

Hitachi-GE Nuclear Energy, Ltd.
UK ABWR GENERIC DESIGN ASSESSMENT
Resolution Plan for RO-ABWR-0009
Analysis of Loss of Offsite Power Events

RO TITLE:	Analysis of Loss of Offsite Power Events	
REVISION :	0	
Overall RO Closure Date (Planned):		
REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION		
Regulatory Queries		
Linked ROs		
Other Documentation		

Scope of work :
<p>Offsite electrical power is an important element for safe operation and accident recovery of UK ABWR. Therefore, loss of offsite power (LOOP) is an initiating event to be considered in both of the design basis analysis and probabilistic safety analysis. In addition to the consideration of LOOP as the initiating event, this RO requires Hitachi-GE to consider the LOOP with a common cause failure (CCF) of the emergency diesel generators (EDGs) and with the loss of the backup building air-cooled diesel generators (DGs).</p> <p>For the long term LOOP events, the three divisional EDGs reduce the probability of station blackout because the on-site fuel tank capacity is more than 7 days (168 hours).</p> <p>Even for the station blackout (LOOP with CCF of EDGs), the UK ABWR has adequate structures, systems or components (SSCs) for core cooling, alternate AC power, and long-term heat removal. AC-independent core cooling is achieved by RCIC (24 hours capability) or alternate water injection from the backup building (more than 7 days) or by AC-independent fire protection system pump. Air-cooled DG in the backup building can supply more than 7 days power. The containment venting can remove the heat using the air-cooled DGs and power truck.</p> <p>Hitachi-GE will perform the safety analyses to demonstrate that the appropriate acceptance criteria will be met for the design basis LOOP events, or the more relaxed criteria will be met for the beyond design basis LOOP events</p>

Description of work:
<p>RO-ABWR-0009.A1: The following 5 events will be analysed or evaluated as design basis faults.</p> <ol style="list-style-type: none"> 1. Short term LOOP (2hr) as a frequent DB fault

2. Medium term LOOP (24hr) as a frequent DB fault
3. Long term LOOP (168hr) as an infrequent DB fault
4. Short term LOOP with CCF of EDGs as an infrequent DB fault
5. Medium term LOOP with CCF of EDGs as an infrequent DB fault

If the EDGs are available, UK ABWR design makes the plant a safe state in a short time. In this case, the ECCS can maintain core cooling and long term heat removal afterward. Therefore, evaluation of short term, medium term and long term LOOP is represented by short time analysis.

Short term and Medium term LOOP with CCF of EDGs will be analysed by December 2014.

RO-ABWR-0009.A2: The following 2 events will be analysed as beyond design basis faults.

6. Long term LOOP with CCF of EDGs
7. Long term LOOP with CCF of EDGs and CCF of B/B DGs

These 2 events will be analysed by December 2014.

Summary of impact on GDA submissions:

GDA Submission Documents	Related GDA RO Action(s)	Submission Date to ONR
Topic Report on Design Basis Analysis	RO-ABWR-0009.A1	8 th August 2014
Topic Report on Analysis of LOOP Events	RO-ABWR-0009.A1 and A2	26 th December 2014

Programme Milestones/ Schedule:

See the Gantt Chart below (Table 1).

Reference:

