



<b>UK EPR</b>	<b>UK EPR GDA PROJECT</b>			
	Title: Resolution Plan for GI-UKEPR-CE06			
	RP unique number: <b>GI-UKEPR-CE06-RP</b>	Revision No.: 0	Effective Date: 29/06/2011	Page No.: 1 of 6
Approved for EDF by: A. PETIT		Approved for AREVA by: C. WOOLDRIDGE		
Name/Initials	 Date 28/06/2011	Name/Initials	 Date 28/06/2011	

### Resolution Plan Revision History

Rev.	Description of update	Date issued
0	First Issue	29/06/2011

#### 1.0 GDA ISSUE

GDA Issue Title	Main Assessment Area	Related Assessment Area
Seismic Analysis Methodology	Civil Engineering	Not Applicable

<b>GDA Issue</b>	There is not yet sufficient justification of the methodologies proposed for the seismic analysis of the UK EPR and treatment of the design of the Raft foundation.
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#### 2.0 OVERVIEW OF SCOPE OF WORK

The use of ETC-C as a design code was examined in detail during GDA. A key aspect to RO-UKEPR-37 was a reliability demonstration of ETC-C as a design code for the UK EPR. ONR paid particular attention to the seismic methodology and associated design approach for the raft foundation. Subsequent to ND Letter EPR70288N transmitted on 21 January 2011, AREVA/EDF provided updates to the previously transmitted RO-UKEPR-37 engineering documentation and responded to all queries contained in ND Letter EPR70288N as transmitted in AREVA/EDF Letters EPR00761N, EPR00768N, and EPR00802N. Additionally, AREVA/EDF met with ONR during topic meeting number 26 (September 2010) and subsequent teleconferences to work through residual comments on the UK EPR seismic analysis methodology and raft foundation design approaches and considerations. These discussions led to the update of engineering report ENGSGC100140, transmitted by AREVA/EDF Letter ND(NII) EPR00742N, and the development of new engineering reports ENGSDS100268 and ENGSDS100269, transmitted by AREVA/EDF Letters ND(NII) EPR00793N and EPR00783N, respectively.

This GDA Issue requests AREVA/EDF to provide support for the ongoing assessment of engineering reports ENGSGC100140, ENGSDS100268, and ENGSDS100269.

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### 3.0 GDA ISSUE ACTIONS AND RESOLUTION PLAN DELIVERABLES

#### 3.1 Action GI-UKEPR-CE06.A1

Action I/D	Action Description
<b>GI-UKEPR-CE06.A1</b>	<p>Support assessment associated with the methodology for the seismic analysis of the raft foundation and nuclear island superstructures and provide adequate responses to any questions arising from the assessment by ONR of documents submitted during GDA Step 4 but not reviewed in detail at that time</p> <p>Based on my full assessment of the earlier reports and a limited, high level review of the reports recently received, I have sufficient confidence in the approach to conclude that it should be possible to provide a suitable demonstration of the suitability of the methodologies proposed.</p> <p>With agreement from the Regulator this action may be completed by alternative means.</p>

#### 3.1.1 Deliverables already submitted to ONR/EA in response to GI-UKEPR-CE06.A1

The following documents have already been submitted in response to this action but have not yet been assessed by ONR.

	<b>Date of submission</b>
ENSGGC100140 Rev. B, Common Foundation Raft And Seismic Analysis – GDA Scope  <i>This document provides a detailed list of requirements and principles applicable to the design of the common Foundation Raft and the seismic analysis of the UK EPR Nuclear Island civil structures</i>	25/01/2011
ENGSDS100268 Rev. A, UK EPR - Seismic Analysis of Foundation Raft  <i>This document provides a description of the use of soil impedances for soil springs determination in a soil structure interaction analysis</i>	17/02/2011
ENGSDS100269 Rev. A, UK EPR - Methodology for Seismic Analysis of NI buildings  <i>This document describes the methodologies to be used and to clarify what will be done for the seismic analysis of safety related C1 classified structures of the Nuclear Island at the Nuclear Site Licence phase</i>	11/02/2011

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### 3.1.2 Planned submissions in response to GI-UKEPR-CE06.A1

#### 3.1.2.1 Description of Scope of Work

AREVA/EDF will support the ONR assessment of the engineering documentation and justification associated with issued reports ENGSGC100140, ENGSDS100268, and ENGSDS100269.

#### 3.1.2.2 Description of Methodology to be employed

The engineering reports which have been provided will require review by ONR. This review is anticipated to require at least one (1) face-to-face meeting to facilitate resolution of any residual questions and/or offer clarifications to these responses. Accordingly, a workshop meeting has been planned for AREVA/EDF and ONR on 4-5<sup>th</sup> July 2011 to facilitate this resolution, along with subsequent progress meetings. These meetings have been accounted for in the work programme.

No updates to the PCSR are expected since the documentation provided in response to RO-UKEPR-37 and ND Letter EPR70288N, along with the update to ENGSGC100140 and development of new reports ENGSDS100268 and ENGSDS100269 were incorporated into the PCSR (Sub-chapter 3.3) as part of the March 2011 PCSR submission. However, if any of these previously submitted documents require revision based on resolution of this GDA Issue, then the PCSR (Sub-chapter 3.3) may require update.

