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Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC.
William States Lee III Nuclear Station - Docket Nos. 52-018 and 52-019
AP1000 Combined License Application for the
William States Lee III Nuclear Station Units 1 and 2
Request for Additional Information (RAI No. 1922)
Ltr# WLG2009.05-08

References: Letter from Tanya Simms (NRC) to Peter Hastings (Duke Energy), *Request For Additional Information Letter No. 064 Related To SRP Section 09.02.01 for the William States Lee III Units 1 and 2 Combined License Application*, dated January 28, 2009

This letter provides the Duke Energy response to the Nuclear Regulatory Commission's (NRC) requests for additional information contained in the referenced letter.

Responses to the NRC information requests described in the referenced letter are addressed in separate enclosures, which also identify associated changes, when appropriate, that will be made in a future revision to the Lee Nuclear Station FSAR.

If you have any questions or need any additional information, please contact Peter S. Hastings, Nuclear Plant Development Licensing Manager, at 980-373-7820.

Bryan J. Dolan
Vice President
Nuclear Plant Development

D093
NRO

Enclosures:

1) Duke Energy Response to Request for Additional Information Letter 064, RAI 09.02.01-5
2) Duke Energy Response to Request for Additional Information Letter 064, RAI 09.02.01-6
3) Duke Energy Response to Request for Additional Information Letter 064, RAI 09.02.01-7

AFFIDAVIT OF BRYAN J. DOLAN

Bryan J. Dolan, being duly sworn, states that he is Vice President, Nuclear Plant Development, Duke Energy Carolinas, LLC, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this supplement to the combined license application for the William States Lee III Nuclear Station and that all the matter and facts set forth herein are true and correct to the best of his knowledge.

Bryan J. Dolan

Bryan J. Dolan

Subscribed and sworn to me on May 15, 2009

Phoebe P. Elliott

Notary Public

My commission expires: June 26, 2011

SEAL

xc (w/o enclosures):

Loren Plisco, Deputy Regional Administrator, Region II
Stephanie Coffin, Branch Chief, DNRL

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Brian Hughes, Senior Project Manager, DNRL
Tanya Simms, Project Manager, DNRL

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 064

NRC Technical Review Branch: Balance of Plant Branch1 (SBPA)

NRC RAI Number: 09.02.01-5

NRC RAI:

In accordance with 10 CFR 50, Appendix A, General Design Criterion (GDC) 2, "Design Basis for Protection Against Natural Phenomena," GDC 4, "Environmental and Dynamic Effects Design Bases," and NRC policy considerations for passive plant designs, the staff confirms that raw water system (RWS) failures are not expected to adversely affect structures, systems, and components (SSCs) that are safety-related or designated for Regulatory Treatment of Non-Safety Systems (RTNSS), impact the control room, or result in excessive releases of radioactivity to the environment.

Although Final Safety Analysis Report (FSAR) Section 9.2.11.1.1, "Safety Design Basis," states that failures of the RWS will not affect the ability of safety-related systems to perform their intended functions, more detailed information is needed to adequately describe the consequences of RWS failures and to explain why safety-related SSCs are not affected. Likewise, additional information is needed to explain why a failure of the RWS will not adversely affect RTNSS systems and components or impact the control room, or result in an unacceptable release of radioactive material into the environment. Because the applicant did not adequately address these considerations, the staff is unable to confirm compliance with GDC 2, GDC 4, and NRC policy considerations that apply to passive plant designs. Therefore, FSAR Section 9.2.11 needs to be revised to address the impact of RWS failures accordingly, including development of plant-specific inspections, tests, analyses, and acceptance criteria; test program provisions; Technical Specifications; and availability controls as appropriate.

Duke Energy Response:

The potential failures of the raw water system (RWS) and the corresponding impact on structures, systems and components (SSCs) that are safety-related or AP1000 equipment Class D are described below:

<u>Failure of RWS piping in yard areas</u>

Underground piping transfers water from the Broad River to Make-Up Pond A and between Make-Up Ponds A and B. The significant above ground portions of this piping are at the intake structures. This piping does not interface with Class D systems nor is it routed in close proximity to safety-related structures or Class D equipment.

Underground piping from the Make-Up Pond A intake structure supplies the water treatment equipment in the RWS Clarifier subsystem, make-up to the circulating water system (CWS) cooling towers, alternate dilution flow to the waste water system (WWS) and alternate make-up to the service water system (SWS). This piping is in relatively close proximity to the underground portions of the CWS, and a break in the RWS piping is bounded by a break in the CWS. As discussed in DCD Tier 2, Subsection 3.4.1.1.1, a failure of the cooling tower or the SWS or the CWS piping under the yard could result in a potential flood source. The consequences of a failure in the yard would be enveloped by the analysis described in DCD Tier 2, Subsection 10.4.5, for failure of the CWS. Site grading will carry the water away from safety-related or important to safety structures, systems or components.

Underground piping from the RWS Clarifier subsystem supplies the clarified water storage tank, where additional underground piping supplies the yard-located interface with the fire protection system (FPS), as well as the SWS, demineralized water treatment system (DTS) and turbine building closed cooling water system (TCS) interfaces located in the turbine building. This underground piping is also in close proximity to the underground portions of the CWS and is bounded by the analysis previously discussed.

<u>Failure of Clarified Water piping within the turbine building</u>

Short runs of RWS piping from the Raw Water Supply and Clarified Water Supply subsystems are routed inside the turbine building to provide normal and alternate supplies to SWS. Clarified Water Supply piping also supplies the interface points with DTS and TCS. The RWS to SWS interface is at the SWS make-up control valve V009 (Refer to DCD Tier 2, Figure 9.2.1-1). The SWS piping is routed from the control valve to the top of the SWS cooling tower basin. There is an air gap between the piping discharge and the SWS cooling tower basin water level. This air gap ensures that any break in the raw water make-up flow path will not result in the draining of the SWS cooling tower basin by preventing backflow from the basin to the break. Therefore, any flooding will be from the RWS water that discharges through the break prior to securing the make-up supply. The RWS piping to DTS and TCS is on the 100'-0" elevation of the turbine building (WLS Elevation 590') and the primary source of flooding in this scenario would be from the RWS water that discharges through a break prior to securing the Clarified Water Supply subsystem. A break in the RWS piping to the SWS, DTS and TCS is bounded by a break in circulating water piping. As discussed in DCD Tier 2, Subsection 3.4.1.2.2.3, the bounding flooding source inside the turbine building is a break in the circulating water piping. Flow from any postulated line breaks above elevation 100'-0" would flow down to elevation 100'-0" via floor gratings and stairwells and would run out of the building through a relief panel in the turbine building west wall. There is no safety-related equipment in the turbine building. The component cooling water and service water components on elevation 100'-0" which provide the RTNSS support for the normal residual heat removal system will remain functional following a flooding event in the turbine building since the pump motors and valve operators are above the flood level. Therefore, a failure of the RWS piping within the turbine building will not adversely impact any safety-related or important to safety systems, structures or components.

Control Room impacts

The control room is located inside the AP1000 nuclear island. No RWS piping is located inside or outside in the vicinity of the nuclear island. Therefore, there are no RWS pipe break or flooding events which could impact the control room. Atmospheric releases of the pH adjustment and chlorination chemicals used in RWS treatment are bounded by the DCD Section 6.4 discussion, as the storage volume is much smaller than those used in CWS treatment. All other chemicals used for RWS treatment are non-toxic, small in volume, and do not represent a hazard to the control room. Therefore, RWS flooding or postulated chemical releases will not adversely impact control room habitability.

Releases of radioactivity to the environment

Accidental releases of radioactive fluids in ground and surface waters are addressed in Subsection 2.4.13 of the WLS FSAR. In accordance with this discussion, any radioactive fluids released from the AP1000 power block would follow the preferential path for groundwater movement. This flow path is generally northward towards the Broad River.

The RWS piping corridor between the intake on the Broad River and Make-Up Pond A is the closest to the preferential groundwater flow path. This piping corridor is positioned above the water table and located approximately 600 to 2150 feet east of the preferential groundwater flow path. The remaining RWS underground piping corridors are located upgradient to the south and west of the preferential groundwater flowpath. When the RWS system is in operation it is under positive pressure. Therefore, migration of any potential contamination from the power block to the piping is considered unlikely.

Interfaces with other plant systems

The RWS does not have the potential to be a flow path for radioactive fluids. The RWS operates at a higher system pressure than those systems that it directly interfaces with and therefore, in-leakage is not feasible when the system is in operation. During normal operations, the interfacing systems for RWS are CWS, WWS at the blowdown sump, SWS, FPS, DTS and TCS. None of these systems have interfaces with radioactive systems.

As discussed in FSAR Subsection 9.2.11.3.3, the Raw Water Supply subsystem supplies an alternate source of dilution water to the WWS for diluting the liquid radwaste system (WLS) effluent stream when the normal dilution source, CWS blowdown, is not available. This function is supported by routing branch lines from the Raw Water Supply subsystem to the CWS blowdown sump. The blowdown sump is open to atmosphere and as shown on FSAR Figure 1.1-202 is located on the east side of the site at an elevation approximately 60 feet above the Broad River. The CWS blowdown sump mixes CWS blowdown (and, if required, RWS) with discharge from WWS and the combined dilution flow gravity drains through an outfall pipe to the Ninety-Nine Islands dam on the Broad River. At the dam, the dilution flow is mixed with WLS effluent from each unit and discharged to the environment through a diffuser mounted on the upstream side of the dam. There are no valves on the outfall piping between the blowdown sump and the dam, so the elevation difference between the sump and the river prevents WLS cross-contamination of the blowdown sump. There is an air gap maintained between the RWS piping discharge into the sump and the sump level that provides additional assurance that cross-contamination is unlikely.

