SUPPLEMENTAL 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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SRP Section: **16 – Technical Specification**

Application Section: **16**

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Question No. 16-7

The ACTIONS section of the Bases for TS 3.8.3 refer to and inoperable EDG subsystem. The Bases for TS 3.8.1 refer to EDG Trains. Explain the difference between EDG subsystem and EDG Train.

Response

The EDG system is a safety-related system consisting of four EDG trains, each of which serves Train A, Train B, Train C, or Train D onsite power distribution systems, respectively. Each EDG train is comprised of a diesel generator and its supporting subsystems, such as fuel oil, lube oil, engine cooling water, starting air, and combustion air intake and exhaust systems.

Supplemental Response

The original response is being supplemented to provide additional information that distinguishes the difference between an EDG subsystem and EDG train. This information will be added to the Bases of EDG TS 3.8.1.

Similarly, it was determined that LCO 3.9.5.b should say “electrical division” instead of “train” because the spray pump and the shutdown cooling pump are powered from separate Class 1E 4160 V buses. Therefore, the LCO will be revised to state, “With REDUCED RCS INVENTORY, the containment spray pump in the same train electrical division as an operating SCS train shall be OPERABLE.”

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

TS Subsection B 3.8.1 and LCO 3.9.5.b will be revised as shown in the Attachment.

Impact on Technical/Topical/Environmental Reports

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

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources – Operating

BASES

BACKGROUND

The Class-1E electrical power distribution system AC power sources consist of the offsite power sources (preferred power sources, normal and alternate), and the onsite standby power sources—two divisions of emergency diesel generators (EDGs), each division consisting of two EDGs (~~EDG A and EDG C~~ for division I, and ~~EDG B and EDG D~~ for division II). As required by 10 CFR Part 50, Appendix A, GDC 17 (Reference 1), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the engineered safety feature (ESF) systems.

Train A and Train C EDGs

Train B and Train D EDGs

The onsite Class 1E AC distribution system is divided into redundant load groups (divisions) so that loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to two preferred offsite power sources and a single EDG.

The unavailability of either one or two EDGs on one division disables one load group to perform its partial or all of the safety functions. Because of the divisional approach of the four EDGs in the APR 1400 design, the condition with three or more AC sources inoperable is divided into two different cases: two offsite circuits and one or more EDGs inoperable, and two offsite circuits and one or more EDGs inoperable.

Offsite power is supplied to the unit switchyard(s) from the transmission network by at least two transmission lines. From the switchyard(s), two electrically and physically separated circuits provide AC power, through [auxiliary transformers], to the 4.16 kV ESF buses. A detailed description of the offsite power network and the circuits to the Class 1E ESF buses is found in DCD Tier 2, Chapter 8 (Reference 2).

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E ESF buses.

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the transformer supplying offsite power to the onsite Class 1E distribution system. Within 1 minute after the initiating signal is received, all automatic and permanently connected loads needed to recover the unit or maintain it in a safe condition are returned to service via the load sequencer.

3.9 REFUELING OPERATIONS

3.9.5 Shutdown Cooling System (SCS) and Coolant Circulation – Low Water Level

LCO 3.9.5 The heat removal system shall be in the following status:

a. Two SCS trains shall be OPERABLE and one SCS train shall be in operation.

b. With REDUCED RCS INVENTORY, the containment spray pump in the same ~~train~~ electrical division as an operating SCS train shall be OPERABLE.

APPLICABILITY: MODE 6 with the water level <7.0 m (23 ft) above the top of reactor vessel flange.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SCS train inoperable.	A.1 Initiate action to restore SCS train to OPERABLE status. AND A.2 Initiate actions to establish ≥ 7.0 m (23 ft) of water above the top of reactor vessel flange.	Immediately Immediately
B. No SCS train OPERABLE or in operation.	B.1 Suspend operations involving a reduction in reactor coolant boron concentration. AND B.2 Initiate action to restore one SCS train to OPERABLE status and to operation AND B.3 Initiate action to raise RCS level to > EL 38.72 m (127'-1/4") when in REDUCED RCS INVENTORY.	Immediately Immediately Immediately