Docket No. 50-336
B17500

Attachment 2

Millstone Nuclear Power Station, Unit No. 2

Addendum 1 - October 14, 1998 to
Millstone Nuclear Power Station Unit No. 2
Annual Report dated July 1, 1998

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INTRODUCTION

None of the plant design changes described herein constitute, nor constituted, an unreviewed safety question per the criteria of 10CFR50.59.

PLANT DESIGN CHANGES

DCN Number	Title (FSAR Sections, Tables, and Figures Affected)
DM2-00-0966-98	Operator Gear Change, Stem Thread Cut, and Power Cable Replacement for Moror Operated Valves (MOVs) (8.7.2; processed with FSARCR 98-MP2-131)

PTSCR Number	Title (FSAR Sections, Tables, and Figures Affected)
2-17-97	Thermal and Hydraulic Design Basis Valves Operation Limits (3.2.3, 4.3.7, 4.5.1, 4.5.3, 7.4.8, T4.3-10, T4.5-2, F4.5-4, F4.5-5; processed with FSARCR 97-MP2-127)

IEE Number	Title (FSAR Sections, Tables, and Figures Affected)
00214742	Waste Gas Compressor Diaphragm Material Change/ Alternate (T11.1-13); processed with FSARCR 98-MP2-14)

FSARCR Number	Title (FSAR Sections, Tables, and Figures Affected)
97-MP2-30	Shutdown Cooling (SDC) System, Plant Heatup, and Plant Cooldown (9.3.3, 9.3.4)
97-MP2-189	Containment Isolation System (T5.2-11, T5.2-12, T5.2-13, F5.2-27 through F5.2-34)
98-MP2-25	High Pressure Safety Injection (HPSI) Pump Temperature (T6.3-2)
98-MP2-32	Loading Combinations and Primary Stress Limits for Reactor Coolant System (RCS) (T4.2-2)
98-MP2-44	Shutdown Cooling (SDC) System Design Parameters (T9.3-2)
98-MP2-51	Design Basis Codes Adhered To (4.2.2)

98-MP2-52	High Pressure Safety Injection and Low Pressure Safety Injection Valves (4.3.7)
98-MP2-55	Containment Spray System (CSS) (6.4.4)
98-MP2-58	Reactor Coolant Pumps (RCPs)/ Instrumentation (4.3.3, 4.3.8, F4.3-3, F4.3-5)
98-MP2-63	Design Criteria Outside Containment and Expanded Spectrum of Tornado Missiles (5.2.3, 5.2.6, Appendix 5D)
98-MP2-74	Reactor Coolant System Components (Appendix 4A, T4A-1, T4A-2, F4A-1, F4A-2)
98-MP2-76	Foundation Elevations for the Condensate Storage and Condensate Surge Tanks (2.7.5)
98-MP2-78	Reactor Water Storage Tank (RWST) Water Temperature (6.2.3, 6.2.4)
98-MP2-85	Spent Fuel Pool Storage (9.8.2)
98-MP2-93	Condensate Storage Tank (CST) Tornado Missile Protection (5.7.2, 5.7.3, 10.4.5)
98-MP2-94	Enclosure Building Filtration System (EBFS) (6.7.1, 6.7.2, 6.7.3, 6.7.4, 6.7.5, T6.7-1, T6.7-2, F6.7-1, F6.7-2
98-MP2-97	Fuel Transfer Tube Connecting Refueling Pool and Fuel Transfer Canal (9.8.2, 9.8.3)
98-MP2-100	Containment and Containment Penetrations (5.2.7)
98-MP2-101	Engineered Safety Features Actuation System (ESFAS) Bistable Trip Bypass (7.3.3)
98-MP2-102	Fracture Toughness Requirements for the Reactor Coolant Pressure Boundary (Appendix 1A, 4.5.1, 4.6.2, 4.6.3, T4.6-1, T4.6-2, T4.6-4, T4.6-12, T4.6-13)
98-MP2-103	Lighting and Communications in Containment Personnel Lock (5.2.7)

98-MP2-106	Control Element Assembly (CEA) Handling Tools, and Spent Fuel Pool (SFP) (9.8.2, 9.8.3)
98-MP2-109	Clarification of Foundation Bearing Pressures (2.7.5, 5.7.1)
98-MP2-112	Spent Fuel Pool (SFP) Makeup (5.4.3, 9.5.2)
98-MP2-115	Chemical and Volume Control System (14.4.6, T14.0.9-1, T14.4.6-1, T14.4.6-2, T14.4.6-3)
98-MP2-121	Reactor Coolant System (RCS) and Pressurizer, Components and Parameters (4.1, 4.3.3, 4.3.7, 4.3.8, 4.6.4, T4.3-4, T4.3-6, T4.4-1, T4.5-1)
98-MP2-122	New Fuel Transfer and Installation of New Control Element Assemblies (CEA) (9.8.3)
98-MP2-125	Service Water System (SWS) Strainer Cover Liner (T9.7-2)
98-MP2-128	Airborne Activity Sampling System for Containment, Spent Fuel and Radwaste Atmospheres (Appendix 11E)
98-MP2-136	High Pressure Safety Injection (T6.3-6)
98-MP2-137	Fuel Handling Ventilation System, and Control Room Air Condition System/ Failure Mode Analysis (T9.9-9, T9.9-11, T9.9-17)
98-MP2-141	Service Water System (SWS) Components (T9.7-2)

DCN Number	Title
DM2-00-0966-98	Operator Gear Change, Stem Thread Cut, and Power Cable Replacement for Motor Operated Valves (MOVs)

Description of Change

This design change supplements changes being implemented by DCR M2-96074 which is an ongoing effort to process to address MOV design. MOVs 2-FW-42A ,2-FW-42B, 2-FW-38A and 2-FW-38B, main feedwater block valves, limitorque motor actuators will be modified to change gear sets due to the Generic Letter 89-10 program. This is necessary to provide adequate thrust to meet closing and opening requirements. Electrical calculations prepared in conjunction with the gear change determined that voltage would be insufficient to power the MOVs under postulated accident conditions. To improve the voltage, power conductors are to be replaced with larger conductors.

