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.:	**135-8001**
SRP Section:	**09.02.06 – Condensate Storage Facilities**
Application Section:	**9.2.6**
Date of RAI Issue:	**08/07/2015**

Question No. 09.02.06-1

GDC 2 establishes requirements with respect to the condensate storage facilities (CSF) design regarding protection against the effects of natural phenomena such as earthquakes, tornados, hurricanes and floods.

DCD Tier 2, Section 9.2.6.2, contains a description of the condensate storage and transfer system. The system includes three larges storage tanks (one 300,000 gallon demineralized water storage tank and two 255,000 gallon condensate storage tanks). These tanks are classified as seismic category III (non-seismic). As indicated in Section I of SRP 9.2.6, the staff's review of the condensate storage facilities includes the review of provisions for mitigating the environmental effects of system leakage or storage tank failure. Details on the provisions made to mitigate environmental effects from system leakage and storage tank failures are not included in the DCD.

The applicant is requested to provide a discussion of the provisions and CSF design features to ensure adequate protection against the effects of natural phenomena and adherence to Position C.2 of Regulatory Guide 1.29, "Seismic Design Classification." This information must be included in the DCD. The applicant is to provide a DCD markup of this response.

Response – (Rev. 2)

GDC 2 states that "Structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornados, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions."

The condensate storage facilities consist of the condensate storage and transfer system and the makeup demineralizer system.

The condensate storage and transfer system is designed as Seismic Category III except for piping connected for backup makeup of the auxiliary feedwater storage tanks in the auxiliary building, which is designed as Seismic Category II and is in accordance with position C2 of Regulatory Guide 1.29 (Rev. 4). DCD Tier 2, Section 9.2.6.2.2 (page 6.2-65) states that "All condensate storage and transfer system components including the CST and piping are non-safety-related and designed in accordance with NRC RG 1.26, Quality Group D. System components including the CST are normally designed as Seismic Category III but piping within safety-related structures containing safety-related components is designed in accordance with Seismic Category II requirements."

The makeup demineralizer system is designed as Seismic Category III except for the containment isolation valves and associated piping, which are designed as Seismic Category I and is in accordance with position C1 of Regulatory Guide 1.29 (Rev. 4). Piping within safety-related structures containing safety-related components is designed as Seismic Category II and is designed in accordance with position C2 of Regulatory Guide 1.29 (Rev. 4). DCD Tier 2, Subsection 9.2.6.2.1 (page 6.2-65) states that "All makeup demineralizer system components are non-safety related except for the containment isolation valves and associated piping, and designed in accordance with NRC RG 1.26, Quality Group D. Containment isolation valves and associated piping are Seismic Category I. Non-safety-related components and piping located in safety-related areas are Seismic Category II."

The failure of non-safety-related onsite tanks such as condensate storage facilities (CSF) could result in a potential flood source. The auxiliary building is the closest safety-related SSC, and it is approximately 90 meters away from the CSF, which is located in the tank yard as shown in DCD Tier 2, Figure 1.2-1. For conservatism, all of the water storage tanks are assumed to fail at the same time and 100% net-volumes are overflowed at the site. The flood level at the entrance doors to the auxiliary building is expected to be 16.7 cm, which is lower than the maximum allowable flood height (40.6 cm) between the bottom elevation of the door (100'-0") and the ground level elevation (98'-8"). In addition, the ESW pump house and CCW heat exchanger buildings and entrance doors are located at the elevations of 98'-8" and 100'-0", respectively. The site grading and drainage will ensure that water does not collect near SSCs. In a response submitted on October 28, 2015 (Transmittal # MKDNW-15-0111) COL Item 3.4(5) was added to the DCD that requires that the COL applicant provide a site-specific design of plant grading and drainage. Also, watertight doors are installed at the exterior entrances of the safety-related buildings in order to prevent flooding source to enter into the safety-related SSCs. DCD Tier 2, Subsection 3.4.1.4 and 9.2.6.2.2 will be revised to clarify a CSF tank failure will not adversely affect safety-related SSCs.

