PMNorthAnna3COLPEmails Resource

From: Barry Bryant [barry.bryant@dom.com]
Sent: Tuesday, October 25, 2011 11:00 AM
To: Patel, Chandu
Cc: Regina Borsh; David Lippard; Diane Aitken
Subject: Additional Information re: Draft RAI 5976
Attachments: Draft -- FSAR Section 12.3.1.3.pdf; Draft -- FSAR Table 12.3-8R.pdf; Draft -- FSAR Table 12.3-201.pdf; Draft -- FSAR Section 10.4.8.2.1.pdf

Chandu,

I sent comments on draft RAI 5976 in an email dated October 13, 2011. The comment on Question 2 stated:

"This question is addressed by COL items 12.3(10), which was added by DCD Rev. 3 and will be included in the next COLA submission. See attached draft FSAR Sections 10.4.8.2.1 and 12.3.1.3."

FSAR Section 12.3.1.3 refers to two new tables (Table 12.3-8R and 12.3-201) that were also added as a result of DCD Rev. 3. Draft copies of these two new tables, along with draft FSAR Sections 10.4.8.2.1 and 12.3.1.3, are attached for your information.

Please let me know if you have any questions.

Thank you.

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Hearing Identifier: NorthAnna3_Public_EX
Email Number: 1037

Mail Envelope Properties (B52570EA21DB3E43BB1BB7891B06067D27093A5785)

Subject: Additional Information re: Draft RAI 5976
Sent Date: 10/25/2011 11:00:23 AM
Received Date: 10/25/2011 11:00:34 AM
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Files	**Size**	**Date & Time**
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Draft -- FSAR Table 12.3-8R.pdf	77542	
Draft -- FSAR Table 12.3-201.pdf	128592	
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Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

12.3.1.2.1.1 Radiation Zoning

STD COL 12.3(4)

Replace the fourth sentence of the fourth paragraph in DCD Subsection 12.3.1.2.1.1 with the following.

Site radiation zones for plant arrangement plan under normal operation/shutdown conditions are shown in Figure 12.3-1R (COL information provided on Sheet 1 of 34).

NAPS SUP 12.3(1)

Add the following after the last Sentence in the fourth paragraph in DCD subsection 12.2.1.2.1.1.

Radiation zoning maps for the Interim Radwaste Storage Facility are shown in Appendix 11AA.

NAPS COL 12.3(10)

12.3.1.3.1.1 Design Considerations for Site Specific Design

This section identifies the site-specific design features of systems that address RG 4.21. These systems include the Startup Steam Generator Blowdown System discharge line and the treated radioactive effluent discharge line from the LWMS. A detailed discussion of these features is provided for the Startup Steam Generator Blowdown System in Subsection 10.4.8.2.1 and for the LWMS in Subsection 11.2.2. A detailed discussion of how these design features meet the design objectives of RG 4.21 is presented in Table 12.3-201. The design features for the LWMS effluent discharge pathway should be reviewed in conjunction with DCD Table 12.3-8. Any site-specific departures regarding DCD Table 12.3-8 are provided in Table 12.3-8R.

STD COL 12.3(10)

The Ultimate Heat Sink (UHS) has an interface with essential service water system (ESWS). As discussed in DCD Table 12.3-8, the ESWS is in compliance with RG 4.21 (Reference 12.3-30), and does not normally contain any radioactivity. Therefore, the UHS has no direct interface with any radioactive system and does not require compliance with RG 4.21.

12.3.1.3.2 Operational/Programmatic Considerations

STD COL 12.1(6)
STD COL 12.1(7)
STD COL 12.1(8)
STD COL 12.3(10)

Replace the last paragraph in DCD Subsection 12.3.1.3.2 with the following.

Programs and procedures are implemented consistent with NEI 08-08A, “Generic FSAR Template Guidance for Life Cycle Minimization of

Contamination," to meet the site-specific, operational and post-construction objectives of RG 4.21 (Reference 12.3-30) and the requirements of 10 CFR 20.1406 (Reference 12.3-29). These objectives include:

- Periodically reviewing operational practices to ensure operating procedures reflect the installation of new or modified equipment, personnel qualification and training are kept current, and facility personnel are following the operating procedures;
- Facilitating decommissioning by maintaining records relating to facility design and construction, facility design changes, site conditions before and after construction, contamination events, and results of radiological surveys;
- Development of a conceptual site model (based on site characterization and facility design and construction) that aids in the understanding of the interface with environmental systems and the features that control the movement of contamination in the environment;
- Evaluating the final site configuration after construction to assist in preventing the migration of radionuclides offsite via unmonitored pathways; and
- Establishing and performing an onsite contamination monitoring program along the potential pathways from the release sources to the receptor points.

12.3.2.2.5 Auxiliary Building Shielding Design

NAPS DEP 9.2(1)

Replace the first sentence of the first paragraph with the following.

During normal operations, the major components in the A/B with potentially high radioactivity are those in the CVCS, SGBDS, GWMS, LWMS, and SWMS.

12.3.2.2.8 Spent Fuel Transfer Canal and Tube Shielding Design

STD COL 12.3(5)

Replace the last paragraph in DCD Subsection 12.3.2.2.8 with the following.

Administrative control of the fuel transfer tube inspection and the access control of the area near the seismic gap below the fuel transfer tube will be addressed in a radiation protection program, described in

12.3(2) ***Deleted from the DCD.***

12.3(3) ***Deleted from the DCD.***

STD COL 12.3(4)
NAPS COL 12.3(4)

12.3(4) ***Site radiation zones***

This COL item is addressed in Subsection 12.3.1.2.1.1 and Figure 12.3-1R (sheet 1 of 34).

STD COL 12.3(5)
NAPS COL 12.3(5)

12.3(5) ***Administrative control of the fuel transfer tube inspection***

This COL item is addressed in Subsection 12.3.2.2.8 and Section 12.5.

STD COL 12.3(6)

12.3(6) ***The radiation protection aspects of the Mobile Liquid Waste Processing System***

This COL item is addressed in Subsection 12.3.1.1.1.2.

STD COL 12.3(7)

12.3(7) ***How the system meets the requirements of 10 CFR 20.1406 and RG 4.21***

This COL item is addressed in Subsections 11.2.1.6 and 12.3.1.1.1.2.

STD COL 12.3(8)

12.3(8) ***Radiation Zones for Mobile Liquid Waste Processing System area***

This COL item is addressed in Subsection 12.3.1.1.1.2.

NAPS COL 12.3(9)
NAPS DEP 9.2(1)

12.3(9) ***Radiation Protection Program contains provisions to ensure the Degasifier Feed Filter and Demineralizer rooms do not become a VHRA.***

This COL item is addressed in Section 12.5.

STD COL 12.3(10)
NAPS COL 12.3(10)

12.3(10) ***The COL Applicant will address the site-specific design features, operational and post-construction objectives of Regulatory Guide 4.21.***

This COL item is addressed in Subsections 12.3.1.3.1.1, 12.3.1.3.2, Tables 12.3-8R and 12.3-201.

Table 12.3-8R Regulatory Guide 4.21 Design Objectives and Applicable DCD Subsection Information for Minimizing Contamination and Generation of Radioactive Waste (Sheet 24 of 61)

Objective		System Features	DCD Reference
2	Provide for adequate leak detection capability to provide prompt detection of leakage for any structure, system, or component which has the potential for leakage.	- The drainage system is equipped with a liquid detection instrument which can provide early warning for leakage and/or overflow condition to initiate operator actions. - The floors of these cubicles containing radioactive fluid are sloped to facilitate faster drainage and to minimize liquid accumulation, and provided with coating with non-porous material to prevent cross contamination. - On the shell side of heat exchangers, the return header has a radiation monitor to isolate the cooling water system, in the event leakage is detected.	12.3.1.1.1.2.E
3	Use leak detection methods (e.g., instrumentation, automated samplers) capable of early detection of leaks in areas where it is difficult or impossible to conduct regular inspections (such as for spent fuel pools, tanks that are in contact with the ground, and buried, embedded, or subterranean piping) to avoid release of contamination of the environment.	The leak detection system is incorporated in all cubicles in which the tanks contain radioactive fluid (refer to system features for objective #2 above). The tanks include: - Holdup Tanks - Volume Control Tank - ~~Boric Acid Tanks~~	—