Reason for Change

The GL 89-10 MOV Program requires that MOVs credited for safety functions have adequate voltage to provide proper torque and thrust for the MOVs under postulated accident conditions. The installation of larger power cables to the MOVs is one way of improving voltages so that motors operate appropriately. FSAR Table 8.7-1 specifically specifies the original cable vendors and cable materials to be used. This DCN and its related FSAR change add a note to Table 8.7-1 to allow use of other cable vendors and materials when they are qualified in accordance with the applicable characteristics, standards,and test and meet the required service conditions.

Safety Evaluation Summary

Valves, 2-FW-38A & B and 2-FW-42A & B, are normally open to provide for feedwater flow to the steam generators during plant operation. The valves are required to stroke close within 13 seconds (14 seconds for signal generation and valve stroke) after receiving a main steam isolation signal. Their safety function is to provide isolation to terminate feedwater flow to the steam generators following a main steam line break with off-site AC power available. The existing motors produce adequate torque for the modified MOVs under most conditions. However, at degraded voltage conditions, the voltage at the motor terminals may be inadequate. This DCN implemented a change to DCR M2-96074 to replace power cables with larger cables. The design changes do not affect existing accident scenarios or introduce any new accident possibilities. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

PTSCR Number	Title
2-17-97	Thermal and Hydraulic Design Basis Valves Operation Limits

Description of Change

The change modifies the reactor coolant system (RCS) pressure/temperature limits, heatup and cooldown limits, and the low temperature overpressure protection (LTOP) requirements.

Reason for Change

The change was made as a result of the new pressure/temperature and LTOP analyses performed.

Safety Evaluation Summary

RCS pressure/temperature curves were generated to replace the current Technical Specification curves. Associated with the new curves are new heatup and cooldown rates. The new rates, which are generally less restrictive, will provide greater flexibility during plant heatup and cooldown. Therefore, this change is safe and does not constitute an Unreviewed Safety Question.

IEE Number	Title
00214742	Waste Gas Compressor Diaphragm Material Change/Alternate

Description of Change

This change revises waste gas diaphram material description to indicate that TP 316 stainless steel as well as TP 301 are used.

Reason for Change

This change was made as the result of an evaluation conducted because replacement diaphragms are needed, and the vendor no longer makes the original 301 SS alloy, but instead makes a 316 SS alloy.

Safety Evaluation Summary

The diaphragms provide a pressure boundary for the safety related reactor building closed cooling water (RBCCW) cooling water that cools the waste gas compressors, thus the change in material must continue to provide this function. The change in material does not change the type of malfunctions, nor the probability of malfunction since the replacement material is similar to the original stainless steel material, and is identical in all other aspects. The consequences of a malfunction, such as a diaphragm failure are unchanged. There is no possibility of a malfunction of a different type than any previously evaluated in the SAR, since the material that was chosen is a proven corrosion resistant material chemically compatible with RBCCW, and with the use within the waste gas compressor. The accident that bounds the waste gas compressors failure is the waste gas decay tank rupture accident. The change in the diaphragm material does not increase the probability of occurrence of any accident evaluated in the SAR since there is no means of a diaphragm failure causing any accident, therefore the diaphragm material change causes no increase in the consequences of any accidents previously evaluated in the SAR. The diaphragm material change can not create the possibility of an accident of a different type than previously evaluated as the waste gas compressor does not serve any accident mitigation or any safety related function other than to maintain the cooling water integrity. The margin of safety is not reduced by this material change, since there is no relation between the waste gas compressors and Technical Specifications. Therefore, this change is safe and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
97-MP2-30	Shutdown Cooling (SDC) System, Plant Heatup, and Plant Cooldown

Description of Change

This change addresses how the reactor coolant system (RCS) temperature is increased during a normal plant heatup and decreased during a normal plant cooldown using the SDC system.

Reason for Change

The existing method of heating up and cooling down the plant has resulted in numerous instances of conflict with Technical Specification heatup and cooldown rate limits.