#### 3.1.2.3 Deliverable description

None

**Submission  
date to  
ONR/EA**

N/A

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#### 4.0 SUMMARY OF IMPACT ON GDA SUBMISSION DOCUMENTATION

##### 4.1 GDA submission documents impacted by GDA Issue and scheduled to be created (C) or updated (U) within GDA

GDA Submission Documents	C/U	Related GDA Issue Action(s)	Submission Date to ONR/EA
<b>SSER sub-chapters</b> Not Applicable		N/A	N/A
<b>GDA reference design documents (SDM in UKEPR-I-002)</b> Not Applicable		N/A	N/A
<b>Other GDA submission supporting documents</b> Not Applicable		N/A	N/A

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## 5.0 JUSTIFICATION OF ADEQUACY

AREVA/EDF will support the ONR assessment of the engineering documentation and justification associated with issued reports ENGSGC100140, ENGSDS100268, and ENGSDS100269.

As delineated in the write-up of GDA Issue GI-UKEPR-CE06, ONR has stated that based on their high level review of the documentation, they are confident that upon a more detailed assessment this GDA Issue can be adequately satisfied.

The engineering documentation which makes up the totality of the response to the seismic analysis methodology and this GDA Issue support the below listed relevant ONR SAPs.

<b>Engineering principles: civil engineering: structural analysis and model testing</b>	<b>Structural analysis and model testing</b>	<b>ECE.12</b>
Structural analysis or model testing should be carried out to support the design and should demonstrate that the structure can fulfil its safety functional requirements over the lifetime of the facility.		

<b>Engineering principles: civil engineering: structural analysis and model testing</b>	<b>Use of data</b>	<b>ECE.13</b>
The data used in any analysis should be such that the analysis is demonstrably conservative.		

<b>Engineering principles: civil engineering: structural analysis and model testing</b>	<b>Sensitivity studies</b>	<b>ECE.14</b>
Studies should be carried out to determine the sensitivity of analytical results to the assumptions made, the data used, and the methods of calculation.		

<b>Engineering principles: civil engineering: structural analysis and model testing</b>	<b>Validation of methods</b>	<b>ECE.15</b>
Where analyses have been carried out on civil structures to derive static and dynamic structural loadings for the design, the methods used should be adequately validated.		

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## 6.0 TIMETABLE AND MILESTONE PROGRAMME LEADING TO THE DELIVERABLES

Consult the following pages for the associated timetable and milestone programme.

ID	Task Name	Duration	Start	Finish	'11																											
					Jan			Feb			Mar			Apr			May			Jun			Jul			Aug			Sep			Oct
1	<b>Civil Topic Meetings</b>	<b>48 days</b>	<b>Mon Jul 4, '11</b>	<b>Wed Sep 7, '11</b>	[Gantt bar from Jul 4 to Sep 7]																											
2	Civil Topic Workshop	2 days	Mon Jul 4, '11	Tue Jul 5, '11	[Gantt bar from Jul 4 to Jul 5]																											
3	Civil Topic Progress/Working Meeting	0 days	Wed Aug 10, '11	Wed Aug 10, '11	[Milestone diamond at Aug 10]																											
4	Civil Topic Progress/Working Meeting	0 days	Wed Sep 7, '11	Wed Sep 7, '11	[Milestone diamond at Sep 7]																											
5	<b>Action 1 of GI-UKEPR-CE06</b>	<b>179 days</b>	<b>Tue Jan 25, '11</b>	<b>Fri Sep 30, '11</b>	[Gantt bar from Jan 25 to Sep 30]																											
6	<b>EDF and AREVA Support ONR Assessment</b>	<b>179 days</b>	<b>Tue Jan 25, '11</b>	<b>Fri Sep 30, '11</b>	[Gantt bar from Jan 25 to Sep 30]																											
7	EDF Report ENGSGC100140 (Actual Submittal to ONR)	0 days	Tue Jan 25, '11	Tue Jan 25, '11	[Milestone diamond at Jan 25]																											
8	EDF Report ENGSDS100268 (Actual Submittal to ONR)	0 days	Thu Feb 17, '11	Thu Feb 17, '11	[Milestone diamond at Feb 17]																											
9	EDF Report ENGSDS100269 (Actual Submittal to ONR)	0 days	Fri Feb 11, '11	Fri Feb 11, '11	[Milestone diamond at Feb 11]																											
10	ONR Assessment	66 days	Fri Apr 29, '11	Fri Jul 29, '11	[Gantt bar from Apr 29 to Jul 29]																											
11	Resolution of ONR Assessment Comments (if applicable)	35 days	Mon Aug 1, '11	Fri Sep 16, '11	[Gantt bar from Aug 1 to Sep 16]																											
12	Issuance of Updated Documentation (if applicable)	10 days	Mon Sep 19, '11	Fri Sep 30, '11	[Gantt bar from Sep 19 to Sep 30]																											

Project: GI-UKEPR-RC02 Schedule  
Date: Tue Jun 28, '11

Task Progress Summary External Tasks Deadline

Split Milestone Project Summary External Milestone

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