Summary

In summary, failure of the RWS or its components will not affect the ability of any safety-related systems to perform their intended safety functions nor will it adversely impact any Class D systems. Postulated breaks in the RWS piping will not impact safety-related components because the RWS is not located in the vicinity of any safety-related equipment and the water from the postulated break will not reach any safety-related equipment, result in impact to the control room, or result in a release of radioactivity to the environment.

Because the RWS is not safety-related and its failure does not lead to failure of any safety-related systems, the requirements of GDC 2 and 4 and the guidance of SRP 9.2.1, regarding safety-related systems, do not apply.

RWS piping and structures are designed and constructed in accordance with nationally recognized codes and standards (such as ASME B31.1, AWWA and IBC). Design features have been included (e.g., the use of buried piping and heat tracing) to ensure RWS piping is reliable and will be available to support normal plant operation and shutdown functions.

As noted in FSAR Subsection 14.3.2.3.3, this site-specific system (RWS) does not meet the inspection, test, analysis and acceptance criteria (ITAAC) selection criteria. ITAAC screening was performed for RWS, using the screening criteria of FSAR Subsection 14.3.2.3, which concluded that ITAAC is not applicable, as indicated in FSAR Table 14.3-201.

No specific Technical Specifications are required for the RWS and none are applicable. Technical Specifications for the AP1000 are provided in FSAR Chapter 16, DCD Section 16.1, and were evaluated by the NRC in the Final Safety Evaluation Report (NUREG-1793), Chapter 16.

There are no availability controls for the RWS, and they are not required, based on the RTNSS evaluation in FSER Chapter 22 and WCAP-15985, Rev. 2. Also, FSAR Chapter 16 and DCD Chapter 16 do not identify any availability requirements for the RWS.

No change to the FSAR is proposed as a result of this response. A revised FSAR Subsection 9.2.11 is provided as part of the response to RAI 09.02.01-6 and addresses the information discussed in the response to this RAI, as appropriate, consistent with NRC guidance provided in Regulatory Guide 1.206, Section C.III.2.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 064

NRC Technical Review Branch: Balance of Plant Branch 1 (SBPA)

NRC RAI Number: 09.02.01-6

NRC RAI:

The raw water system (RWS) is relied upon for achieving and maintaining cold shutdown conditions which is necessary for satisfying Technical Specification requirements. In accordance with NRC policy considerations for passive plant designs, non-safety related active systems that are relied upon for achieving and maintaining cold shutdown conditions (i.e., transitioning from Mode 4 to Mode 5) should be highly reliable and able to accommodate single active failures without a loss of the cooldown capability that is needed. The staff found that Section 9.2.11 of the Final Safety Analysis Report (FSAR) does not provide a clearly defined design basis with respect to the RWS cooldown function, and the reliability and capability of the RWS to perform this function for the most limiting situations were not adequately described and addressed. For example, the minimum RWS flow rate, water inventory, temperature limitations, and corresponding bases for providing SWS makeup for the two Lee units were not described. Also, the suitability of RWS materials for the plant-specific application and measures being implemented to resolve vulnerabilities and degradation mechanisms to assure RWS functionality over time were not addressed. Consequently, Section 9.2.11 of the FSAR needs to be revised to properly describe and address the RWS design bases in this regard and to include design specifications that are necessary to ensure the reliability and capability of the RWS to perform its cooldown function. The following guidance is generally applicable and should be considered as appropriate when revising the FSAR in response to this question:

a. The design bases should specifically recognize and describe cold shutdown functions that are credited, and applicable design considerations that pertain to these functions should be specified, such as reliability, redundancy, backup power, etc. Other parts of the DCD should not be referred to in lieu of providing a complete description of the design-bases in FSAR Section 9.2.11.

b. The system description should explain how the applicable design-bases considerations referred to in (a) are satisfied. For example:

   - The minimum required system functional capability and the bases for this determination should be described (note that a minimum of seven days worth of on-site water inventory should be available for reactor decay heat removal and spent fuel cooling);

   - The description should explain how design-bases considerations are satisfied;

   - The guidance in SRP Sections 9.2.1 and 9.2.5 that are relevant for ensuring the capability and reliability of the RWS to perform its design-bases functions should be considered and addressed as appropriate (materials considerations, net positive suction head, waterhammer, etc.);

- Operating experience considerations that pertain to the capability and reliability of the system to perform its design-bases functions needs to be addressed (note that the relevance of operating experience is independent of safety classification considerations);

- In order to demonstrate adequate reliability, the system design should include (among other things) the capability of all necessary components (pumps, valves, strainers, instrumentation and controls, etc.) to function during a loss of off-site power and redundancy for single active failure vulnerabilities;

- Dual-unit considerations need to be addressed.

c. Major components and features that are important to ensure the capability and reliability of the system to perform its cooldown function should be described. Applicable industry codes and quality group designations that are commensurate with plant-specific RWS reliability considerations should be specified and reflected in Chapter 3, "Design of Structures, Components, Equipment, and Systems." Note that this may be different from what is specified for the standard plant design since it was based solely on regulatory treatment of non-safety systems considerations and did not include consideration of the cooldown function.

d. System design parameters that are important for performing the cold shutdown function should be specified, such as water inventory, flow rate, nominal pipe sizes, limiting flow velocities, and design temperatures and pressures.

e. The RWS operating modes for performing its cold shutdown function should be described, such as interlocks, protective features, and automatic actuation.

f. Limitations on the capability of the RWS to perform its cold shutdown function should be described, such as minimum required water inventory and temperature restrictions that apply.

g. Instrumentation (e.g., indication, controls, interlocks and alarms) that are relied upon by plant operators in the main control room and at the remote shutdown panels for performing cooldown functions should be described.

h. System diagrams should show division designations, flow paths, major components and features, nominal pipe sizes, and instrumentation that is relied upon to ensure proper operation of the system by operators in the main control room and at the remote shutdown panels.

i. The more important periodic inspections that will be completed and specified frequencies for ensuring the capability and reliability of the system should be described. For example, design provisions and actions that will be implemented to periodically assess the condition of buried or otherwise inaccessible piping and components should be described.

j. The more important periodic tests that will be completed and specified frequencies for ensuring the capability and reliability of the system should be described. For example, periodic testing of pumps, valves, self-cleaning strainers, and vacuum breakers should be described.

k. Based on the FSAR description, plant-specific ITAAC should be established that are appropriate and sufficient for verifying that the RWS is constructed as designed.

l. The initial test program should test all modes of RWS operation that are credited for performing its cooldown function and confirm acceptable performance for the most limiting assumptions. For example, confirmation that net positive suction head requirements are satisfied for minimum pump suction head and maximum water temperature conditions with all pumps running at full flow, and that waterhammer will not occur during situations when voiding is most likely to occur should be specified. It should be clear from the information provided in Section 9.2.11 of the FSAR what constitutes acceptable performance.

Duke Energy Response:

As described in FSAR Section 9.2.11, the Raw Water System consists of five subsystems. Of these subsystems only two supply water to support plant system functions during Modes 1 through 5. The Clarified Water Supply subsystem supplies treated make-up and fill water to the demineralized treatment system (DTS) and fire protection system (FPS) in both units and serves as the preferred make-up and fill supply to the service water system (SWS). The Raw Water Supply subsystem supplies untreated make-up and fill water to the circulating water system (CWS). The Raw Water Supply subsystem also provides an assured make-up supply to SWS to ensure that the power generation design basis for SWS is maintained during abnormal conditions that could deplete the inventory in the Clarified Water Supply subsystem.

This response specifically focuses on the Clarified Water Supply and Raw Water Supply subsystems interfaces with SWS. This is because, as noted in the response to RAI 09.02.01-05, the other functions performed by RWS do not have a direct interface with any other system identified within the AP1000 which is safety-related, designated for Regulatory Treatment of Non-Safety Systems (RTNSS), or designated as AP1000 Class D.

The RWS Clarified Water Supply and Raw Water Supply subsystems provide a water fill/make-up interface with the SWS. The SWS has investment protection short-term availability controls as described in DCD Table 16.3-2 which are applicable in Mode 5 with the reactor coolant system (RCS) pressure boundary open, and in Mode 6 with the upper internals in place or cavity level less than full. Under these conditions, the SWS is directly providing active core cooling and, as noted in the response to RAI 09.02.01-05, was evaluated by Westinghouse and determined to meet the RTNSS criteria as documented in NUREG-1793 and WCAP-15985. Unlike the SWS, the RWS does not directly provide core cooling. As discussed in response to RAI 09.02.01-05, RWS support of the SWS cooling function was evaluated in WCAP-15985 and determined to not meet the RTNSS criteria and to not require investment protection short-term availability controls.

