ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Friday, June 24, 2011 1:10 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); KOWALSKI David (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 476 (5551), FSAR Ch. 9, Supplement 1
Attachments: RAI 476 Supplement 1 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the three questions in RAI No. 476 on April 7, 2011. The attached file, "RAI 476 Supplement 1 Response US EPR DC.pdf" provides technically correct and complete final responses to the three questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the responses to RAI 476 Questions 09.03.03-7 and 09.03.03-9.

The following table indicates the respective pages in the response document, "RAI 476 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 476 — 09.03.03-7	2	3
RAI 476 — 09.03.03-8	4	4
RAI 476 — 09.03.03-9	5	7

This concludes the formal AREVA NP response to RAI 476, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
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From: WELLS Russell (RS/NB)
Sent: Thursday, April 07, 2011 4:40 PM
To: 'Tesfaye, Getachew'
Cc: KOWALSKI David (RS/NB); BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 476 (5551), FSARCh. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 476 Response US EPR DC," provides a schedule since technically correct and complete responses to the three questions are not provided.

The following table indicates the respective pages in the response document, "RAI 476 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 476 — 09.03.03-7	2	2
RAI 476 — 09.03.03-8	3	3
RAI 476 — 09.03.03-9	4	4

The schedule for technically correct and complete responses to these questions is provided below.

Question #	Response Date
RAI 476 — 09.03.03-7	June 24, 2011
RAI 476 — 09.03.03-8	June 24, 2011
RAI 476 — 09.03.03-9	June 24, 2011

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Monday, March 07, 2011 8:13 PM
To: ZZ-DL-A-USEPR-DL
Cc: Nolan, Ryan; Lee, Samuel; Segala, John; Hearn, Peter; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 476 (5551), FSARCh. 9

Attached please find the subject request for additional information (RAI). A draft of the RAI was provided to you on March 4, 2011, and on March 7, 2011, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3155

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Subject: Response to U.S. EPR Design Certification Application RAI No. 476 (5551), FSAR Ch. 9, Supplement 1
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Response to

Request for Additional Information No. 476(5551), Supplement 1

3/07/2011

U.S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.03.03 - Equipment and Floor Drainage System
Application Section: 09.03.03

QUESTIONS for Balance of Plant Branch 2 (SBPB)

Question 09.03.03-7:

Follow-up to RAI 163, question 09.03.03-2:

GDC 2 requires that all safety related portions of the NIDVS system are capable of withstanding the effects of natural phenomena. Regulatory Guide (RG) 1.29 provides guidance for seismic-qualifying both safety and non-safety related portions of the system. FSAR Tier 2 Section 9.3.3, "Equipment and Floor Drainage System," repeatedly mentions that the safety-related portions of NIDVS meet certain GDC requirements including GDC 2. However, it is unclear to the staff which portions of the NIDVS are safety-related and which are non-safety related in accordance with RG 1.29 Position C1 and C2.

Provide clarification in both the description of NIDVS in FSAR Tier 2 Section 9.3.3 and in Figure 9.3.3.1 of exactly which portions of the system (piping, valves, alarms, tanks, etc.) are safety-related, and describe the compliance of all of the safety related portions and non-safety portions with RG 1.29 Position C1 and C2, respectively.

Response to Question 09.03.03-7:

The nuclear island drain/vent system (NIDVS) has two safety-related functions:

- Maintain containment isolation.
- Cope with large flooding events in non-controlled areas of each Safeguard Building (SB).

With respect to the containment isolation function of the NIDVS, the safety-related components are the piping through the building penetration and the associated motor-operated valves:

- 30KTA10AA017/018.
- 30KTD10AA015/024.
- 30KTC10AA005/029.
- 30KTC10AA006/010.

These valves automatically close following the receipt of a containment isolation signal. This is consistent with the guidance in RG 1.29, Regulatory Positions C1.o and C1.q.

