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## REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

### APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.: 357-8344  
SRP Section: 06.02.04 – Containment Isolation System  
Application Section: 6.2.4  
Date of RAI Issue: 01/05/2016

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### **Question No. 06.02.04-11**

Describe inspections, tests, analyses and acceptance criteria (ITAAC) for verification of containment isolation valve (CIV) placement

10 CFR 52.47(b)(1) requires that a DC application contain the proposed ITAAC that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and will operate in accordance with the design certification.

DCD Tier 1, Table 2.11.3-2 "Containment Isolation System ITAAC", provides the ITAAC for the CIVs. How will this ITAAC, as written, ensure that the supplied as-built piping distances from the outer CIV to the containment will be such that the valves are located as close to containment as practical? (i.e. describe any inspections, tests, or acceptance criteria which will confirm that the as built piping distances will not exceed those listed in DCD Tier 2, Table 6.2.4-1).

In addition, indicate the associated containment penetration numbers in DCD Tier 1, Table 2.11.3-1 "Containment Isolation System Component List."

### **Response – (Rev. 3)**

GDCs 55, 56, and 57 require that isolation valves outside containment should be located as close to containment as practical. The APR1400 design has incorporated this design concept into the location of the containment isolation valves and has reflected the locations in the piping analyses performed. However, in applying the graded approach for piping design and analysis, only specific piping lines that penetrate containment are in the scope of the program and are required to be analyzed. Acceptable containment isolation valve location is assured through the overall design and piping analysis program. The length of pipe between containment and the outboard isolation valve indicated in DCD Tier 2, Table 6.2.4-1 does not necessarily represent a bounding condition for each piping line listed. However, in order to document this item during the design/construction phase, an ITAAC has been added to DCD Tier 1, Table 2.11.3-2 as

shown in Attachment . Additionally, the pipe length from an operational plant has been provided in DCD Tier 2, Revision 2, Table 6.2.4-1 as a reference and is subject to change during the detailed design phase.

The changes to the DCD made in the response to the RAI 306-8240 Question 06.02.06-9 and RAI 357-8344 Question 06.02.04-9 have been addressed in DCD Tier 2, Revision 1, Table 6.2.4-1. However, incorrect information in item nos. 48, 49, 50, 55, 161, 162, 163 in DCD Tier 2, Table 6.2.4-1 have been identified and corrected in DCD Tier 2, Revision 2.

Containment penetration numbers have been added in DCD Tier 1, Revision 1, Table 2.11.3-1 according to the response to the RAI 357-8344 Question 06.02.04-11, Revision 0. However, some incorrect information regarding valves FW-V132, IA-V0020, PS-V0032, PS-V0258, and WI-V0015 have been identified and corrected in DCD Tier 1, Revision 2. Finally, the missing valves VQ-V2014, VQ-V2016, and VQ-V2024 have been added in DCD Tier 1, Revision 2, Table 2.11.3-1.

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### **Impact on DCD**

DCD Tier 1, Table 2.11.3-2 will be revised as shown in the attachment to this response.

- DCD Tier 1, Table 2.11.3-2 (Attachment )

### **Impact on PRA**

There is no impact on the PRA.

### **Impact on Technical Specifications**

There is no impact on the Technical Specifications.

### **Impact on Technical/Topical/Environmental Reports**

There is no impact on any Technical, Topical, or Environmental Report.

**APR1400 DCD TIER 1**

11. MOVs, AOVs, SOVs, E/H valves located inside and outside the containment in series on the same penetration are powered from different Class 1E divisions.

2.11.3.2 Inspections, Tests, Analyses, and Acceptance Criteria

The inspection, tests, analyses, and associated acceptance criteria for the CIAS are specified in Table 2.11.3-2.

12. Containment isolation valves outside the containment as listed in Table 2.11.3-1 and as shown in Figure 2.11.3-1, are located as close to the containment as practical, consistent with General Design Criteria 55, 56, and 57.

