REGULATORY OBSERVATION

REGULATOR TO COMPLETE

RO unique no.:	RO-ABWR-0039
Date sent:	14th December 2015
Acknowledgement required by:	7th January 2016
Agreement of Resolution Plan Required by:	*To be determined by the Hitachi-GE Resolution Plan*
Resolution of Regulatory Observation required by:	*To be determined by the Hitachi-GE Resolution Plan*
TRIM Ref.:	2015/472712
Related RQ / RO No. and TRIM Ref. (if any)**:**	
Observation title:	UK learning from the Fukushima Dai-ichi events
Technical area(s) 18. Severe Accident Analysis	**Related technical area(s)** 2. Civil Engineering 3. External Hazards 5. Fault Studies 6. Control & Instrumentation 7. Electrical Power Supply 4. PSA 13. Human Factors 21. Generic Environmental Permitting

Regulatory Observation

Summary

In response to the events at Fukushima Dai-ichi in March 2011 the UK produced several reports collating the UK learning from these events. The UK nuclear industry's response to the events at Fukushima resulted in a number of modifications to existing and planned nuclear facilities in the UK to further increase the resilience of these facilities against a Fukushima type event. This work was largely managed through the application of the Chief Inspectors Recommendations and the EU stress test process. ONR considers the UK industry's learning from the Fukushima to be relevant good practice and it is appropriate for a requesting party (Hitachi-GE) to allocate additional focus to these issues through provision of the information requested below.

Hitachi-GE are expected to consider all relevant learning from the events at Fukushima Dai-ichi for the design of the UK ABWR (as specified in ONR's GDA guidance); this RO is targeted at specific UK learning from this event to ensure a process is in place to manage Hitachi-GE's response to this learning. ONR will assure that all further learning from this event is taken into account within the design of the UK ABWR through normal technical interactions with Hitachi-GE throughout the GDA process.

Background

Following the nuclear incident at Japan's Fukushima Dai-ichi site, the UK Secretary of State for Energy and Climate Change formally asked HM Chief Inspector of Nuclear Installations to provide a report to Government on the implications and lessons learnt for the UK nuclear industry. The HM Chief Inspector of Nuclear Installations produced two reports (www.onr.org.uk/fukushima/interim-report.pdf and www.onr.org.uk/fukushima/final-report.pdf); these reports contained 26 Interim Recommendations and 12 Final Recommendations aim at the UK Government, ONR and the UK nuclear industry. Following the publication of the HM Chief Inspector's reports, ONR asked the UK nuclear industry to identify which Recommendations were relevant to each nuclear site and to provide a formal response to these Recommendations.

Further, in the wake of events at Fukushima, every nuclear power generating country in Europe agreed to carry out safety 'stress tests'. The stress test process was carried out in three steps: a self-assessment by licensees, followed by an independent review by the national regulatory bodies, and by a third phase of international peer reviews (nuclear power plants only). The tests, completed by licensees, involve a targeted reassessment of each stations safety margins in light of extreme natural events, such as earthquake, flooding,

extreme weather and tsunami. The stress test can be summarised as the licensed nuclear installations targeted reassessment of the relevant safety margins in light of the events which occurred at Fukushima Dai-ichi. In addressing the stress tests the licensees identified a number of potential improvements (referred to as "Considerations") to increase defence in depth against events beyond design basis. Further, ONR's review of the licensees' stress tests (www.onr.org.uk/fukushima/stress-tests-301211.pdf and www.onr.org.uk/fukushima/ngpf-report.pdf) has resulted in a number of Stress Test Findings to be addressed by the UK nuclear industry. The international peer review also contain specific recommendations to the participating member states for their consideration or good practices that may have been identified and, to some extent, information specific to each country and installation. The international peer review report for the UK is located at: www.ensreg.eu/sites/default/files/Country%20Report%20UK%20Final.pdf.

In response to both the HM Chief Inspector's Recommendations and the European stress test process the UK nuclear industry has derived a significant number of improvements, mainly to enhance resilience for emergency actions following events beyond the design basis and also to enhance margin assessment methods. There are also potential improvements to the type or number of barriers to some hazards (e.g. flooding) which should increase defence in depth against events beyond design basis.

Subsequently, UK operating organisations and ONR have produced implementation reports detailing how the UK nuclear industry is responding to the HM Chief Inspector's Recommendations, Stress Test Findings, EU peer review recommendations and their own considerations. The reports provide a summary of the progress that has been made on addressing the HM Chief Inspector's recommendations and the outcomes of the European stress tests reports, both in terms of the national reports for the UK and the European level peer review.