In the unlikely event of a failure of the RWS to provide adequate make-up flow to the SWS cooling tower basins during the short time period in which the SWS is performing a RTNSS function as stated above, the remaining inventory in the service water cooling tower basins and the stored water which is available in the upper region of the secondary fire water tank provide ample time (more than 24 hours) to restore the RWS make-up flow or take the procedural actions necessary to exit the conditions for applicability. Therefore, the RWS is not a RTNSS system or subject to investment protection short-term availability controls. However, as described below, the RWS is designed to be a highly reliable and robust system, capable of operating during a loss of normal ac power to provide RWS make-up flow under normal and abnormal conditions. Procedural controls, which provide for continued operation of the RWS or re-establishment of operations under off-normal conditions, will be contained in operating procedures, where appropriate.

As defined in DCD Subsection 3.2.2.6, a structure, system or component is classified as Class D when:

- The SSC directly acts to prevent unnecessary actuation of the passive safety systems, or

- The SSC supports those SSCs which directly act to prevent the actuation of passive safety systems.

Class D has normally been applied to AP1000 systems, structures, and components that perform defense-in-depth functions. While the SWS is designated within the DCD as a defense-in-depth, Class D system, the RWS is designated as a Class E system. The basis for this classification is:

- In the unlikely event of a failure of the RWS, the inventory in the service water cooling tower basin and in the upper region of the secondary fire water tank ensure that the SWS can maintain the required defense-in-depth cooling functions for an extended period of time.

- A failure of the RWS will not directly cause an actuation of a passive system nor will it initiate the failure of a SSC which directly acts to prevent the actuation of a passive safety system.

As described in DCD Subsection 5.4.7.1.2.1, the normal residual heat removal system (RNS), in conjunction with its associated support systems, the component cooling water system (CCS) and the SWS, are used for shutdown heat removal. The RWS provides indirect support for this function by providing a source of make-up water to the SWS cooling tower basins to compensate for evaporation, drift, and blowdown. The RWS provides this make-up water to support the cooling requirements for the SWS. During a normal plant cooldown, the RNS and CCS reduce the temperature of the reactor coolant system from approximately 350°F to approximately 125°F within 96 hours after shutdown. The RWS is designed to provide ample make-up flow to both units' cooling tower basins during these conditions using the clarified water supply pumps.

FSAR Figure 2.4.1-202 identifies the maximum make-up requirement for RWS to the service water systems in both units to be 1660 gpm (830 gpm per unit). This demand represents a design maximum make-up to the SWS cooling towers, occurring four hours after a simultaneous shutdown of both units, when the maximum SWS heat load is encountered at the beginning of cooldown. This flow rate is very conservative, as the decay heat load decreases during cooldown with an accompanying decrease in make-up requirements.

If cooldown to Cold Shutdown (Mode 5) is required within 36 hours to comply with a Limiting Condition for Operation in accordance with the Technical Specifications, heat will be transferred from the reactor coolant system via the steam generators to the main steam system for a longer period of time, allowing RNS to be placed in service at a lower temperature with lower decay heat levels. Because of the reduced RNS heat removal requirements associated with this cold shutdown sequence, the required RWS make-up flow to the SWS cooling towers is less than normal cooldown requirements.

For a loss of normal ac power scenario, Westinghouse AP1000 design data indicates an RWS flow of approximately 108 gpm will provide sufficient make-up to account for evaporation and drift losses from the SWS cooling tower following the first 28 hours of event initiation.

The Clarified Water Supply subsystem is the normal make-up source for the SWS cooling towers in both units and the preferred source of water for the normal plant cooldown described in the power generation design basis. The clarified water storage tank, shared by both units, has a capacity of 2.7 million gallons. There are four clarified water supply pumps (two per unit) that take suction from the storage tank. Each pump has a design flowrate of 1500 gpm, so one pump can easily supply the maximum make-up requirements for the associated unit.

The Raw Water Supply subsystem provides the assured make-up supply to SWS to ensure that the power generation design basis for SWS is maintained during abnormal conditions that could deplete the inventory in the Clarified Water Supply subsystem. The inventory for the subsystem is Make-Up Pond A, which has a useable storage volume of 1200 acre-ft and provides sufficient capacity to support a dual unit cooldown to cold shutdown conditions and maintain the station in this condition for longer than 7 days. There are six raw water supply pumps (three per unit) that take suction from Make-Up Pond A. Each pump has a design flowrate of 15,000 gpm.

The underground RWS piping will be high-density polyethylene (HDPE), which is not susceptible to corrosion or biological fouling. Therefore, periodic inspections of the underground RWS piping are not required. Equipment that remains idle for extended periods of time (pumps, valves) will be operated periodically in accordance with vendor recommended maintenance practices.

As discussed above, the lack of designation of the RWS as RTNSS or Class D indicates there is no performance requirement for the system in the event of a single active failure or during a loss of normal ac power. Nonetheless, the RWS is highly reliable based on its design, and a single failure of an active component in the RWS would not affect normal plant cooldown. Only one of the two clarified water supply pumps or one of the three raw water supply pumps are required to support make-up to the SWS cooling tower basins in each unit during all modes of SWS operation. Failure of an operating pump or electrically-operated valve in the make-up path to the SWS would not prevent the RWS from providing make-up to the cooling towers. The clarified water supply pumps are supplied from separate buses that are automatically loaded on the standby power supply during a loss of normal ac power. All RWS valves in the make-up to

SWS are manual. Restoring make-up flow requires starting a pump from the control room. The raw water supply pumps are supplied by separate buses and two pumps in each unit are on buses that can be manually loaded on the standby power supply. If the Clarified Water Supply subsystem is not available, operator actions will be taken to align the Raw Water Supply subsystem as described in FSAR Subsection 9.2.11.3.3. The water inventory in the SWS cooling tower basins provides adequate time to perform the manual actions needed to restore SWS make-up. The RWS, therefore, continues to maintain the capability to provide make-up water to the SWS cooling tower basins during loss of normal ac power events.

In the unlikely event that all RWS flow to the SWS cooling towers is lost, there is ample time to identify and correct the situation or to align alternate sources of water to provide that make-up flow, and the RWS is shown to not be a RTNSS system nor subject to investment protection short-term availability controls. It is also important to note that neither the RNS, CCS, SWS, nor RWS are required to establish and maintain the AP1000 plant in a safe shutdown condition, since passive safety-related systems perform that function. This is explicitly recognized throughout the AP1000 DCD and NRC Final Safety Evaluation Report, NUREG-1793.

FSAR Subsection 9.2.11 will be revised to include additional details to address the applicable system attributes provided in (a) through (l) of the RAI. In addition, Attachment 09.02.01-06A has been prepared as a reviewer aid to identify whether the information requested in (a) through (l) is:

1. Provided in the response to RAI 09.02.01-06 or other RAI responses
2. Provided in the revised FSAR Subsection 9.2.11, or
3. Not provided or addressed

Where the information is not provided or addressed, a basis for not providing the requested information or a clarification of the information provided is supplied.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

The following changes will be made in a future revision of the WLS FSAR.

1. COLA Part 2, FSAR Chapter 9 replace:

- Figure 9.2-201, Raw Water System, River Water Subsystem
- Figure 9.2-202, Raw Water System, Raw Water Supply Subsystem
- Figure 9.2-203, Raw Water System, Make-Up Pond B Subsystem
- Figure 9.2-204, Raw Water System, Clarifier Subsystem and
- Figure 9.2-205, Raw Water System, Clarified Water Supply Subsystem,

with the revised figures provided in Attachment 2.

2. Replace COLA Part 2, FSAR Chapter 9, Subsection 9.2.11 with:

WLS SUP 9.2-4

9.2.11 RAW WATER SYSTEM

The raw water system (RWS) withdraws water from the Broad River, transfers it for storage in Make-Up Ponds A and B and supplies raw and treated water to various plant systems.

9.2.11.1 Design Basis

9.2.11.1.1 Safety Design Basis

The RWS serves no safety-related function and therefore has no nuclear safety design basis.

Failure of the RWS or its components will not affect the ability of safety-related systems to perform their intended function.

9.2.11.1.2 Power Generation Design Basis

The RWS provides water to the circulating water system (CWS), service water system (SWS), fire protection system (FPS), demineralized water treatment system (DTS), turbine building closed cooling water system (TCS) and waste water system (WWS) for purposes such as system make-up, fill, cooling, and dilution.

The RWS provides inventory and SWS make-up flow to support normal plant cooldown. During this operational sequence, the normal residual heat removal system (RNS) and associated component cooling water system reduces the temperature of the reactor coolant system from approximately 350°F to approximately 125°F within 96 hours after shutdown.

The RWS is designed with sufficient inventory and pump capacity to provide makeup needs for the limiting SWS heat load identified in DCD Table 9.2.1-1.

The Clarified Water Supply subsystem, using the inventory provided in the clarified water storage tank, is the normal make-up supply to the SWS cooling towers in both units. The Clarified Water Supply subsystem contains approximately 2.7 million gallons of inventory and is equipped with redundant pumps capable of receiving power from the standby diesels.

9.2.11.2 System Description

9.2.11.2.1 General Description

The various subsystems in the raw water system are shown on the following figures:

- Figure 9.2-201 River Water Subsystem
- Figure 9.2-202 Raw Water Supply Subsystem
- Figure 9.2-203 Make-Up Pond B Subsystem
- Figure 9.2-204 Clarifier Subsystem
- Figure 9.2-205 Clarified Water Supply Subsystem

A discussion of ice effects at the Lee Nuclear Station is provided in FSAR Subsection 2.4.7. In summary, the regional climate does not support ice formation on surface waters and the potential for ice jams or frazil ice formation that would affect intake structures is remote.