U.S, EPR FSAR Tier 2, Figure 9.3.3-1–Nuclear Island Drain and Vent System, Sheet 4 of 8, shows the four containment penetrations and associated isolation valves, which represent the safety-related portion of the NIDVS. These isolation valves are listed in U.S. EPR FSAR Tier 2, Table 3.2.2-1–Classification Summary as safety-related and Seismic Category I.

With respect to the function of the NIDVS being able to cope with large flooding events in non-controlled areas of each SB, the NIDVS sump located in the lowest level of each SB is equipped with redundant safety-related level instrumentation (30KTE20 CL001/CL003/CL005/CL007), which automatically trips the essential service water system pump and closes the associated pump discharge valve. U.S. EPR FSAR Tier 2, Table 3.2.2-1 lists this level instrumentation as

safety-related and Seismic Category I. This instrumentation is also listed in U.S. EPR FSAR Tier 2, Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment.

U.S. EPR FSAR Tier 2, Section 9.3.3.1 will be revised to include this clarifying information.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 9.3.3.1 will be revised as described in the response and indicated on the enclosed markup.

Question 09.03.03-8:

Follow-up to RAI 113, Question 09.03.02-8:

Part 3 of RAI response to question 09.03.02-8, dated November 6, 2008, requested additional information regarding the flow of the steam generator (SG) blowdown sampling system fluids when the blowdown system is unavailable to have the sample flow reprocessed. The response stated that the sample flow would be directed to the NIDVS and processed by the plant waste liquid system. Based on current sampling frequency and analysis requirements for the SG blowdown in the EPR Secondary Water Chemistry Guidelines, each steam generator will likely need at least 2 gpm of flow in order to maintain appropriate monitoring of SG chemistry.

The applicant should provide a description of the design of the NIDVS sump that will receive this process flow and be able to adequately handle this input (as well as other inputs to the sump) without exceeding its capacity for volume or flow. In addition, in the second paragraph of FSAR Tier 2, Section 9.3.3.2.1, the applicant discusses the "maximum expected rate of influx and total volume of expected leakage." It is not clear to the staff which plant inputs are used to calculate these values; therefore, the applicant should clarify this information in the FSAR.

Response to Question 09.03.03-8:

To avoid any flooding inside the Nuclear Auxiliary Building during normal plant operation, the specific capacity requirements of the NIDVS sump pumps are calculated by considering the maximum estimated volume of effluents collected in the tanks and sumps. The response to RAI 113, Question 09.03.02-8, Part 3, stated that a sump in the NIDVS collects blowdown samples from the steam generator blowdown system (SGBS), when the SGBS is either unavailable or leakage is present. The blowdown liquid drains to 260 gallon capacity tanks in the Safeguards Building and is then routed to the Radioactive Waste Processing Building for treatment. The nominal NIDVS sump pump flow rate of 24 gpm is not limiting for the SGBS.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 09.03.03-9:

Demonstrate that the Equipment and Floor Drainage System satisfies the requirements of General Design Criteria (GDC) 2, 4, and 60. FSAR Tier 2, Section 9.3.3, "Equipment and Floor Drainage System," contains description of satisfying these GDC requirements; however, the staff noted that the FSAR needed clarification in the following areas:

1. The fourth bullet under FSAR Section 9.3.3.1 discusses safety-related portions of the NIDVS design as it relates to GDC 60. However, GDC 60 is not just for safety-related portions of piping, it is for all portions that contain radioactive fluids and materials. This should be corrected.
2. It is unclear to the Staff the meaning of "to a practical extent" in the twelfth bullet under FSAR Section 9.3.3.1, thus further clarification is needed.
3. The FSAR refers multiple times to "redundancy, location, and physical separation" as a basis for adequate protection. This statement is unclear to the Staff and should be justified. Specifically, the applicant should provide a description of the use of redundancy, location, and physical separation in the design.
4. Provide a definition of the terms "controlled" and "non-controlled" area that used in the FSAR and the Figures, and identify interconnections between the two, if any.
5. FSAR Section 9.3.3 discuses drains for the nuclear island, however SRP 9.3.3 encompasses all drains in the plant. Therefore, provide information regarding drains outside the NIDVS and discuss if those drains have any impact on NIDVS. In addition, the applicant should justify the absence of these drains from Section 14.2 testing (test abstract #098).
6. The last bullet under FSAR Section 9.3.3.1 states that all floor drains are gravity fed to the building sump. However, FSAR Section 9.3.3.2.1 states that wherever drainage is impractical, mobile pumps are used. The applicant should clarify this apparent discrepancy and identify the locations for using the mobile pumps (i.e. identify the portions of NIDVS that cannot use gravity-fed drains).
7. The last bullet of FSAR Section 9.3.3.3 is unclear with respect to the meaning of "system design and operational controls." Identify the credit being taken in the standard plant design for these controls or clarify if the applicant was referring to a COL item. The applicant should either clarify the controls used or make a separate COL item.

