FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT 3
DOCKET NO. 50-302/LICENSE NO. DPR-72

ATTACHMENT B

FINAL SAFETY ANALYSIS REPORT REVISION 26

FSAR Safety Evaluation Summaries, 10 CFR 50.59(b)(2)

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SA/USQD Number: 98-0025, Revision 1 **FSAR Change(s):** None

SA/USQD Title: MAR96-11-02-01, FCN 5; MAR96-11-02-02 High Pressure Injection to Reactor Building Sump and High Pressure Injection Recirculation Electrical

Description

These modifications provide recirculation capability to the high pressure injection (HPI) pumps during piggyback operation, by providing a recirculation line to the reactor building sump. All the water collected in the sump will be available when the low pressure injection (LPI) and building spray (BS) pump suctions are switched from the borated water storage tank (BWST). Flow initiation is controlled by four normally de-energized solenoid valves (SOVs). The SOVs are only required to open during a small break LOCA when the existing recirculation line to the Makeup Tank is unavailable. Operation of the new recirculation line is controlled by Emergency Operating Procedures (EOPs).

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The modification meets the design, material and construction standards applicable to the HPI/makeup system, and does not affect the integrity of the fuel or the Reactor Coolant System (RCS). Although the change adds piping to the HPI system, it is not within the RCS boundary. Because the new recirculation line is not within the RC pressure boundary, and because, except for testing and certain small break LOCA accidents, the new recirculation line is closed and its controls are isolated from other plant equipment, this change cannot initiate any of the accidents previously evaluated in the SAR. Therefore, addition of the planned line cannot increase the probability of occurrence of any accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   HPI's ability to inject water into the RCS is not altered by this modification. The installation of the recirculation line ensures the system can continuously supply water for leak rates which fall below the minimum flow requirements of the pump. With this change in place, the assumptions in the SAR accident analyses will remain valid and the dose consequences of all accidents will remain the same. Therefore, this activity does not increase the consequences of an accident evaluated previously in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The line meets single failure criteria and allows a flow path to be established or isolated with an assumed single failure. Therefore, HPI delivers its assumed flow even with an assumed failure of the recirculation line. Providing minimum flow capabilities cannot increase the probability of a malfunction of the HPI pumps due to low flow. The new circuits do not have any interaction with existing electrical systems other than the requirement for power, supplied from the DC distribution panels and main control board lighting circuits. There is redundancy and separation in the electrical system to prevent an increase in the probability of malfunction of existing equipment. The containment isolation boundary moves to new valves located inside and outside the reactor building (RB). Inboard isolation is provided by a check valve. The net positive suction head (NPSH) requirements of the building spray and decay heat pumps are met and the probability of a malfunction of the pumps is not increased.

Changes made by this modification do affect the containment boundary, the HPI system, RB sump, and the 125 VDC and 120 VAC systems; however, these changes do not increase the probability of occurrence of a malfunction of equipment important to safety evaluated previously in the SAR. All of the changes being made to the containment boundary, HPI, electrical systems, and RB sump will maintain the design and basis of these systems.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Arrangement of the recirculation line maintains redundancy of the HPI system. Placing the recirculation line in service will allow the HPI system to operate when leak rates drop below the minimum required to protect the pump. Electrical separation, and maintaining the solenoid valves de-energized during normal operation, avoids direct effects on electrical system operation. Containment isolation integrity is maintained by the valve arrangement used to protect penetration 353. During an accident, RB sump level is unchanged by this modification. Even with the changes incorporated by this modification, the system performances assumed in the SAR accident evaluations are unchanged. Because system performance is unchanged, the consequences of malfunctions previously evaluated will also remain unchanged. Therefore, the proposed activity does not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Changes to the containment boundary are similar to current configurations and do not introduce any new type of isolation or boundary feature. The effects on the BWST and RB sump, due to the design changes, are negligible. The depletion rate of the BWST and the discharge of fluid into the sump are bounded by the design basis accident. There are

no credible failures of the recirculation line which affect the reactor coolant boundary, reactivity systems, or HPI capabilities that are not bounded by accidents evaluated in SAR Chapter 14. Therefore, no new credible accidents of a different type are created as a result of the implementation of this modification.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The HPI recirculation line is designed to meet single failure criteria. Failure of one valve does not prevent a flow path from being established through the line. Manual valves in the flow path are locked open to prevent operation. For the check valve in the recirculation line, single failure does not apply.

The new recirculation line is isolated at all times except during periodic testing and certain small break LOCAs. Electrical and mechanical components used in the new recirculation line are equivalent to those in the balance of the system. Therefore, the planned change cannot create the possibility of a malfunction of equipment important to safety of a different type than previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Providing a recirculation flow path for the HPI pumps is not discussed in the basis of any technical specification. For HPI to perform its function, the system must be able to deliver sufficient water over a range of leak sizes. This modification ensures that a recirculation flow path can be established during emergency core cooling system (ECCS) piggy-back operation or if a single failure of the existing recirculation line occurs.

Two redundant, 100% capacity HPI trains are provided for core cooling after an accident. This design change does not affect the redundant capability of the system. The HPI recirculation line is designed to meet single failure criteria. Failure of one valve will not prevent a flow path from being established through the line. Manual valves in the flow path will be locked open to prevent operation.

Because installation and use of the makeup recirculation line cannot affect the HPI system response following an accident, post-accident HPI system response will remain as assumed in the SAR accident analyses and no margin of safety in the basis for any ITS is reduced.

SA/USQD Number: 98-0097, Revision 1 **FSAR Change(s):** None

SA/USQD Title: Deficiency Report for PC97-8499; MAR98-08-04-01
Vital Bus Regulating Transformer Operability Analysis

Description

Deficiency Report (DR) 97-8499 addresses operation of 120 VAC Vital Bus Regulating Transformers VBTR-4A, B, C, D below the nominal power factor. During maintenance on Vital Bus Dual Input Inverter VBIT-1C, VBTR-4C was providing power to the 120 VAC Vital Power System. Engineered Safeguards equipment fed from Vital Bus Distribution Panels VBDP-5 and VBDP-9 were powered from VBTR-4C. During maintenance on VBIT-1C, VBTR-4C exhibited output voltage oscillations outside the specified range (i.e., ± 2%). Precursor Card (PC) 97-8499 and DR97-8499 have been generated to address the VBTR-4C operating anomaly and to determine the extent of condition and operability of the 120 VAC Vital Power System.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Failure of the 120 VAC Vital Bus Regulating Transformers VBTR-4A, B, C, D due to its derating from 30 kVA at 0.90 power factor to 20 kVA at 0.54 power factor is not a precursor or initiating event for any accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The 120 VAC Vital Power System provides Class 1E 120 VAC power to essential electrical power, control and instrumentation loads. The system is designed to satisfy the Single Failure Criteria of IEEE 279 and IEEE 308 (as per the CR-3 Topical Design Basis Document for Single Failure Criteria) by incorporating two electrically and physically independent, redundant trains of Class 1E power into the 120 VAC Vital Power System. The analyses and conclusions presented in the DR have no effect on any accidents per SAR Section 14. The ability of the 120 VAC Vital Power System to respond to any Design Basis Event as described in the SAR is not affected by the derating of VBTR-4A, B, C, D. Channel redundancy and independence are maintained such that the availability of the 120 VAC Vital Power System (and associated ES loads) is not affected by the troubleshooting and maintenance activities and/or analyses and conclusions of the DR.

   Further, the DR has no effect on the capability of the 120 VAC vital bus system to withstand any single failure; derating VBTR-4A, B, C, D has no adverse effect on the 120 VAC vital bus system's ability to perform its Class 1E function. Challenges to the capabilities and capacities of VBTR-4A, B, C and D subsequent to a Design Basis Event

are reduced as proven by measurements of 120 VAC bus loading and power factor during SP-417A & B testing. These measurements show that 120 VAC vital bus kVA load decreases and load power factor increases during actuation of ECCS systems thus presenting less of a challenge to the capacities and capabilities of Regulating Transformers VBTR-4A, B, C, D. Therefore, the ability of the 120 VAC Vital Power System to mitigate the consequences of a Design Basis Event is not altered and the severity of those consequences is not increased with the analyses and conclusions of the DR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The 120 VAC Vital Power System is classified for Class 1E service. Section 8.2.2.7 of the CR-3 SAR discusses the 120 VAC Vital Power System and its purpose to provide reliable UPS-backed power for essential electrical loads.

