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.:	**491-8613**
SRP Section:	**09.05.02 – Communication Systems**
Application Section:	
Date of RAI Issue:	**05/26/2016**

Question No. 09.05.02-5

Clarify what the applicant means by “Functional Arrangement of Communication Systems” in APR1400 FSAR, Tier 1, Rev. 0, Table 2.6.9-1, “Communication System ITAAC”.

10 CFR 52.47(b)(1) requires that a design certification application contain the proposed ITAAC that are necessary and sufficient to provide reasonable that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the plant that incorporates the design certification has been constructed and will be operated in conformance with the design certification, the provisions of the Atomic Energy Act of 1954, and NRC rules and regulations.

APR1400 FSAR, Tier 1, Rev 0, Table 2.6.9-1 states in part that, “The functional arrangement of communication systems are as described in the Design Description of Subsection 2.6.9.1”. Similarly, APR1400 FSAR, Tier 1, Rev 0, Section 2.6.9.1.g, “Wireless Communication System” states in part, “The functional arrangement of the communication systems are as described in the Design Description of Subsection 2.6.9.1”. However, there is no such description in Subsection 2.6.9.1.

(a) The applicant needs to clarify what they mean by functional arrangement of communication systems. A definition for functional arrangement of communication systems in APR1400 FSAR Tier 1, Section 2.6.9 is needed. Update FSAR documents accordingly.

(b) The ITTAC and Acceptance Criteria provided in APR1400 FSAR Tier 1, Table 2.6.9-1 are not clear as to what particular procedures would be followed to ensure that each communication system is capable of performing its intended function. The applicant needs to mention applicable COL Items in their responses and why the COL Items are sufficient to meet the requirement of 10 CFR 52.47(b)(1). In case there are no applicable COL Items, more detail is required within the communication systems ITAAC and acceptance criteria descriptions in Table 2.6.9-1 for the staff to ensure compliance with the requirements of 10 CFR 52.47(b)(1). Update FSAR documents accordingly.

(c) There is a inconsistency between the items in the list provided in APR1400 FSAR, Tier 1, Rev 0, Section 2.6.9.1, “Design Description” and APR1400 FSAR, Tier 2, Rev 0, Section 9.5.2.2, “System Description”. These sections describe in part, the buildings within the APR1400 facility which contain communication systems. APR1400 FSAR, Tier 1, Rev 0, Section 2.6.9.1 needs to include all the buildings provided in APR1400, Tier 2, Rev 0, Section 9.5.2.2. Similarly Section 2.6.9.1 mentions “Page Phone System” while Section 9.5.2.2 mentions “Paging phone system”. APR1400 FSAR, Tier 1, Rev 0 information needs to be corrected and updated in both these instances such that information is consistent between Tier 1 and Tier 2 of the FSAR.

Response

(a) There is editorial error in DCD Tier 1, Subsection 2.6.9.1. Design description 1), 2), and 3) are not sub-descriptions of DCD Tier 1, Subsection 2.6.9.1.h, “Wireless communication system”. In this subsection 2.6.9.1, the configuration of communication system is described. Thus “the functional arrangement” will be changed with “the communication system configuration”. DCD Tier 1, Subsection 2.6.9.1 will be revised.

(b) The COL item for the initial test program of the plant and offsite communication system is addressed in DCD Tier 2, Subsection 14.2.13 as COL 14.2(11). The test procedures for security communication are provided in DCD Tier 2, Subsection 14.2.12.1.146 per the response of RAI 197-8176 Question No. 14.03.12-7 (MKD/NW-15-0252L). COL 14.2(11) will be revised that “The COL applicant is to prepare the site specific preoperational and startup test specification and test procedure and/or guideline for plant and offsite communication system.” DCD Tier 2, Subsection 14.2.13 and Table 1.8-2(25 of 29) will be revised.

(c) For consistency between DCD Tier 1 and Tier 2, DCD Tier 1, Subsection 2.6.9.1 and Tier 2, Subsection 9.5.2.2 will be revised.