Subsystems that provide normal and alternate make-up flow to the SWS cooling towers utilize high density polyethylene (HDPE) material for all underground piping. Operating experience has demonstrated that HDPE is compatible with raw and treated water chemistry and is highly resistant to corrosion and biofouling. All RWS piping is designed to ASME Code for Power Piping, B31.1.

RWS underground piping in the vicinity of the turbine building uses the same routing as the circulating water system piping to the main condenser. Flooding in the yard area adjacent to the turbine building resulting from an RWS piping failure is bounded by a postulated piping failure in the circulating water system.

RWS piping from the Clarified Water Supply subsystem is routed inside the turbine building to the demineralized water treatment system and turbine building closed cooling water systems. The effects of a RWS pipe failure would not result in detrimental effects on safety-related equipment since there is no safety-related equipment in the turbine building. A break in the RWS piping inside the turbine building is bounded by a postulated pipe failure in the circulating water system.

9.2.11.2.2 Subsystems Providing Off-Site Supply and On-Site Storage

Make-Up Pond A serves as a central repository for raw water and contains the intake structure for the station. During normal Broad River flow conditions, withdrawal from the river is used to maintain a normal level in Make-Up Pond A and, if required, store water in Make-Up Pond B. During low flow conditions on the Broad River, withdrawal from Make-Up Pond B, and if available, the Broad River, are used to maintain a normal level in Make-Up Pond A.

The water inventory required to support the power generation design basis is provided by the Raw Water Supply subsystem and maintained in Make-Up Pond A. The River Water and Make-Up Pond B subsystems provide water storage and source diversity to adapt to Broad River flow conditions.

River Water Subsystem

The River Water subsystem withdraws water from the Broad River and transfers it to maintain normal level in Make-Up Pond A and provide water for storage in Make-Up Pond B.

An intake on the Broad River contains four river water pumps. The function of the river water subsystem is to maintain Make-Up Pond A at its normal level. Two pumps are normally in operation and two are in standby. There are conditions when one or no Broad River pumps are required to support operations, based on unit demand, or utilization of the alternate supply source, Make-Up Pond B. For example, during low river flow conditions, withdrawals may be reduced or terminated. During these conditions, supplemental water stored in Make-Up Pond B is used to maintain Make-Up Pond A level.

Make-Up Pond B Subsystem

The Make-Up Pond B subsystem receives and stores water from the Broad River, utilizing a transfer path through Make-Up Pond A. Make-Up Pond B maintains normal level in Make-Up Pond A when withdrawals from the Broad River are reduced or terminated. An intake on Make-Up Pond B contains four make-up pond pumps, two per unit.

9.2.11.2.3 Subsystems Supplying Raw Water and Treated Raw Water

Raw Water Supply Subsystem

The Raw Water Supply subsystem supports the SWS make-up function described in the power generation design basis. The Raw Water Supply subsystem receives and stores water from the Broad River and/or Make-Up Pond B and supplies untreated water to plant systems. The subsystem consists of Make-Up Pond A, an intake, pumps, piping, valves and instrumentation. The intake contains six raw water pumps, three per unit.

During abnormal conditions, for example, when the Clarified Water Supply subsystem is not available, the Raw Water Supply subsystem provides an assured make-up supply to maintain the power generation design basis for SWS. Make-Up Pond A has a useable storage volume of 1200 acre-ft, which provides sufficient capacity to support a dual unit cooldown to cold shutdown conditions and maintain the station in this condition for longer than 7 days.

Clarifier Subsystem

The Clarifier subsystem receives water from the Raw Water Supply subsystem and treats the water, using chemical and physical processes. The treated water is then forwarded to the Clarified Water Supply subsystem for storage and distribution.

The Clarifier subsystem has a design capacity sufficient to supply the design demands of all systems supplied by the Clarified Water Supply subsystem for both units.

Clarified Water Supply Subsystem

The Clarified Water Supply subsystem receives and stores treated water from the Clarifier subsystem and supplies flow to SWS, DTS and FPS in both units. The subsystem consists of a clarified water storage tank with an approximate storage capacity of 2.7 million gallons that is shared by both units. Four pumps, two per unit, take suction from the tank and discharge to unit-specific headers.

The Clarified Water Supply subsystem is the normal make-up source for the SWS cooling towers in both units and is the preferred source of water for the normal plant cooldown described in the power generation design basis. In the event the clarifier fails or is out-of-service during a normal plant shutdown of both units, the inventory in the SWS cooling tower basin, secondary fire water tank, and the clarified water storage tank contain a sufficient volume to support aligning the Raw Water Supply subsystem to the SWS cooling towers.

9.2.11.3 Component Description

9.2.11.3.1 River Water Subsystem

Intake

The river water intake structure supports the pumps and related equipment (i.e. intake screens, screen wash pumps, etc.). The intake structure has four separate forebays, each equipped with a traveling screen and one steel bar/trash rack assembly.

Pumps

Four river water pumps are located in the intake structure. Each pump is sized to supply 100 percent of the design raw water demand for one unit. The river water pumps are of vertical turbine, wet pit design. The length of each pump barrel is sized to meet the minimum submergence and net positive suction head (NPSH) requirements for the pump based on minimum level conditions in the Broad River.

Piping

The discharges of the river water pumps for both units are routed to a common header and pipeline to Make-Up Pond A. A break tank structure is installed between the intake and Make-Up Pond A. The break tank is open to atmosphere and is used to dissipate the hydraulic energy in the flow from the river intake. Check valves are installed on the pump discharge piping to limit reverse flow in the system following a pump trip.

Valves

Motor operated and manual valves are installed on the discharge of the river water and screen wash pumps. These valves are used for normal system alignments.

9.2.11.3.2 Make-Up Pond B Subsystem

Intake

The Make-Up Pond B intake consists of two structures: the intake box and the pump structure. The intake box, equipped with a passive screening system, is located at the bottom elevation of Make-Up Pond B. Piping connects the intake box to the pump structure located on the shoreline of the pond. The pump structure has two forebays, each containing two pumps.

Make-Up Pond B Pumps

Four Make-Up Pond B pumps are located in the pump structure. Each pump is sized to supply 100 percent of the normal raw water demand for one unit. When Make-Up Pond B is used to supply the station, two pumps are in operation and two are in standby. The pumps are of vertical turbine, wet pit design. The design of the intake box, pump structure and connecting piping maintains the pump forebay water level at the same level as Make-Up Pond B. The length of each pump barrel is sized to meet the minimum submergence and NPSH requirements for the pump for the maximum draw down level in Make-Up Pond B.

Piping

The Make-Up Pond B pumps discharge header supplies a pipeline to the break tank between the river water intake and Make-Up Pond A. Valves are installed to allow the same piping to be used to both fill Make-Up Pond B and transfer water back to Make-Up Pond A.

Valves

The fill line for Make-Up Pond B from Make-Up Pond A is equipped with a motor operated valve. The remaining valves are operated manually.

9.2.11.3.3 Raw Water Supply Subsystem

Intake

The Make-Up Pond A intake supplies both units at the Lee Nuclear Station. The intake is separated into six forebays; three for each unit. Each forebay is equipped with a raw water pump and a separate traveling screen assembly. The separate forebays and traveling screens provide diversity to ensure the ability to supply raw water system flow.

The traveling screens are powered from the normal ac power system, and are not backed by the standby power supply for occurrences of loss of normal ac power. Raw water system make-up requirements following a loss of normal ac power condition are a small fraction of the normal flow. In this condition, the intake screens act as a passive screen. This is acceptable because the lower flow velocities and limited duration reduce the potential for entrainment and impingement.

Raw Water Supply Pumps

Six raw water supply pumps are located in the Make-Up Pond A pump structure. Each pump is sized to supply 50 percent of the design raw water demand for one unit, so one pump is typically in standby for each unit. If river water is transferred for storage in Make-Up Pond B with both units at full power, a standby pump(s) would be placed in service. The pumps are of vertical turbine, wet pit design. The length of each pump barrel is sized so that the minimum submergence and NPSH requirements for the pump are satisfied during the maximum operating drawdown condition for Make-Up Pond A.

The standby pumps are isolated from the discharge header by a motor-operated valve. Each pump is equipped with a pressure transmitter on the discharge piping that alarms in the control room on a low pressure condition. To start the standby pump, the operator manually opens the isolation valve and starts the pump either remotely or locally.

The pumps are powered from the normal ac power system in each unit. Each pump is supplied from a separate bus, and two of the raw water pumps in each unit are backed by the standby power supply for occurrences of loss of normal ac power. In the event of a loss of normal ac power, standby power is manually aligned to one or more raw water supply pumps. The pumps are started by operations, either locally or remotely as necessary.

If the Raw Water Supply subsystem alignment to support SWS cooling tower make-up is required, and all three raw water supply pumps are shut down, the manual isolation valves between the pump discharge and the clarified water supply header are opened. The selected pump is aligned to the discharge header by opening the motor operated discharge valve and minimum flow path valve. These valves can be operated from the control room or a local handswitch. The valve operators are also equipped with handwheels to allow the valves to be opened manually during a loss of normal ac power condition. The pump is started to refill the SWS cooling tower basin and secured when the desired level is attained. Once the discharge and minimum flow recirculation flowpaths have been aligned, the pump can be restarted from the control room to maintain the desired basin level.

