

**Hitachi-GE Nuclear Energy, Ltd.
UK ABWR GENERIC DESIGN ASSESSMENT
Resolution Plan for RO-ABWR-0005
Hitachi-GE Nuclear Energy Ltd.Human Factors Specialist
Resource and Organisation**

RO TITLE:	Hitachi-GE Nuclear Energy Ltd. Human Factors Specialist Resource and Organisation.	
REVISION :	0	
Overall RO Closure Date (Planned):	23.Dec.2014	
REFERENCE DOCUMENTATION RELATED TO REGULATORY OBSERVATION		
Regulatory Queries	-	
Linked ROs	-	
Other Documentation	Human Factors Integration Plan (TBD) HF Resource Plan (TBD) General Quality Management Plan (GNQA13-0066)	

Scope of work :
<p>Background Hitachi-GE officially started the GDA process in April of 2013. Hitachi-GE formed 18 teams each lead by a Subject Matter Expert (SME) who is the lead technical contact with the Regulators. Human Factor (HF) is one of the 18 ‘topic areas’. This is described in Hitachi-GE Step 1 A Submission ‘Description of Hitachi-GE Organisational Capability, Systems and Management Arrangements’. Hitachi-GE commenced technical discussions with ONR HF Assessor in Japan in October 2013 when it agreed its Step 2 Programme of Submissions in conjunction with ONR. A number of Submissions have been made during GDA Step 2.</p> <p>In accordance with Hitachi-GE’s standard practice the GDA HF team was located within the C&I design team because of its close association with Human Machine Interface (HMI). ONR advised this arrangement did not meet its expectations and was un-likely to be capable of delivering the quantity of information in HF (not only HMI) within the required timeframes. In response Hitachi-GE proceeded to form the HF team as an independent organization to the C&I department, recruit external HF specialists in the UK, USA and Japan and also allocate Hitachi-GE’s internal human resources who we consider have adequate experience and competence to undertake HF work.</p> <p>The scope of this organisational change and approach did not meet ONR’s expectations and RO was raised to clarify its requirements. This RO was by ONR in accordance with its Interface Arrangements document on 17th April 2014.</p> <p>Scope of Work As part of the planned Step 2 work Hitachi-GE has undertaken a Baseline HF Assessment in order to ensure the HFI programme for UK ABWR could be designed as effectively and appropriately as possible given the baseline HF position; from this activity its HF Integration Plan (HFIP) [Ref[1]] including its plans to develop the team will be prepared.</p> <p>In response to this RO and based on the Baseline HF Assessment and HFIP Hitachi-GE will develop its HF team in accordance with its HF Resource Plan [Ref[2]]. The Resource Plan will evolve as the scope of work develops through GDA Step 2, 3 and 4. It should be noted as with any organisational development / recruitment project the HF Resource Plan will be subject to change as a consequence of staff changes and the availability of staff resource and consultants within the market.</p>

Description of work:

ACTION 1 - Hitachi-GE needs to appoint suitably qualified and experienced HF professionals as SME in Hitachi city and within the supporting team for the UK ABWR.

Hitachi-GE has appointed a suitable qualified HF SME to lead HF activities so this part of the action is closed.

As part of the planned Step 2 work Hitachi-GE has undertaken a Baseline HF Survey and will develop its HF Integration Plan (HFIP) including its plans to develop the team.

In response to RO-ABWR-0005.A1 and A4 Hitachi-GE will assess the work required and develop its HF Resource Plan which will be referenced from the HFIP. The HF Resource Plan will define the team Hitachi-GE consider is required to implement the planned work-scope of GDA Step 3 and implement this by the end of September 2014.

ACTION 2 - The position and authority of the appointed HF professionals should be declared in Terms of Reference, which gives such persons authority, consistent with Hitachi-GE's management arrangements, to ensure that their areas of responsibility are accomplished. They should have the authority and accountability to determine what and where human factors input to the design and safety case is required, to access all relevant design and safety case information and be able to intervene and make decisions to influence the design and safety case production and any changes.

Hitachi-GE will clearly define the responsibilities and the authorities of the HF specialists and the HF team in accordance with ONR's Technical Assessment Guide 58 (TAG 58). This will be described in an update of the relevant Hitachi-GE project and management documentation [Ref[3]] by 1st August 2014.

ACTION 3 - Hitachi-GE to define its qualification, experience and training expectations for those with formal HF roles in the design and safety case process and demonstrate that the HF specialists employed have suitable qualifications and experience. Typical UK regulatory expectations for this are a Bachelor of Science Degree (or equivalent) in Human Factors, Ergonomics, Psychology/Organisational Psychology or related science / engineering degree, and at least four years cumulative experience related to the application of HF to safety cases and design of nuclear plant or similar high hazard industries such as major chemical processing plant.

Role Profiles for its HF team including those in cross cutting roles (RO1-A5) will be provided by 1st August 2014. Hitachi-GE will assess the suitability of its HF team in accordance with Role Profiles and Analysis Form for HF specialist.

ACTION 4 - Hitachi-GE should produce a resource strategy and plan detailing how it will obtain and mobilise necessary and suitable HF professionals to deliver a successful Step 2 GDA (and subsequent steps), including contingencies should this not be achieved.

Hitachi-GE has already commenced development of the team to deliver GDA Step 2.

As part of the planned Step 2 work Hitachi-GE has undertaken a Baseline HF Assessment in order to ensure the Human Factors Integration programme for UK ABWR could be designed as effectively and appropriately as possible given the baseline HF position; from this activity it will develop its HF Integration Plan (HFIP) [Ref[1]] including its plans to develop the team in ways appropriate for the identified HF activities required for GDA.

In response to RO-ABWR-0005.A1 and A4 Hitachi-GE will assess the work required and develop its HF Resource Plan [Ref[2]] which will be referenced from the HFIP [Ref[1]]. The HF Resource Plan will define the team Hitachi-GE consider is required to implement the planned work-scope of GDA Step 3.

Suitable contingency plans will be developed including potentially securing additional expertise from its supply chain to supplement its in-house team and help build capability.

ACTION 5 - Hitachi-GE should explain how those engineers appointed for cross-cutting work will have a suitable level of knowledge and experience in HF to identify important human factors issues.

Hitachi-GE understands the importance of awareness and effective application of HF principles throughout its design and engineering organisation and will ensure a suitable level of such knowledge is maintained through appropriate means throughout GDA.

This will be defined in Hitachi-GE's Human Factors Integration Plan (HFIP) which will be provided by the 1st August 2014.

Programme Milestones/ Schedule:

See attached Gantt Chart (Table 1).

Impact assessment:

GDA Submission Documents	Related GDA RO Action(s)	Submission Date to ONR
Human Factors Integration Plan (GA32-1501-0007-00001)	RO-01.A1,A5	1 st August 2014
HF Resource Plan (TBD)	RO-01.A1,A4	1 st August 2014
General Quality Management Plan (GA70-1501-0007-00001)	RO-01.A2	1 st August 2014

Reference:

Ref[1]	Human Factors Integration Plan	GA32-1501-0007-00001 Rev.A
Ref[2]	HF Resource Plan	TBD
Ref[3]	General Quality Management Plan	GA70-1501-0007-00001 Rev.2