The condensate storage tanks are not treated as potentially containing radioactive material due to the APR1400 design features that are described below. The condensate and demineralized water is filtered water to remove dissolved and suspended impurities. There are no supply lines to the condensate storage tanks (CSTs) except the nitrogen and demineralized water lines. The CSTs can only add condensate to the hotwell. There is not a return line to the CST for the control of condensate overflow, DCD Tier 2, Figure 10.4.7-1 shows that there is a line to the condensate overflow storage sump to control the condenser hotwell level at a hotwell level high condition. Also, the CSTs are located at the ground level elevation (98'-8") and the condenser hotwells are located at the condenser pit (elevation 55'-0") as shown in DCD Tier 2 Figure 1.2-32. According to HEI-Standards for Steam Surface condensers, hotwell makeup water lines from the CSTs are connected above the top tube or in the transition section of condenser; this assures that there is no contact between the CST supply lines and the condensate. The location of the connection from the CST supply line to the hotwell, along with the approximate 40' elevation difference would not allow back leakage from condenser hotwells to CSTs. Therefore, the CSTs do not contain radioactive fluids.

In conclusion, a CSF tank leakage or failure would not cause adverse effects on the environment, safety-related SSCs, or the ability for safe shutdown.

Impact on DCD

DCD Tier 2, Subsection 3.4.1.4, 9.2.6.2, and Table 6.2.4-1 will be revised as indicated on the attached markup.

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.

The systems in the emergency diesel generator building to be protected from flooding are Class 1E emergency diesel generator system, and the emergency diesel generator fuel oil storage and transfer system. The components to be protected from flooding are diesel generator, diesel fuel oil transfer pump, and exhaust fan.

d. Site-specific safety structures

The COL applicant is to provide flooding analysis with flood protection and mitigation features from internal flooding for the CCW Heat Exchanger Building and ESW Building (COL 3.4(2)).

Tables 3.4-1 and 3.4-2 provide the locations of safety-related SSCs and a comparison of the maximum internal flood elevation in the vicinity of the components. Figures 3.4-1 through 3.4-7 provide the locations of watertight doors and flood barriers in the auxiliary building.

3.4.1.4 Evaluation of External Flooding

External flooding is evaluated based on flooding sources such as natural phenomena and the failure of onsite tanks or large buried pipes. The maximum water level and flow velocity of an individual flood event are determined to estimate flood loads on seismic Category I structures and the watertightness of the structures during an external flood event. Seismic Category I structures are designed for the design basis flood level and the maximum groundwater level defined in Table 2.0-1.

The COL applicant is to confirm that the potential site-specific external flooding events are bounded by design basis flood values or otherwise demonstrate that the design is acceptable (COL 3.4(3)).

No permanent dewatering systems are necessary to maintain safe and acceptable groundwater levels.

The failure of non-safety related onsite tanks such as condensate storage facilities (CSF) could result in a potential flood source. However, onsite tanks are located in the tank yard that is an adequate distance from safety-related structures, and watertight doors are installed at the exterior entrances located on the ground level of safety-related structures to prevent inflow of external flooding . Therefore, a non-safety related tank failure does not result in adverse effects to safety-related SSCs.

Table 6.2.4-1 (10 of 15)