NAPS COL 12.3(10)
NAPS DEP 9.2(1)

Table 12.3-8R Regulatory Guide 4.21 Design Objectives and Applicable DCD Subsection Information for Minimizing Contamination and Generation of Radioactive Waste (Sheet 60 of 61)

Auxiliary Steam Supply System **(Note: The "System Features" column consists of excerpts/summary from the DCD)**

		Objective	System Features	DCD Reference
	1	Minimize leaks and spills and provide containment in areas where such events may occur.	The condensate piping from the ASSS drain tank is a single-walled carbon steel pipe run above ground in pipe chases from the A/B to the T/B, and is then connected to double-walled welded carbon steel piping through the T/B wall penetration to the auxiliary boiler. Since this is not a high traffic area, this segment of pipe is run above ground and is slightly sloped so that any leakage is collected in the outer pipe and drained to the auxiliary boiler building. At the auxiliary boiler building end, a leak detection instrument is provided to monitor leak. A drain pipe is provided to direct any drains to the building sump. The steam piping is jacketed with insulation and heat protection. This design is supplemented by operational programs which includes periodic hydrostatic or pressure testing of pipe segments, instrument calibration, and when required, visual inspection and maintenance of piping, trench and instrument integrity.	10.4.11.2.1
NAPS COL 12.3(10) NAPS DEP 9.2(1)	2	Provide for adequate leak detection capability to provide prompt detection of leakage for any structure, system, or component which has the potential for leakage.	The auxiliary steam drain monitors the leakage of the radioactive materials from the ~~boric acid evaporator~~ degasifier to the condensed water of the ASSS.	10.4.11.1.2
			Monitoring the leakage from the primary side of the ~~evaporator~~ degasifier, the radiation monitor is attached to the downstream of the auxiliary steam drain pump. The high alarm of the monitor isolates the pump discharge line and steam supply line from main steam and trips the pump.	10.4.11.2.1
			Leakage of radioactive materials from primary side in the ~~B/A evaporator~~ degasifier.	10.4.11.2.3

NAPS COL 12.3(10)
NAPS DEP 9.2(1)

Table 12.3-8R Regulatory Guide 4.21 Design Objectives and Applicable DCD Subsection Information for Minimizing Contamination and Generation of Radioactive Waste (Sheet 61 of 61)

Objective	System Features	DCD Reference
	If there is leakage of radioactive materials from the primary side in the ~~B/A evaporator~~ degasifier, the auxiliary steam drain tank pump discharge isolation valve is closed and the auxiliary steam drain pumps are tripped by the auxiliary steam drain monitor high alarm. The high signal is alarmed to the main control room.	

NAPS COL 12.3(10)

Table 12.3-201 Regulatory Guide 4.21 Design Objectives and Applicable FSAR Subsection Information for Minimizing Contamination and Generation of Radioactive Waste

Startup Steam Generator Blowdown System

(Note: This table addresses the site-specific components and must be reviewed in parallel with DCD Table 12.3-8 for standard components and Table 12.3-8R for departure components. The "System Features" column consists of excerpts from the FSAR.)

