

Westinghouse UK
AP1000® GENERIC DESIGN ASSESSMENT
Resolution Plan for GI-AP1000-IH-02
Internal Flooding Safety Case

MAIN ASSESSMENT AREA	RELATED ASSESSMENT AREA(S)	RESOLUTION PLAN REVISION	GDA ISSUE REVISION
Internal Hazards	Fault Studies PSA Civil Engineering	9	1

GDA ISSUE:	There is a need to provide an updated internal flooding safety case as there are inconsistencies associated with claims made on barriers, drains and sumps, and flood calculations.
ACTION: GI-AP1000-IH-02.A1	<p>Provide an updated internal flooding safety case that considers the claims, arguments and evidence associated with internal flooding. As part of the production of the aforementioned case there is a need to consider the following aspects within the safety case:</p> <ol style="list-style-type: none"> 1. All potential unmitigated flood sources taking into account bounding flood sources and volumes. 2. The barriers claimed to provide segregation of safety significant SSCs in the event of internal flooding. 3. Any claims made on drainage systems, sumps, drains, flow paths etc and arguments and evidence provided to demonstrate that they will be available for postulated internal flooding events. 4. Any claims made on pressure relief panels and compartment vents need to be supported by arguments and evidence to demonstrate that they will be available for postulated internal flooding events. 5. Any ALARP claims made on operator actions in relation to the mitigation of potential flood events rather than assuming operator success as part of the deterministic case. <p>The list above should not be considered to be exhaustive and the items detailed above are provided as a means to inform Westinghouse of ONRs expectations.</p> <p>Or alternative means as agreed by the Regulator.</p>
RELEVANT REFERENCE DOCUMENTATION RELATED TO GDA ISSUE	
Technical Queries	TQ-AP1000-425 TQ-AP1000-495 TQ-AP1000-496 TQ-AP1000-497 TQ-AP1000-498

	TQ-AP1000-499 TQ-AP1000-520
Regulatory Observations	None
Other Documentation	UKP-GW-GLR-001, Rev 3 UKP-GW-GL-793, Rev 0

Scope of work:

A Westinghouse review relative to the above defined Action GI-AP1000-IH-02 will be conducted by qualified personnel and non-compliances with the existing safety case (UN REG WEC 000484) noted for potential future action.

This work will be documented in a manner suitable for referencing in the safety case.

Description of work:

This work shall include:

1. An Internal Flooding Safety Case review and verification relative to items 1-5 above.
2. Provision of an updated Internal Flooding Safety Case, or confirmation that the existing internal flooding safety case remains valid.
3. Further, additional information will be compiled addressing:
 - a. The impact of potential PCSR changes relating to the outcome of this review on other safety case submissions such as civil engineering and mechanical engineering.
 - b. Identification and consideration of further defence in depth and ALARP measures that may be implemented into the design relative to the Internal Flooding Safety Case.

Documentation previously provided to the ONR as relevant to this Issue:

- UN REG WEC 000484, dated 20 January 2011
- TQs as identified in the table below:

TQ/Subject	Response Date	Status
TQ-AP1000-520 - Penetration Seal Qualification Against Internal Flooding	15 Apr 2010	Closed - Full Response Sent
TQ-AP1000-499 - Internal Flooding - Accredited Test Programme for Active Protection/Mitigation Provisions	25 Mar 2010	Closed - Full Response Sent
TQ-AP1000-498 - Internal Hazards - Applicability of US Codes and Standards	31 Mar 2010	Closed - Full Response Sent
TQ-AP1000-497 - Internal Hazards - Codes and Standards relating to Internal Flooding	1 Apr 2010	Closed - Full Response Sent
TQ-AP1000-496 - Nuclear Safety Claims on Drainage	25 Mar 2010	Closed - Full Response Sent
TQ-AP1000-495 - AP1000 Internal Hazards Topic Report Reference Request re Internal Flooding	6 Dec 2010	Closed - Full Response Sent
TQ-AP1000-425 - AP1000 Internal Flooding Layouts	25 Feb 2010	Closed - Full Response Sent