Item No.	Service	Line Size (in)	Valve No.	Closure Time (sec)	Figure No.	Valve Type	Fluid	Length of Pipe(ft)[15]	Location Relative to Contain-ment	Flow Direction Relative to Contain-ment	Valve Arrange-ment (GDC)[2]	Valve Position[3] Nor-mal	Fail Safe	Shut-down	Acci-dent	Actuator Type[4]	Actuation Signal[5]	Type[6]	Type Test	Type-C Test	Justifi-cation for Not Testing	Essential/ Nonessential Line[7]
68	PCW return from containment ventilation units	12 12 -	WI-0012 WI-0015 WI-0014	50 50 -	9.2.7-2	Gate[12] Gate[12] Relief	Chilled water	4 - -	Outside Inside Inside	Out	33 (56)	O O C	C AI -	O O C	C C C	P E -	CIAS CIAS RV setpoint	A,R,M A,R,M -	C	Yes	[14]	Nonessential
69	Containment radiation monitor (inlet)	3/4 3/4	PR-432 PR-431	15 15	-	Gate[12] Gate[12]	Containment Atmosphere	- -	Outside Inside	Out	24 (56)	O O	AI AI	O O	C C	E E	CIAS CIAS	A,R,M A,R,M	C	Yes	-	Nonessential
70	Containment radiation monitor (outlet)	3/4 3/4	PR-434 PR-1433	15 -	-	Gate[12] Check	Containment Atmosphere	- -	Outside Inside	In	5 (56)	O O	AI -	O O	C C	E -	CIAS -	A,R,M -	C	Yes	-	Nonessential
71	Containment pressure sensing line	3/4 3/4 3/4 3/4 3/4 3/4	CM-17 CM-18 CM-19 CM-20 CM-21 CM-22	OPEN OPEN OPEN OPEN OPEN OPEN	-	Globe Globe Globe Globe Globe Globe	Containment Atmosphere	- - - - - -	Outside Outside Outside Outside Outside Outside	Out Out Out Out Out Out	13 (56)	O O O O O O	O O O O O O	O O O O O O	O O O O O O	S S S S S S	- - - -	R,M R,M R,M R,M R,M R,M	C	Yes	-	Essential
72	Demi. water	2 2	WM-1751 WM-1752	- -	~~9.2.3-1~~ 9.2.6-1	Globe Check	Demi. water	- -	Outside Inside	In	9 (56)	C C	- -	C C	C C	HW -	- -	M -	C	Yes	-	Nonessential
73	Nitrogen supply to safety injection tanks and RDT	1 1	NT-0004 NT-1016	15 -	-	Globe) Check	Nitrogen Gas	- -	Outside Inside	In	28 (55)	O O/C	C -	O O/C	C C	P -	CIAS -	A,R,M -	C	Yes	-	Nonessential
74	Containment air sample	1/2 1/2	PX-0041 PX-0042	15 15	9.3.2-1	Gate Gate	Containment Atmosphere	- -	Inside Outside	Out	22 (56)	C C	A1 A1	C C	O/C O/C	E E	CIAS CIAS	A,R,M A,R,M	C	Yes	-	Nonessential
75	Containment drain sump pump discharge line	4 4	DE-0006 DE-0005	20 20	9.3.3-1	Globe Globe	Primary Coolant	- -	Outside Inside	Out	27 (56)	O O	C AI	O O	C C	P E	CIAS CIAS	A,R,M A,R,M	C	Yes	-	Nonessential
76	Containment air sample	1/2 1/2	PX-0043 PX-1020	15 -	9.3.2-1	Gate Check	Containment Atmosphere	- -	Outside Inside	In	4 (56)	C C	A1 -	C C	O/C O/C	E -	CIAS -	A,R,M -	C	Yes	-	Nonessential
77	Reactor drain tank gas space to GWMS	1 1	GW-0002 GW-0001	15 15	11.3-1	Globe Globe	Gas	- -	Outside Inside	In/Out	30 (56)	O O	C AI	O O	C C	S E	CIAS CIAS	A,R,M A,R,M	C	Yes	-	Nonessential

g. CST and reactor makeup water tank (RMWT) through the MORS

The condensate storage and transfer system is designed to:

a. Provide demineralized water for initial fill of the condensate and feedwater systems

b. Provide makeup condensate by the hotwell level control system

c. Maintain proper feedwater inventory in the secondary system during startup, shutdown, hot standby, and normal operation

d. Maintain water purity and restrict oxygen content

The condensate storage facilities handle non-radioactive fluid. Therefore, NRC RG 4.21 (Reference 9) and GDC 60 are not applicable for the condensate storage facilities.

9.2.6.2 System Description

9.2.6.2.1 Makeup Demineralizer System

makeup demineralizer

The ~~demineralized water~~ system (see Figure 9.2.6-1) supplies filtered and demineralized water to the AFWST for makeup and to other systems for various services during all modes of normal operation including startup, power operation, hot shutdown, cold shutdown, and refueling. This system provides the demineralized and degasified water to the CST and RMWT through MORS. The water from the DWST is pumped by demineralized water transfer pumps to the MORS. The MORS reduces the oxygen concentration of the demineralized water. The makeup demineralized water meets the chemistry requirements of Table 9.2.6-2.

makeup demineralizer

The ~~demineralized water~~ system except for the DWST is located on the ground floor of the water treatment building in the yard. The DWST is located in the yard. The source to ~~demineralizer water~~ is supplied from the fresh water tanks in the fire protection program described in Subsection 9.5.1, through a series of demineralizers to the DWST.

the makeup demineralizer system

makeup demineralizer

All system components meet design code requirements consistent with the component quality group and seismic design classification, as described in Section 3.2. All ~~demineralized water~~ system components are non-safety related except for the containment isolation valves and associated piping, and designed in accordance with NRC RG 1.26 (Reference 11), Quality Group D. Containment isolation valves and associated piping are seismic Category I. Non-safety-related components and piping located in safety-related areas are seismic Category II. The others including the DWST are seismic Category III. Design parameters of the DWST and demineralized water transfer pumps are shown in Table 9.2.6-1.

