



UK EPR	UK EPR GDA PROJECT			
	Title: Resolution Plan for GI-UKEPR-CE03			
	RP unique number: GI-UKEPR-CE03-RP	Revision No.: 1	Effective Date: 6/07/2011	Page No.: 1 of 8
Approved for EDF by: A. PETIT Name/Initials  Date 06/07/2011		Approved for AREVA by: C. WOOLDRIDGE Name/Initials  Date 6/07/2011		

Resolution Plan Revision History

Rev.	Description of update	Date issued
0	Initial issuance	29/06/2011
1	Related Assessment Area added	6/07/2011

1.0 GDA ISSUE

GDA Issue Title	Main Assessment Area	Related Assessment Area
Beyond Design Basis Behaviour of the Containment	Civil Engineering	PSA

GDA Issue	There is not yet sufficient justification of the beyond design basis behaviour of the EPR containment structure.
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2.0 OVERVIEW OF SCOPE OF WORK

Justification of the beyond design basis behaviour of the UK EPR inner containment structure has been submitted in GDA Step 4 through the response to RO-UKEPR-37 which presents the demonstration of the reliability of the civil design code ETC-C for the UK EPR. Residual comments from ONR were transmitted by ONR via letter EPR70288N dated 21st January 2011.

EDF/AREVA considers that the requirements of this GDA issue are fulfilled by information submitted in response to letter EPR70288N via EDF/AREVA letters EPR00761N, EPR00768N and EPR00802N and their enclosed engineering reports PEPSPF11051, ENGSDS100093 Rev. B, and ENGSGC100106 Rev. B. This information was submitted towards the end of GDA Step 4 and was not yet assessed by ONR.

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3.0 GDA ISSUE ACTIONS AND RESOLUTION PLAN DELIVERABLES

3.1 Action GI-UKEPR-CE03.01

Action I/D	Action Description
GI-UKEPR-CE03.01	<p>Support assessment of the beyond design basis analysis approach by providing adequate responses to any questions arising from assessment by ONR of documents submitted during GDA Step 4 but not reviewed in detail at that time.</p> <p>Based on a high level review of the documents and assurances provided to date I have sufficient confidence in the design process to conclude that it should be possible to provide a suitable demonstration of the beyond design basis performance.</p>

3.1.1 Deliverables already submitted to ONR/EA in response to GI-UKEPR-CE03.01

The following deliverables have been submitted in GDA Step 4 but have not been assessed by ONR

	Date of submission
ENGSDS100093 Rev. B, RO 37 - Reliability of the EPR Inner Containment to Earthquake (submitted by AREVA/EDF Letter ND(NII) EPR00761N) <i>This document describes a study of the reliability of the UK EPR Inner containment in Earthquakes. This document demonstrates that the inner containment has a high seismic capacity and that its seismic failure frequency is well below the probabilistic objective required to meet UK probabilistic safety targets</i>	25/01/2011
Appendix to AREVA/EDF Letter ND(NII) EPR00768N, Response to Regulatory Observation RO-UKEPR-37 <i>This letter responded to specific ONR comments issued through Letter EPR70288N</i>	03/02/2011
PEPSPF11051 - Target Reliabilities for UK EPR Structures built with ETC-C (submitted by AREVA/EDF Letter ND(NII) EPR00768N) <i>This document provides details of the identified target reliabilities to be considered for UK EPR structures built with ETC-C</i>	03/02/2011
Appendix to AREVA/EDF Letter ND(NII) EPR00802R, Response to Regulatory Observation RO-UKEPR-37 <i>This letter responded to the remaining specific ONR comments issued through Letter EPR70288N</i>	24/02/2011

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Date of submission

ENSGGC100106 Rev. B, Study of the Behaviour of the EPR Inner Containment Wall Beyond Design-Basis Conditions (submitted by AREVA/EDF Letter ND(NII) EPR00802R) 24/02/2011

This document constitutes a summary of the studies on the ultimate behaviour of the EPR inner containment under overpressure and thermal conditions characteristic of severe accidents and derives a reliability curve for overpressure

3.1.2 Planned submissions in response to GI-UKEPR-CE03.01

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 referred above.

3.1.2.2 Description of Methodology to be employed

The engineering reports which have been provided require review by ONR. Following this review it is anticipated at least one (1) face-to-face meeting between ONR and AREVA/EDF will be required to facilitate resolution of any residual questions and/or provide clarifications to these responses. Accordingly, a workshop meeting has been planned for AREVA/EDF and ONR on 4-5th July 2011 to facilitate this resolution.