Objective	System Features	FSAR Reference
1 Minimize leaks and spills and provide containment in areas where such events may occur.	The Startup Steam Generator Blowdown System includes a stainless steel flash tank and a heat exchanger (stainless steel on tube side) which have a welded design to minimize leakage. The components are housed in a facility in which the concrete foundation is epoxy-coated and sloped toward a sump to facilitate the collection of leakage. The piping after the heat exchanger is constructed of stainless steel up to and including the connector after the isolation valve. The discharge piping that continues the discharge line from the connector is a double-walled HDPE pipe. Within the double-walled pipe, the blowdown water flows through the inner pipe while the outer pipe serves as containment in the event of leakage. Once the pipe exits the facility, the HDPE pipe is buried and routed underground to the blowdown sump. The buried piping is equipped with manholes, also constructed of HDPE, located at specified piping lengths to facilitate the containment of leakage by means of a collection basin. From the blowdown sump, the blowdown water, mixed with the liquid waste effluent and the flows from the CWS and UHS cooling towers, is routed through additional piping leading to the discharge canal.	10.4.8
2 Provide for adequate leak detection capability to provide prompt detection of leakage for any structure, system, or component which has the potential for leakage.	The Startup Steam Generator Blowdown Facility has an epoxy-coated concrete floor which is sloped to facilitate drainage to a sump for leakage collection. The sump is equipped with level detection instrumentation which alarms to the Main Control Room (MCR) for operator action. Outside of the facility, the buried piping segments are sloped toward the next downstream manhole. The manholes are watertight to prevent the intrusion of precipitation or groundwater. Each manhole contains a collection basin so that any leakage in the outer pipe is collected from a given segment of piping. The manhole collection basin is equipped with level detection instrumentation. This design approach, which utilizes manholes along the buried pathway, provides early leak detection capability and provides accessibility to facilitate periodic testing and inspection to maintain pipe integrity.	10.4.8

NAPS COL 12.3(10)

Table 12.3-201 Regulatory Guide 4.21 Design Objectives and Applicable FSAR Subsection Information for Minimizing Contamination and Generation of Radioactive Waste *(continued)*

Objective		System Features	FSAR Reference
3	Use leak detection methods (e.g., instrumentation, automated samplers) capable of early detection of leaks in areas where it is difficult or impossible to conduct regular inspections (such as for spent fuel pools, tanks that are in contact with the ground, and buried, embedded or subterranean piping) to avoid release of contamination of the environment.	The equipment and associated piping located within the Startup Steam Generator Blowdown Facility are accessible for inspection and maintenance. The sump provided to collect leakage within the facility is equipped with level detection instrumentation to provide early leak detection. When liquid accumulates in the sump to a predetermined setpoint, the instrument sends a signal to the MCR to alarm for operator action. Once the piping is outside the facility, the double-walled piping is buried to the blowdown sump. The manholes located along this buried pathway are each equipped with a collection basin and level detection instrumentation. When liquid accumulates in the basin to a predetermined setpoint, the instrument sends a signal to the MCR to alarm for operator action. Analysis of samples of the liquid collected in the manholes can also differentiate whether the liquid is rainwater, groundwater or leakage from the discharge piping; these results will dictate the need for treatment prior to discharge of the collected liquid. The manholes also allow for increased accessibility to the buried piping segments in order to conduct periodic testing and inspection. The double-walled piping, manhole stations, and level detection instrumentation serve to provide early leak detection and avoidance of unintended release of contamination to the environment.	10.4.8

NAPS COL 12.3(10)

Table 12.3-201 Regulatory Guide 4.21 Design Objectives and Applicable FSAR Subsection Information for Minimizing Contamination and Generation of Radioactive Waste *(continued)*

Objective		System Features	FSAR Reference
4	Reduce the need to decontaminate equipment and structures by decreasing the probability of any release, reducing any amounts released, and decreasing the spread of contaminant from the source.	The Startup Steam Generator Blowdown equipment is welded in order to avoid crud traps and have smooth and polished surfaces to further minimize the trapping of solids. The Startup Steam Generator Blowdown Facility floor is epoxy-coated in order to provide a smooth surface for draining and cleaning. This design reduces the need for decontamination of equipment and minimizes the spread of contamination from the source. The use of double-walled piping to transport the system discharge reduces the probability of contaminated releases by providing a secondary boundary to the environment. Leakage from the inner pipe carrying the contaminated liquid is contained within the outer pipe which is detected quickly using the leak detection methods described for Objectives 2 and 3. The double-walled HDPE piping is fuse-welded in order to minimize crud traps. The discharge piping is also sloped towards the nearest downstream manhole en route to the blowdown sump in order to minimize liquid retention inside the pipe in the case of leakage. The manholes each contain a collection basin to hold any leakage that is transferred downstream through the sloped piping segments. This design helps to decrease the spread of contaminated liquid from the point of leakage as the piping segment between manholes can be quickly identified for replacement and the leakage is collected before it reaches downstream piping segments.	10.4.8