9.2.6.2.2 Condensate Storage and Transfer System

The condensate storage and transfer system (see Figure 9.2.6-2) provides a readily available source of deaerated condensate for makeup to the condenser. The condensate storage and transfer system provides condensate by means of gravity to the following equipment:

a. Condenser hotwell

b. Auxiliary feedwater pump suction as alternate non-safety backup supply

c. Miscellaneous condensate makeup demands

All system components meet design code requirements consistent with the component quality group and seismic design classification, as described in Section 3.2. All condensate storage and transfer system components including the CST and piping are non-safety-related and designed in accordance with NRC RG 1.26, Quality Group D. System components including the CST are normally designed as seismic Category III but piping for within safety-related structures containing safety-related components is designed in accordance with seismic Category II requirements. The CSTs are pressurized by the nitrogen system to minimize air ingress. Design parameters of the CST are shown in Table 9.2.6-1.

The condensate storage facilities are located in the tank yard that is an adequate distance from safety-related structures and equipment such that a failure of the tanks does not result in adverse effects as described in Section 3.4.1.4.

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.:	**135-8001**
SRP Section:	**09.02.06 – Condensate Storage Facilities**
Application Section:	**9.2.6**
Date of RAI Issue:	**08/07/2015**

Question No. 09.02.06-2

Section 9.2.6.1 of the APR1400 DCD states that "the condensate storage facilities handle nonradioactive fluid. Therefore NRC RG 4.21 and GDC 60 are not applicable for the condensate storage facilities."

The staff disagrees with the above statement. The condensate storage and transfer system is designed to maintain proper feedwater inventory in the secondary system during startup, shutdown, hot standby, and normal operation as indicated in DCD Section 9.2.6.1. During normal operation the hotwell level control maintains a normal level in the condenser hotwell by directing condensate flow to and from the condensate storage tank, as described in DCD Section 10.4.7.2. Since the steam and power conversion system may become contaminated through steam generator tube leakage, as indicated in DCD Section 10.1.1, the condensate exchanged between the condensate storage facilities and the condenser hotwell may result in the handling of radioactive fluids by the condensate storage facilities. It should be noted that DCD table 11.1-6 provides design basis radionuclide concentrations for the secondary system, which also suggest that the fluids handled by the condensate storage facility may be radioactive, which is opposite to what is claimed in DCD section 9.2.6.

The technical rationale for GDC 60 being applicable to the condensate storage facilities is provided in Section 9.2.6, "Condensate Storage Facilities," of NUREG-0800, "Standard Review Plan" which states "GDC 60 requires that nuclear power unit designs include a means to control the release of radioactive materials in liquid effluents produced during normal operation, including anticipated operational occurrences. The criteria in GDC 60 apply to all tanks that are located outside the reactor containment and include radioactive materials in liquids. These tanks have the potential for uncontrolled releases of radioactive materials attributed to spillage. Through its connections with the reactor coolant system (in boiling-water reactors) or secondary coolant system (in pressurized water reactors), the CSF potentially contains radioactive material. Meeting GDC 60 requirement ensures that radiation exposures for operating personnel and the general public are as low as reasonably achievable. Regulatory Guide 1.143 provides guidance for implementing GDC 60. Following the regulatory guide provides assurance that the design of the CSF will include features to prevent uncontrolled releases of radioactive material. "

The current DCD does not indicate that the CSF meets the GDC 60 requirements, or that the design was developed using the guidance provided in Regulatory Guide 1.143.

The applicant is requested to describe how the APR1400 CSF meets the requirements of GDC 60 including design features for leakage detection, leakage prevention and leakage containment. This information must be included in the DCD. The applicant is to provide a DCD markup of this response including any table and/or diagram affected.

Response – (Rev. 1)

DCD Tier 2, Subsection 9.2.6.1 states that "The condensate storage and transfer system is designed to:

b. provide makeup condensate by the hotwell level control system"

DCD Tier 2, Figure 9.2.6-2 shows that there is no supply lines to the condensate storage tanks (CSTs) except nitrogen and demineralized water lines.

DCD Tier 2, Figure 10.4.7-1 shows that there is a line to condensate overflow storage sump to control the condenser hotwell level at a hotwell level high condition, but there is not an overflow line that goes back to CSTs.