The maintenance and troubleshooting activities associated with the DR have assured operability of VBTR-4C through replacement of degraded control cards and transformer safety, functional, and output tests. These tests include dielectric withstand tests to assure no stray current paths are present and to assure the adequacy ground insulation as well as output voltage and current measurements to assure transformer operation within specification. Based on results of these tests and the results of measurements made during the performance of SP-417A & B, VBTR-4A, B, C, D transformers kVA rating and power factor were reduced from 30 kVA at 0.90 power factor to 20 kVA at 0.54 power factor. Derating VBTR-4A, B, C, D does not add any actual load or change existing load power factors, therefore no actual increased challenge to the Regulating Transformers demonstrated capacity and reliability is created by this DR. Thus, the capability and reliability of VBTR-4A, B, C, D to perform their Class 1E function is maintained and the analyses and conclusions of the DR have no adverse effect on the capability and reliability of the 120 VAC Vital Power System to provide power to essential electrical loads. Therefore, establishment of a derated operating specification of 20 kVA and 0.54 power factor for VBTR-4A, B, C, D does not increase the probability of occurrence of any malfunction of equipment associated with the 120 VAC Vital Power System or any other equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

CR-3 FSAR Chapter 14 includes discussion of various accidents for which essential loads are required to respond (e.g., Engineered Safeguards and ECCS). Of these loads, 120 VAC powered equipment are fed from the 120 VAC Vital Bus Power System. The 120 VAC Vital Power System has been designed to satisfy the Single Failure Criteria of IEEE 279 and IEEE 308 (per the CR-3 Single Failure Criteria Topical Design Basis Document) and incorporates electrical and physical separation and channel independence and redundancy in its design. The derating of VBTR-4A, B, C, D and the troubleshooting and maintenance activities associated with this DR have no adverse effect on the Class 1E design of the 120 VAC Vital Bus Power System. Since these activities do not change the

performance of the 120 VAC Vital Bus Power System in mitigating the consequences of an accident, the activities, analyses, and conclusions associated with the DR do not increase the consequences of a malfunction of equipment important to safety previously evaluated in the FSAR.

5. Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR? No

Any single failure of the 120 VAC Vital Bus Power System is not an initiating event for any challenge to a fission product barrier. As a Class 1E system, the 120 VAC Vital Bus Power System has been designed to withstand any single failure without degrading its ability to provide its Nuclear Safety Related function to power essential loads during normal plant operation or subsequent to a Design Basis Event. The activities, analyses, and conclusions associated with the DR do not change the overall operation, performance, or single failure withstand capabilities of the 120 VAC Vital Bus Power System. System response to any initiating event evaluated in the SAR is not changed and no new accident scenarios are created with the activities addressed in this analysis. Therefore, the replacement of the AC Line Regulator control boards, maintenance and test activities, analyses and conclusions included in the DR cannot create the possibility of an accident of a different type than previously evaluated in the SAR.

6. Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR? No

The activities associated with the DR do not introduce any new or different failure modes than previously evaluated in the SAR for VBTR-4A, B, C, D or any other component or aspect of the 120 VAC Vital Power System. The maintenance activities performed on VBTR-4C (i.e., replacement of AC Line Regulator integrated circuit control boards, correction of lead wire terminations, and tightening of terminations) have been performed to assure continued operation of the transformer. The analyses and conclusions of DR97-8499 demonstrate the functional acceptability of VBTR-4A, B, C, D to be de-rated from 30 kVA at 0.90 power factor to 20 kVA at 0.54 power factor without adversely affecting its demonstrated ability to power essential loads during normal operation, or subsequent to a Design Basis Event.

The analysis and conclusions of the DR have no effect on the availability of any ES equipment, as demonstrated by analysis of the 120 VAC Vital Power System with regard to single failure withstand capabilities, channel separation, independence and redundancy. No aspect of DR97-8499 (including the derating of VBTR-4A, B, C, D) has any effect on the availability or performance of any ES System or components. Thus, the analysis and conclusions of the DR do not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

The worst case scenario created by the DR for reduction in margin of safety as defined in the ITS Bases, is the concurrent failure of both Regulating Transformers on a single train while supplying load to their respective 120 VAC vital buses during a battery charging evolution. Operation at a condition more challenging than this (e.g.; Regulating Transformers on separate redundant trains used to supply 120 VAC power to their respective vital buses at the same time) is not allowed by ITS LCO 3.8.7 restrictions. Failure of both Regulating Transformers on the same train, at the same time while supplying load, would create an inoperable AC vital bus subsystem (train) [Reference ITS Bases Section B 3.8.9 Background for definition of subsystem (train)]. This condition is addressed by ITS LCO 3.8.9 Action B. This scenario and the resultant impact on plant safety are discussed in ITS Bases Section B 3.8.9 Actions B.1. This DR does not alter this discussion in any manner. Therefore, the DR does not reduce the margin of safety as defined in the bases for any Improved Technical Specification.

SA/USQD Number: 98-0108, Revision 3 **FSAR Change(s):** None

SA/USQD Title: MAR95-06-01-01, FCN 1
Installation of Clam-Trol (Spectrus CT1300) Injection Equipment

Description

MAR95-06-01-01 installs equipment necessary to support Spectrus CT1300 (Clam-Trol) chemical injection into the Raw Water (RW) System. This SA/USQD is to support the equipment installation and allow for the receipt/storage of the chemicals onsite only.

Implementation of the chemical injection for which the equipment provided by MAR95-06-01-01 is being installed will reduce the growth rate of shellfish in the RW intake and thus reduce the potential for impaired heat exchanger performance due to tube sheet blockage.

Spectrus CT1300 is a chemical treatment process injected into Seawater at specific concentrations to kill various shellfish such as mussels, barnacles and mollusks. The intention of this system will be to inject Spectrus CT1300 into the Raw Water System Intake on established frequencies, as required, to reduce and control the cumulative growth rate of the shellfish which grow in the Raw Water System Intake.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The scope of MAR95-06-01-01 is for equipment installation and the initial storage of chemicals as required to support the Chemical Injection System only. This equipment will not be placed in operation until the approval of the injection procedure and its supporting SA/USQD.

   Operation, performance, or failure of any systems which could be affected by the installation of this equipment is not a precursor or initiating event for any accident evaluated in the SAR. Therefore, implementation of MAR95-06-01-01 does not increase the probability of occurrence of any accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   FSAR Section 9.5.1 does imply that systems reliant upon the Raw Water Intake are required to mitigate the consequences of an accident previously evaluated in the SAR. The scope of MAR95-06-01-01 is for equipment installation and the initial storage of chemicals as required to support the Chemical Injection System only. This equipment will not be placed in operation until the approval of the injection procedure and its supporting SA/USQD. There are no failure modes associated with the installation of this equipment or the storage of the associated chemicals that could affect the operability of the Raw

Water Intake.

Installation of this equipment cannot increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The scope of MAR95-06-01-01 is for equipment installation and the initial storage of chemicals as required to support the Chemical Injection System only. This equipment will not be placed in operation until the approval of the injection procedure and its supporting SA/USQD. There are no failure modes associated with the installation of this equipment or the storage of the associated chemicals that could increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR. Thus, the implementation of MAR95-06-01-01 cannot increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Since the implementation of MAR95-06-01-01 is for equipment installation only, it cannot change the performance of any system important to safety involved in mitigating the consequences of an accident. Thus, the implementation of MAR95-06-01-01 cannot increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

As the equipment installed by MAR95-06-01-01 will not be placed in operation, failure of this equipment cannot be a precursor or initiating event for any challenge to a fission product barrier. Therefore, implementation of MAR95-06-01-01 cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The activities associated with the chemical injection will be addressed in the SA/USQD issued to support the procedure controlling the actual injection activities.

The storage of chemicals onsite will be controlled consistent with the vendor Material Safety Data Sheets (MSDS) by existing plant programs and procedures. The failure modes associated with the installation of the equipment necessary to support this chemical injection due to chemical spills or natural phenomena cannot create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

The scope of MAR95-06-01-01 is for equipment installation and the initial storage of chemicals as required to support the Chemical Injection System only. This equipment will not be placed in operation until the approval of the injection procedure and its supporting SA/USQD.

Therefore, any margin of safety, as defined in the basis for any Improved Technical Specification cannot be reduced as a result of the implementation of MAR95-06-01-01.

SA/USQD Number: 98-0208, Revision 6 **FSAR Change(s):** None

SA/USQD Title: PC97-8080
Administrative Ultimate Heat Sink Limit

Description

During a design basis accident, under certain postulated conditions, the Nuclear Services Closed Cycle Cooling Water Service Water Heat Exchangers (SWHEs) and Decay Heat Closed Cycle Heat Exchangers (DCHEs) are limited in the amount of heat they can transfer from the SW and DC systems to the Gulf of Mexico, Crystal River's ultimate heat sink (UHS). This is a concern when the Improved Technical Specification (ITS) UHS limit of 95°F is used in the SWHE and DCHE performance evaluations. At this temperature, the design basis post-accident heat load can challenge the design limits of the SW and DC systems.