Schedule/ programme milestones:

The specific deliverables associated with this Action are:

- A summary roadmap of the Internal Flooding Safety Case.
- A topical report of the Internal Flooding Safety Case.
- Delivery of an updated Internal Flooding Safety Case or confirmation that the existing safety case remains valid. Such delivery shall provide an updated internal flooding safety case that considers the claims, arguments and evidence associated with internal flooding. As part of the production of the aforementioned case there is a need to consider the following aspects within the safety case:
 - All potential unmitigated flood sources taking into account bounding flood sources and volumes.
 - The barriers claimed to provide segregation of safety significant SSCs in the event of internal flooding.
 - Any claims made on drainage systems, sumps, drains, flow paths etc and arguments and evidence provided to demonstrate that they will be available for postulated internal flooding events.
 - Any claims made on pressure relief panels and compartment vents need to be supported by arguments and evidence to demonstrate that they will be available for postulated internal flooding events.
 - Any ALARP claims made on operator actions in relation to the mitigation of potential flood events rather than assuming operator success as part of the deterministic case.

Further, information will be compiled within the Safety Case Topic Report addressing the impact of potential PCSR design changes relating to the outcome of this review on other safety case submissions. Identification and consideration of further defence in depth and ALARP measures that may be implemented into the design relative to the Internal Flooding Safety Case.

The Westinghouse review shall be completed in accordance with the Integrated Schedule provided on the following page. Should the safety case require revision, this work will be scheduled accordingly or alternatively confirmation will be provided that the existing internal flooding safety case remains valid.

#	Activity Name	2015												2016												2017		
		Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	
1	UK Generic Design Assessment (GDA) Resolution Plans (51)																											
2	INTERNAL HAZARDS																											
3	IH.02 Internal Flooding Safety Case-Resolution Plan																											
4	IH.02 Internal Flooding Roadmap																											
5	Internal Flooding Roadmap - Submit to ONR																											
6	Internal Flooding Roadmap - ONR Review of Submittal																											
7	IH.02 Internal Flooding Topic Report																											
8	Internal Flooding Topic Report Submit to ONR																											
9	Internal Flooding Topic Report -ONR Review of Submittal																											
10	IH.02 Internal Flooding Topic Report, Rev 0																											
11	Internal Flooding Topic Report, Rev 0 Submit to ONR																											
12	Internal Flooding Topic Report, Rev 0 -O_NR Review of Submittal																											

Methodology:

Potential PCSR changes will be identified and assessed by Westinghouse Licensing personnel; ALARP reviews will be conducted through use of an expert panel.

Justification of adequacy:

During Step 4 of the GDA, Westinghouse internally identified a number of shortfalls associated with the presentation of the internal flooding safety case within the PCSR. As a result, Westinghouse revised the internal flooding technical basis and reissued a revised internal flooding safety case to ONR for assessment. This flooding safety case has not been included as part of the ONR Step 4 assessments.

As part of this Action, Westinghouse will undertake a review of this safety case in light of the GDA Issue to confirm ONR expectations. This review will corroborate the internal flooding safety case as submitted, consider the totality of the PCSR in relation to the claims made associated with internal flooding and (if necessary) update the internal flooding safety case accordingly or provide confirmation of the validity of the existing case. As part of the work undertaken for this Action, a review of further potential defence in depth or ALARP provisions will be undertaken.

Westinghouse believes that the deliverables from these actions will be in line with ONR expectations, as this work will validate the deterministic design for internal flooding. Additionally, the review addresses compatibility of the flooding safety case with other safety case submissions and further potential defence in depth or ALARP changes to the design.

Impact assessment:

Safety case impacts (PCSR / ALARP assessment / Master Submission List), if any, are to be assessed following completion of the defined workscope and changes identified if necessary and warranted. Any design changes will be captured and evaluated as part of the Westinghouse Design Change Process.