NAPS COL 12.3(10)

Table 12.3-201 Regulatory Guide 4.21 Design Objectives and Applicable FSAR Subsection Information for Minimizing Contamination and Generation of Radioactive Waste *(continued)*

Objective		System Features	FSAR Reference
5	Facilitate decommissioning by (1) minimizing embedded and buried piping, and (2) designing the facility to facilitate the removal of any equipment and/or components that may require removal and/or replacement during facility operation or decommissioning.	The overall plant layout dictates the need for buried piping from the Startup Steam Generator Blowdown Facility to the blowdown sump. In all instances in which the buried piping must be routed beneath a roadway, support structures are built in order to preserve the integrity of the pipe and prevent damage which may lead to unintended releases. The blowdown sump is designed to mix the CWS and UHS cooling water blowdown flows, startup steam generator blowdown discharge, and treated liquid effluent. From the blowdown sump, there is a single flowpath routed to the discharge canal which minimizes the total length of buried piping for replacement during facility operation and for removal during decommissioning. This piping is routed to a concrete tunnel and then from the tunnel to the discharge canal. The current design combines the normal SGBDS (for normal power operation) alternate discharge line and the Startup Steam Generator Blowdown System discharge line at the Startup Steam Generator Blowdown Facility. This design approach avoids the routing of two separate buried pipes to the blowdown sump. The use of manholes between pipe segments also facilitates the identification of the leakage sources by having a collection basin and leak detection instrumentation in each manhole. This design enables the replacement of the segment of leaking piping, instead of necessitating the replacement of the entire pipeline from the facility to the blowdown sump.	10.4.8
6	Minimize the generation and volume of radioactive waste both during operation and during decommissioning (by minimizing the volume of components and structures that become contaminated during plant operation).	As described in Objective 5, the current design approach combines the normal SGBDS alternate discharge piping and the Startup Steam Generator Blowdown System discharge piping into a single pipe for transfer to the blowdown sump. This design approach minimizes the overall length of piping material needed, and thus reduces the amount of contaminated material for normal operation and decommissioning. Also described for Objective 5, the placement of manholes at specified distances along the buried piping reduces the generation and volume of radioactive waste by allowing for the replacement of a piping segment identified as the source of leakage instead of requiring the replacement of the entire pipeline.	10.4.8

NAPS COL 12.3(10)

Table 12.3-201 Regulatory Guide 4.21 Design Objectives and Applicable FSAR Subsection Information for Minimizing Contamination and Generation of Radioactive Waste *(continued)*

Liquid Waste Management System (LWMS)

(Note: This table addresses the site-specific components and must be reviewed in parallel with DCD Table 12.3-8 for standard components and Table 12.3-8R for departure components. The "System Features" column consists of excerpts from the FSAR.)

	Objective	System Features	FSAR Reference
1	Minimize leaks and spills and provide containment in areas where such events may occur.	The LWMS effluent release piping for transporting radioactive effluent from the discharge valve inside the A/B to the blowdown sump is constructed from double-walled HDPE piping. The liquid effluent flow is contained in the inner pipe, and the outer pipe serves as containment in the event of leakage from the inner pipe. In the blowdown sump, the liquid effluent mixes with flows from the CWS and UHS cooling towers and then flows through additional piping to the discharge canal. The buried HDPE piping is run from the A/B to the blowdown sump entirely outside of the plant buildings with manholes constructed at specified piping lengths to allow for the detection of leakage along the buried pathway.	11.2.2
2	Provide for adequate leak detection capability to provide prompt detection of leakage for any structure, system, or component which has the potential for leakage.	The buried LWMS effluent release piping has manholes provided at specified distances along the buried pathway for monitoring leakage. The manholes, which are also constructed from HDPE, are each equipped with a collection basin and level detection instrumentation. The manholes are watertight to prevent the intrusion of precipitation or groundwater. This design approach provides early leak detection and provides accessibility to facilitate periodic testing (hydrostatic or pressure) or visual inspection to maintain pipe integrity.	11.2.2