Impact on DCD

DCD Tier 1, Subsection 2.6.9.1 and Table 2.6.9-1, and Tier 2, Subsections 9.5.2.2, 14.2.13, and Table 1.8-2(25 of 29) will be revised as shown in the 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 on impact on any Technical, Topical, or Environmental Report.

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2.6.9 Communication Systems

2.6.9.1 Design Description

The plant communication systems are non safety-related systems that provide effective intra-plant and plant-to-offsite communications. The following buildings contain communications systems:

a. Reactor containment building

b. Turbine generator building

c. Auxiliary building

d. Compound building

e. Emergency diesel generator building

f. Alternate ac diesel generator building

g. ESW pump house
h. CCW HX building
i. Central alarm system building / Secondary alarm system building
j. Guard house building

The communication systems consist of the following independent subsystems:

a. ~~Page~~ phone system → Paging

b. Evacuation alarm address system

c. Public address system

d. Sound powered telephone system

e. Telephone system

f. Plant time synchronizing system

g. LAN system → and VPN

The various communication systems provide independent and alternate paths to provide reasonable assurance of the capability to communicate with plant personnel and organizations during all operating or emergency conditions.

h. Wireless communication system

1) ~~The functional arrangement of the communication systems are~~ The communication system configuration is as described in the Design Description of Subsection 2.6.9.1.

2) Communication systems provide communication facilities between plant buildings and offsite areas, including the load dispatching center and emergency facilities, during both normal and emergency operations.

3) Communication systems are provided to ensure a means of intra-plant communication.

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2.6.9.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.6.9-1 describes the inspections, tests, analyses, and associated acceptance criteria for the communication systems.

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Table 2.6.9-1

Communication Systems ITAAC

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. ~~The functional arrangement of the communication systems are~~ as described in the Design Description of Subsection 2.6.9.1.	1. Inspection of the as-built communication systems will be performed. The communication system configuration is	1. The as-built communication systems conform with the functional arrangement as described in the Design Description of Subsection 2.6.9.1.
2. Communication systems provide communication facilities between plant buildings and offsite areas, including the load dispatching center and emergency facilities, during both normal and emergency operations.	2. Test of the as-built communication systems between plant buildings and offsite areas will be performed.	2. The as-built communication systems between plant buildings and offsite areas have been established.
3. Communication systems are provided to ensure a means of intra-plant communication.	3. Test of the as-built communication systems between plant buildings (intra-plant communications) will be performed.	3. The as-built communication systems between plant buildings (intra-plant communications) have been established.

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9.5.2.2 System Description

The following buildings within the APR 1400 facility contain communication systems:

a. Reactor containment building

b. Turbine generator building

c. Auxiliary building

d. Compound building

e. Emergency diesel generator building

f. Alternate ac diesel generator building

g. ESW pump house

h. CCW HX building

i. Central alarm system building / Secondary alarm system building

j. Guard house ~~buildings~~ building

The communication systems consist of the following independent subsystems:

a. Plant communication systems

1) Paging phone system

2) Evacuation alarm address system

3) Public address system

4) Sound powered telephone system

COL 14.2(8) The COL applicant that references the APR1400 design certification is to identify the specific operator training to be conducted as part of the low-power testing program related to the resolution of TMI Action Plan Item I.G.1, as described in (1) NUREG-0660 – NRC Action Plans Developed as a Result of the TMI-2 Accident, Revision 1, August 1980 and (2) NUREG-0737 – Clarification of TMI Action Plan Requirements.

COL 14.2(9) The COL applicant is to prepare the preoperational test of cooling tower and associated auxiliaries, and raw water and service water cooling systems.

COL 14.2(10) The COL applicant is to develop the test program of personnel monitors and radiation survey instruments.

COL 14.2(11) ~~The COL applicant is to develop the test procedure of the communication system.~~ procedures for

14.2.14 References systems described in Subsection 9.5.2.

1. 10 CFR Part 50, Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” U.S. Nuclear Regulatory Commission.