Response to Question 09.03.03-9:

1. U.S. EPR FSAR Tier 2, Sections 9.3.3.1 and 9.3.3.3 will be revised to reflect that GDC 60 applies to all portions of the NIDVS that contain radioactive fluids and materials.
2. U.S. EPR FSAR Tier 2, Section 9.3.3.1 will be revised to include the following clarification:

   "The leakage detection function provided by the NIDVS is a non-safety related augmented quality function and consists of water level measurements provided by the system's sumps and collection tanks as part of the reactor coolant leakage detection capability. Sump levels within the NIDVS are used to confirm the initial assumptions for reactor coolant leakage and leak before break (LBB) analysis. Refer to FSAR Section 5.2."
3. With respect to containment isolation, redundant inner and outer containment isolation valves refers to valves that are physically separated by one valve being installed in the

Reactor Building and the other valve installed in the Fuel Building. The containment isolation system is described in U.S. EPR FSAR Tier 2, Section 6.2.4.

4. U.S. EPR FSAR Tier 2, Section 12.3 defines the terms "controlled" and "non-controlled" areas. U.S. EPR FSAR Tier 2, Sections 9.3.3.2.2 and 9.3.3.3 will be revised to reflect further clarification concerning the use of these two terms.

5. The review areas of SRP 9.3.3 are limited to plant areas that perform the following:

   - Leakage detection capability that is relied upon for identifying conditions that are adverse to safety, such as excessive leakage that could compromise the capability of structures, systems and components (SSC) to perform safety functions or could result in an uncontrolled release of radioactive material to the environment.
   - System features that are relied upon to prevent flooding due to drain backflow that may result from malfunction of active components, blockage or the probable maximum flood, which could affect an SSC that is important to safety.
   - System features that are relied upon to prevent an inadvertent transfer of contaminated fluids to non-contaminated drainage systems or to otherwise prevent uncontrolled releases of radioactive material to the environment.
   - System features, a failure or malfunction of which could result in adverse effects on an SSC important to safety, or could result in an uncontrolled release of radioactive material to the environment.

   The nuclear island drain/vent system (NIDVS) collects, temporarily stores and discharges radioactive fluids from the nuclear island (NI) area to other plant systems in a controlled manner. The NI area consists of the following buildings: Reactor Building, Safeguard Buildings, Fuel Building, Access Building, Nuclear Auxiliary Building and Radioactive Waste Processing Building. These drains are within the scope of SRP 9.3.3 and are described in U.S. EPR FSAR Tier 2, Section 9.3.3. A Turbine Building drains and vents system collects drains from the Turbine Island. A discharge monitor is provided in the common release line as described in U.S. EPR FSAR Tier 2, Section 11.5.4.15. There are no safety-related SSC located in the Turbine Building.

   In summary, plants drains within the scope of SRP 9.3.3 have been addressed. Plant drains located outside of the NIDVS do not have an adverse impact on the operation of the NIDVS. U.S. EPR FSAR Tier 2, Sections 9.3.3 and 14.2.12.9.8 (Test #098) do not have to be revised to contain information describing plant drains not located in the NIDVS.

6. U.S. EPR FSAR Tier 2, Section 9.3.3.2.1 will be revised to reflect further clarification concerning the use of mobile (portable) pumps.