NAPS COL 12.3(10)

Table 12.3-201 Regulatory Guide 4.21 Design Objectives and Applicable FSAR Subsection Information for Minimizing Contamination and Generation of Radioactive Waste *(continued)*

Objective		System Features	FSAR Reference
3	Use leak detection methods (e.g., instrumentation, automated samplers) capable of early detection of leaks in areas where it is difficult or impossible to conduct regular inspections (such as for spent fuel pools, tanks that are in contact with the ground, and buried, embedded or subterranean piping) to avoid release of contamination of the environment.	The manholes provided along the buried LWMS effluent release piping have level detection instrumentation within each collection basin in order to provide early leak detection. When liquid in the manhole collection basin reaches a predetermined setpoint, the leak detection instrumentation sends a signal to the Main Control Room (MCR) to alarm for operator action. Analysis of samples of the liquid collected in the manholes can also differentiate whether the liquid is rainwater, groundwater or leakage from the effluent release piping; these results will dictate the need for treatment prior to discharge of the collected liquid. The manholes also allow for increased accessibility to the buried piping segments in order to conduct inspections and periodic testing. The double-walled piping, manhole stations, and level detection instrumentation serve to provide early leak detection and the avoidance of unintended release of contamination to the environment.	11.2.2
4	Reduce the need to decontaminate equipment and structures by decreasing the probability of any release, reducing any amounts released, and decreasing the spread of contaminant from the source.	The double-walled piping used to transport the liquid effluent reduces the probability of contaminated releases by providing a secondary boundary to the environment. Leakage from the inner pipe carrying the contaminated liquid is contained within the outer pipe which is detected quickly using the leak detection methods described for Objectives 2 and 3. The double-walled HDPE piping is fuse-welded in order to minimize crud traps. The liquid effluent piping is also sloped towards the nearest downstream manhole in order to minimize liquid retention inside the pipe in the case of leakage. The manholes each contain a collection basin to hold any leakage that is transferred downstream through the sloped piping segments. This design helps to decrease the spread of contaminated liquid from the point of leakage as the piping segment between manholes can be quickly identified for replacement and the leakage is collected before it reaches downstream piping segments. In addition, the liquid effluent is discharged from the LWMS through a batch operation process such that contaminated liquid is flowing through the buried piping for a few hours on the basis of approximately one batch per week.	11.2.2

NAPS COL 12.3(10)

Table 12.3-201 Regulatory Guide 4.21 Design Objectives and Applicable FSAR Subsection Information for Minimizing Contamination and Generation of Radioactive Waste *(continued)*