This SA/USQD supports the Condition Resolution (CR) for PC97-8080, which administratively limits the UHS temperature to 93.9°F, as well as the required procedure changes. The new administrative limit on UHS temperature precludes SW temperatures from exceeding 104°F at 50 minutes post-LOCA. To operate at this elevated temperature, the pre-rotation vanes on the Control Complex Chiller must be manually controlled until the condenser pressure stabilizes. This is only an interim corrective action while evaluating the Control Complex Chiller's ability to operate at higher service water temperatures.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The UHS and Control Complex Chillers are not accident initiators. Neither a change to the ultimate heat sink temperature limit, nor starting the Chiller, with the prerotation vanes operated in manual, can initiate an accident. Therefore, the probability of occurrence of an evaluated accident cannot be increased.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The bounding accident is the Loss of Coolant Accident. The UHS must be capable of removing sufficient heat from the SW system to prevent it from exceeding 104°F fifty minutes into the accident, and to prevent the DC system from exceeding its design bases temperature of 115°F.

   The Condition Resolution (CR) will administratively reduce the maximum ITS UHS temperature limit to a level where the SW system will not exceed 104°F at 50 minutes post-LOCA and the DC system will not exceed its design temperature of 115°F. At this temperature, the Control Complex Chillers, with the prerotation vanes in Manual, are

capable of operating and will maintain room temperatures below design levels. The DC system will be limited to a UHS of 92°F, but this can be increased up to 95°F with increased cleaning of the heat exchangers. By not preventing a system, structure or component from performing its safety function during a LOCA, the reduction in UHS temperature will not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The ability of the SW system to provide cooling water to equipment important to safety will be maintained by the reduction in the maximum ITS UHS temperature limit by the CR. Operating at UHS temperatures that are at or below the administrative limit will ensure SW temperatures will not exceed a limit of 104°F fifty minutes into the accident and will prevent the DC system from exceeding its design bases temperature of 115°F.

The reduction in the UHS limit does not require the DC system to be changed. It will operate as described in the SAR. Without a change to equipment or the method of operation, there is no increased probability of a malfunction of equipment important to safety.

FSAR Section 9.7.2.1.g.1 states: "All equipment of this system [Chillers] is manually started from the control room and/or from stations local to the equipment." In the SER for License Amendment No. 163, the starting of a Control Complex Chiller is recognized as a manually initiated function. In either case, no auto-functions of the Chillers are assumed.

Operation of the prerotation vanes in Manual will ensure the probability of a malfunction of the Control Complex Chiller is not increased. This, in turn, ensures equipment important to safety that is cooled by the Chiller will function as designed. If any of the manual steps already identified in EOP-14, Enclosure 18, "Control Complex Chiller Startup," are not performed, or are performed incorrectly, the Chiller may not operate. Incorrect operation of the prerotation vanes is no different. The operator control is being used to prevent the prerotation vanes from opening too quickly on a Chiller start, if SW temperatures are greater than 102°F. The rate at which the prerotation vanes can open is limited by the speed of the motor. At a minimum, with the vanes in automatic, it takes approximately 90 seconds for the vanes to go from full closed to full open. In the first three minutes (2x the minimum 90 second vane opening time) of a Chiller start, the operator will leave the vanes in their closed position. This ensures the unit stabilizes and the hot gas bypass is available by allowing its interlock to time-out in the event surging were to occur.

The EOP steps also limit the rate at which the prerotation vanes stroke open. With the prerotation vanes in automatic, the Chiller would immediately try to pick up load by opening the vanes at the maximum rate upon start. The three minute wait also allows the Chiller to start and stabilize before picking up additional load. Then, when the operator

starts picking up additional load, it is done in small incremental steps by jogging the prerotation vanes open while closely monitoring the condenser pressure for rate of change. Each of these actions prevents the prerotation vanes from opening as fast as they could if the prerotation vanes were in automatic, and it minimizes the rate of increase in condenser pressure by limiting the rate of load addition. This restriction on loading rate provides better control of condenser pressure, minimizing the necessity for the protective logic to actuate.

The protective logic is not bypassed when the prerotation vanes are in manual. When condenser pressure reaches 14.3 psig, the prerotation vanes cannot be opened any further. If pressure reaches 14.6 psig, the prerotation vanes will automatically start to close until the pressure is at or below 14.3 psig. These settings, if reached, serve to protect the unit from tripping if load is accumulated too fast. If pressure reaches 15 psig, then the Chiller will trip. The Chiller is still protected by the protective logic and the probability associated with the failure to perform any step correctly is the same for all of the Chiller EOP actions. York International has concluded that this is an acceptable method for starting the Chillers at SW temperatures greater than 102°F and up to 104°F.

Administratively limiting the UHS temperature to 93.9°F ensures the SW and DC systems will not exceed their design limits. Starting the Control Complex Chiller with the prerotation vanes in manual, provides added assurance that the machine will start and run during an accident. When starting the Chiller, the 3 minute delay time, plus the jogging open of the prerotation vanes, provides enough time for the machine to be loaded slowly and achieve stabilization at conditions below the protective features. If, by some chance, condenser pressure was to raise to rapidly, the protective features of the machine would help prevent the pressure from reaching the trip setpoint. Therefore, the change in the manual operating instruction in the EOP will not result in an increase in the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

By reducing the maximum allowable UHS temperature operating limit, the service water heat exchangers and DCHEs are capable of removing more heat from the Service Water and DC systems. As long as the heat removal rate prevents SW and DC temperatures from exceeding their design limits and reduces the SW temperature below 104°F 50 minutes post-LOCA, then the equipment cooled by SW and DC will be capable of performing their design functions.

The starting of the Control Complex Chillers is recognized as a manually initiated function, and placing the prerotation vanes in manual has no impact on chiller operability. The operator control is being used to prevent the prerotation vanes from opening too quickly on a Chiller start if SW temperatures are greater than 102°F. Consequences of a malfunction of the Chiller due to manual operation has already been accounted for, and starting the Chiller with the prerotation vanes in manual is already bounded by those

consequences.

The consequences of a malfunction of equipment important to safety has been evaluated at a UHS temperature of 95°F, with a service water temperature of 110°F and a DC temperature of 115°F. Operating at a reduced UHS temperature provides added heat removal capability and prevents the SW temperature from increasing above 104°F fifty minutes into a LOCA and the DC system from exceeding 115°F, while accommodating a reasonable degree of heat exchanger debris blockage. Consequences of a malfunction of equipment important to safety are bounded by the 110°F and 115°F and, since these are not being changed, there is no increase in those consequences.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This administrative ITS UHS temperature limit prevents the thermal overloading of the SW and DC systems in order to preserve the operability of equipment cooled by these systems. Additionally, the SW, DC and RW systems support the engineered safeguards (ES) equipment designed to mitigate an accident. These components cooled by SW, DC and RW cannot create challenges to fluid system boundaries or fission product barriers. The ES electrical busses and the Emergency Diesel Generator are not affected by this administrative change or testing. All containment design conditions are met with this change.

The starting of the Control Complex Chillers is recognized as a manually initiated function, and placing the prerotation vanes in manual has no impact on chiller operability. The operator control is being used to prevent the prerotation vanes from opening too quickly on a Chiller start if SW temperatures are greater than 102°F. This ensures equipment important to safety that is cooled by the Chiller will function as designed and no challenges to fluid system boundaries or fission product barriers created.

Therefore, this administrative temperature change, and starting of the Control Complex Chillers with the prerotation vanes in manual, cannot create the possibility of an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The CR will administratively limit the UHS temperature to 93.9°F, requiring some procedure changes. These changes will not prevent the Chiller, SW or DC systems from performing their design functions. There are no physical changes to systems, structures, or components (SSCs). The procedure changes associated with the administrative limit will not prevent the SSCs from performing their design function. Therefore, the administrative temperature change cannot create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

The starting of the Control Complex Chillers is recognized as a manually initiated function, and placing the prerotation vanes in manual has no impact on chiller operability.

