
REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

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

Docket No. 52-046

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Question No. 19.03-21

NRC Commission paper SECY-12-0025 (February 17, 2012), “Proposed Orders and Requests for Information in Response to Lessons Learned from Japan’s March 11, 2011, Great Tohoku Earthquake and Tsunami,” stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events,” (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

Technical Report, APR1400-E-P-NR-14005-P, Table 6-1, “External Connection Components for BDBEE,” lists diesel fuel oil supply line isolation valves that are not consistent with DCD, Tier 2, Figure 9.5.4-1, “Diesel Fuel Oil Transfer System Flow Diagram.” For example, Technical Report Table 6-1 is missing V2208. The staff requests that the applicant address any inconsistencies between Technical Report Table 6-1 and DCD, Tier 2, Figure 9.5.4-1.

Response – (Rev. 1)

During Phase 2, the fuel for the FLEX equipment is supplied by gravity flow from the emergency diesel generator (EDG) fuel oil day tank (Train A or B). Once the 480 V mobile GTG is running, the existing diesel fuel oil transfer pump (Train A or B) is used to make up day tank from the EDG fuel oil storage tank. During Phase 2, the day tank of train A or B supplies the fuel to following FLEX equipment at Full Power or Low Mode.

- 480 V Mobile GTG
- Primary high-head FLEX pump
- Primary low-head FLEX pump
- SFP makeup pump
- SFP spray pump
- AF FLEX pump
- ECSBS FLEX pump

Therefore, Technical Report, APR1400-E-P-NR-14005-P, Table 6-1 will be revised to correct any inconsistency with the above information and the DCD.

Impact on DCD

There is no impact on the DCD.

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

ARP1400-E-P-NR-14005-P/NP, Table 6-1 will be revised as shown in the Attachment.

Table 6-1 External Connection Components for BDBEE (1 of 2)

Component	DCD Chapter and/or Section	Function
V2601	Figure 6.3.1-2	SFP external makeup line check valve
V2602	Figure 6.3.1-2	SFP external makeup line isolation valve
V2605	Figure 6.3.1-2	SFP external spray line check valve
V2606	Figure 6.3.1-2	SFP external spray line isolation valve
V2611	Figure 6.3.1-2	SFP external makeup line check valve
V2612	Figure 6.3.1-2	SFP external makeup line isolation valve
V2615	Figure 6.3.1-2	SFP external spray line check valve
V2616	Figure 6.3.1-2	SFP external spray line isolation valve
SI-801	Table 3.9-4, Table 3.9-13, Figure 6.3.2-1 (4 of 4)	External emergency injection line check valve
SI-803	Table 3.9-4, Table 3.9-13, Figure 6.3.2-1 (4 of 4)	External emergency injection line isolation valve
SI-805	Figure 6.3.2-1 (4 of 4)	External emergency injection line fill isolation valve
SI-807	Figure 6.3.2-1 (4 of 4)	External emergency injection line isolation valve
CH-784	Figure 9.3.4-1 (4 of 7)	Primary side high-head FLEX pump suction isolation
V2678A	Figure 10.4.9-1	AF FLEX pump suction line backflow prevention
V2678B	Figure 10.4.9-1	AF FLEX pump suction line backflow prevention
V2679A	Figure 10.4.9-1	AF FLEX pump suction line isolation
V2679B	Figure 10.4.9-1	AF FLEX pump suction line isolation
V2098A	Figure 10.4.9-1	AF FLEX pump discharge line backflow prevention
V2098B	Figure 10.4.9-1	AF FLEX pump discharge line backflow prevention
V2102A	Figure 10.4.9-1	AF FLEX pump discharge line isolation
V2102B	Figure 10.4.9-1	AF FLEX pump discharge line isolation
V2001A	Figure 9.5.4-1	Diesel fuel oil day tank discharge line to mobile equipment isolation
V2001B	Figure 9.5.4-1	Diesel fuel oil day tank discharge line to mobile equipment header isolation
V2001C	Figure 9.5.4-1	Diesel fuel oil day tank discharge line to mobile equipment header isolation
V2001D	Figure 9.5.4-1	Diesel fuel oil day tank discharge line to mobile equipment header isolation
V2202A	Figure 9.5.4-1	Diesel fuel oil supply line to mobile GTG isolation
V2202B	Figure 9.5.4-1	Diesel fuel oil supply line to mobile GTG isolation
V2202C	Figure 9.5.4-1	Diesel fuel oil supply line to mobile GTG isolation
V2202D	Figure 9.5.4-1	Diesel fuel oil supply line to mobile GTG isolation
V2204A	Figure 9.5.4-1	Diesel fuel oil supply line to primary high-head pump isolation
V2204B	Figure 9.5.4-1	Diesel fuel oil supply line to primary high-head pump isolation
V2204C	Figure 9.5.4-1	Diesel fuel oil supply line to primary high-head pump isolation

header isolation

V2203A Figure 9.5.4-1 Diesel fuel oil supply line to AF FLEX pump isolation
V2203B Figure 9.5.4-1 Diesel fuel oil supply line to AF FLEX pump isolation

Evaluations and Design Enhancements to Incorporate
Lessons Learned from Fukushima Dai-Ichi Nuclear Accident

APR1400-E-P-NR-14005-NP, Rev. 0

Table 6-1 External Connection Components for BDBEE (2 of 2)

Component	DCD Chapter and/or Section	Function
V2204D	Figure 9.5.4-1	Diesel fuel oil supply line to primary high-head pump isolation
V2205A	Figure 9.5.4-1	Diesel fuel oil supply line to primary low-head pump isolation
V2205B	Figure 9.5.4-1	Diesel fuel oil supply line to primary low-head pump isolation
V2205C	Figure 9.5.4-1	Diesel fuel oil supply line to primary low-head pump isolation
V2205D	Figure 9.5.4-1	Diesel fuel oil supply line to primary low-head pump isolation
V2203C	Figure 9.5.4-1	Diesel fuel oil supply line to AF-FLEX pump isolation
V2203D	Figure 9.5.4-1	Diesel fuel oil supply line to AF-FLEX pump isolation
V2206A	Figure 9.5.4-1	Diesel fuel oil supply line to SFP pump isolation
V2206B	Figure 9.5.4-1	Diesel fuel oil supply line to SFP pump isolation
V2207A	Figure 9.5.4-1	Diesel fuel oil supply line to SFP spray pump isolation
V2207B	Figure 9.5.4-1	Diesel fuel oil supply line to SFP spray pump isolation
Circuit Breaker of Class 1E 4.16 kV Switchgear 01A (1-823-E-SW01A)	Figure 8.1-1 (1 of 2)	Provision for connecting to 4.16 kV mobile generator
Circuit Breaker of Class 1E 4.16 kV Switchgear 01B (1-823-E-SW01B)	Figure 8.1-1 (2 of 2)	Provision for connecting to 4.16 kV mobile generator
Circuit Breaker of Class 1E 480 V Load Center 01A (1-825-E-LC01A)	Figure 8.1-1 (1 of 2)	Provision for connecting to 480V mobile generator
Circuit Breaker of Class 1E 480 V Load Center 01B (1-825-E-LC01B)	Figure 8.1-1 (2 of 2)	Provision for connecting to 480V mobile generator
Battery	9.5.2.1	The communication systems are powered from one of the two dedicated 16-hour-rated non-safety-related batteries (normal and standby) in case of either AAC GTG failure during a LOOP or SBO condition.

V2208A Figure 9.5.4-1 Diesel fuel oil supply line to ECSBS FLEX pump
V2208B Figure 9.5.4-1 Diesel fuel oil supply line to ECSBS FLEX pump