Piping

The raw water pumps in each unit discharge to a common header that has supply piping take-offs to various systems. The minimal elevation difference between the

Make-Up Pond A intake structure and the supplied equipment limits column separation if the pumps trip, as well as transient effects during restart. Check valves installed on the pump discharges also maintain the discharge piping filled. Temperatures in the system are moderate and the pressure of the fluid is maintained above saturation at all locations to minimize the potential for thermodynamic water hammer.

The Raw Water Supply subsystem provides dilution water to the WWS during unit outage conditions when CWS blowdown is unavailable. The Raw Water Supply subsystem and WWS effluent flow are combined in a blowdown sump structure that is open to the atmosphere. From the sump, the dilution water gravity drains towards the Broad River. The WLS effluent from both units is piped separately to the Broad River and the two fluids are mixed directly upstream of a diffuser structure that discharges into the river. The elevation difference between the blowdown sump and the diffuser physically prevents WLS effluent from back-flowing into the blowdown sump and cross-contaminating RWS and CWS. The atmospheric pressure conditions in the sump prevent formation of a vacuum that could draw WLS effluent into the sump.

Valves

Motor operated valves are located on the discharge of each raw water supply pump. They are supplied from the normal ac power system in each unit. The valves are designed to fail "as-is" during a loss of normal ac power condition. The operator on each valve is equipped with a handwheel to allow manual realignment if ac power is lost or an actuator fails.

Two manual valves isolate the Raw Water Supply subsystem in each unit from the Clarified Water Supply subsystem make-up piping to the service water system. These valves are manually opened to align the Raw Water Supply subsystem for make-up to the SWS cooling tower basins.

Conditions affecting the operation of an intake screen, raw water pump or associated discharge valve are addressed by aligning and starting the standby pump. This action is normally performed from the control room. The motor-operated valves are also equipped with handwheels, if local operation is required.

9.2.11.3.4 Clarifier Subsystem

Clarifier Equipment

A single clarifier and associated chemical feed and filtration equipment provides treated water for both units. The clarifier is a solids contact design, and primarily functions to remove total suspended solids from the raw water. The treated water is then transferred to the Clarified Water Supply subsystem for storage and distribution. Due to the time required to place a clarifier in operation and obtain the desired water quality, the clarifier normally remains in operation, with the supply flow balanced to maintain normal level in the clarified water storage tank.

9.2.11.3.5 Clarified Water Supply Subsystem

Storage

A clarified water storage tank, with a useable inventory of approximately 2.7 million gallons, provides normal fill, make-up and supply to the SWS, DTS and FPS systems in both units. The tank is maintained in the full inventory condition during normal operation by the continuous operation of the Clarifier subsystem.

The elevation head of the clarified water storage tank maintains a positive pressure on system supply lines, reducing the potential for column separation following a clarified water supply pump trip and subsequent transient effects during restart. Temperatures in the system are moderate and the pressure of the fluid is maintained above saturation at all locations to minimize the potential for thermodynamic water hammer.

Pumps

Four pumps, two per unit, take suction from the tank. Each pump is sized to provide 100 percent of the combined design demands of DTS, FPS and SWS for a single unit. The pumps are of centrifugal, horizontal design. The design NPSH for the pumps supports operation to the tank's low-low level setpoint. Minimum flow piping is installed on the discharge of the pumps to support sustained operation at reduced flow.

Both the operating and standby pump for each unit is normally aligned to the discharge header. Pressure indication on the discharge header in each unit alerts the control room of a low pressure condition, whereby the operator manually starts the standby pump.

The pumps are powered from the normal ac power system in each unit. Each pump is supplied by a separate bus that is automatically loaded on the standby diesel.

Piping

The two clarified water supply pumps in each unit discharge to a unit specific header and distribution piping. The distribution piping in each unit has an individual cross tie to the Raw Water Supply subsystem header.

Clarified water demand from the DTS, SWS and FPS is controlled by flow control valves, and is variable. The system utilizes a minimum flowpath back to the clarified water storage tank to maintain a constant header pressure and protect the pumps from damage during sustained low-flow operation. The minimum flow loop also allows pressure to increase gradually when the system is started following an outage or trip to prevent void formation in the piping and the subsequent hydraulic transient during restart.

Valves

The clarified water supply pumps in each unit are equipped with a minimum flow line that automatically opens to prevent pump dead-heading when the pumps are placed into service under low system demand. All remaining valves in the Clarified Water Supply subsystem are manual, and the only realignments expected during operation would be to support individual component or system maintenance.

9.2.11.4 System Operation

The RWS operates during normal modes of plant operation, including startup, power operation (full and partial loads), cooldown, shutdown, and refueling. The Raw Water Supply and Clarified Water Supply subsystems are also available during loss of normal ac power conditions.

9.2.11.4.1 System Startup

For initial system startup, the River Water subsystem is started and, if required, Make-Up Pond A is filled to the normal operating level. The Raw Water Supply subsystem is then started to support fill and startup of the Clarifier subsystem and, if required, transfer water to Make-Up Pond B for storage. Once the Clarifier subsystem is producing water of the desired quality, the clarified water storage tank is filled and the Clarified Water Supply subsystem is placed in operation.

9.2.11.4.2 Plant Startup

During plant startup, the River Water and Raw Water Supply subsystems will be in operation to supply water to refill circulating water system piping and to replace evaporative losses as the CWS cooling towers are placed into operation. Clarifier and Clarified Water Supply subsystems operate to support the water demands of SWS, DTS and FPS.

9.2.11.4.3 Power Operation

During normal operation, one river water pump and two raw water supply pumps are normally in operation to supply untreated water to the circulating water system cooling towers and Clarifier subsystem. If water storage in Make-Up Pond B is desired, a standby raw water supply pump in the Make-Up Pond A intake is placed in service. A standby river water pump is placed in service as necessary to maintain level in Make-Up Pond A.

If low flow conditions are in effect on the Broad River, the river water pumps may operate at partial flow or may be isolated. The Make-Up Pond B pumps are placed in service to maintain normal level in Make-Up Pond A.

The Clarifier subsystem is in service, maintaining level in the clarified water storage tank. One clarified water supply pump is in service, while the other is in standby for each unit.

9.2.11.4.4 Plant Cooldown/Shutdown

The plant cooldown phase utilizes the same system alignment as normal power operation. As untreated make-up demand from the CWS cooling towers decreases, one raw water supply pump on the shutdown unit is stopped and placed in standby.

9.2.11.4.5 Refueling

During refueling, one raw water supply pump is in service on the shutdown unit to support operation of the Clarifier subsystem and to provide dilution water for the waste water system. The River Water subsystem is operated as necessary to maintain level in Make-Up Pond A. The Clarifier and Clarified Water Supply subsystems are in the same system alignment as normal power operation.

9.2.11.4.6 Loss of Normal AC Power Operation

In the event of a loss of normal ac power, the clarified water supply pumps and instrumentation associated with pump discharge pressure indication and clarified water storage tank level are automatically loaded on their assigned diesel buses. The clarified water supply pumps in each unit have a motor operated minimum flow valve that normally opens during pump start to prevent pump dead-heading. Depending on the system alignment at the time of the event, these valves may have to be manually re-opened before restarting the pumps. If so, the minimum flow valves are equipped with handwheels to allow manual operation. The pump is manually restarted locally.

The flow control valve on the make-up line to the service water cooling towers is part of the service water system and isolates on a loss of normal ac power.
The normal level in the clarified water storage tank, the check valves on the discharge of the clarified water supply pumps, and the pump minimum flow lines prevent transient effects when the pumps are tripped and restarted.

The Clarifier subsystem is not powered from a diesel-backed bus. If a long-term loss of normal ac power condition depletes the clarified water storage tank, make-up flow to the service water system is aligned to the Raw Water Supply subsystem as described in subsection 9.2.11.3.3. Two of the three raw water supply pumps in each unit are on buses that can be manually aligned to receive power from associated standby diesels. The raw water supply pumps can be started locally, or from the Control Room. The motor-operated valves in the Raw Water Supply subsystem are designed to fail as-is during a loss of normal ac power, but can be operated locally by manual handwheels.

9.2.11.4.7 Abnormal Conditions

The Clarified Water Supply subsystem is the normal source of make-up to the SWS cooling towers. If the clarified water storage tank has been depleted or both clarified water supply pumps are unavailable, the Raw Water Supply subsystem is aligned as described in subsection 9.2.11.3.3.

Issues affecting the performance of an in-service raw water supply pump or discharge valve are detected by a low pump discharge pressure alarm in the control room. The response is to align and start the standby pump.

9.2.11.5 Safety Evaluation

The raw water system has no safety-related functions and therefore requires no nuclear safety evaluation.

9.2.11.6 Tests and Inspections

Preoperational testing is described in FSAR Chapter 14. System performance and structural and pressure integrity of system components are demonstrated by operation of the system, monitoring of system parameters such as flow and pressure, and visual inspection. Administrative procedures provide direction for operation of the system under all modes of required operation.

9.2.11.7 Instrumentation Requirements

The intakes on the Broad River and Make-Up Pond A are equipped with level transmitters on the upstream and downstream sides of the traveling screens. An indicated level difference identifies flow degradation through the screens and equipment malfunctions. Trouble alarms are used by the control room to identify degraded component issues and initiate subsequent actions.