The operator control is being used to prevent the prerotation vanes from opening too quickly on a Chiller start if SW temperatures are greater than 102°F. A malfunction of the Chiller due to manual operation has already been accounted for, and starting the Chiller with the prerotation vanes in manual is already bounded. Therefore, starting the Chiller with the prerotation vanes in manual does not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

A maximum UHS temperature limit, per ITS Bases 3.7.11, is specified to ensure that adequate heat removal capacity is available during normal and emergency modes of operation. There may not be sufficient heat removal capacity to reduce the SW temperature to 104°F or less 50 minutes into a LOCA to support Control Complex Chiller operation. To prevent this from occurring, an administrative temperature limit is placed on the ITS UHS temperature limit. Limiting operation to a lower UHS temperature increases the heat removal capacity of the RW system. By increasing the RW system's heat removal capability, all of the structures, systems and components requiring SW and DC, are able to perform as designed. The starting of the Control Complex Chillers is recognized as a manually initiated function and placing the prerotation vanes in manual has no impact on Chiller operability. As long as all the SSCs perform as expected, then all accident assumptions are maintained and there are no changes to the margin of safety provided by these SSCs. Therefore, the margin of safety is not reduced by administratively reducing the ITS UHS temperature limit.

SA/USQD Number: 98-0297, Revision 0 **FSAR Change(s):** Figure 9-2

SA/USQD Title: MAR97-12-03-01; FSAR Change 1999-0046
Installation of Panametrics Flow Instrument

Description

This MAR will remove the temporary Panametrics system installed by temporary MAR(TMAR) 97-10-09-01 and install a permanent Panametrics flow and will establish an upper limit on this flow. The TMAR established the flow requirement of 36 gpm.

The flow instrument provides local indication to measure the minimum normal MU supply flow during normal operation (Modes 1, 2, 3 and 4). MU-24-FI in the Control Room provides makeup (MU) flow indication, but the accuracies are limiting for the lower ranges. MU bypass flow is controlled by MUV-30 and is referred to as minimum bypass flow around MUV-31. MU-24-FI will remain in place and will continue to be used for normal MU flow indication.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   An accident initiator of a small break (SB) LOCA is the condition of thermal cycling of the High Pressure Injection (HPI)/Makeup (MU) nozzle area. Severe and continuous thermal cycling of the HPI nozzle area could result in a crack or break in the HPI/MU nozzle area. This would be a SBLOCA. This modification will not create a condition that would cause more thermal cycles to the HPI/MU nozzle than would occur without the MAR. Therefore, this activity will not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The HPI system is required to mitigate accidents with radiological consequences as identified above. This modification will not change the ability of the HPI system to perform its safety function. The 36 gpm maximum bypass limit is ensured by setting MUV-30 and maintaining it in that position until the HPI system is called on to perform its safety function. Therefore, the proposed activity will not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The equipment important to safety is the HPI piping at the location of the ultrasonic detectors and the HPI/MU nozzle area. The installation of the ultrasonic transducers in the HPI piping has been seismically analyzed and determined to not cause a malfunction

preventing the HPI system from performing its safety function. Thermal cycling of the HPI nozzle area will not be increased by this MAR, therefore a malfunction of that portion of the piping is not created by this MAR.

As such, the proposed activity will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The HPI system is required to mitigate accidents with radiological consequences as identified previously. This modification will not change the ability of the HPI system to perform its safety function.

The equipment important to safety is the HPI piping at the location of the ultrasonic detectors and the HPI/MU nozzle area. The installation of the ultrasonic transducers in the HPI piping has been seismically analyzed and determined to not cause a malfunction preventing the HPI system from performing its safety function. Thermal cycling of the HPI nozzle area will not be increased by this MAR, therefore a malfunction of that portion of the piping is not created by this MAR.

As such, the proposed activity will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

A break at the HPI nozzle area is analyzed in the SAR as a SBLOCA. This modification only affects that accident as an accident initiator. This modification will not create any new accident initiators. Therefore, the proposed activity does not create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The modification is only associated with the HPI system. Malfunctions of the HPI system (piping breaks) were considered in the safety analysis, as mentioned above. There are no other SSCs affected by this modification. The modification will not affect any other portion of the HPI system. Therefore, the proposed activity does not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The margin of safety that is to be considered here is the excess HPI flow above the minimum required amount to mitigate certain accidents. The HPI hydraulic calculations

that were performed as input to the SBLOCA analysis which established Peak Clad Temperature, account for MUV-30 being throttled to a position equal to 36 gpm during normal operation. As long as MUV-30 is maintained in that position at the start of the accident mitigation process, the HPI system will be able to deliver its required flows within the expected margin. Therefore, the proposed activity does not reduce the margin of safety as defined in the bases for any Improved Technical Specification.

SA/USQD Number: 98-0343, Revision 0 **FSAR Change(s):** Figure 9-7

SA/USQD Title: PC98-3368; PC98-2705; DCN98-0144; FSAR Change 1998-0144 Downgrade of Raw Water Sump Standpipe

Description

This activity will downgrade the Raw Water (RW) standpipe used for atmospheric venting of the RW sump from ISI Code Class 3 to ISI Code Class 4. The pipe will remain safety related, assuring appropriate quality repairs in the future, but will be exempt from ASME Section XI rules. This activity will also justify an Interim Use-As-Is of the standpipe, with the patches identified under PC98-2705 and PC98-3368. The justification provides assurance that the patches should not fail under worst case postulated conditions. If failure of the patches should occur, there are systems in place which will mitigate the effects of any leaks.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Neither the RW system, nor the subject standpipe, initiate any FSAR Chapter 14 accidents. Therefore, there cannot be an increased probability of occurrence of accidents evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The standpipe is an atmospheric vent line and is normally void with the possibility of having sea water present during a Probable Maximum Hurricane (PMH). This standpipe is in no way connected to the RCS or located near equipment/piping that can be a source for dose consequences. Therefore, this activity cannot create any new mechanisms that would lead to an increase in consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The only failure evaluated in the SAR for the RW system is the failure of expansion joints (FSAR Section 9.5.2.1.6). There is no interface between the subject standpipes and the expansion joints. Therefore, this activity cannot increase the probability of equipment failure previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The SAR does not evaluate any RW equipment malfunctions that cause dose consequences.

Therefore, this activity cannot increase the consequences previously evaluated.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

It is not expected that the standpipe will fail under worst case postulated conditions. If there is a failure of the patches and the station was under a PMH condition, there is an existing mechanism (area sump pumps SDP-2A/2B) in place which will mitigate the consequences of leakage precluding safety related equipment in the seawater room from being compromised. Additionally, a repair to this type of service pipe can be easily made in the event of a leak. Therefore, this activity cannot increase consequences of equipment failures of accidents previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

A different type of equipment malfunction would be damage due to flooding. If there is a failure of the patches and the station was under a PMH condition, area sump pumps (SDP-2A/2B) will mitigate the consequences of leakage precluding safety related equipment in the Sea Water room being compromised. Additionally, a repair to this type of service pipe can be easily made in the event of a leak. Therefore, a new type of equipment malfunction is not possible by this proposed activity.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS Bases does not address the requirements of the standpipe. Therefore, there is no safety margin associated with the standpipe that can be reduced.

SA/USQD Number: 98-0347, Revision 1 **FSAR Change(s):** None

SA/USQD Title: MAR97-10-11-01, FCN 1; PC97-7115; PC97-7134
MCC Motor Circuit Protector Trip Setpoints Evaluations

Description

This activity evaluates the trip setpoints of motor circuit protectors for safety related equipment at CR-3. Various parameters, such as postulated high voltage conditions, motor circuit protector (MCP) trip setpoint error range, maintenance and testing equipment (M&TE) error, variation in full load current, etc., are accounted for. Calculations are performed to determine the appropriate trip setpoints, and a Modification package is issued to change the setpoints in the field. Minor drawing corrections are made to document field conditions.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

The circuit breaker's probability of failure to open when operated or automatically tripped, or failure to close when operated, has not been increased by increasing the circuit breaker trip setting. However, the probability of the circuit breaker failing due to spuriously tripping has been decreased since the purpose of increasing the circuit breaker trip settings is to ensure the equipment supplied by the circuit breakers is available to perform their function. The circuit breaker's possible failure modes are unchanged for the different modes of concern (normal operation, accident conditions and post accident conditions). The circuit breaker's safety function is to provide power to safety related loads and a circuit breaker failure is not an accident initiator. Therefore, the MAR does not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The revised design criteria will ensure circuit breakers do not trip when motorized equipment is started by adding additional conservatism to the calculated minimum circuit breaker trip setting. The new design criteria provides for the worst case timing of the circuit breaker closure (voltage equal zero) and a starting power factor of approximately 15%, which equates to a DC offset allowance of 1.3. The revised design criteria will provide for a circuit breaker trip setting tolerance of 25% and a motor nominal locked rotor tolerance of 10%. Coordination of the trip settings between the upstream circuit breakers (short time trip settings) and the branch circuit's circuit breakers with increased instantaneous trip settings is maintained and ensures that the increased trip setting does not cause the loss of other equipment due to the upstream circuit breaker tripping for a fault at the branch circuit level. The increased circuit breaker trip setting ensures spurious tripping does not occur which would cause equipment to be unavailable for accident

mitigation. Therefore, the increased circuit breaker trip settings will ensure that equipment required for accident mitigation is not jeopardized and there are no increases in the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The MAR increases circuit breaker trip settings to ensure against unexpected circuit breaker trips, replaces circuit breakers to obtain different trip ranges and increase its reliability but does not change any existing system interfaces. The purpose of the circuit breaker's automatic trip is to isolate the circuit for an electrical fault, prevent the supply bus from being impacted by the fault and limit equipment damage. Since the replacement equipment (circuit breakers) does not increase the probability of the equipment failure (similar equipment to that being replaced and of common use in the plant), or cause a loss of coordination between the branch circuit's circuit breaker and the upstream circuit breaker, the replacement equipment does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