2. Regulatory Guide 1.28, “Quality Assurance Program Requirements (Design and Construction),” Rev. 4, U.S. Nuclear Regulatory Commission, June 2010.

3. Regulatory Guide 1.68, “Initial Test Programs for Water-Cooled Nuclear Power Plants,” Rev. 4, U.S. Nuclear Regulatory Commission, June 2013.

4. Regulatory Guide 1.68.2, “Initial Startup Test Program to Demonstrate Remote Shutdown Capability for Water-Cooled Nuclear Power Plants, U.S. Nuclear Regulatory Commission, April 2010.

5. Regulatory Guide 1.68.3, “Preoperational Testing of Instrument and Control Air Systems,” U.S. Nuclear Regulatory Commission, September 2012.

6. Regulatory Guide 1.79, “Preoperational Testing of Emergency Core Cooling Systems for Pressurized Water Reactors, U.S. Nuclear Regulatory Commission, October 2013.

The COL applicant is to prepare the site specific preoperational and startup test specification and test procedure and/or guideline for plant and offsite communication system.

RAI 197-8176 - Question 14.03.12-4

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Table 1.8-2 (25 of 29)

Item No.	Description
COL 14.2(8)	The COL applicant that references the APR1400 design certification is to identify the specific operator training to be conducted as part of the low-power testing program related to the resolution of TMI Action Plan Item I.G.1, as described in (1) NUREG-0660, "NRC Action Plans Developed as a Result of the TMI-2 Accident," Revision 1, August 1980 and (2) NUREG-0737, "Clarification of TMI Action Plan Requirements."
COL 14.2(9)	The COL applicant is to prepare the pre-operational test of cooling tower and associated auxiliaries, and raw wa~~systems described in Subsection 9.5.2~~
COL 14.2(10)	The COL applica~~procedures for~~ est program of personnel monitors and radiation survey instruments.
COL 14.2(11)	~~The COL applicant is to develop the test procedure of the communication system.~~
COL 14.3(1)	The COL applicant is to provide the ITAAC for the site-specific portion of the plant systems specified in Subsection 14.3.3.
COL 14.3(2)	The COL applicant is to provide the proposed ITAAC for the facility's emergency planning addressed in Subsection 14.3.2.10.
COL 14.3(3)	The COL applicant is to provide the proposed ITAAC for the facility's physical security hardware addressed in Subsection 14.3.2.12.
COL 14.3(4)	The COL applicant is to provide a DAC closure schedule for implementing the piping DAC.
COL 15.0(1)	The COL applicant is to perform the radiological consequence analysis using site-specific χ/Q values, unless the χ/Q values used in the DCD envelop the site-specific short-term or long-term χ/Q values of the DCD, and to show that the resultant doses are within the guideline values of 10 CFR 50.34 for EAB and LPZ and that of 10 CFR Part 50, Appendix A, GDC 19 for the MCR and TSC.
COL 17.4(1)	The COL applicant is to develop and implement Phases 2 and 3 of the design RAP, including QA requirements. In Phase 2, the plant's site-specific information is to be subjected to the design RAP process, and the site-specific risk-significant SSCs are combined with the APR1400 design risk-significant SSCs into one list for the plant. Phase 2 is to be performed during the COL application phase and updated/maintained during the COL license holder phase. In Phase 3, procurement, fabrication, construction, and test specifications for the SSCs within the scope of the RAP provide reasonable assurance that key assumptions, such as equipment reliability, are realistic and achievable. The QA requirements are implemented during the procurement, fabrication, construction, and pre-operational testing of the SSCs within the scope of the RAP. Phase 3 is to be performed during the COL license holder phase and prior to initial fuel loading. The COL applicant is to propose a method for incorporating the objectives of the reliability assurance program into other programs for design or operational errors that degrade non-safety-related, risk-significant SSCs.

The COL applicant is to prepare the site specific preoperational and startup test specification and test procedure and/or guideline for plant and offsite communication system.