Objective		System Features	FSAR Reference
5	Facilitate decommissioning by (1) minimizing embedded and buried piping, and (2) designing the facility to facilitate the removal of any equipment and/or components that may require removal and/or replacement during facility operation or decommissioning.	The overall plant layout dictates the need for buried piping from the LWMS discharge valve to the blowdown sump. In all instances in which the buried piping must be routed beneath a roadway, support structures are built in order to preserve the integrity of the pipe and prevent damage which may lead to unintended releases. The blowdown sump is designed to mix the CWS and UHS cooling water blowdown flows, startup steam generator blowdown discharge, and treated liquid effluent. From the blowdown sump, the mixed liquid discharge is routed through additional piping to a concrete tunnel which houses the piping to direct the mixed liquid discharge to the discharge canal. This piping contains the mixed contents of the blowdown sump which includes the CWS and UHS cooling tower blowdown flows as well as the treated liquid effluent. Thus, this design minimizes the number and the lengths of buried piping for replacement during facility operation and decommissioning. The placement of manholes between buried pipe segments also facilitates the identification of the locations of leakage sources by having a collection basin with leak detection instrumentation in each manhole. The manholes further facilitate the replacement of damaged or leaking piping segments instead of requiring the replacement of the entire length of effluent release piping.	11.2.2
6	Minimize the generation and volume of radioactive waste both during operation and during decommissioning (by minimizing the volume of components and structures that become contaminated during plant operation).	As described in Objective 5 above, the manholes installed at intervals along the buried piping allow for the identification of the piping segment where the leakage source is located. This allows for the replacement of a segment of buried piping instead of having to replace the entire length of piping from the A/B to the blowdown sump. This approach reduces the generation of radioactive waste by reducing the amount of contaminated piping that is removed from the system.	11.2.2

10.4.7.7 Water Hammer Prevention

STD COL 10.4(6)

Replace the first sentence of 6th paragraph in DCD Subsection 10.4.7.7 with the following.

The operating and maintenance procedures regarding water hammer are included in system operating procedures in Subsection 13.5.2.1. A milestone schedule for implementation of the procedures is also included in Subsection 13.5.2.1.

10.4.8.1.2 Non-safety Power Generation Design Bases

NAPS COL 10.4(2)
NAPS CDI

Add the following text before the first paragraph in DCD Subsection 10.4.8.1.2.

Throughout this subsection 10.4.8, "waste water system (WWS)" described in DCD 10.4.8 is replaced with "blowdown sump".Add the following text after the last bullet in DCD Subsection 10.4.8.1.2.

- Discharge secondary side water (after cooling) to the blowdown sump or LWMS during plant start up and abnormal chemistry conditions.
- Monitor the concentration of radioactive material in the cooled blowdown water with startup SG blowdown heat exchanger downstream radiation monitor located downstream of startup SG blowdown heat exchanger.

10.4.8.2.1 General Description

STD COL 10.4(2)

Replace the first and second paragraph in DCD Subsection 10.4.8.2.1 with the following.

The steam generator blowdown system (SGBDS) flow diagrams are shown in Figures 10.4.8-1R, 10.4.8-2R, and 10.4.8-201. Classification of equipment and components in the SGBDS is provided in Subsection 3.2.

The SGBDS equipment and piping are located in the containment, the reactor building, the auxiliary building, the turbine building (T/B), and outdoors.

Add the following text after the third paragraph in DCD Subsection 10.4.8.2.1.

The SGBDS also includes startup SG blowdown flash tank, startup blowdown heat exchanger, piping, valves and instrumentation used during plant startup and abnormal water chemistry conditions.

NAPS COL 10.4(2)
NAPS CDI

Replace the thirteenth and fourteenth paragraph in DCD Subsection 10.4.8.2.1 with the following.

During plant startup, the blowdown rate is up to approximately 3% of maximum steaming rate (MSR) at rated power. The blowdown from each SG flows to the startup SG blowdown flash tank. The blowdown lines from SGs A and B and the blowdown lines from SGs C and D are joined together before flowing to the startup SG blowdown flash tank.

The blowdown water from each SG is depressurized by a throttle valve located downstream of the isolation valves located in the startup blowdown line. The throttle valves can be manually adjusted to control the blowdown rate.

The depressurized blowdown water flows to the startup SG blowdown flash tank, where water and flashing vapor are separated. The vapor is diverted to the condenser and the water flows to the startup SG blowdown heat exchanger for cooling. The CWS cools blowdown water in this heat exchanger before discharging to the blowdown sump. After further cooling in this sump the blowdown water is discharged to Waste Heat Treatment Facility (WHTF). A radiation monitor located downstream of the startup SG blowdown heat exchanger measures radioactive level in the blowdown water. When an abnormally high radiation level is detected, the blowdown lines are isolated and the blowdown water included in the SGBDS is transferred to waste holdup tank in the LWMS. The location and other technical details of the monitor (RMS-RE-037) are described in Subsection 11.5.2.5.3 and Table 11.5-201.