7. The NIDVS in the U.S. EPR standard plant design only interfaces with plant systems within the nuclear island. The operation of the NIDVS does not take credit for an existing COL information item nor is there any basis to generate a new COL information item.

   U.S. EPR FSAR Tier 2, Section 9.3.3.3 will be revised to reflect further clarification concerning the meaning of “system design and operational controls.”

FSAR Impact:

U.S. EPR FSAR Tier 2, Sections 9.3.3.1, 9.3.3.2.1, 9.3.3.2.2 and 9.3.3.3 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

9.3.3 Equipment and Floor Drainage System

The nuclear island drain/vent system (NIDVS) collects, temporarily stores and discharges radioactive fluids from the nuclear island (NI) area to other plant systems in a controlled manner. Portions of the NIDVS are classified safety-related. The NIDVS operates during normal power, start-up and shutdown conditions.

9.3.3.1 Design Bases

09.03.03-7

The NIDVS performs the following ~~safety-related~~ functions:

- Maintain safety-related containment isolation. NIDVS lines penetrating containment are capable of isolation upon receipt of a containment isolation signal (CIS) from the reactor protection system. (Refer to Section 6.2.4 and Section 7.3.)
- Flooding detection inside the RB (containment and annulus), SBs, and FB. (Refer to Section 9.3.3.3 and Section 9.3.3.5).
- Safety-related ~~T~~trips the essential service water system (ESWS) pump and closes the ESWS pump discharge valve in a Safeguard Building (SB) flooding event. (Refer to Section 9.3.3.3 and Section 9.3.3.5.)
- Supports reactor coolant pressure boundary (RCPB) leakage detection.

The NIDVS has the following design basis requirements:

- Safety-related portions of the NIDVS are designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami and seiches without loss of capability to perform their safety functions (GDC 2).
- Safety-related portions of the NIDVS are designed to accommodate the effects of and be compatible with the environmental conditions associated with normal operation, maintenance, surveillance testing and postulated accidents. These portions of the NIDVS are protected against dynamic effects, including the effects of missiles, pipe whipping and discharging fluids that may result from equipment failures and from events and conditions outside the nuclear power unit (GDC 4).

09.03.03-7 and 09.03.03-9

- ~~Safety-related portions of t~~The NIDVS design includes means to suitably control the release of radioactive materials in gaseous and liquid effluents produced during normal reactor operation, including anticipated operational occurrences (AOO) (GDC 60).

The NIDVS is designed to meet the following functional criteria:

- Facilitate optimized treatment of liquid and gaseous radioactive effluents.
- Evacuate potentially radioactive gases in the reactor coolant system (RCS).
- Cool primary system effluent to a temperature safe for the demineralizer resins contained in the coolant purification system (CPS).

- For certain beyond design basis events (DBE), store highly contaminated liquid samples collected in the Nuclear Auxiliary Building (NAB) within the Reactor Building (RB) to delay their treatment.

09.03.03-9

- Detect and identify ~~(to a practical extent)~~ the location of the source of reactor coolant leakage within the RB. The leakage detection function provided by the NIDVS is a non-safety-related augmented quality function and consists of water level measurements provided by the sumps and collection tanks in the system as part of the reactor coolant leakage detection capability. Sump levels within the NIDVS are used to confirm the initial assumptions for reactor coolant leakage and leak before break analysis. Refer to Section 5.2.

- The floor drains in the NIDVS have the capacity to accommodate the maximum expected flow rate from a rupture of the largest water pipe in the NFSF area. The floor drains are gravity fed to the building sump. Because there are no drain connections on the drain header higher in elevation than the NFSF floor drains, backflow is prevented.

9.3.3.2 System Description

9.3.3.2.1 General Description

The NIDVS is connected to a variety of systems by means of temporary and permanent connections. Permanent connections to systems of high design pressures are protected by means of flow restrictors and safety valves to maintain the pressure below the allowable design pressure of the drain system. Piping is principally arranged for gravitational flow from the drain collectors to the drain tanks. ~~Wherever gravity drainage is impractical, mobile (portable) pumps are used.~~

09.03.03-9

Mobile (portable) pumps are used where no leakage is expected, such as for in-containment refueling water storage tank liner leakage. Mobile pumps may also be used during infrequent maintenance on the steam generator blowdown system. Mobile pumps are connected to the permanent piping using temporary flexible hoses. The general arrangement of the NIDVS is provided in Figure 9.3.3-1—Nuclear Island Drain and Vent System.