The increases to the trip settings ensure the circuit breaker does not cause equipment to be unavailable for conditions other than an electrical fault, and for an electrical fault the equipment is already unavailable. Therefore, the only malfunction the circuit breaker could cause is to not isolate the MCC bus from an electrical fault and cause the upstream circuit breaker to perform the electrical fault isolation. Low impedance fault currents will be isolated rapidly at even the highest trip settings and credible high impedance electrical faults, which are below the threshold of the branch circuit's circuit breaker trip setting, will continue to be isolated by the motor's overloads or the fault will escalate into a low impedance fault that trips the branch circuit's circuit breaker. Since increased circuit breaker trip settings will prevent equipment from malfunctioning due to an unexpected circuit breaker trip and not decrease the probability of the circuit breaker to isolate a faulted circuit, the increase in circuit breaker trip settings does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR. The tolerances used in deriving the new trip setting criteria in this MAR add confidence that the spurious tripping due to starting current will not occur, while still providing adequate circuit protection under normal and extreme plant conditions. These tolerances will be further validated by the testing performed by the MAR. The smallest circuit breaker's margin to the upstream feeder breaker is 35% for AHF-18B. This breaker is warranted to be within ±20% at its new trip setting and will not require testing. Any Westinghouse circuit breakers which are not at their highest or lowest trip setting will be tested to verify their trip settings.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The MAR does not change the function of the circuit breakers or the single failure criteria to which the safety related system is designed. The MAR does provide additional conservatism in the circuit breaker's trip setting to ensure a common mode event such as

overvoltage will not defeat the single failure design criteria. If a circuit breaker fails to isolate a circuit fault (a second failure), then the upstream circuit breaker will isolate the supply bus from the fault and the redundant safety related electrical bus will continue to supply the redundant equipment trains which are important to safety. If a circuit breaker trips (fails open), the redundant safety related equipment is available as designed to the single failure criteria. Therefore, the proposed activity will not cause an increase in the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The MAR does not create any new failure modes for the electrical system or change the function of the circuit breakers. The circuit breaker trip settings are increased to ensure the circuit breaker trips only for a circuit fault and not when the equipment is started. The circuit breaker replacements provide a trip range which will allow a setting that will ensure the equipment ratings are properly coordinated and do not introduce a new failure mode. Therefore, the increased circuit breaker settings, along with the circuit breaker replacements, will not introduce the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This MAR does not introduce any new fluid, electrical, control or instrument interfaces nor does it increase operator burden or introduce any new failure modes. The function and operation of the replacement circuit breakers have not been changed. The circuit breakers with revised trip settings and the replacement circuit breakers will continue to isolate the ES bus from faulted equipment, limit damage to the faulted equipment and allow normal operation of the load supplied by the circuit breaker. All of the circuit breakers of this MAR will have their load functionally tested to demonstrate operability after the trip setting is changed. Therefore, the limited testing and the existing test program, along with the trip adjustment mechanism's inherently reliable design, will validate the circuit breaker trip settings without 100% trip setting testing. Also, the circuit breakers do not presently have a tripping problem and the increase in the trip setting will only ensure additional conservatism for the circuit breaker's safety function of providing reliable power to safety related equipment. Therefore, the increase in circuit breaker trip settings and the subsequent circuit breaker replacement do not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Additional conservatism in the circuit breaker trip settings bounds the worst case normal operating conditions and continues to isolate circuit faults from the 1E distribution system. Selective coordination is maintained between the branch circuit's circuit breakers and the

upstream feeder circuit breakers. Credible high impedance electrical faults which are below the threshold of the branch circuit's circuit breaker trip setting will continue to be isolated by the motor's overloads, or the fault will escalate into a low impedance fault that trips the branch circuit's circuit breaker. Therefore, the margin of safety is not reduced as defined in the bases for any Improved Technical Specification, since the increased circuit breaker trip settings will ensure equipment is available to mitigate an accident and no new failure modes are introduced.

SA/USQD Number: 98-0348, Revision 0 **FSAR Change(s):** Appendix 14B; Appendix 14C

SA/USQD Title: PC97-8609; PC97-8632 (CA Step 21); PC98-0171; PC98-0197; PC98-0620; FSAR Change 1998-0104 Complete Rewrite Of FSAR Appendix 14B; Deletion of Appendix 14C

Description

FPC has reevaluated hydrogen generation and purge operations following a Maximum Hypothetical Accident (MHA), which is the Large Break Loss of Coolant Accident (LBLOCA) at CR-3. These new analyses were performed with proper consideration of post-LOCA containment temperature, with updated aluminum and galvanized surface inventories, with more realistic corrosion rates, and with bounding Effective Full Power Days (730 EFPD) and core thermal power level (2595 MW_t [102%]) input.

Numerous tables and figures have been deleted, replaced or updated to reflect the reanalyses for the proposed FSAR Appendix 14B update. FSAR Appendix 14C will be deleted in its entirety with adoption of the proposed changes to Appendix 14B because the relevant information has been included in the proposed new Appendix 14B text.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   All aspects of the FSAR Chapter 14 LOCA analyses are unchanged by the proposed activity. Outcomes of the existing LBLOCA analyses are inputs to the new hydrogen purge analyses, but the new hydrogen purge analyses have no means to affect the existing MHA analyses in FSAR Chapter 14.

   The proposed changes to FSAR Appendix 14B do not require or relate to any physical changes to the plant. The proposed changes are a change to the design and licensing bases of hydrogen purge operations, but the design and operation of the hydrogen purge equipment is unchanged. No credible failure modes can be attributed to the proposed changes. Therefore, the changes to FSAR Appendix 14B do not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The present FSAR low population zone (LPZ) doses due to continuous purge following the MHA are reflected as 17 mRem thyroid and 13 mRem whole body. The reanalysis for the proposed FSAR Appendix 14B changes calculate worst case doses due to continuous purge as 360 mRem thyroid and 19 mRem to the whole body. Even when combined with the design basis LPZ dose identified in FSAR Section 14.2.2.5.10, the reanalyzed values

are substantially less than 25 Rem to the whole body and 300 Rem to the thyroid, as mandated by 10 CFR 100.11. Similar analyses have been reviewed and approved by the NRC using these limits.

The dose consequences of purging were previously calculated to be much less than 1% of the acceptance limits in 10 CFR 100.11. The thyroid dose, using the revised assumptions and methods, changes the most and yet is conservatively estimated to remain less than 0.5% of the limit. While the relative change (17 to 360 mRem) appears substantial, the erosion of available margin is insignificant and well within the limits in 10 CFR 100.11. Further, the revised calculation presumes (and the increased dose results principally from) premature purging to provide a conservative upper bound of the dose. FPC's emergency response personnel would balance conservative hydrogen control with off-site dose management based on actual indications, trend, meteorology, etc. Thus, the actual dose will be directly managed by emergency response personnel and will likely be much lower than the conservative bounding calculation. The higher calculated, as well as any actual, change is considered negligible with regard to the intent and purpose of 10 CFR 50.59.

While not the basis for this evaluation, it is worth noting that planned changes to 10 CFR 50.59 and associated guidance would clearly consider such changes to not warrant prior NRC review and approval.

