V compared with the 6.9kV of the reactor building and will for independence requirements have no electrical connections with the Class 1 system in the reactor building.

As a result of this change to the back-up building electrical system there will no longer be a facility for one of the back-up building diesel generators to provide a safety role supporting the three emergency diesel generators.

Safety analysis is currently being performed by Hitachi-GE of the requirement to provide an additional power source supporting the three emergency diesel generators thus performing the same role as the 6.9kV back-up building diesel in the original design. Hitachi-GE are considering a diverse power source which would be installed in a location separated from the reactor building and the back-up building.

The design solution adopted by Hitachi-GE for the diversity of the back-up building electrical supplies is a significant development as this determines the main electrical system architecture. However, the resolution of the requirement for an additional power source will also impact on the electrical system architecture as this potentially requires an additional power source which can be connected to support any one of the emergency diesel generators. The additional power source, if required, will involve additional electrical distribution equipment which impacts on the electrical safety case, electrical protection, electrical interlocking, cable routes

and electrical system studies.

Regulatory Expectation

Hitachi-GE have advised that they are conducting an analysis of the possible requirement to provide an additional power source having a safety role supporting the three emergency diesel generators. ONR expectation is that this analysis is conducted and resolved so as not to adversely impact document submissions to ONR for UK ABWR GDA assessment

Regulatory Observation Actions

RO-ABWR-0038.A1

Hitachi-GE to conduct an analysis of the possible requirement to provide an additional power source having a safety role supporting three emergency diesel generators

Resolution required by 06/03/2015

RO-ABWR-0038.A2

If a decision is made to modify the design then Hitachi-GE to submit updated design submissions for GDA assessment of the UK ABWR electrical system following resolution of the requirement for an additional power source.

Resolution required by 06/03/2015

REQUESTING PARTY TO COMPLETE

Actual Acknowledgement date:	
RP stated Resolution Plan agreement date:	