Pressure indication, with high and low level alarms, is provided for the discharge of each raw water supply pump.

Pressure indication, with high and low level alarms, is provided on each unit-specific clarified water supply pump discharge header.

Flow instrumentation is provided on the discharge of the clarifier equipment to identify issues affecting the normal refilling of the clarified water storage tank.

Level instrumentation, with high and low level alarms, is provided on the clarified water storage tank for control room status of clarified water inventory.

Power actuated valves in the RWS are provided with valve position indication instrumentation.

Attachments:

Attachment 1, Reviewers Aid

Attachment 2, Revised FSAR Figures 9.2-201, 9.2-202, 9.2-203, 9.2-204 and 9.2-205

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1

Reviewers Aid

RAI 09.02.01-06 Response to items (a) thru (I)

Reviewers Aid

RAI 09.02.01-06 Sub-question	Where RAI Response is addressed	Basis for Not Providing Requested Information or Clarification of Information Provided
a.	Revised FSAR Subsection 9.2.11.3	The WLS COL Application incorporates the AP1000 DCD by reference, and is of necessity referenced in discussions of systems other than the Raw Water System (RWS) and in discussions of Technical Specifications (TS). Otherwise, the references to the DCD are minimized to the degree possible in describing the design basis, components, functions, and operation of the RWS. The cold shutdown function for RWS is covered in FSAR Subsection 9.2.11.3.
b.	Revised FSAR Subsections 9.2.11.1.2, 9.2.11.2, 9.2.11.2.1, 9.2.11.2.3, 9.2.11.3, 9.2.11.4.6, and 9.2.11.6 Response to RAI 09.02.01-06	• In the third bullet of this sub-question, the term "ensure" should be replaced by "provide" to appropriately represent the capability and reliability of this non-safety, but robust and highly reliable system to perform its design bases functions. • The role of the clarified water storage tank and Make-Up Pond A in providing a 7-day supply of water is maintained as discussed in FSAR Subsections 9.2.11.1.2 and 9.2.11.2.3. • The design bases are satisfied by system and component descriptions in Subsection 9.2.11.2. • As appropriate, water hammer prevention in each RWS subsystems is addressed under "Piping" and NPSH is discussed under "Pumps" in the Component Descriptions of Subsection 9.2.11.3. Piping materials are discussed in Subsection 9.2.11.2.1. • Operating experience has been incorporated by virtue of system operation and monitoring of system parameters addressed in FSAR Subsection 9.2.11.6. • Single active failure is addressed in the response to RAI 09.02.01-6. • Considerations applicable to the components in the Clarifier and the Clarified Water Supply subsystems shared by both units are discussed in FSAR Subsection 9.2.11.4.6.
c.	Response to RAI 09.02.01-6, Revised FSAR Subsection 9.2.11.1.2, and 9.2.11.2.1, DCD Rev 17, Subsection 3.2.2	• The cooldown function is described in the Power Generation Design Basis in FSAR Subsection 9.2.11.1.2. Components required to support this function are described in the response to RAI 09.02.01-6. • Applicable industry codes and standards for this non-safety system are identified in FSAR Subsection 9.2.11.2.1 and in DCD Rev. 17, Subsection 3.2.2. • No change is proposed in the current Class E classification of the RWS; the basis and justification is provided in the discussions of RTNSS applicability and

		Class E systems in the response to RAI 09.02.01-6.
d.	Revised FSAR Subsection 9.2.11.2.3, Response to RAI 09.02.01-6	Flow and inventory requirements to support the Power Generation Design Basis are discussed in the response to RAI 09.02.01-6. RWS Subsystem support of the basis is described in FSAR Subsection 9.2.11.2.3. Design parameters such as nominal pipe sizes, limiting flow velocities, design temperature, and pressure are beyond the level of detail necessary to describe this non-safety system.
e.	Revised FSAR Subsection 9.2.11.4	RWS operating modes, to the appropriate level of detail, are discussed in FSAR Subsection 9.2.11.4.
f.	Revised FSAR Subsections 9.2.11.1.2 and 9.2.11.2.1 FSAR Subsection 2.4.7 Response to RAI 09.02.01-6	• The cooldown function is described in the Power Generation Design Basis in FSAR Subsection 9.2.11.1.2. Components required to support this function are described in the response to RAI 09.02.01-6. • Minimum required water inventory restrictions on RWS operation are not applicable, due to the volume of the assured inventory: Make-Up Pond A. • The impact of icing effects on the site water sources are discussed in FSAR Subsections 2.4.7 and 9.2.11.2.1.
g.	Revised FSAR Subsection 9.2.11.7	The RWS system does not have a direct cooldown requirement. The RWS design does not incorporate indications and controls on the remote shutdown panel. Instrumentation, alarms, and interlocks applicable to the RWS are discussed in FSAR Subsection 9.2.11.7.
h.	Revised FSAR Subsection 9.2.11, Revised FSAR Figures 9.2-201 thru 9.2-205	FSAR Figures 9.2-201 thru 9.2-205 show the appropriate RWS system piping connections and appropriate interface breaks at proper locations. Division designations are not shown on the RWS flow diagrams. The RWS is non-divisional. The Figures identify instrumentation discussed in FSAR Subsection 9.2.11.
i.	Revised FSAR Subsection 9.2.11.6, Response to RAI 09.02.01-6	RWS system operation, monitoring, and inspection are covered in FSAR Subsection 9.2.11.6. Periodic inspections of the type identified in this question are typically not discussed in the DCD or the FSAR for other non-safety systems such as RWS. However, inspection requirements for HDPE piping are discussed in the response to RAI 09.02.01-6.
j.	Not specifically addressed in this response	Periodic or surveillance tests, as appropriate, are developed as a part of the procedures process under COL information Item 13.5-1, in DCD and FSAR Section 13.5.
k.	Response to RAI 09.02.01-5	As described in the response to RAI 09.02.01-5, this letter response, the RWS system screens out for ITAAC when the screening criteria of FSAR Section 14.3 are applied.
l.	Revised FSAR Subsection 9.2.11.6	The appropriate considerations for modes of RWS operation to provide assurance that the system will perform its design

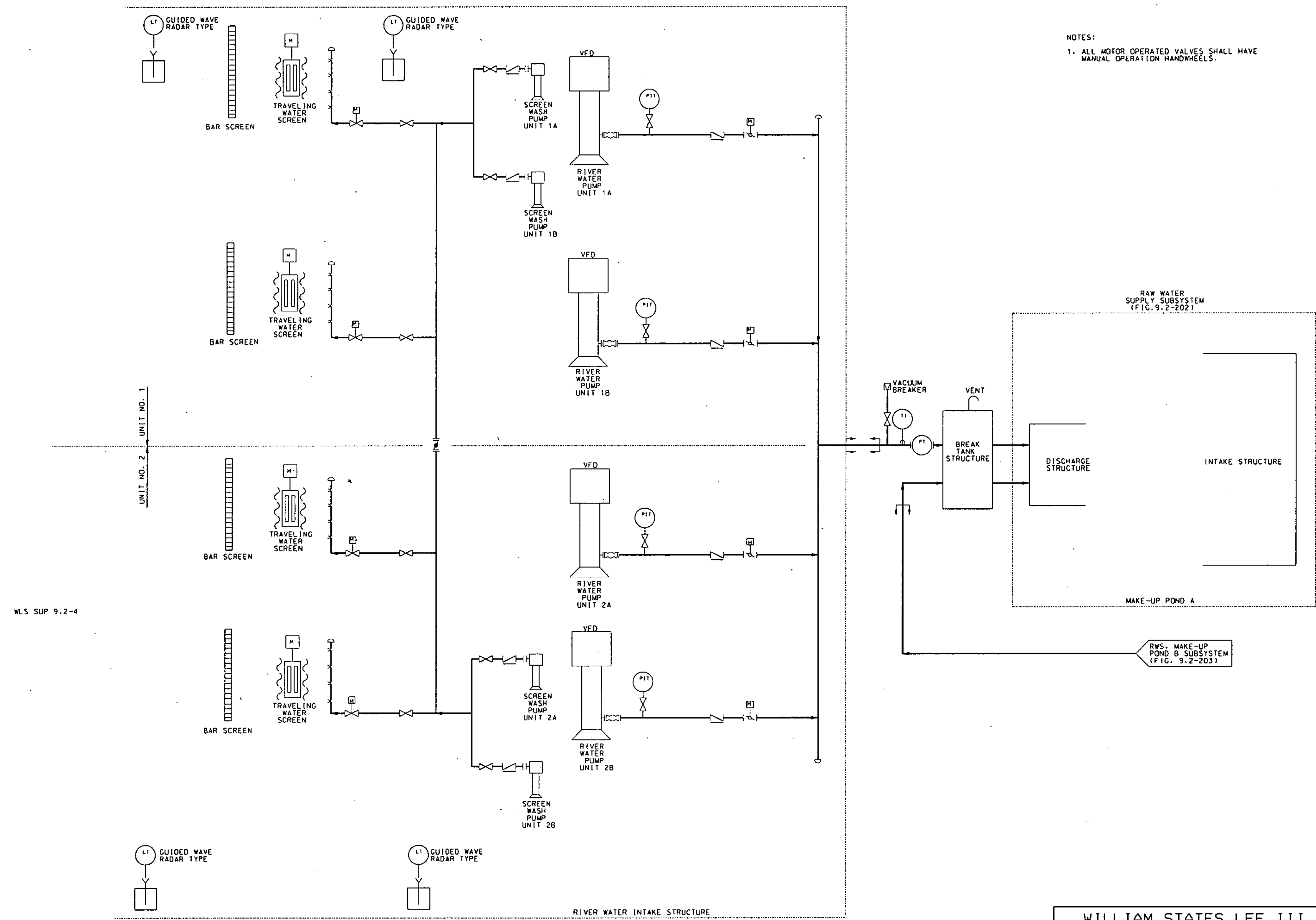
	FSAR Subsections 13.5 and 14.2.9.4.24	basis function under limiting conditions will be encompassed in the construction turnover and preoperational tests performed on the system detailed. The initial test requirements for the RWS are described in FSAR Subsection 14.2.9.4.24. The operational and preventive maintenance testing will be developed in response to COL Information Item 13.5-1 in the DCD, as described in FSAR Subsections 9.2.11.6 and 13.5.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 2