Additionally, the dose to the control room operator and the mission dose to perform the required purge have been reanalyzed to these revised hydrogen purge assumptions. All doses remain within NUREG-0737 acceptance criteria.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed changes to the FSAR Appendix 14B text is a wholesale rewrite of the Appendix necessitated by reanalyses of hydrogen purge operations. The method of purging is unchanged. The proposed FSAR text will not result in any modification to Plant equipment. No new failure modes may be attributed to this activity. Therefore, a malfunction of equipment important to safety previously evaluated in the SAR is not credible.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This activity does not result in any physical change to the Plant. Although dose to the public is increased as a result of the reanalyses of purging operations, this increase is due to necessary changes in input parameters to more accurately model the Plant's purging operations, and not due to a component malfunction. The reanalyses supporting the changes to FSAR Appendix 14B cannot create new failure modes. Therefore, an increase in the consequences of a malfunction of equipment important to safety previously evaluated in the SAR is not feasible.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Purging of the Reactor Building is an activity which follows a LOCA at a prescribed time. Therefore, it is not credible to consider an accident during purging operations. The method of purge will not be changed. The changes to FSAR Appendix 14B text have no means to create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The reanalyses of hydrogen purge operations result in a change to the design and licensing bases of the Plant. The proposed changes to FSAR Appendix 14B text resulting from these reanalyses do not require physical change to the Plant. No new failure modes are created by this activity. Therefore, there is no possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The conservatism inherent in the new analysis result in considerable design margin for hydrogen purge operations following a LOCA. The Improved Technical Specifications (ITS) do not provide detail to the level of the subject analyses results. The ITS establishes the minimum performance requirements of some Post-Accident Venting System components; the proposed changes to FSAR Appendix 14B will in no way prevent the components from satisfying ITS requirements. Margins of safety that might be found in other documents, such as the referenced Safety Evaluation Reports (SERs), implied commitments to the Standard Review Plan (SRP), Offsite Dose Calculation Manual (ODCM), Core Operating Limits Report (COLR), Design Basis Documents, etc., will not be reduced as a result of this activity. Therefore, the margin of safety as defined in the bases for any Improved Technical Specification will not be reduced by the implementation of the proposed changes.

SA/USQD Number: 98-0351, Revision 0 **FSAR Change(s):** None

SA/USQD Title: PC98-2260
Power Down CR-1 and CR-2 Local Sulfur Dioxide Monitors

Description

The proposed activity is to power down and not maintain the local sulfur dioxide monitors at the empty tank at CR-1 and CR-2. This amounts to turning off the power switch which, in effect, disables the normally open relay contacts from providing alarms or trips to CR-3.

A toxic gas release is a Licensing Basis accident. Emptying of the CR-1 and CR-2 sulfur dioxide tank eliminates one potential source for this accident. In fact, a leak from the CR-1 and CR-2 tank at 750 feet from the Control Complex intake was the worst case event for a sulfur dioxide release. The proposed activity powers down the detectors and stops testing and maintaining them. The monitors do not have new failure modes powered down then they have in a powered-up state.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The probability of a toxic gas release is not affected by the local monitors. The possibility of a toxic gas release at an empty tank is zero. Powering down and not maintaining (i.e., not calibrating or not testing) the monitors will not increase the probability of occurrence of an accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The consequences of a toxic gas release without the local monitors has been analyzed and found acceptable in NUREG-0737, Item III.D.3.4, Control Room Habitability Evaluation Report, dated June 30, 1987. Since the tank is empty, the consequences are eliminated.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   NUREG-0737, Item III.D.3.4 (Control Room Habitability Evaluation Report, dated June 30, 1987) showed that the local monitors were not important to safety and that, without them, the limit of 40 ppm would not be exceeded in the Control Room 2 minutes after detection. The probability of a sulfur dioxide release is reduced to zero by emptying the tank. The toxic gas system interconnects with only the AH-XK, VB and DP systems. Other automatic signals are in parallel with the relays from CR-1 and CR-2 to place the Control Complex into recirculation, and these will still perform their intended safety function with the CR-1 and CR-2 monitors powered down. The DP and VB systems are

protected by their standard breaker and fuse coordination. Powering down the monitors will lessen the chance of them impacting the VB and DP systems.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

NUREG-0737, Item III.D.3.4 (Control Room Habitability Evaluation Report, dated June 30, 1987) showed that the local monitors were not important to safety and that the limit of 40 ppm would not be exceeded in the Control Room two minutes after detection by the CR-3 intake duct monitors. The consequences are zero if the tank is empty.

The toxic gas system interconnects with only the AH-XK, VB and DP systems. Other automatic signals are in parallel with the relays from CR-1 and CR-2 to place the Control Complex into recirculation, and these will still perform their intended safety function with CR-1 and CR-2 monitors powered down. The DP and VB systems are protected by their standard breaker and fuse coordination. Powering down the monitors will lesson the chance of their impacting the VB and DP systems.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Powering down and not maintaining the local monitors will not cause a new type of accident. The monitors have normally open contacts that place the CR-3 Control Complex into recirculation. When the unit is powered down, the contact will remain open and will not place the CR-3 Control Complex into recirculation. The cable and wiring configuration approved by the modification installing the monitors will not be changed.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The local toxic gas monitors cannot cause a new type of malfunction. The monitors are powered down and will not pick up the relay to place the Control Complex into recirculation. The cable and wiring configuration approved by the modification which installed the monitors will not be changed. There are no new failure modes with these detectors powered down than there would be if they were powered up.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The basis of ITS 3.7.12 CREVs mentions that an Engineered Safeguards signal and a toxic gas signal will also place the Control Complex into recirculation. This refers to the interlock from the intake duct provided by the CR-3 monitors. Eliminating local monitoring of the empty storage tank at CR-1 and CR-2 cannot reduce safety margins.

SA/USQD Number: 98-0361, Revision 1 **FSAR Change(s):** None

SA/USQD Title: Temporary MAR98-06-05-01; Temporary MAR99-00-00-06
Temporary Bearing Flush Water Supply To CWP-1C Or CWP-1D

Description

A temporary Demineralized Water (DW) connection is being installed on the pump bearing flush water supply line of Circulating Water Pump CWP-1C or CWP-1D. The purpose of this connection is to be able to use Demineralized Water, which is at a higher pressure than Domestic Water, for bearing flush. This higher pressure flush water is intended to be used if Domestic Water flush flow approaches 0.5 gpm and to allow for a scheduled power reduction to initiate repairs.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The Circulating Flush Water System and Demineralized Water System are not accident initiators. The DW system does not connect directly to the Reactor Coolant System (RCS) but it does interact with systems that interface with the RCS. Through these systems demineralized water entering the RCS, in an uncontrolled manner, could produce excess reactivity in the core. To prevent this from happening there are administrative controls and physical interlocks to terminate a dilution event. These control and interlocks are not being changed by the temporary modification. Therefore, the probability of occurrence of an accident previously evaluated in the SAR is not increased.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   No changes are being made to the administrative controls or physical interlocks that preclude any unplanned addition of demineralized water to the RCS and the consequences of the Moderator Dilution Accident are not being changed. The Circulating Flush Water System only interacts with the Circulating Water pump and neither of these systems are capable of increasing the consequences of an accident. The temporary supply of demineralized water will be restricted to CWP-1C or CWP-1D via isolation valves. Flush water to the Raw Water (RW) pumps and remaining Circulating Water (CW) pumps will still be supplied by the Domestic Water (DO) system. Therefore, there is no increase in the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The Circulating Flush Water System only interacts with the Circulating Water pump and

not with any equipment important to safety. The temporary supply of demineralized water will be restricted to CWP-1C or CWP-1D via isolation valves. Flush water to the RW pumps and remaining CW pumps will still be supplied by the DO system.

For normal operations, the DW System provides filtered/treated demineralized water to various systems and components throughout the plant as well as providing the capacity to transfer demineralized water between Crystal River Units 1, 2, and 3. The DW System is not required to function during an accident, but portions of the system are required to be operational and intact to provide containment isolation upon an Engineered Safeguards (ES) actuation signal. The ability of the DW system to perform its containment isolation function is not being altered by this temporary modification.

Since these systems (except for containment isolation) are not required during an accident, any additional failures that may possibly be introduced by this temporary modification cannot increase the probability of occurrence of a malfunction of equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Since the Circulating Flush Water System and DW systems are already considered inoperable post-accident (except for containment isolation), the consequences of any accident has taken into account the failure of these systems and the effects on systems important to safety. The temporary supply of demineralized water will be restricted to CWP-1C or CWP-1D via isolation valves. Flush water to the RW pumps and remaining CW pumps will still be supplied by the DO system. The containment isolation function is not being altered by the temporary modification. Therefore, there is no increase in the consequences of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

There are no new credible failures of the Circulating Flush Water, CW, or DW systems, which affect the reactor coolant boundary or reactivity systems. The temporary modification is supplying demineralized water from the DW system to the Circulating Flush Water System. The temporary supply of demineralized water will be restricted to CWP-1C or CWP-1D via isolation valves. Flush water to the RW pumps and remaining CW pumps will still be supplied by the DO system. With the exception of a containment isolation function, these systems are not required to operate post-accident. The containment isolation function is not being altered. Any failure of the modification will not affect the integrity of the fuel or the reactor coolant system. Therefore, no new credible accidents of a different type are created as a result of the implementation of this design change.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The DW and Circulating Flush Water System are not required to function during an accident. The temporary supply of demineralized water will be restricted to CWP-1C or CWP-1D via isolation valves. Flush water to the RW pumps and remaining CW pumps will still be supplied by the DO system. DW's containment isolation function is not being changed by this modification. Since the temporary modification only affects these two systems, it cannot create the possibility of a different type of malfunction of equipment important to safety.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

ITS bases do not address the DW or Circulating Flush Water System. Since the Circulating Flush Water System and DW systems are already considered inoperable post-accident (except for containment isolation), there is no reduction in the margin of safety in the basis of any ITS. The containment isolation function of DW is not being altered by this temporary modification.