Effluents are classified in different groups according to their processing requirements and by whether or not they are recycled. They are collected according to their state (liquid or gaseous) and origin (primary drains, process drains, floor drains and decontamination effluents). Leakage to reactor containment from identified sources is collected so that flow rates are monitored separately from unidentified leakage and the total flow rate of each type is established and monitored. Leakage to reactor containment from unidentified sources is collected and the flow rate monitored with an accuracy of one gallon per minute or better. NIDVS pumps, tanks and sumps are sized to process the maximum expected rate of influx and total volume of expected leakage.

- Vent and rinse collection inside FB.
- Vent and rinse collection inside NAB.

Type 1 Floor Drains Subsystem

09.03.03-9

This subsystem includes Type 1 floor drains, which are located in the radiologically controlled area and contain low boron-10 concentrations. It is further divided into five portions:

- RB floor drains.
- SBs floor drains.
- FB floor drains.
- NAB floor drains.
- Radioactive Waste Processing Building floor drains.

Type 2 Floor Drains Subsystem

This subsystem includes Type 2 floor drains, which are located in the radiologically controlled area and contain no boron-10 but may have some chemical contamination. It is further divided into three portions:

- Low contamination RB drains.
- Low contamination NAB drains.
- Low contamination Access Building drains.

Type 3 Floor Drains Subsystem

This subsystem includes Type 3 floor drains, which are located in the non-radiologically controlled area. It is further divided into two portions:

- SBs non-radiologically controlled area floor drains.
- NAB non-radiologically controlled area floor drains.

9.3.3.2.3 System Operation

During normal plant operation, the NIDVS collects different categories of liquid and gaseous effluents. Liquid leakages or discharges drain by gravity to sumps. Sump pumps automatically or manually transfer their contents to storage tanks. Sump discharge lines in each of the SB and FB are routed individually to their destination in the NAB.

Boron-containing reactor coolant leakage from primary vents, drains, pump seal and valve stem leakage, and safety valve discharges, is collected and stored for further processing to recover the boron by the coolant supply and storage system, coolant purification system and coolant treatment system. Liquid effluents produced by the decontamination facilities are collected and stored by the NIDVS for routing to the liquid waste storage system and then for processing in the liquid waste processing system. Recovered gaseous wastes are routed to the gaseous waste processing system or appropriate ventilation system for treatment.

9.3.3.3 Safety Evaluation

Safety-related components and equipment in the NIDVS include containment isolation valves (CIV), connecting piping and penetrations. CIVs are located in portions of the following subsystems:

- Drains/vents and safety valve discharges system - primary effluents inside RB.
- Type 1 floor drains system - RB floor drains.
- Type 2 floor drains system - low contamination RB drains.

The design of safety-related portions of the NIDVS satisfies GDC 2 regarding the effects of natural phenomena.

- Safety-related portions of the NIDVS are located in the RB and FB. These buildings are designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, tsunami and seiches. Section 3.3, Section 3.4, Section 3.5, Section 3.7 and Section 3.8 provide the bases for the adequacy of the structural design of the buildings.
- Safety-related portions of the NIDVS are designated Seismic Category I and are designed to remain functional during and following a safe shutdown earthquake (SSE). Section 3.7 provides the design loading conditions that are considered.
- Safety-related portions of the NIDVS are protected against the effects of flooding by consideration of the following design features: redundancy, location and physical separation.