Revised FSAR Figures

9.2-201
9.2-202
9.2-203
9.2-204
9.2-205



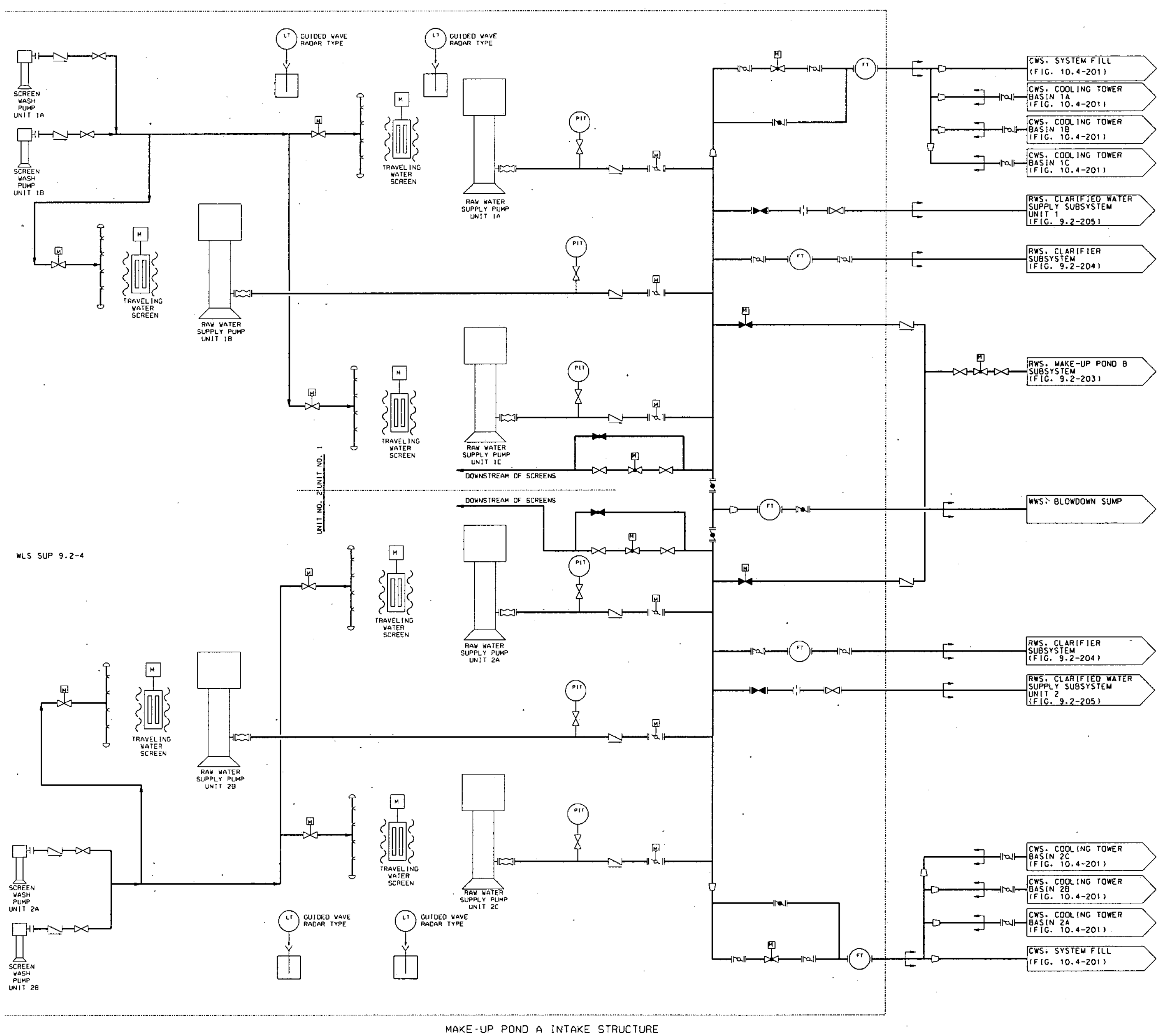
WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Raw Water System,
River Water Subsystem

FIGURE 9.2-201 Rev. 1

NOTES:

1. ALL MOTOR OPERATED VALVES SHALL HAVE MANUAL OPERATION HANDWHEELS.



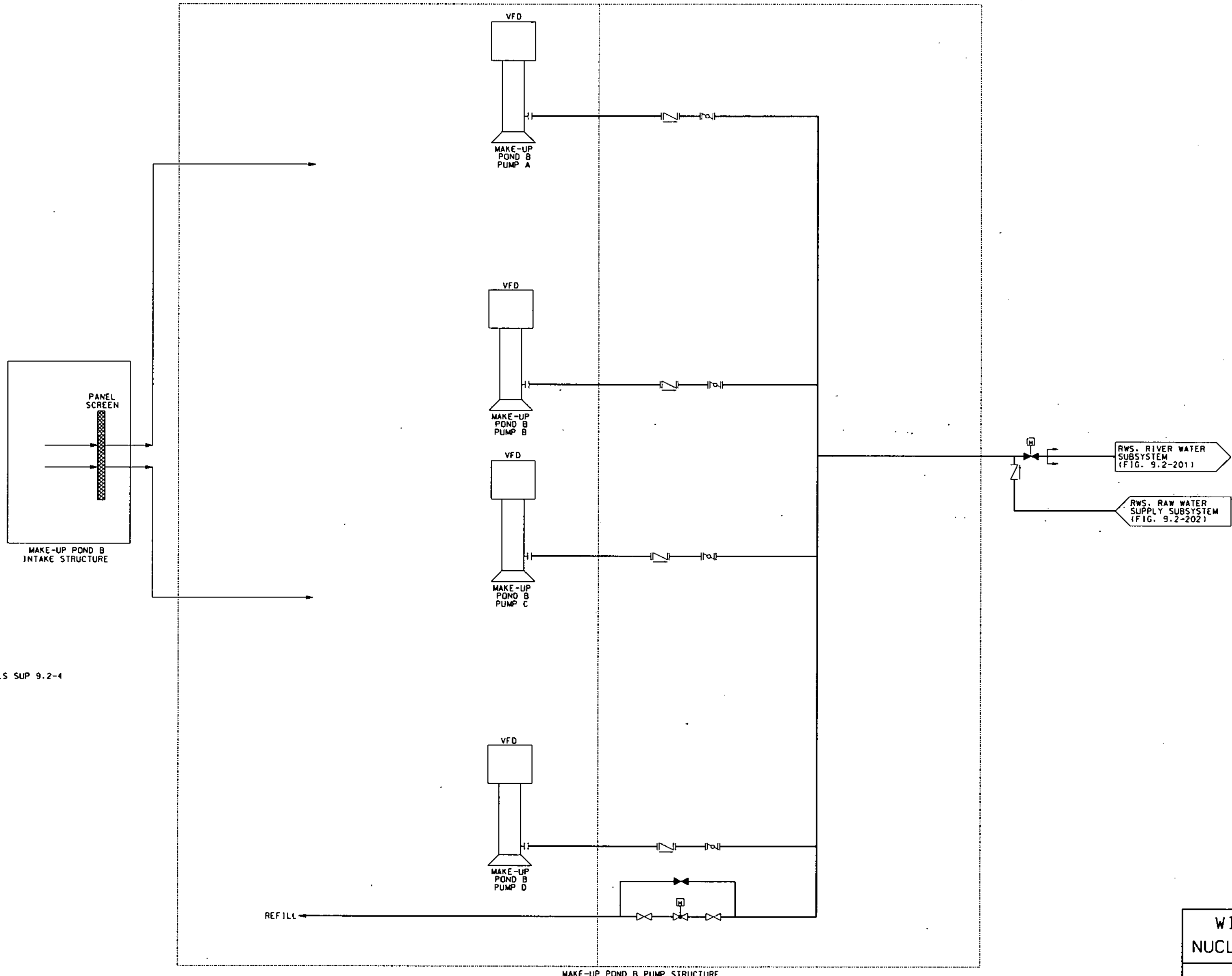
WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Raw Water System,
Raw Water Supply Subsystem

FIGURE 9.2-202 Rev. 1

NOTES:

1. ALL MOTOR OPERATED VALVES SHALL HAVE MANUAL OPERATION HANDWHEELS.

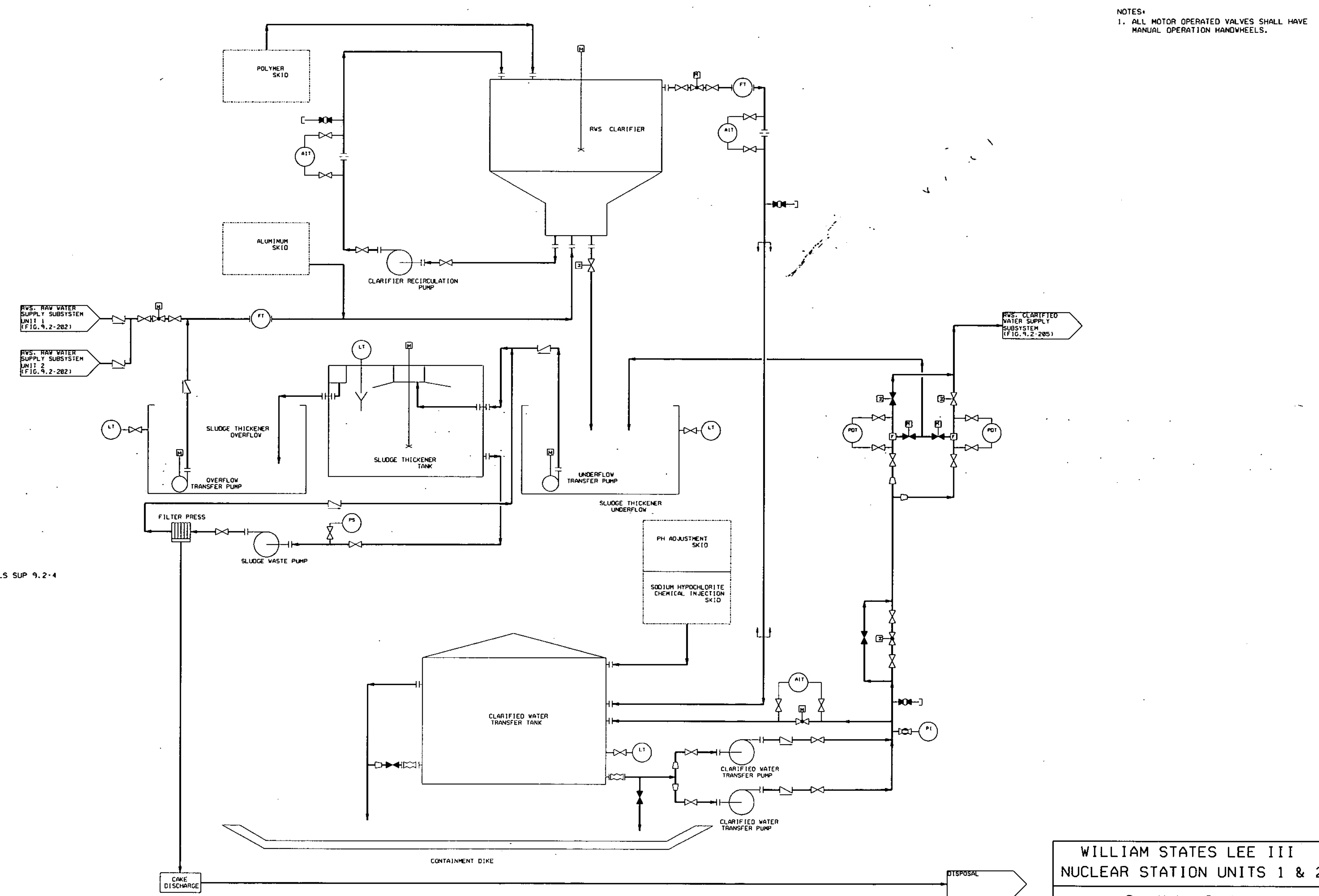


WLS SUP 9.2-4

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Raw Water System,
Make-Up Pond B Subsystem

FIGURE 9.2-203 Rev. 1

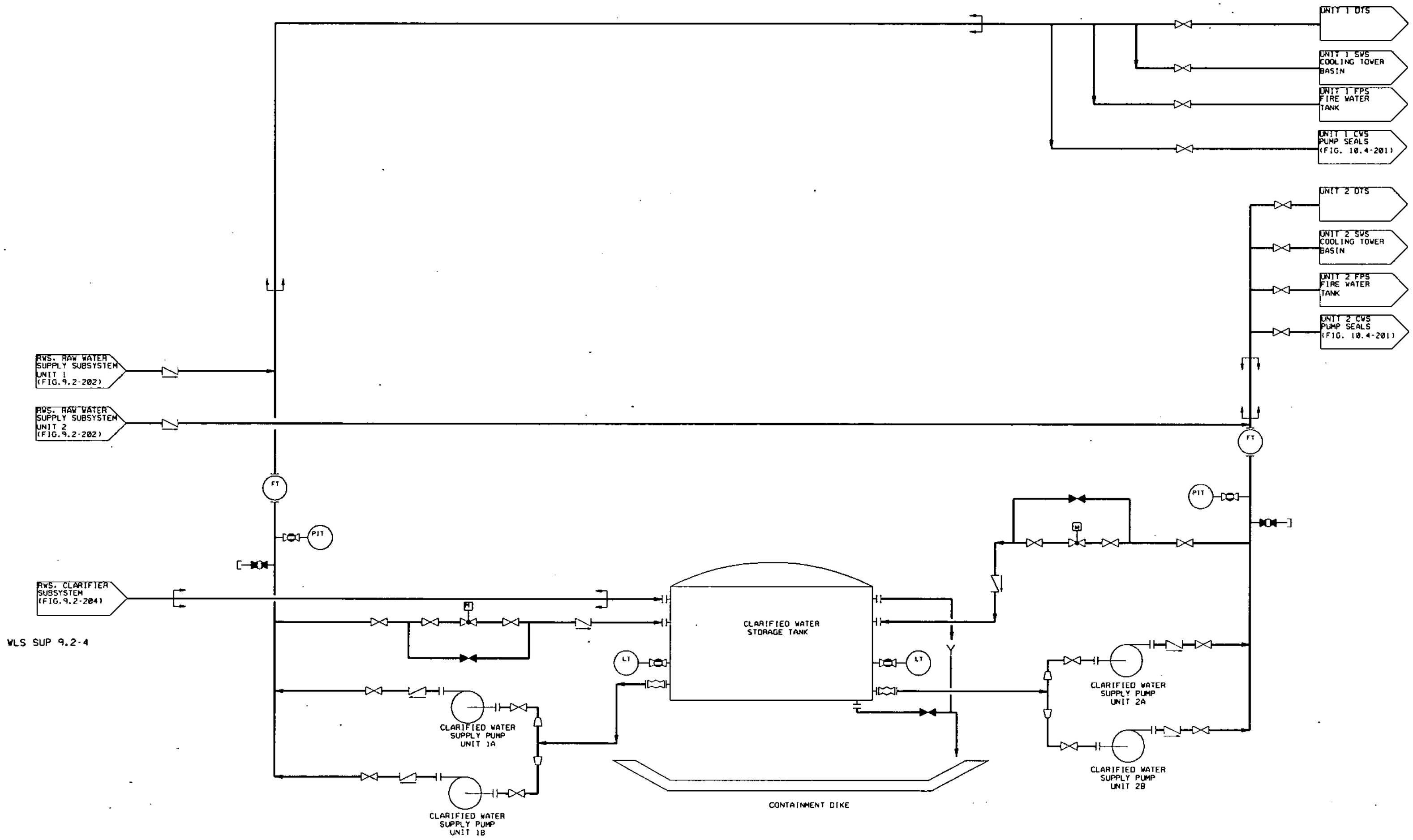


WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Raw Water System, Clarifier Subsystem

FIGURE 9.2-204 Rev. 1

NOTES:
1. ALL MOTOR OPERATED VALVES SHALL HAVE MANUAL OPERATION HANDWHEELS.



WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Raw Water System,
Clarified Water Supply Subsystem

FIGURE 9.2-205 Rev. 1

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 064

NRC Technical Review Branch: Balance of Plant Branch 1 (SBPA)

NRC RAI Number: 09.02.01-7

NRC RAI:

The staff notes that while the service water system (SWS) is designated for regulatory treatment of non-safety systems (RTNSS) during reduced reactor inventory conditions, the raw water system (RWS) is evidently not needed to support the SWS cooling function during this condition, because RWS is not designated for RTNSS treatment. However, there is no explanation in Section 9.2.11 of the applicant's Final Safety Analysis Report (FSAR) as to why this is the case. Also, because the SWS cooling tower basins are limited in their capacity, it isn't clear why RWS makeup is not required for this situation. Consequently, Section 9.2.11 of the FSAR needs to be revised to explain why RWS makeup is not needed during reduced reactor inventory conditions and in particular, to describe controls that will be implemented to ensure that SWS makeup assumptions are valid for this situation

Duke Energy Response:

Please refer to the response to RAI 09.02.01-6 for an explanation of why the RWS is not designated as a RTNSS system and make-up from the RWS to the SWS cooling tower basins is not required during reduced reactor inventory conditions. The referenced RAI response also discusses that procedural controls will be established to take the required actions to exit the conditions for applicability of the SWS as a RTNSS system, in the unlikely event of a failure to re-establish RWS make-up capability. Plant documentation, in the form of a system description for the RWS, will include the information addressed in these RAI responses, as appropriate.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

None

Attachments:

None