# REGULATORY OBSERVATION

## REGULATOR TO COMPLETE

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| **RO unique no.:** | RO-ABWR-0049 |
| **Date sent:** | 6th May 2015 |
| **Acknowledgement required by:** | 28th May 2015 |
| **Agreement of Resolution Plan Required by:** | 28th May 2015 |
| **Resolution of Regulatory Observation required by:** | *To be determined by Hitachi-GE Resolution Plan* |
| **TRIM Ref.:** | 2015/166980 |
| **Related RQ / RO No. and TRIM Ref**. (if any)**:** | |
| **Observation title:** | Mechanical Engineering – Dropped Load Counter Measures |
| **Technical area(s)**<br>11. Mechanical Engineering | **Related technical area(s)**<br>1. Internal Hazards<br>2. Civil Engineering<br>13. Human Factors<br>16. Conventional Safety & Decommissioning |

## *Regulatory Observation*

**Summary**

This mechanical engineering regulatory observation is cross cutting. It is being raised to ensure the UK ABWR lifting sequences are aligned to UK legislation requirements and have been optioneered to reduce the risks So Far Is Reasonably Practicable (SFAIRP).

**Assessment Observation**

During the third Step 3 mechanical engineering technical workshop; Jan 2015; the Requesting Party (RP) explained in detail with the aid of its 3D computer aided design model how its main steam isolation valves and safety relief valves are manoeuvred from their operating position to a dedicated maintenance workshop during an outage when the reactor is shutdown and depressurised.

The RP stated proprietary manual block and tackle lifting equipment is used to transfer safety cat “A”; class “1” components directly over other cat “A” class “1” SSCs.

In addition, the RP responses to RQ-ABWR-0001 and RQ-ABWR-0264 do not provide an adequate level of assurance of understanding UK legislation requirements.

I consider:

1. the explanation represented an out of date approach that is not aligned with UK Relevant Good Practice (RGP);
2. the explanation demonstrated the RP has undertaken limited optioneering to either eliminate or to optimise the transfer route to reduce drop load risks SFAISP and to secure an As Low As Reasonably Practicable (ALARP) design.
3. the RP has not taken adequate account of the UK Management of Health and Safety at Work Regulations 1999 requirements. In this case the regulations require a risk assessment to be carried out to identify the nature and level of risks associated with lifting sequences and the need to take appropriate consideration to either eliminate or control the identified risks.
4. a lifting schedule has the ability to set out each lifting sequence claims, arguments and evidence for the concept design; for example:
    a. all the nuclear safety lift sequences associated with normal operations and maintenance tasks;
    b. lifting descriptions, routes and other equipment demands; and
    c. lifting sequence hazards, risks, consequences and mitigation measures.

I consider the following Safety Assessment Principles (SAPs) to be pertinent to this topic:

1. EDR.1 – Failure to safety – due account should be taken of the need for structures, systems and components to be designed to be inherently safe, or to fail in a safe manner, and potential failure modes should be identified, using a formal analysis where appropriate;

2. ELO.1 – Access - the design and layout should facilitate access for necessary activities and minimise adverse interactions while not compromising security aspects;

3. ELO.4 - Minimisation of the effects of incidents - the design and layout of the site, its facilities (including enclosed plant), support facilities and services should be such that the effects of faults and accidents are minimised; and

4. EHA.6 – Analysis - the effects of internal and external hazards that could affect the safety of the facility should be analysed. The analysis should take into account hazard combinations, simultaneous effects, common cause failures, defence in depth and

consequential effects.

I consider this regulatory observation to be cross-cutting and of interest to:

1. Internal hazards; and
2. Conventional safety

To conclude, I consider the RP design process arrangement for lifting sequences in support of the above maintenance activity:

1. is not aligned with UK legislation or RGP;
2. it doesn't reduce the risks SFAIRP; thus doesn't secure an ALARP design basis; which is a requirement of UK legislation (Health & Safety at Work etc. Act 1974); and
3. a GDA can't be concluded without this regulatory observation being adequately addressed in an auditable manner.

**Regulatory Expectations**

It is my regulatory expectation that the RP:

1. identifies, reviews and understands the applicable UK legislation requirements associated with lifting sequences;
2. undertakes a review of all its lifting sequences important to safety (both during normal operations and planned maintenance) against the UK legislation requirements to:
    a. reduce the SSCs risks SFAIRP; a requirement of UK legislation (Health & Safety at Work etc. Act 1974) and to secure an ALARP design basis;
    b. meet the expectations of the ONR's SAPs; and
    c. meet the expectations of UK relevant good practice.
3. generates an auditable trail to its safety claims, supporting arguments and substantiation evidence.

## *Regulatory Observation Actions*

***RO-ABWR-0049.A1***

Generate a resolution plan that will:

a. present its detailed strategy to demonstrate the UK ABWR lifting sequences are aligned with UK legislation and are optioneered to be ALARP;
b. define and scope the planned activities;
c. include a controlled programme identifying: planned activities; deliverables; milestones; timescales and resource requirements; and
d. provide the audit trail to demonstrate the UK ABWR lifting sequences hazards and risks have been reduced SFAIRP and demonstrate the lifting sequences are ALARP.

*Resolution required by: To be determined by Hitachi-GE Resolution Plan*

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***RO-ABWR-0049.A2***

*Provide progress updates to ONR through the planned GDA engagements*

*Resolution required by: To be determined by Hitachi-GE Resolution Plan*

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***RO-ABWR-0049.A3***

*Make available to ONR activity deliverables, conclusions and recommendations*

*Resolution required by: To be determined by Hitachi-GE Resolution Plan*

***RO-ABWR-0049.A4***

if appropriate:

a. raise design changes; and
b. update the UK ABWR safety case, system designs and substantiation

*Resolution required by: To be determined by Hitachi-GE Resolution Plan*

***RO-ABWR-0049.A5***

*Make available any appropriate updated documents and substantiation for ONR assessment.*

*Resolution required by: To be determined by Hitachi-GE Resolution Plan*

## REQUESTING PARTY TO COMPLETE

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| **Actual Acknowledgement date:** | |
| **RP stated Resolution Plan agreement date:** | |