Safety Evaluation Summary

The changes require the operation of the reactor coolant pumps (RCP) at a pressure lower than previously allowed. This lower pressure operation has been evaluated and found to be acceptable. An increase in RCS pressure as a result of starting an RCP in a solid RCS with a higher steam generator temperature is less likely as a result of these changes. Concurrent RCP/ SDC operation results in concurrent cooldown of the steam generators and the rest of the RCS, minimizing the temperature difference that drives this transient. In addition, RCP starts with the pressurizer solid will be administratively precluded. The requirement to assure that the shutdown cooling system is sufficiently borated prior to initiation is replaced. The new requirement assures that the RCS has sufficient boron so that mixing with the SDC system, assuming it is filled with pure water, will assure that the minimum shutdown margin is maintained. Therefore, this change is safe and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
97-MP2-189	Containment Isolation System

Description of Change

The change consists of several parts that are all associated with Chapter 5 Section 5.2.8 Containment Isolation System and addresses Containment Penetrations, Containment Isolation Valves, Containment Local Leakage Rate Testing, and Containment Integrity. Tables 5.2-12 and 5.2-13, are revised to reflect the actual plant conditions based on the P&IDs, drawings and specifications. The parts being changed are:

Table 5.2-11, Containment Structure Isolation Valve Information
Table 5.2-12, Containment Penetration Piping
Table 5.2-13, Containment Isolation Valves
Figures 5.2-27 through 5.2-34 Isolation Valve Arrangements

Reason for Change

The change was made to ensure the FSAR conforms to established plant configuration and procedures.

Safety Evaluation Summary

This change modifies the normal valve position for approximately 89 valves from Closed to Locked Closed and adds reverse direction testing for specific valves. It also changes valve types from Gate valve to Globe valve. It adds notes on all sheets to clarify that all listed valves are not credited as containment isolation valves (CIVs), and refer to the Technical Requirements Manual for the CIVs. These tables (5.2-12 and 5.2-13) and figures (5.2-27 through 5.2-34) are revised to reflect the actual plant conditions based on P&IDs, drawings, and specifications. The changes include the revisions in material specifications, type of fittings, and line designation column information. Therefore, this change is safe and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-25	High Pressure Safety Injection (HPSI) Pump Temperature

Description of Change

This change revises the HPSI pumps temperature of pumped fluid in Table 6.3-2 from 40-300 °F to 35-300 °F.

Reason for Change

The change was made to ensure consistency between the descriptions in the FSAR and the Technical Specifications.

Safety Evaluation Summary

Technical Specification state the requirements for minimum reactor water storage tank temperature is 35 °F. The pump vendor verified that it is acceptable to operate the HPSI pumps with the pumped fluid within the temperature range given in the Technical Specification (35-300 °F) . The effect of the change on the ductility of the pump materials is minimal. Therefore, the change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-32	Loading Combinations and Primary Stress Limits for Reactor Coolant System (RCS)

Description of Change

The change revises FSAR Table 4.2-2 to accurately reflect the loading combinations and Code stress allowables used in the design of the RCS vessels and main coolant loop piping. Also, editorial changes were made to some symbols and subscripts.

Reason for Change

The preliminary design equations and stress limits from the PSAR were carried forward into the FSAR and had not been updated to reflect the final design. This change provides the final design information.

Safety Evaluation Summary

This change removes preliminary design methodology from Table 4.2-2 and replaces it with the loading combinations and Code stress allowables that were used for final design of the RCS components, information that is reported in the Code Design Reports. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-44	Shutdown Cooling (SDC) System Design Parameters

Description of Change

This change revises Table 9.3-2 information on the SDC startup to be approximately 3-1/2 hours after reactor shutdown or trip.

Reason for Change

The Combustion Engineering estimate of time after reactor shutdown to startup of SDC is 3-1/2 hours, however, Table 9.3-2 did not previously reflect this. Time for normal reactor cooling system (RCS) cooldown from Tave = 572° F to less than 300°F at a rate of 80° F/hour is approximately 3-1/2 hours.

Safety Evaluation Summary

The change revises the stated time for startup of the SDC and adds the qualifier, approximately. Time, per se, is not an important consideration during the startup; RCS temperature and pressure are the monitored parameters and are used to determine when to start SDC injection. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-51	Design Basis Codes Adhered To

Description of Change

The change revises Section 4.2.2 to add ASME Code Section III, Class 2 and 3 to the second sentence of the information under the ANSI B31 Code Cases.

Reason for Change

The deleted sentence was determined not applicable for Class 2 and 3 components made of austenitic stainless steel. The change to the second sentence identifies that the statement is made with regard to ASME Code Section III, Class 2 and 3 components.

Safety Evaluation Summary

The change is a clarification of the conservative allowable stress limits used for evaluation of Class 2 and 3 components under faulted conditions. The clarification does not change the allowables. The FSAR statement clarification does not affect the reliability of the plant nor in any way endanger the health and safety of the public. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-52	High Pressure Safety Injection and Low Pressure Safety Injection Valves

Description of Change

This change revises Section 4.3.7, which lists active pumps and valves outside of the reactor coolant pressure boundary to relocate the valve type to underneath the system identifier in the Component column.

Reason for Change

To ensure that the FSAR correctly reflects the as-analyzed and as-operated configuration of the plant.

Safety Evaluation Summary

The change corrects the description of the position of several safety related valves. The change is consistent with the as-operated and as-analyzed configuration of the plant. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-55	Containment Spray System (CSS)

Description of Change

This change updates the FSAR to reflect the results of a calculation that determined the minimum available net positive suction head (NPSH) for the CSS pumps in the sump recirculation mode.

Reason for Change

A previous calculation of NPSH available to the CSS pumps, after a sump recirculation actuation signal, was based on an assumed sump water temperature of 189° F at an ambient pressure of 14.7 psia. As a result, the difference between ambient pressure and vapor pressure of the sump water increased the NPSH by 13.4 feet. No previous reference for the assumption of 189° F water temperature had been provided. To address this a new calculation was performed.