DCD Tier 2, Subsection 9.2.6.1 states that "The condensate storage facilities handle non-radioactive fluid. Therefore, NRC RG 4.21 and GDC 60 are not applicable for condensate storage facilities."

DCD Subsection 10.4.1.5 and 10.4.7.2.1 will be revised to have a consistency with other DCD sections as follows:

"The condenser hotwell level is maintained by receiving condensate from the condensate storage tank and directing condensate overflow to the condensate overflow storage sump.

Also, the condensate overflow from the hotwell is directed to the condensate overflow storage sump in the TGB and the discharge from the condensate overflow storage sump will be routed to the condensate polishing area sump. The discharge from the condensate polishing area sump is monitored for radioactive contamination. When contaminated fluid is detected at or exceeding a predetermined radiation level setpoint, the waste from the condensate polishing area sump is routed to the liquid waste management system (LWMS) for processing and release. This is described on DCD Subsection 9.3.3.2.6.

Impact on DCD

DCD Tier 2, Subsection 10.4.1.5 and 10.4.7.2.1 will be revised as indicated on the attached markup.

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.

equipment in the T/G building. Flood protection from internal sources is described in Subsection 3.4.1.

10.4.1.4 Inspection and Testing Requirements

The condenser is tested in accordance with the HEI "Standards for Steam Surface Condensers". The condenser is designed to be capable of being filled with water for hydrostatic tests. The condenser shells, hotwells, and waterboxes are provided with access openings to permit inspection and repairs; periodic visual inspections of and preventive maintenance on condenser components are conducted according to normal industrial practice.

10.4.1.5 Instrumentation Requirements

All of the instrumentation for the condenser is for normal power operation, and is not required for safe shutdown of the reactor. Sufficient instrumentation is provided throughout the plant power generation systems to facilitate an accurate heat energy balance of the plant.

Hotwell level and pressure indications are provided locally, and associated alarms are provided in the main control room (MCR) for each condenser shell. ~~The condensate level in the hotwell is maintained within proper limits by automatically transferring condensate to or from the condensate storage system.~~ Condensate temperature (measured in the condensate system), condenser pressure, circulating water temperature and pressure, and differential pressure from waterbox-to-waterbox are monitored and used to verify main condenser operation.

Turbine trip is activated by pressure transmitters located in the condenser shells upon a loss of condenser vacuum when the condenser pressure reaches or exceeds the setpoint [[0.26 kg/cm^2 A(7.5 in HgA)]].

Refer to Subsection 7.7.1.1 for a description of the process component control system, which provides the applicable non-safety remote monitoring and controls from the MCR.

The condenser hotwell level is maintained by receiving condensate from condensate storage tank and directing condensate overflow to the condensate overflow storage sump.

f. In conformance with GDC 46, the condensate and feedwater system is designed to permit appropriate functional testing of the system and components to provide reasonable assurance of structural integrity and leaktightness, operability, and performance of active components, and the capability of the integrated system to function as intended during normal, shutdown, and accident conditions.

g. The portion is designed to withstand loads arising from the various specified normal operating and design basis events (DBEs).

10.4.7.2 System Description

10.4.7.2.1 General Description

The condensate and feedwater system delivers feedwater from condenser hotwells to the SGs at the required temperature, pressure, and flow rate. Condensate and feedwater is heated through the LP feedwater heaters and HP feedwater heaters. The condensate and feedwater system is composed of a condensate system and feedwater system.

The condensate system consists of three condensate pumps, three stages of three parallel LP heaters, a deaerator, and two deaerator storage tanks. Three 50 percent capacity motor-driven condensate pumps (two operating and one standby) deliver condensate from the condenser hotwells to the deaerator through the condensate polisher, a steam packing exhauster, and three stages of LP feedwater heaters. Condensate is provided to the SG blowdown regenerative heat exchanger for cooling.

The deaerator storage tank level is controlled by two pneumatic valves. ~~The condenser hotwell level is maintained by directing condensate flow to and from the condensate storage tank using makeup lines.~~

Drains from the LP feedwater heaters are cascaded to the next lower-pressure feedwater heaters with drains from the lowest-pressure feedwater heaters draining to the condenser.

The feedwater system consists of three main feedwater pumps, three feedwater booster pumps, a startup pump, three stages of two parallel HP heaters, main feedwater isolation valves (MFIVs), feedwater check valves, and feedwater control valves.

