

REGULATORY OBSERVATION	
REGULATOR TO COMPLETE	
RO unique no.:	RO-ABWR-0015
Date sent:	16 th September 2014
Acknowledgement required by:	07 October 2014
Agreement of Resolution Plan Required by:	28 November 2014
Resolution of Regulatory Observation required by:	28 June 2015
TRIM Ref.:	2014/253182
Related RQ / RO No. and TRIM Ref. (if any):	
Observation title:	Mechanical engineering SSC's qualification and layout provision
Technical area(s) Mechanical engineering	Related technical area(s) Conventional safety Radiation protection MSQA Decommissioning and radioactive waste Internal hazards Civil engineering and external hazards
<i>Regulatory Observation</i>	

Summary

This mechanical engineering regulatory observation is cross cutting and is being raised to ensure all structures, systems and components (SSCs) important to safety are:

1. adequately qualified for the purpose which they are to be used; and
2. the building layout has fully engineered routing provision for each SSC requiring replacement.

Assessment Observation

The requesting party's (RP) plant reference design has a 40 year design life; however, for the UK ABWR submission the RP has increased the plants design life to 60 years.

Through assessment and technical discussion of the RP's Step 2 basis of safety case submissions, the RP has provided limited assurance that it has reviewed or considered the need to undertake additional qualification of mechanical engineering SSCs important to safety to support its 60 year design life claim. I consider this to be a shortfall in my regulatory expectations.

The exceptions to this are the main steam isolation valves and the pressure relief valves; the RP has stated that it intends to undertake additional valve cycling qualification to substantiate the valves for the revised claim. I am encouraged by the RP's strategy for these specific SSCs.

The RP has also provided limited assurance that it has considered the building layout and ingress/egress provision as being adequate to replace any large SSC that is to retain a 40 year design life. An example of this is the ability to replace the condensate and feedwater system heaters. I also consider this to be a shortfall in my regulatory expectations.

I judge engineered SSCs need to be optioneered and designed to deliver their required safety functions with adequate reliability. It is the SSC qualification processes and assignment of a commensurate examination, inspection, maintenance and testing regime that provides assurance of achieving the reliability requirements. Also, if a SSC is expected to be replaced during the life of the plant, adequate engineered ingress / egress provision should be provided.

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

1. conventional safety;
2. radiation protection,
3. MSQA
4. decommissioning and radioactive waste;
5. internal hazards; and
6. civil engineering and external hazards.

In conclusion, I consider:

1. the RP's claim may be reasonable but further assurance is required;
2. the RP has provided limited assurance that it has reviewed or considered undertaking additional SSC qualification to support the revised claim for all its SSC's;
3. the RP has not adequately demonstrated the building layout incorporates sufficient ingress / egress provision for SSCs that will require replacement during the plants operational phase;
4. a GDA can not be concluded without the assessment observation being adequately addressed in an auditable manner.

Regulatory Expectations

It is my regulatory expectation that:

1. each mechanical engineering SSC has been:
 - a. optioneered to reduce the risks so far as is reasonably practicable (SFAIRP); a requirement of UK legislation (Health & Safety at Work etc. Act 1974);
 - b. optioneered to minimise the volume of radioactive waste generated;

- c. optioneered to reduce operator dose uptake; and
 - d. adequately qualified for its design intent and life.
2. the building layout incorporates a fully engineered route for each mechanical engineering SSC that is planned to be replaced during the operational phase of the plant.

Regulatory Observation Actions

The RP is expected to:

1. generate a resolution plan that will:
 - a. present its detailed strategy to demonstrate each UK ABWR mechanical engineering SSC is adequately qualified. In addition, where necessary the building layout has sufficient provision to support a replacement;
 - 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:
 - i. each SSC design has been adequately qualified;
 - ii. each SSC design risks have been reduced SFAIRP demonstrating the design is as low as reasonably practicable (ALARP); and
 - iii. where necessary the building layout provision is sufficient to support a SSC replacement.
2. undertake a multidiscipline review (include an independent) that will:
 - e. clarify a SSC design life; noting SSCs identified to support post operational clean out (POCO) and decommissioning phases for example ventilation systems will have an increased life requirement;
 - f. establish the design life limiting factors;
 - g. establish if a SSC has been fully optioneered and its design is ALARP;
 - h. establish the adequacy of existing qualification substantiation;
 - i. establish if it is reasonable and ALARP to undertake further qualification; and
 - j. establish where necessary if the building layout ingress/ egress provision is adequate to support a SSC replacement.
3. adopt a hierarchical and phased approach to undertaking the review;
4. provide progress updates to ONR through the planned GDA engagements;
5. make available to ONR the review conclusions and recommendations;
6. if appropriate:
 - a. raise design changes; and
 - b. update the UK ABWR safety case, system designs and substantiation; and
7. make available any appropriate updated documents and substantiation for ONR assessment.

Actual Acknowledgement date:	
RP stated Resolution Plan agreement date:	