Safety Evaluation Summary

Because the new calculation takes no credit for any differential between containment pressure and vapor pressure of the pumped fluid, it is much more conservative than the previous calculation. The resulting NPSH is considered to be the minimum available for the CSS pumps in the sump recirculation mode and still meets the NPSH for the CSS pumps. Therefore, the pumps will perform as designed, without cavitation, in all of the possible sump recirculation alignments. The new calculation verifies that the CSS pumps operation, if called upon. Therefore, the change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-58	Reactor Coolant Pumps (RCPs)/Instrumentation

Description of Change

The changes are to FSAR Section 4.3.3, RCPs, however, additional issues which require correction or clarification were noted in the review and are addressed in the FSARCR.

Five intent changes were identified:
1) page 4.3-6, the method of attachment of the pump impeller,
2) page 4.3-7, description of RCP material,
3) page 4.3-8, the addition of the modifier "rated" to describe speed and voltage,
4) page 4.3-9, heat treatment of the original flywheels,
5) page 4.3-11, the description of the flywheel material, heat treatment and test results in the replacement reactor coolant pump motors.

Additional changes were made for editorial content, clarification and/or amplification.

Reason for Change

This change is to resolve issues that were identified during a review of the licensing and design bases of the RCPs. The change ensures that the information contained in the FSAR correctly reflects the current plant configuration and to add clarifications where necessary.

Safety Evaluation Summary

The change in description of the method of attachment of the impeller to the shaft is a more accurate description of the as-installed original configuration. The change in the description of the RCP austenitic stainless steel components revises the text to be consistent with the data presented in FSAR Table 4.3-4. The addition of the word "rated" to describe the voltage and speed was added to improve the clarity of the statement. The correction of the tempering data in the original flywheels results in a more exacting description. Updating the description of the manufacturing controls, the heat treatment information, and the addition of the material properties data for the flywheels in the replacement RCP motors demonstrate that the flywheels are able to perform their intended function. Therefore, this change is safe and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-63	Design Criteria Outside Containment and Expanded Spectrum of Tornado Missiles

Description of Change

This change:

1) Revises a formula for striking velocity of a missile at water surface within Attachment A of Appendix 5D to be consistent with the reference to BC-TOP-9 cited in Appendix 5D.

2) Changes the presentation of the Ammann & Whitney formulas for thickness of spalling within Appendix 5D and adds the name of the consulting engineers firm that prepared the report on the formulas.

3) Changes a load factor associated with tornado loads in load combination equation 4 of the at factored load combinations of Section 5.2.3.2.5 for containment design.

Reason for Change

The change resulted from information gathered during FSAR verification effort, and updates the FSAR to reflect that information.

Safety Evaluation Summary

The revised formula for determination of striking velocity of a missile at water surface was previously used in the process of evaluating impactive energy effects on fuel racks during the original plant design and in a later evaluation. This change also updates the FSAR to appropriately document the load factor in the FSAR since the licensing basis was clarified in the response to NRC Question 4.13 to the PSAR, is stated in Appendix 5B of the FSAR, and the appropriate load factors for normal wind and tornado loads have been used in a calculation for the containment design. The impact of this change requires appropriate evaluation of concrete for spalling due to the tornado missile impact in accordance with the licensing basis referenced. The revised formula for determination of spalling has been used to evaluate concrete walls in tornado missile protection Calculation 97-ENG-01947C2, Revision 00. The Calculation shows that there is no spalling. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-74	Reactor Coolant System Components

Description of Change

The change revises Appendix 4A, including tables and figures, to accurately reflect the design basis seismic analysis methods, analysis results, and specified design basis loads for reactor coolant system components.

Reason for Change

The change was initiated to address inconsistencies between FSAR Appendix 4A information and design documentation upon which the information is based and reconciles the FSAR with the design basis seismic analyses documentation and with the reactor coolant system component design specifications.

Safety Evaluation Summary

This change corrects discrepancies and reconciles the seismic analysis method descriptions, calculated responses, and reactor coolant system component design loads presented in Appendix 4A of the FSAR with the design calculations and specifications upon which they are based. This reconciliation has no impact on the facility design, compliance with design criteria acceptance limits, or on the conclusions presented in Appendix 4A. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-76	Foundation Elevations for the Condensate Storage and Condensate Surge Tanks

Description of Change

This change to FSAR Section 2.7.5 updates the information for foundation elevations for the condensate storage and condensate surge tanks to be consistent with the as-built foundation design drawing.

Reason for Change

Correct foundation elevations in the information summary table was changed from 9 feet to 11 feet to agree with the bottom elevations of the foundations as shown on as-built design drawings.

Safety Evaluation Summary

The change to the bottom elevations of the foundations of the condensate storage and condensate surge tanks is based on the design drawing and foundation sizing calculations. There is no change to the operation of plant systems since the elevations of the tanks is unchanged. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-78	Reactor Water Storage Tank (RWST) Water Temperature

Description of Change

The descriptions of the RWST water temperature in FSAR Sections 6.2.3 and 6.2.4 were changed to reflect the mode dependency of the allowable temperature as permitted by the Technical Specifications (TS) of the Operating License. TS 3/4.1.2.7, 3/4.1.2.8, and 3/4.5.4 limit the lower temperature to 50°F in Modes 1 and 2, and 35°F in Modes 3 through 6. The TS are consistent with the accident analyses.