ONR expects that appropriate learning from the Fukushima Dai-ichi events will be accounted for within the design of the UK ABWR. This RO requests the Requesting Party to identify the relevant UK learning from the Fukushima Dai-ichi events and requests the Requesting Party to demonstrate that this learning has been fully incorporated into the design of the UK plant. Further, the Requesting party is also requested to identify the interfaces between the designer and the potential future nuclear site licensee in addressing the relevant UK learning from the Fukushima Dai-ichi events.

Hitachi-GE have already provided a high level response to the Chief Inspector's recommendations at the start of the GDA process within the Resilience of design against Fukushima type events (GA91-9901-0014-00001 Rev A) document. This document makes commitments that all of the conclusions and recommendations, which relates to GDA, will be considered in the current configuration of ABWR. Further, more detailed responses to the Chief Inspector's recommendations will be required for ONR to confirm that the intent of these recommendations has been fully incorporated into the design of the UK ABWR.

ONR is currently going through a process with the UK nuclear industry to ensure that all of the Fukushima Chief Inspector's recommendations, stress test findings and other relevant recommendations are addressed and agreed with ONR. As the design of the UK ABWR develops Hitachi-GE will have to demonstrate that all of the UK learning from the events at Fukushima has been incorporated, clear interfaces with the potential future licensee has been identified and present this information in such a way that ONR can agree that all of the relevant UK learning for the design of the UK ABWR has been addressed by the requesting party.

December 2015 Update

The international community continues to review the events at the Fukushima Dai-ichi plant in 2011. Since the original issue of RO-ABWR-0023 in February 2015, the Director General of the International Atomic Energy Agency (IAEA) has published a comprehensive report on the causes and consequences of the incident and the lessons for governments, regulators and nuclear power plant operators throughout the world. The report is located at: http://www-pub.iaea.org/books/IAEABooks/10962/The-Fukushima-Daiichi-Accident. The key findings of the report are summarised in the form of observations and lessons under the themes of nuclear safety, emergency preparedness and response, radiological consequences and post-accident recovery. ONR's expectation is that the aspects of this learning relevant to GDA should be addressed by Hitachi-GE. Where appropriate, there should be clear a statement on interface arrangements to ensure that learning can be taken forward by the future licensee.

Regulatory Observation Actions

RO-ABWR-0039.A1: *Response to the HM Chief Inspector's Recommendations*
a) Hitachi-GE are requested to clearly identify and report which of the HM Chief Inspector's Recommendations are relevant to the design of the UK ABWR plant.
b) Once the Recommendations which are relevant to the design of the UK ABWR have been identified, Hitachi-GE is requested to provide a written response detailing how the relevant Recommendations have been / will be addressed within the design of the UK ABWR. If modifications or further analysis is requested to fully address the intent of the HM Chief Inspector's Recommendations a schedule of further work should be provided.
Resolution requested by: To be determined by Hitachi-GE's Resolution Plan.

Resolution required by 30/03/2015

RO-ABWR-0039.A2*: Response to the outcomes of the European stress test reports*
a) Hitachi-GE are requested to clearly identify and report which of ONR's Stress Test Findings, other Licensee's Considerations and recommendations from the European peer review are relevant to the design of the UK ABWR plant .
b) Once the outcomes which are relevant to the design of the UK ABWR have been identified, Hitachi-GE is requested to provide a written response detailing how the relevant Findings, Considerations and European peer review Recommendations have been / will be addressed within the design of the UK ABWR. If modifications or further analysis is requested to fully address the intent of outcomes a schedule of further work should be provided.

Resolution requested by: To be determined by Hitachi-GE's Resolution Plan.

Resolution required by 11/05/2015

RO-ABWR-0039.A3*: Response to the IAEA's observations and lessons*
a) Hitachi-GE are requested to clearly identify and report which of the lessons /observations from the IAEA Director General's report on the Fukushima Dai-ichi Accident are relevant to the design of the UK ABWR plant.
b) Once the observations /lessons which are relevant to the design of the UK ABWR have been identified, Hitachi-GE is requested to provide a written response detailing how the relevant observations and lessons have been / will be addressed within the design of the UK ABWR. If modifications or further analysis is requested to fully address the intent of the IAEA's observations/lessons a schedule of further work should be provided

Resolution requested by: To be determined by Hitachi-GE's Resolution Plan.

Resolution required by to be determined by Hitachi-GE Resolution Plan

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REQUESTING PARTY TO COMPLETE

Actual Acknowledgement date:	
RP stated Resolution Plan agreement date:	