SA/USQD Number: 98-0362, Revision 0 **FSAR Change(s):** Section 9.8.7

SA/USQD Title: Mechanical MAR98-04-07-03; FSAR Change 1998-0117
Addition of Plant Administration Building Mechanical Systems (HVAC, Plumbing) to Technical Support Center

Description

Mechanical MAR98-04-07-03 provides for the addition of non-safety related systems and components for the Plant Administration Building (PAB). This addition will include four non-safety related Mechanical systems. They are the Domestic Water (DO) System, The Sanitary Sewage (SE) System, the Fire Protection System, and the HVAC System. The added systems, with the exception of the PAB HVAC System, all tie in to the existing systems at the Technical Support Center (TSC). The DO and SE systems will be extended through penetrations in the TSC roof, while the fire services (FS) will interface inside the TSC, near the far east wall in the HVAC room.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   MAR98-04-07-03 ties into the following existing non-safety related plant systems: Fire Service, Domestic Water and Sanitary Sewage. Should any of these systems in the PAB fail, they would not be an initiating event for any previously evaluated accident in the FSAR Chapter 14. Therefore, their existence or failure cannot increase the probability of occurrence of any previously evaluated accident in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   MAR98-04-07-03 does not design, install, test or inspect any safety related equipment. A failure of the added systems in the PAB could have no impact on any other systems needed to mitigate the consequences of an accident previously evaluated in the SAR. The TSC is not evaluated for accident mitigation in the SAR; therefore, the failure of TSC systems due to interaction with PAB systems does not increase the consequences of an accident previously evaluated in the SAR. The DO system has a safety-related backup, and is not relied upon for accident mitigation. The Sanitary Sewer System does not interact with any systems which support accident mitigation. The PAB HVAC does not interface with other plant systems. The Fire Service System is relied upon to mitigate the consequences of an Appendix R fire; however, failure of the PAB or other portions of the Fire Service System concurrent with an Appendix R fire is not postulated. The Fire Service System is therefore available to perform its function. The non-safety related PAB systems have no impact on SSCs necessary to perform the mitigating functions, nor have any direct actions to perform mitigation, and therefore cannot increase the consequences of an accident

previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The Fire Service Pumps, TSC HVAC/recirculation system, and TSC diesel generator are listed in NOD-31. The TSC HVAC/recirculation system and TSC diesel generator are not evaluated in the SAR. The installation of the Fire Service System in the PAB, per this MAR, ties into the existing Fire Service System and, consequently, creates an additional load to the existing Fire Service Pumps. The design, installation, testing, and inspection of the new Fire Service System in the PAB is performed in accordance with the requirements of the CR-3 Fire Protection Program and National Fire Protection Association (NFPA), and the system demand and testing requirements are compatible with pump design. The load has been evaluated as acceptable and will not impact the function and operation of the Fire Service Pumps. Therefore, the addition of the Fire Service System to the PAB will not increase the probability of occurrence of a malfunction of equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The Fire Service Pumps, TSC HVAC/recirculation system, and TSC diesel generator are listed in NOD-31. The TSC HVAC/recirculation system and TSC diesel generator are not evaluated in the SAR. The addition of the Fire Service System to the PAB has no impact to the Fire Protection System's ability to supply Fire Protection in an Appendix R scenario. During an Appendix R fire scenario, there is one fire. The PAB Fire Services would therefore not be activated, as they are not Appendix R related. The consequences of the fire would be no different than that currently evaluated for Appendix R fires. This MAR cannot increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This MAR98-04-07-03 does not add any new systems and does not change the function of any SSC which could be an accident initiator. The additional loads added to the PAB systems will have no impact on any SSC as evaluated in the MAR. Since no function changes occur to any equipment considered important to safety, this activity will not increase the possibility of an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The systems which are impacted by this activity, (FS, DO, SE, and the TSC HVAC and Diesel Generator) have no failure modes which were not previously present. The addition to the Fire Service System cannot cause failure of the Fire Service Water Pumps (listed in

NOD-31) in a different manner than the existing Fire Service System, as they are both installed in accordance with NFPA-13, and there is no unique configuration which could lend itself to a unique failure. Failure of a FS component requires operator isolation of that portion of the system which has failed. The isolation valve between the TSC and PAB FS systems enables this to be accomplished and is not considered to be an additional operator action, as this is considered an individual action which replaces an existing action (i.e., the manual operation of the TSC FS isolation valve).

The DO system has a safety-related backup water supply which does not interface with the portion of the system involved in this activity. The addition to the SE system does not involve any unique configuration which could lend itself to a different type of failure mode that may require evaluation. The TSC HVAC and Diesel Generator (listed in NOD-31) have always been susceptible to fire and water damage. Although their failure is mitigated by relocation of the TSC, the probability of their failure due to the aforementioned interactions with PAB systems is considered low. None of these failures can therefore cause a malfunction of any equipment of a different type than previously evaluated.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There are no margin of safety requirements specified in the ITS or other documents of committal which are related to domestic water (DO), fire services (FS), sanitation systems (SE), and HVAC systems within the PAB addition. This MAR provides a non-safety related system addition (PAB), which does not impact the function or impact the operation of any equipment important to safety and, therefore, cannot reduce the margin of safety as defined in the ITS.

SA/USQD Number: 98-0369, Revision 0 **FSAR Change(s):** None

SA/USQD Title: PC97-8634
Reactor Coolant System Level Instrument Tolerance

Description

This activity corrects Improved Technical Specification Bases 3.7.4, "Turbine Bypass Valves (TBVs)," as it pertains to Atmospheric Dump Valve operation during a non-design basis Steam Generator Tube Rupture (SGTR) accident. The correction replaces a discussion referring to an analysis performed during initial licensing, with a more appropriate discussion involving the Emergency Operating Procedure Technical Basis Documents. The discussion refers to EOP basis guidance that assures that off-site doses will be less than 10 CFR 100.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   This activity corrects Improved Technical Specification Bases (ITSB) 3.7.4, which governs the use of the TBVs and describes the role of the ADVs during a non-design basis Steam Generator Tube Rupture (SGTR) accident. No modifications will be made to either TBV or ADV. Additionally, no accident previously evaluated in the SAR is initiated by either component. Therefore, this activity cannot increase the probability of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   No modifications will be made to either TBV or ADV. As such, this activity cannot result in an increase of consequences, nor will the design basis accident analysis assumptions be invalidated. Further, the existing ITSB 3.7.4 already acknowledges that a non-design basis SGTR would result in an off-site dose higher than that associated with the design basis scenario, which utilizes the TBVs. Therefore, this activity cannot increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   This activity effects no changes to any structures, systems, or components, nor does it introduce any procedural changes which could affect any systems. Therefore, this activity cannot increase the probability of occurrence of a malfunction of equipment important to safety evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Because no structures, systems, or components are affected in any way by this activity, this activity cannot increase the consequences due to a malfunction of equipment important to safety evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This activity does not affect any structures, systems, or components. No new interfaces are created which initiate accidents of a different type than any previously evaluated in the SAR. Therefore, this activity cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This activity does not affect any structures, systems, or components. No new interfaces are created which could initiate the malfunction of a structure, system, or component. No common mode failures which could affect either ADV (or TBV) are created by this activity. Therefore, this activity cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

This activity improves the content of ITS Bases 3.7.4. This Bases section appropriately associates TBV and ADV operation during an SGTR with 10 CFR 100 limits. This activity only provides a more sound basis for concluding that, for beyond-design basis scenarios, ADV operation in accordance with the SGTR EOP still assures compliance with 10 CFR 100. Therefore, the margin of safety cannot be reduced by this activity.