Reason for Change

The change to the FSAR provides consistency with the accident analyses and the TS.

Safety Evaluation Summary

The change will make the FSAR consistent with the values previously reviewed as part of the TS. In addition, the inputs to the accident analyses were reviewed. RWST minimum water temperature is used only in the large break loss of coolant accident (LOCA) and the main steam line break (MSLB) analyses. The change to the FSAR is consistant with the values used in the accident analyses for LOCA and MSLB. Therefore, the change is safe and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-85	Spent Fuel Pool Storage

Description of Change

This change updates the description of storage restrictions in the spent fuel pool. The text of FSAR Section 9.8.2 was changed to clarify the storage limits with respect to the thermal loads on the spent fuel pool cooling system.

Reason for Change

The FSAR required updating to correct several discrepancies with the Technical Specifications with respect to allowable spent fuel pool storage capacity.

Safety Evaluation Summary

The change clarifies the relationship between the usable storage locations and the storage limit due to spent fuel pool cooling. The change does not affect the licensed storage capacity. It is consistent with the bases of the Technical Specifications as described in the Safety Evaluation Reports. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-93	Condensate Storage Tank (CST) Tornado Missile Protection

Description of Change

This change to FSAR sections 5.2, 5.7.3 and 10.4.5 provides additional detail to be consistent with structural related information pertaining to the protection of the CST for tornado effects.

Reason for Change

A determination was made during the ongoing FSAR verification effort that certain information related to the protection of the CST contained in various FSAR sections required clarification.

Safety Evaluation Summary

The protection of the CST from tornado missiles and the ability of the CST to provide sufficient water to the auxiliary feedwater system to support safe shutdown of the plant as required by the Technical Specifications is not affected. Previously evaluated malfunctions and accidents and their consequences are unchanged and malfunctions or accidents of a different type have not been created. Therefore, this change is safe and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-94	Enclosure Building Filtration System (EBFS)

Description of Change

This change to FSAR Section 6.7 updates the information to reflect that the functional requirements of the EBFS are to collect and process potential containment leakage, and to minimize environmental activity levels resulting from all sources of containment leakage following a fuel accident in the spent fuel area which results in a release of radioactivity or a loss of coolant accident (LOCA).

Reason for Change

During the ongoing FSAR verification effort certain information concerning the EBFS was identified as requiring correction, clarification, and amplification.

Safety Evaluation Summary

The information within the FSAR which is affected by the changes of the subject FSARCR regards:

- System/operational description and details of the EBFS
- EBFS functional capability
- EBFS performance and failure mode analyses details and results
- EBFS testing details

The functional requirements of the EBFS are to collect and process potential containment leakage following a LOCA, and to minimize environmental activity levels resulting from all sources of containment leakage following a fuel accident in the spent fuel area which results in a release of radioactivity. Implementation of the FSAR changes associated with the system/operational description and details of the EBFS, EBFS functional capability, and performance and failure mode details and results, is considered a change of the information presented in the FSAR, but do not impact the capability of the EBFS to meet its design basis. The FSAR changes do provide additional and revised information, however changing the information presented in the FSAR does not impact the results of the system safety capability and performance. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-97	Fuel Transfer Tube Connecting Refueling Pool and Fuel Transfer Canal

Description of Change

This FSAR change revises the description in Sections 9.8.2 and 9.8.3 of actions concerning the fuel transfer tube's connections with the fuel transfer canal and the refueling pool inside containment.

Reason for Change

During the ongoing FSAR verification effort is was determined that inconsistencies between approved procedures, Technical Specifications and FSAR, existed. This change was initiated to address and resolve those inconsistencies.

Safety Evaluation Summary

The FSAR changes are consistent with approved procedures which are consistent with corresponding Technical Specification requirements concerning the following topics: (a) water inventories in the spent fuel pool, transfer canal, and refueling pool (b) reactivity control in the spent fuel pool, transfer canal, and refueling pool, (c) ventilation systems in the auxiliary building and containment, and (d) the movement of loads either in, above, or within the vicinity of the spent fuel pool. The FSAR changes do not change the content of these Technical Specifications and procedures. Additionally, the FSAR changes do not change the controls on the content of these same Technical Specifications and procedures. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-100	Containment and Containment Penetrations

Description of Change

This change to FSAR section 5.2.7 ensures consistency between the FSAR , Station Procedures and Technical Specification (TS) Section 6.19 regarding the test pressures for the Personnel Airlock and Equipment Hatch door gaskets.

Reason for Change

During the ongoing FSAR verification effort, it was identified that certain information in FSAR Section 5.2.7 regarding personnel airlock and equipment hatch door gasket test pressures was not consistent with station procedures and TS Section 6.19.

Safety Evaluation Summary

This FSAR change is consistent with the TS requirements and approved plant procedures and conforms to the requirements of 10CFR50 Appendix J Option B. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-101	Engineered Safety Features Actuation System (ESFAS), Bistable Trip Bypass

Description of Change

This change to FSAR Section 7.3.3 bypass key description for ESFAS clarifies that the information does not apply to both the auxiliary feedwater automatic initiation system (AFAIS) and engineered safeguards actuation system (ESAS) sub-systems of the ESFAS by modifying the existing ESAS description and adding information for the AFAIS.