The condenser hotwell level is maintained by receiving condensate from condensate storage tank and directing condensate overflow to the condensate overflow storage sump.

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.:	**135-8001**
SRP Section:	**09.02.06 – Condensate Storage Facilities**
Application Section:	**9.2.6**
Date of RAI Issue:	**08/07/2015**

Question No. 09.02.06-3

The DCD does not discuss how the condensate storage facilities (CSF) comply with 10 CFR 20.1406. In DCD section 9.2.6.1 the applicant states that NRC RG 4.21, which provides regulatory guidance on how to comply with 10 CFR 20.1406, is not applicable. The staff does not agree with the applicant position.

10 CFR 20.1406 requires, in part, that each design certification applicant describe how the facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, as well as the generation of radioactive waste. Since the condensate storage facilities interfaces with systems containing radioactive fluids, and can potentially contain radioactive fluids due to primary to secondary leakage (i.e., steam generator tube leakage), 10 CFR 20.1406 applies to the CSF for the APR1400. Regulatory Guide 4.21 provides guidance on meeting the requirements of 10 CFR 20.1406.

The applicant is requested to describe how the CSF comply with 10 CFR 20.1406, including information describing design features for leakage prevention and early leak detection. Also to be identified is whether the system uses any buried piping and how monitoring and inspection will be performed for those portions of the system. The applicant is requested to include the information in the DCD and provide a markup of the DCD text as well as any table and/or diagram affected.

Response – (Rev. 1)

The CSF consists of the demineralized water (DM) system and the condensate storage and transfer (CT) system. The DM system provides demineralized water to the condensate storage tanks (CSTs) and CT system supplies condensate to hotwell.

The condensate storage tanks are not treated as potentially containing radioactive material due to the APR1400 design features that are described below. The condensate and demineralized water is filtered water to remove dissolved and suspended impurities. There are no supply lines to the condensate storage tanks (CSTs) except the nitrogen and demineralized water lines. The CSTs can only add condensate to the hotwell. There is not a return line to the CST for the control of condensate overflow, DCD Tier 2, Figure 10.4.7-1 shows that there is a line to the condensate overflow storage sump to control the condenser hotwell level at a hotwell level high condition. Also, the CSTs are located at the ground level elevation (98'-8") and the condenser hotwells are located at the condenser pit (elevation 55'-0") as shown in DCD Tier 2 Figure 1.2-32. According to HEI-Standards for Steam Surface condensers, hotwell makeup water lines from the CSTs are connected above the top tube or in the transition section of condenser; this assures that there is no contact between the CST supply lines and the condensate. The location of the connection from the CST supply line to the hotwell, along with the approximate 40' elevation difference would not allow back leakage from condenser hotwells to CSTs.

Therefore, based on the design features described above, the CSTs do not contain radioactive fluids and additional facility design features and procedures for operation to minimize the contamination of the facility and the environment are not required to meet the requirements of 10 CFR 20.1406.

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

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

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.:	**135-8001**
SRP Section:	**09.02.06 – Condensate Storage Facilities**
Application Section:	**9.2.6**
Date of RAI Issue:	**08/07/2015**

Question No. 09.02.06-4

DCD Tier 2 Table 1.9-2 under the heading “Conformance or Summary Description of Deviation” states that SRP Section 9.2.6 is not applicable because “Condensate storage facilities have no safety-related functions and handle non-radioactive fluid, and that the APR1400 is not multiunit.”

Although not all portions of SRP 9.2.6 are applicable to the APR1400, the staff finds that SRP 9.2.6 is still partially applicable since GDCs 2 and 60 apply to all CSFs.

The applicant is requested to revise and update the FSAR to correctly show the applicability of SRP 9.2.6 to the APR1400 CSF designs. The applicant is to provide a DCD markup of this response including any table and/or diagram affected.

Response – (Rev. 1)

The condensate storage facilities (CSF) consist of the condensate storage and transfer system and the makeup demineralizer system.