The discharge line to the blowdown sump consists of the following segments and design features:

1. The piping after the startup SG blowdown heat exchanger is constructed of stainless steel up to and including the connector after the isolation valve following the radiation monitor.

2. The discharge piping that continues the discharge line from the connector is a double-walled high density polyethylene (HDPE) pipe. The HDPE piping is fusewelded in order to prevent leakage and minimize crud traps. Within the doublewalled pipe, the blowdown water flows through the inner pipe while the outer pipe serves as containment in the event of leakage. Once the pipe exits the startup SG blowdown facility, the HDPE pipe is buried and routed underground to the blowdown sump.

3. Manholes constructed of HDPE are located at specified pipe lengths along the buried pathway to facilitate the containment of leakage by means of a collection basin. This design approach minimizes unintended releases and provides accessibility to facilitate periodic testing and visual inspection to maintain pipe integrity.

4. From the blowdown sump, the blowdown water, mixed with the liquid waste effluent and the blowdown flows from the CWS and UHS cooling towers, is routed through additional piping leading to the WHTF for discharge.

The manholes provided along the buried discharge piping are watertight to prevent the intrusion of precipitation or groundwater. The double-walled HDPE piping is sloped in the direction of flow so that leakage can be collected at the next downstream manhole. The manholes each contain a collection basin equipped with level detection instrumentation in order to provide early leak detection. When liquid in the manhole collection basin reaches a predetermined setpoint, the leak detection instrumentation sends a signal to the Main Control Room (MCR) to alarm for operator action. This approach also facilitates the determination of the leaking segment of pipe. Analysis of samples of the liquid collected in the manholes can also determine if the liquid is rainwater, groundwater or leakage from the discharge piping. These design features comply with the guidance of RG 4.21 as described in Subsection 12.3.1.3.1.1.

In addition, the startup SG blowdown facility has an epoxy-coated concrete floor which is sloped to facilitate drainage to a sump for leakage collection. The sump is equipped with level detection instrumentation which alarms to the Main Control Room (MCR) for operator action. These design features of the startup SG blowdown facility comply with RG 4.21.

With abnormal water chemistry, the flow of blowdown up to approximately 3% of MSR at rated power is directed to the blowdown sump via the startup SG blowdown flash tank for processing. In this mode, flashed vapor from the startup SG blowdown flash tank flows to the deaerator.

During normal operation, blowdown rate is approximately 0.5 to 1% of MSR at rated power. At the 1% of MSR at rated power blowdown rate, both cooling trains are used.

STD COL 10.4(2)

Add the following text after last bullet of the seventeenth paragraph in DCD Subsection 10.4.8.2.1.

- High radiation signal from startup SG blowdown water radiation monitor
- High water level in the startup SG blowdown flash tank
- High pressure in the startup SG blowdown flash tank

10.4.8.2.2.4 Steam Generator Drain

NAPS COL 10.4(5)
NAPS CDI

Replace the DCD Subsection 10.4.8.2.2.4 with the following.

Pressurized nitrogen is used to send secondary side water in the steam generators under pressure to the blowdown sump or the condenser. An approximate 20 psig pressure is maintained. This pressure facilitates draining steam generators without using a pump. If the SG drain temperature exceeds the operating temperature limit of the blowdown sump prior to discharging to this sump, the SG drain is cooled in the startup SG blowdown heat exchanger.

10.4.8.2.3 Component Description

STD COL 10.4(2)

Replace the first sentence of first paragraph in DCD Subsection 10.4.8.2.3 with the following.

Component design parameters are provided in Table 10.4.8-1R.

NAPS COL 10.4(2)

Add the following text after the last paragraph in DCD Subsection 10.4.8.2.3.

(9) **Startup SG blowdown flash tank**

The startup SG blowdown flash tank is located outdoors. During plant startup operation and abnormal secondary water chemistry conditions,