Reason for Change

During the ongoing FSAR verification effort, it was identified that certain information regarding the bypass key description for the ESAS could be misunderstood to also apply to the AFAIS. This change resolved that concern to accurately distinguish between the ESAS and the AFAIS bypass key configurations.

Safety Evaluation Summary

The FSAR change adds to and modifies FSAR Section 7.3.3, to accurately distinguish between the ESAS and the AFAIS bypass key configurations. The change reflects the existing plant design and does not modify the Technical Specifications. There is no increase in the probability of occurrence of previously evaluated accidents or malfunctions of equipment important to safety nor does it increase the consequences of previously evaluated accidents or malfunctions of equipment important to safety. There is no increase in the possibility of an accident or malfunction of a different type than previously evaluated, nor is there a decrease in the margin of safety. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-102	Fracture Toughness Requirements for the Reactor Coolant Pressure Boundary

Description of Change

FSAR Appendix 1A, Criterion 31 and FSAR Sections 4.5.1, 4.5.1.1, 4.5.1.2 and 4.5.1.4 are revised to provide the current regulatory commitments and practices regarding prevention of brittle fracture. A new Reference 4.5-2 is added. Sections 4.6.2 and 4.6.3, and Tables 4.6-1, 4.6-2, 4.6-4, 4.6-12 and 4.6-13 are updated to reflect current practice and the evaluation results of surveillance capsule W-104.

Reason for Change

These changes address the fracture toughness requirements associated with the reactor coolant pressure boundary, encompassing the original materials testing and the current practice for achieving regulatory compliance and for providing safe operating pressure and temperature limits. The current Technical Specifications (TS) provide operational limits in the form of heatup and cooldown rates and associated reactor coolant system pressure/temperature limits in TS Section 3/4.4.9. These limits have been developed to satisfy regulatory requirements of 10 CFR 50, Appendix G and were updated by Amendment 170 to incorporate the results of surveillance capsule W-104 evaluation.

Safety Evaluation Summary

Adjusted reference temperatures (ART) for the reactor vessel beltline materials are presented based upon the most current information. The proposed changes to FSAR Sections 4.5 and 4.6 address current regulatory requirements and related commitments and practices to achieve regulatory compliance. The current requirements, commitments and practices exhibit the results of knowledge gained by regulatory and utility personnel through 25 years of operating experience. The measured current values and predicted end of life values of ART resulting from evaluations of irradiated surveillance capsules, W-97 and W-104, indicate far less degradation of fracture toughness than was initially predicted. Therefore, this change is safe and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-103	Lighting and Communications in Containment Personnel Lock

Description of Change

FSAR Section 5.2.7 is changed to reflect that lighting and the communication system, provided in the interior of the containment personnel lock, operate from external power supplies but not external emergency power supplies.

Reason for Change

During the ongoing FSAR verification effort, it was identified that certain information in FSAR Section 5.2.7 regarding emergency lighting and communication system, operating from an external emergency supply, was not consistent with the information regarding lighting and the communication system in FSAR sections 8.4 and 7.8, respectively. In these sections, lighting and the communication system in the containment personnel lock are not identified as required for emergency conditions or receiving emergency power.

Safety Evaluation Summary

The containment personnel lock provides a route to enter and exit the containment. It is not a normally occupied area and is not required to be occupied to operate or control plant systems. Therefore, there is no need to provide emergency lighting or a communication system, in the interior of the containment personnel lock, operating from emergency sources to mitigate the consequences of an accident or to achieve safe shutdown. In addition, hand held lights are provided at the containment lock entrance for emergency use should containment access be required when normal lighting is unavailable. The change will make the wording in FSAR section 5.2.7 consistent with the design of the plant as it existed at the time of original licensing (and currently exists) as described in FSAR sections 8.4 and 7.8 which contain the descriptions of the lighting and the communication system, respectively. Therefore, this change is safe and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-106	Control Element Assembly (CEA) Handling Tools, and Spent Fuel Pool (SFP)

Description of Change

This change to FSAR Sections 9.8.2 and 9.8.3., is made to more accurately describe the transfer of CEAs in the refueling pool using a handling tool and the auxiliary hoist of the refueling machine, and in the SFP using a handling tool and the SFP platform crane, and to note that the SFP platform crane is used to transfer CEAs in the spent fuel storage racks in the SFP.

Reason for Change

During the ongoing FSAR verification effort it was identified that the text of FSAR Sections 9.8.2 and 9.8.3 should be revised for consistency, and to agree with approved operating procedure OP 2303C.

Safety Evaluation Summary

The FSAR changes are consistent with Technical Specification requirements and approved plant procedures. The FSAR changes have been reviewed with respect to reactivity issues, CEA handling malfunctions and fuel handling accidents and are safe. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-109	Clarification of Foundation Bearing Pressures

Description of Change

This change revised FSAR Section 2.7.5 and 5.7.1 to more accurately define a column heading, to clarify that pressure values are foundation static contact pressures for settlement which represent conservative estimates of long term static loadings, and to clarify soil bearing pressures applicable to the sizing of the concrete foundations for the condensate storage tank (CST) and the refueling water storage tank (RWST). Values representing design allowable soil bearing pressures for underlying supporting materials for the CST and RWST are also included.

Reason for Change

The changes are being made to ensure understanding of the relationship between the plant site geotechnical information regarding foundation bearing pressures presented in FSAR Chapter 2 and the information pertaining to the design of plant structures in FSAR Chapter 5.