**APR1400 DCD TIER 1**

Table 2.11.3-2 (6 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria																																												
11. MOVs, AOVs, SOVs, E/H valves located inside and outside the containment in series on the same penetration are powered from different Class 1E divisions.	11. Inspection of the MOVs, AOVs, SOVs, E/H valves located inside and outside the containment in series on the same penetration will be performed.	11. The following MOVs, AOVs, SOVs, E/H valves located inside and outside the containment in series on the same penetration are powered from different Class 1E divisions.																																												
		<table><tr><th>Inside containment</th><th>Outside containment</th></tr><tr><td>CC-V0249(MOV)</td><td>CC-V0250(MOV)</td></tr><tr><td>CC-V0297(MOV)</td><td>CC-V0296(MOV)</td></tr><tr><td>CC-V0301(MOV)</td><td>CC-V0302(MOV)</td></tr><tr><td>CV-V506(AOV)</td><td>CV-V505(AOV)</td></tr><tr><td>CV-V522(AOV)</td><td>CV-V523(AOV)</td></tr><tr><td>CV-V560(AOV)</td><td>CV-V561(AOV)</td></tr><tr><td>DE-V0005(MOV)</td><td>DE-V0006(AOV)</td></tr><tr><td>GW-V0001(MOV)</td><td>GW-V0002(SOV)</td></tr><tr><td>PR-V431(MOV)</td><td>PR-V432(MOV)</td></tr><tr><td>PX-V0001(SOV)</td><td>PX-V0002(SOV)</td></tr><tr><td>PX-V0003(SOV)</td><td>PX-V0004(SOV)</td></tr><tr><td>PX-V0005(SOV)</td><td>PX-V0006(SOV)</td></tr><tr><td>PX-V0021(SOV)</td><td>PX-V0020(SOV)</td></tr><tr><td>PX-V0041(MOV)</td><td>PX-V0042(MOV)</td></tr><tr><td>SI-V653(MOV)</td><td>SI-V655(MOV)</td></tr><tr><td>SI-V654(MOV)</td><td>SI-V656(MOV)</td></tr><tr><td>VQ-V0012(MOV)</td><td>VQ-V0011(E/H)</td></tr><tr><td>VQ-V0013(MOV)</td><td>VQ-V0014(E/H)</td></tr><tr><td>VQ-V0032(AOV)</td><td>VQ-V0031(AOV)</td></tr><tr><td>VQ-V0033(AOV)</td><td>VQ-V0034(AOV)</td></tr><tr><td>WI-V0015(MOV)</td><td>WI-V0012(AOV)</td></tr></table>	Inside containment	Outside containment	CC-V0249(MOV)	CC-V0250(MOV)	CC-V0297(MOV)	CC-V0296(MOV)	CC-V0301(MOV)	CC-V0302(MOV)	CV-V506(AOV)	CV-V505(AOV)	CV-V522(AOV)	CV-V523(AOV)	CV-V560(AOV)	CV-V561(AOV)	DE-V0005(MOV)	DE-V0006(AOV)	GW-V0001(MOV)	GW-V0002(SOV)	PR-V431(MOV)	PR-V432(MOV)	PX-V0001(SOV)	PX-V0002(SOV)	PX-V0003(SOV)	PX-V0004(SOV)	PX-V0005(SOV)	PX-V0006(SOV)	PX-V0021(SOV)	PX-V0020(SOV)	PX-V0041(MOV)	PX-V0042(MOV)	SI-V653(MOV)	SI-V655(MOV)	SI-V654(MOV)	SI-V656(MOV)	VQ-V0012(MOV)	VQ-V0011(E/H)	VQ-V0013(MOV)	VQ-V0014(E/H)	VQ-V0032(AOV)	VQ-V0031(AOV)	VQ-V0033(AOV)	VQ-V0034(AOV)	WI-V0015(MOV)	WI-V0012(AOV)
		Inside containment	Outside containment																																											
		CC-V0249(MOV)	CC-V0250(MOV)																																											
		CC-V0297(MOV)	CC-V0296(MOV)																																											
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		GW-V0001(MOV)	GW-V0002(SOV)																																											
		PR-V431(MOV)	PR-V432(MOV)																																											
		PX-V0001(SOV)	PX-V0002(SOV)																																											
		PX-V0003(SOV)	PX-V0004(SOV)																																											
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		VQ-V0012(MOV)	VQ-V0011(E/H)																																											
		VQ-V0013(MOV)	VQ-V0014(E/H)																																											
		VQ-V0032(AOV)	VQ-V0031(AOV)																																											
		VQ-V0033(AOV)	VQ-V0034(AOV)																																											
		WI-V0015(MOV)	WI-V0012(AOV)																																											


 Insert No. 12

No. 12

A report exists and concludes that the

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
12. Containment isolation valves outside the containment as listed in Table 2.11.3-1 and as shown in Figure 2.11.3-1, are located as close to the containment as practical, consistent with General Design Criteria 55, 56, and 57.	12. An inspection will be performed to verify the as-built location of outside containment isolation valves.  or analysis	12. The as-built outside containment isolation valves listed in Table 2.11.3-1 and shown in Figure 2.11.3-1 are located as close to the containment as practical with consideration of the following: <ul style="list-style-type: none"> <li>• Access for inspection of welds</li> <li>• Containment leak testing</li> <li>• Replacement</li> <li>• Valve maintenance</li> </ul>