The condensate storage and transfer system is designed as Seismic Category III except for piping connected for backup makeup of the auxiliary feedwater storage tanks in the auxiliary building, which is designed as Seismic Category II and is in accordance with position C2 of Regulatory Guide 1.29 (Rev. 4). The makeup demineralizer system is designed as Seismic Category III except for the containment isolation valves and associated piping, which are designed as Seismic Category I and is in accordance with position C1 of Regulatory Guide 1.29 (Rev. 4). Piping within safety-related structures containing safety-related components is designed as Seismic Category II and is designed in accordance with position C2 of Regulatory Guide 1.29 (Rev. 4). DCD Tier 2, Section 9.2.6.2.2 (page 6.2-65) states that “All condensate storage and transfer system components including the condensate storage tanks (CSTs) and piping are non-safety-related and designed in accordance with NRC RG 1.26, Quality Group D. System components including the CST are normally designed as Seismic Category III but piping within safety-related structures containing safety-related components is designed in accordance with Seismic Category II requirements." Therefore, GDC 2 is applicable and the CSF conforms to GDC 2.

The CSF is not treated as potentially containing radioactive material due to the APR1400 design features that are described below. The condensate and demineralized water is filtered water to remove dissolved and suspended impurities. There are no supply lines to the CSTs except the nitrogen and demineralized water lines. The CSTs can only add condensate to the hotwell. There is not a return line to the CST for the control of condensate overflow, DCD Tier 2, Figure 10.4.7-1 shows that there is a line to the condensate overflow storage sump to control the condenser hotwell level at a hotwell level high condition. Also, the CSTs are located at the ground level elevation (98'-8") and the condenser hotwells are located at the condenser pit (elevation 55'-0") as shown in DCD Tier 2 Figure 1.2-32. According to HEI-Standards for Steam Surface condensers, hotwell makeup water lines from the CSTs are connected above the top tube or in the transition section of condenser; this assures that there is no contact between the CST supply lines and the condensate. The location of the connection from the CST supply line to the hotwell, along with the approximate 40' elevation difference would not allow back leakage from condenser hotwells to CSTs. Therefore, the CSF does not contain radioactive fluids, and GDC 60 is not applicable.

DCD Tier 2, Table 1.9-2 (19 of 33) under "Conformance or Summary Descriptions of Deviation" will be revised as follows:

"The APR1400 conforms with this SRP with exceptions. Since the condensate storage facilities have no safety-related function and the APR1400 is not multi-unit, Criteria 2, 3, 4, 5, 6, and 7 of this SRP are not applicable."

Impact on DCD

DCD Tier 2, 1.9-2 (19 of 33) will be revised as indicated on the attached markup.

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.

Table 1.9-2 (19 of 33)

SRP Section/Title	Revision / Issue Date	Conformance or Summary Description of Deviation	DCD Tier 2 Section
9.2.1 – Station Service Water System	Rev. 5 03/2007	The APR1400 conforms with this SRP.	9.2.1
9.2.2 – Reactor Auxiliary Cooling Water System	Rev. 4 03/2007	The APR1400 conforms with this SRP.	9.2.2
9.2.4 – Potable and Sanitary Water Systems	Rev. 3 03/2007	The APR1400 conforms with this SRP.	9.2.4
9.2.5 – Ultimate Heat Sink	Rev. 3 03/2007	The APR1400 conforms with this SRP.	9.2.5
9.2.6 – Condensate Storage Facilities	Rev. 3 03/2007	Not applicable. Condensate storage facilities have no safety-related functions and handle nonradioactive fluid. The APR1400 is not multi-unit.	9.2.6
9.3.1 – Compressed Air System	Rev. 2 03/2007	The APR1400 conforms with this SRP.	9.3.1
9.3.2 – Process and Post-Accident Sampling Systems	Rev. 3 03/2007	The APR1400 conforms with this SRP.	9.3.2
9.3.3 – Equipment and Floor Drainage System	Rev. 3 03/2007	The APR1400 conforms with this SRP.	9.3.3
9.3.4 – Chemical and Volume Control System (PWR) (Including Boron Recovery System)	Rev. 3 03/2007	The APR1400 conforms with this SRP.	9.3.4
9.3.5 – Standby Liquid Control System (BWR)	Rev. 3 03/2007	Not applicable (BWR)	N/A
9.4.1 – Control Room Area Ventilation System	Rev. 3 03/2007	The APR1400 conforms with this SRP.	9.4.1

~~The APR1400 conforms with this SRP except for the safety function of safety related systems, GDC 60, and 10 CFR 50.63.~~

The APR1400 conforms with this SRP with exceptions.
Since the condensate storage facilities have no safety-related function and the APR1400 is not multi-unit, Criteria 2,3,4,5,6, and 7 of this SRP are not applicable.