Safety Evaluation Summary

This FSAR change provides clarifications associated with the interaction between the plant structures and the plant site subsurface. There is no change in subsurface characteristics, allowable bearing capacity of the subsurface or loads imposed on the subsurface by plant structures. The interaction between the subsurface and plant structures is therefore unaffected. As a result, there will be no change in the ability of plant systems, structures, or components to perform their designed functions. There is no change in the probability or consequences of previously evaluated malfunction or accidents; the possibility of malfunctions or accidents of a different type is not created; and the margin of safety as defined in the basis of any technical specifications is not reduced. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-112	Spent Fuel Pool (SFP) Makeup

Description of Change

This change to FSAR Sections 5.4.3 and 9.5.2 revises SFP makeup information to more accurately reflect the current plant configuration, and identify that the refueling water purification (PU) system may be used to provide SFP makeup water from the refueling water storage tank (RWST), to identify SFP makeup may be provided an auxiliary feedwater (AFW) pump taking suction from the condensate storage tank, to remove the term maximum in regards to the fire protection system (FPS) flow rate identified in this section, and to clarify the wording associated with makeup from the RWST.

Reason for Change

During the ongoing FSAR verification effort, it was identified that various descriptions in sections 5.4.3 and 9.5.2 were in need of correction, clarification, or amplification to more accurately reflect the current plant conditions, to eliminate possible misinterpretation or to ensure no conflict of information between the sections.

Safety Evaluation Summary

One of the functions performed by the PU, PMW, FP, AFW, low pressure safety injection, and SFP cooling and purification systems is to provide an adequate SFP makeup when required. Implementation of these changes alters information presented in the FSAR regarding SFP makeup but does not preclude these systems from performing this function. Additionally, due to the administrative nature of the subject change, its implementation has no effect on malfunctions/accidents previously evaluated and could not create malfunctions/accidents of a different type than previously evaluated. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-115	Chemical and Volume Control System

Description of Change

This change to Section 14.4.6, and Tables 14.0.9-1 and 14.4.6-3 updates the FSAR information to reflect the current analysis assumptions for the maximum dilution rate and the shutdown cooling flow measurement uncertainty which have changed, and the boron dilution event described in the FSAR Section 14.4.6 which has been reanalyzed by Siemens. The reanalysis results show that the conclusions of the FSAR Section 14.4.6 remain valid. The FSAR change reflects the new analysis. The changes proposed in the FSAR Section 14.4.6 include change in the description of the analysis, change in the result of the analysis, and wording changes for clarification to be more consistent with the Siemens' analysis report. Editorial changes are also included for the FSAR change. The change in the Table 14.0.9-1 is an editorial change only.

Reason for Change

As a result of the reanalysis performed by Siemens for the boron dilution event and the revised engineering calculation for the low pressure safety injection flow loop accuracy, the description of the analysis and the analysis result in FSAR Section 14.4.6 required updating, as well as certain editorial changes.

Safety Evaluation Summary

Revised analysis and evaluation have been performed for the boron dilution event described in the FSAR Section 14.4.6 to incorporate the revised charging flow rate of 49 gpm per pump and the shutdown cooling flow measurement uncertainty. The results show that the conclusion of Section 14.4.6 is unchanged. The analysis results show that there is no complete loss of shutdown margin for at least 15 minutes for Modes 1 through 5 and 30 minutes in Mode 6. For all operating modes, there is adequate time for the operator to manually terminate the source of dilution flow. The FSAR change reflects the revised description of the analysis and the reanalysis results. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-121	Reactor Coolant System (RCS) and Pressurizer, Components and Parameters

Description of Change

This change updates the descriptions of the reactor coolant pump (RCP) instrumentation in FSAR Section 4.3.8. It adds a new subsection to describe the use of thermocouples in the RCS high-point vent piping to detect leakage past the vent manifolds. It also updates and clarifies information in Tables 4.3-6, 4.4-1 and 4.5-1.

Reason for Change

During the ongoing FSAR verification it was identified that certain information in section 4.3.8, 4.6.4, and Table 4.3-6 required correction, clarification, or amplification to more accurately reflect the current plant conditions.

Safety Evaluation Summary

The changes, in general, describe additional instrumentation or more reliable instrumentation than the existing descriptions. Therefore, the operator is provided with additional information on the condition of the RCPs. Additionally, the changes are primarily realignment of tabulated data, clarifications regarding clad materials and corrections of typographical errors. The tabulated number of pressurizer instrument nozzles is increased by one, and the pressurizer surge nozzle schedule is corrected from 120 to 160 to agree with the installed configuration. All other changes do not modify the plant structures or operating procedures. The change also adds a subsection to FSAR Section 4.3.8.1 to describe the use of thermocouples installed downstream of the reactor coolant gas vent system valves to detect leakage past the valves. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-122	New Fuel Transfer and Installation of New Control Element Assemblies (CEA)

Description of Change

This FSAR change to Section 9.8.3 updates the descriptions of the storage location of new fuel assemblies and the location of the installation of a new CEA into a new fuel assembly.

Reason for Change

The changes to FSAR text are made to make the FSAR consistent with (a) the approved operating procedures for the inspection and installation of new CEAs and (b) the approved operating procedures for the handling and storage of new fuel. These procedures are consistent with Technical Specifications concerning: (a) new fuel storage, (b) reactivity control in the spent fuel pool and fuel transfer canal, and (c) restrictions on the movement of loads over irradiated fuel in the spent fuel pool.