No updates to the PCSR are expected since the documentation provided in response to RO-UKEPR-37 was 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

Submission date to ONR/EA

None

N/A

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3.2 Action GI-UKEPR-CE03.02

Action I/D	Action Description
GI-UKEPR-CE03.02	<p>Provide a justification of the approach used for the development of the containment fragilities used in the PSA analysis by comparison with the approaches used for beyond design basis assessment.</p> <p>Based on a high level review of the documents and assurances provided to date I have sufficient confidence in the design process to conclude that it should be possible to provide a suitable demonstration of the containment fragility.</p> <p>With agreement from the Regulator this action may be completed by alternative means.</p>

3.2.1 Deliverables already submitted to ONR/EA in response to GI-UKEPR-CE03.02

The following deliverables have been submitted in GDA Step 4 but have not been assessed by ONR

	Date of submission
ENGSGC100106 Rev. B, Study of the Behaviour of the EPR Inner Containment Wall Beyond Design-Basis Conditions (submitted by AREVA/EDF Letter ND(NII) EPR00802R)	24/02/2011

This document constitutes a summary of the studies on the ultimate behaviour of the EPR inner containment under overpressure and thermal conditions characteristic of severe accidents and derives a reliability curve for overpressure

3.2.2 Planned submissions in response to GI-UKEPR-CE03.02

3.2.2.1 Description of Scope of Work

AREVA/EDF will provide a comparison of the fragilities used in the UK EPR PSA and the fragilities developed in support of the beyond design basis assessment.

3.2.2.2 Description of Methodology to be employed

Task 1 of GI-UKEPR-CE03.02 – EPR Nuclear Island Civil Engineering Design Process Note

AREVA/EDF will provide a qualitative comparison of the fragilities developed in support of the beyond design basis assessment to the fragilities used in the UK EPR PSA studies. This will provide confidence and ensure that the approach and assumptions applied to the UK EPR PSA are in

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agreement with these studies. As part of this effort, differences between the two approaches and potential deviations in results will be described such that these potential differences are clearly understood and explained. This information will be captured and included as an addendum to ENGSGC100106. Furthermore, completion and outcome of the ONR assessment period associated with Task 1 of this issue action is a predecessor to this finalisation of this addendum.

Note the results of this qualitative comparison will not require nor will they result in the UK EPR PSA models being re-run.

The comparison which will be provided will require review by ONR. Following this review it is anticipated at least one (1) face-to-face meeting between ONR and AREVA/EDF will be required to facilitate resolution of any residual questions and/or provide clarifications to these responses. Accordingly, progress meetings have been accounted for in the work programme to facilitate this resolution.

Note that ENGSGC100106 is not referenced in the March 2011 PCSR. Accordingly, no update to PCSR Sub-chapter 3.3 is expected or planned.

3.2.2.3 Deliverable description

**Submission
date to
ONR/EA**

ENGSGC100106, Study of the Behaviour of the EPR Inner Containment Wall Beyond Design-Basis Conditions

30/09/2011

This document constitutes a summary of the studies on the ultimate behaviour of the EPR inner containment under overpressure and thermal conditions characteristic of severe accidents and derives a reliability curve for overpressure

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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
SSER sub-chapters Not Applicable		N/A	N/A
GDA reference design documents (SDM in UKEPR-I-002) Not Applicable		N/A	N/A
Other GDA submission supporting documents ENGSGC100106, Study of the Behaviour of the EPR Inner Containment Wall Beyond Design-Basis Conditions	U	GI-UKEPR-CE03.02	30/09/2011

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5.0 JUSTIFICATION OF ADEQUACY

AREVA/EDF will support the ONR assessment of the engineering documentation and justification associated with the final set of reports sent in response to RO-UKEPR-37 towards the end of GDA Step 4. Furthermore, the task associated with GI-UKEPR-CE03.02 will provide confidence and ensure that the approach and assumptions applied to the UK EPR PSA are in agreement with the RO-UKEPR-37 studies.

As confirmed in the GDA Issue GI-UKEPR-CE03, 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 beyond design analysis (e.g. RO-UKEPR-37) and potential clarifications provided under this GDA Issue support the below listed relevant ONR SAPs.

Engineering principles: external and internal hazards	'Cliff-edge' effects	EHA.7
A small change in DBA parameters should not lead to a disproportionate increase in radiological consequences.		

Para 282 j) for structures for which the consequence of failure would be high, predictable, gradual and detectable failure modes for severe loadings.

Para 288 For more severe loadings of structures that provide a principal means of ensuring nuclear safety, predicted failure modes should be gradual, ductile and, for slowly developing loads, detectable.

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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.