09.03.03-9

- To cope with a large flooding event, the NIDVS sump located in the lowest level of the non-radiologically controlled area of each SB is equipped with safety-related level instrumentation to automatically trip the ESWS pump and close the associated discharge isolation valve. The level setpoint that initiates ESW isolation via the NIDVS safety-related sensors is above the floor level. The safety-related sensors are provided with Class 1E power and are classified as Seismic Category I.~~To cope with a large flooding event, the NIDVS sump located in the lowest level of the non-controlled areas of each SB is equipped with redundant safety-related level instrumentation to automatically trip the ESWS pump and close the~~

~~associated discharge isolation valve. This instrumentation is located above floor level, provided with Class 1E power, and is classified as Seismic Category I.~~

- To notify the MCR operator of a flooding event and to begin operator action to isolate the flooding source, the RB sumps and the FB sumps are equipped with safety-related Seismic Category I instrumentation to alarm in the MCR.

The design of safety-related portions of the NIDVS satisfies GDC 4 regarding the capability to withstand the effects of and to be compatible with the environmental conditions (e.g., flooding) associated with normal operation, maintenance, testing and postulated accidents (e.g., pipe breaks, tank ruptures).

- Safety-related portions of the NIDVS inside the RB are located at sufficient elevation to be protected from flooding events inside this building.

- Sumps inside the RB, SBs, and FB are equipped with safety-related Seismic Category I level instrumentation to mitigate the effects of internal flooding and maintain safe shutdown capability. This instrumentation provides alarms in the MCR to initiate operator action to isolate the flooding source or provides signals to automatically isolate the source.

- The NIDVS contains instrumentation that monitors the RCS leak tightness and reactor coolant inventory using leak detection and measurement means in the RB.

- The NIDVS is designed to prevent backflow of water through the drain systems into areas of the plant containing safety-related equipment by the use of check valves.

- Safety-related portions of the NIDVS are protected against the effects of internal missiles by consideration of the following design features: redundancy, location and physical separation.

- The NIDVS design considers: (1) actuation of installed fire suppression systems (e.g., gas and water), (2) accumulation of fire fighting water, and (3) prevention of backflow of combustible liquids into safety-related areas.

- Redundancy and physical separation of CIVs provide assurance that the containment isolation function is protected against fire-related events. The inner and outer CIVs are located in separate fire zones.

- The NIDVS, including floor drains and sump pumps, is assumed to be unavailable to mitigate the effects of internal flooding.

09.03.03-9

The design of the ~~safety-related portions of the~~ NIDVS satisfies GDC 60 concerning the suitable control of the release of radioactive materials in gaseous and liquid effluents, including AOOs.

- The NIDVS is designed to prevent the inadvertent transfer of contaminated fluids to non-contaminated drainage systems.

- Portions of the NIDVS that are located in areas that may contain radioactive effluents are physically separated from the plant areas that do not contain radioactive effluents. System design and operational controls monitor the transfer of effluents to the appropriate treatment systems. NIDVS effluents are only transferred to a radiologically controlled area for recycle or treatment.

09.03.03-9

9.3.3.4 Inspection and Testing Requirements

Safety-related portions of the NIDVS are inspected and tested as part of the initial test program. Refer to Section 14.2 (test abstract #098) for initial plant startup test program. The performance and structural integrity of system components is demonstrated by continuous operation.

CIV valve function and performance is tested in accordance with Technical Specifications in Chapter 16 of the FSAR and 10 CFR 50, Appendix J, programmatic requirements (refer to Section 6.2.6). Periodic inservice functional operation is monitored by instrumentation that readily identifies equipment degradation. Section 6.6 provides the ASME Boiler and Pressure Vessel Code, Section XI (Reference 1) requirements that are appropriate for the NIDVS.

9.3.3.5 Instrumentation Requirements

The CIS is originated by the reactor protection system. Containment isolation and containment valve position indication are available in the main control room. Control room alarms and indications are provided as required for:

- Water detection in the spreading area.
- RCS leakage.
- Flooding detection inside the RB (containment and annulus), SBs, and FB.
- Automatic isolation of ESWS train in the event of a large flooding event in a SB.

9.3.3.6 References

1. ASME Boiler and Pressure Vessel Code, Section XI: "Rules for Inservice Inspection of Nuclear Power Plant Components," The American Society of Mechanical Engineers, 2004.

Next File