Safety Evaluation Summary

The operations processes that correspond to the changes in the FSAR are consistent with Technical Specification requirements concerning (a) new fuel storage, (b) reactivity control in the spent fuel pool, (c) water inventory control in the spent fuel pool, (d) the control of radiological releases from the spent fuel pool and fuel handling areas in the auxiliary building, (e) restrictions on the movement of loads over irradiated fuel in the spent fuel pool, and (f) the testing of CEAs. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-125	Service Water System (SWS) Strainer Cover Liner

Description of Change

This change to Table 9.2-7 addresses the use of elastomeric rubber (eg. , polyvinyl chloride PVC) for the SWS strainer covers

Reason for Change

The strainer covers were originally coated with carbomastic epoxy and later coated with PVC. During the ongoing FSAR verification effort it was identified that although the FSAR described the strainer body coating as nofoul rubber, it required revision to describe the cover coating, which were coated with nofoul rubber.

Safety Evaluation Summary

Utilizing elastomeric rubber for the strainer covers is safe since the covers are upstream of the strainer septums and coating failure will be effectively removed by the strainer or strainer maintenance. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-128	Airborne Activity Sampling System For Containment, Spent Fuel and Radwaste Atmospheres

Description of Change

This change to FSAR Appendix 11E revises the description of the analysis of particulate and iodine air samples to agree with current, approved station procedures, relocates the supplemental air sample location based on work activities rather than specifying the crane bridge, and makes some typographical and editorial changes.

Reason for Change

During the ongoing FSAR verification effort, it was determined that the analysis method described in the FSAR required updating to reflect that only those samples showing greater than 100 cpm by screening count are counted in the lab, per the current procedure.

Safety Evaluation Summary

These changes update information for particulate and iodine air samples, to reflect current reviewed and approved procedures. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-136	High Pressure Safety Injection

Description of Change

This change to FSAR Table 6.3-6 updates information regarding injection mode and recirculation mode to more accurately reflect current plant conditions and to clarify information to ensure no misinterpretation.

Reason for Change

During the ongoing FSAR verificaiton effort it was determined that certain information in FSAR Table 6.3-6, required correction, or clarification to ensure consistency with the current plant conditions and with other portions of the FSAR.

Safety Evaluation Summary

Due to the nature of the subject changes (i.e., change information in the FSAR, but not affect systems design, configuration, or operation), implementation of these changes does not initiate an accident previously evaluated and identified in the FSAR. More specifically, implementation of the subject changes does not initiate, or impact the radiological consequences of, a loss of coolant accident, or any of the other accidents identified in the FSAR. Additionally, the subject does not initiate an accident of a different type than addressed in the FSAR. Implementation of these changes would also not create the possibility of a malfunction of equipment important to safety, not affect the consequences of such a malfunction, and not affect any bases identified in the Technical Specifications. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-137	Fuel Handling Ventilation System, and Control Room Air Condition System/Failure Mode Analysis

Description of Change

These changes to FSAR Tables 9.9-9, 9.9-11, and 9.9-17 update information to include the major subcomponents such as cooling/heating coils, motors, compressors, and filters. The changes consist in removing non-essential information and adding some parameters that were missing. The design inputs are those that support the ultimate equipment performance criteria, such as the fan air flow capacity (cfm), and the cooling/heating capacity (Btu/hr).The FSAR information being changed include the design data for the respective fans and related components (motor, compressor, cooling/heating coils, and filters).

Reason for Change

During the ongoing FSAR verification effort it was identified that discrepancies exist in these FSAR Tables, which conflict with parameters described in the related subsection of Section 9.9. The revisions consist of providing the current information as well as having only pertinent information in the FSAR tables, while the non-essential information is available in the original equipment specifications, purchase orders, design drawings, or other retrievable QA documents.

Safety Evaluation Summary

The changes to FSAR Tables 9.9-9, and 9.9-11 removed information considered non-essential or non-critical, lower tier design inputs. The information/data that relates to parameters required to meet safety functions for the system are left or added in the affected FSAR tables. The change to Table 9.9-17 consists of replacing the attribute Permanently CLOSED to Permanently OPEN. The damper was permanently opened as the result of an earlier reviewed, approved and implemented design change. This FSAR change reflects the current approved plant condition. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.

FSARCR Number	Title
98-MP2-141	Service Water System (SWS) Components

Description of Change

This change to FSAR Table 9.7-2 updates the information regarding applicable material specifications and compositions associated with SWS piping.

Reason for Change

During the ongoing FSAR verification effort it was identified that the FSAR required updating to more accurately indicate the ASME specification and composition, and include all specifications and compositions associated with copper-nickel (CUNI) SWS piping.

Safety Evaluation Summary

Due to the nature of the changes (i.e., change information in the FSAR, but not affect equipment or operation), implementation of these changes does not initiate an accident previously evaluated and identified in the FSAR. More specifically, implementation of these changes does not initiate or impact the radiological consequences of a loss of coolant accident, or another of the accidents identified in the FSAR. Additionally, implementation of these changes does not initiate an accident of a different type than addressed in the FSAR, nor create the possibility of a malfunction of equipment important to safety, not affect the consequences of such a malfunction, and not affect the bases identified in the Technical Specifications associated with the SW System. Therefore, this change is safe, and does not constitute an Unreviewed Safety Question.