SA/USQD Number: 98-0377, Revision 0 **FSAR Change(s):** Section 10.1.3

SA/USQD Title: PC97-8583; OP-103B, Revision 24;
OP-202, Revision 108; FSAR Change 1998-0114
Revise Pressure Limits At Low Once-Through-Steam-Generator (OTSG) Shell Temperatures

Description

This SA/USQD evaluates a change of the Once Through Steam Generator (OTSG) secondary side pressure limits for a given OTSG shell side temperature of ≤ 110 °F. This change is from the present minimum shell temperature ≥ 110 °F for secondary pressure ≥ 237 psig to a curve of maximum pressures for temperatures ≥ 40 °F and ≤110 °F.

Based on FSAR Table 4-2 and the vendor instruction manual (Book No. 121), the OTSGs are ASME III, Class A vessels, designed and fabricated in accordance with the 1965 Edition of the ASME Code, up to and including the Summer 1967 Addenda. FPC Calculation No. M97-0086, performed for FPC by Framatome (OEM), provides the design basis for the new low temperature P/T curve. This calculation (FTI Document No. 32-1169000-00, performed in 1987) uses a linear elastic fracture mechanics approach as described in ASME Section XI as the primary technical justification for the new curve.

A review of this nil-ductility transition (NDT) fracture mechanics analysis shows that the Code of Record was maintained for the vessel. The 1987 10 CFR 50.55(a) 'Codes and Standards' authorized the use of ASME XI editions up through the Summer 1983 Addenda, and ASME III editions up through the Summer 1984 Addenda for RCS pressure boundary components constructed in accordance with ASME Code rules. The ASME Code methods used in the fracture mechanics analysis were those described in Appendix A of ASME Section XI (1980) with a factor of safety of 2 applied to the stress intensity factors as described in Appendix G of ASME Section III (1980). Since both of these Code Editions were authorized for use in 1987, it is concluded that the Code rules were appropriately used in the determination of the new P/T curve for low temperatures and the prevention of OTSG shell brittle fracture has been maintained.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Operation within the calculated pressure and temperature limits ensures failure modes of the OTSG secondary side are minimized. These limits, based in the ASME Code, prevent brittle fracture and prevent initiation of brittle crack propagation, which could cause failures at higher operating pressures. Elimination of these failures does not increase the probability of those Chapter 14 accidents discussed in the SAR.

2. Could the proposed activity increase the consequences of an accident previously evaluated in the SAR? No

Failure of the OTSG secondary side at high temperature is evaluated as a steam rupture accident. Operation within the updated limits will not increase the consequences of secondary side rupture beyond those already assumed by FSAR Section 10.1.3 for the single pressure and temperature limit.

3. Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR? No

The OTSG pressure and temperature limits of FSAR Section 10.1.3 are followed to prevent brittle fracture of the secondary side of the OTSGs. The calculation of the curve was based in the ASME Code Case rules. The curve changes will not increase the likelihood of an OTSG malfunction and will not increase the consequences of shell side fracture. The change in limits only provides greater operator flexibility in the event of OTSG temperatures of ≤ 110 °F. The probability of occurrence of brittle fracture is not increased.

4. Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR? No

The consequences of brittle fracture at low temperature are not changed for the revised temperature and pressure limits. The revised operational limits just document the latest calculated values that will prevent brittle fracture if maintained.

5. Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR? No

Undetected brittle fracture of the OTSG secondary side could lead to the equivalent of a Main Feedwater Line Break (MFLB) or Main Steam Line Break (MSLB) Accident. These accidents have already been evaluated. There are no new types of accidents created by the revised pressure and temperature limits.

6. Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR? No

Not maintaining OTSG secondary temperatures and pressures could lead to brittle fracture of the OTSG shell only. This condition has been evaluated. Brittle fracture does not prevent the function of any other equipment not previously evaluated. The OTSG and other equipment important to plant safety will continue to operate as before.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

There are no ITS limits or associated ITS bases for operation of the OTSGs at the temperatures discussed in this change. The ITS basis for operation of the Steam

Generators deals with steam at much higher temperatures than those associated with this change. Operation within the pressure/temperature curve will ensure that brittle fracture will not effect the OTSG in those operational conditions mentioned in the ITS. The margin of safety for the ITS is not reduced.

SA/USQD Number: 98-0381, Revision 0

FSAR Change(s): Section 9.8.7.4.c; Figure 1-2 and Figure 1-3

SA/USQD Title: MAR98-05-02-01; MAR98-05-02-02; FSAR Change 1998-0159
Nuclear Administration Building Security Enhancement

Description

This proposed modification will relocate the Protected Area Security Fence and Perimeter Detection Zones located between the TSC/OSC and the Nuclear Administration Building. The fence and zones will be relocated to the west side and north side of the NAB near the roadway. This will become the new Protected Area and the existing fence and zones located on the south and east side of the NAB will be removed.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The Protected Area Fence configuration along with the supporting Security equipment will be relocated to encircle the Nuclear Administration Bldg. This new configuration will continue to allow Security to monitor the Protected Area boundary effectively. The components associated with this modification are not associated with any accident initiators. The system provides maximum security and ensures the integrity of CR-3 by detecting unauthorized intrusions for purposes of radiological sabotage or malicious acts as described in 10 CFR Part 73. The new Security fence and zone do not increase the probability of occurrence of any accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The revisions to the aerial views of CR-3 located on FSAR Figure 1.2 and 1.3 only depict an overview of the site layout and do not affect any SSC design or function. Radiological dose to the public will not be increased by relocation of a Protected Area Fence and the supporting equipment. The system provides maximum security and ensures the integrity of CR-3 by detecting unauthorized intrusions for purposes of radiological sabotage or malicious acts as described in 10 CFR Part 73. Therefore, the proposed activity will not increase the consequences of an accident as previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The changes to FSAR Figure 1.2 and 1.3 have no impact on SSC supporting equipment important to safety. Relocation of the Protected Area Fence is outside the vital area boundary of equipment important to safety. Any malfunction of security equipment is addressed in the CR-3 Physical Security Plan. Therefore, the proposed activity does not

increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Changes to FSAR Figure 1.2 and 1.3 showing the new fence location will not jeopardize equipment important to safety. Relocating the Security Fence from between the TSC/OSC and the NAB will allow Security to monitor the Plant Perimeter more effectively therefore ensuring safe operation of plant equipment.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Relocation of the Security Fence to include the NAB in the Protected Area on Figures 1.2 and 1.3 does not create an accident of a different type than previously evaluated in the SAR. There are no changes to the design or function of any SSC required to mitigate an accident as evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Security fence and zone relocation does not induce equipment malfunction for accident mitigation in the SAR. The system provides maximum security and ensures the integrity of CR-3 by detecting unauthorized intrusions for purposes of radiological sabotage or malicious acts as described in 10 CFR Part 73. Security activities during all modes are addressed within the CR-3 Physical Security Plan.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Changes to Security operation or design functions are not mentioned in the ITS or the ITS Bases. Relocating the Protected Area Fence to include the NAB will not reduce the margin of safety as defined in any Improved Technical Specification, therefore no change is required.

SA/USQD Number: 98-0399, Revision 0

FSAR Change(s): Section 9.9; Table 9-19; and Figure 9-4

SA/USQD Title: MAR98-07-10-01; FSAR Change 1998-0147
Reactor Coolant System Analysis Sample Upgrade

Description

This modification will install three benchtop analyzers to measure Reactor Coolant System (RCS) for dissolved oxygen, nitrogen, hydrogen, pH, and conductivity. The scope of work includes tapping into the existing sample lines in the sample hood located in the Nuclear Sample Room, and routing the sample lines through sensing elements also located within the hood. These elements will provide a signal to portable benchtop analyzers, shelf-mounted outside the hood, to provide the readout. Shutoff valves will be installed to allow for proper alignment of the analyzers to the sample being tested. Two of the benchtop analyzers are dual channel: one will measure pH and conductivity and the other will measure dissolved hydrogen and nitrogen. The single channel analyzer will measure dissolved oxygen. All three analyzers will be powered from a receptacle located at the sample hood.

In order to purge the sensors and for calibration, hydrogen and nitrogen will be supplied from cylinders which will be seismically attached to the wall and connected to the sensors through two filter regulators. A seismically-designed bracket will be installed on the east wall of the Nuclear Sample Room to hold the cylinders. This bracket will be designed as Seismic Category II. An interim change to the Fire Hazard Analysis will be made to document the increased amount of combustibles in the Nuclear Sample Room due to the addition of the hydrogen.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR? No

This sampling system is not credited in any accident scenario as an initiator or mitigator. There are no new credible failure modes associated with this activity. The analyzers are isolated from the RCS when not in use and do not create any new system interfaces with the RCS system. The possibility of the cylinders becoming a missile is not an issue since they will be seismically mounted.

2. Could the proposed activity increase the consequences of an accident previously evaluated in the SAR? No

The sampling lines are isolated by an ES actuation signal and are not credited for any accident mitigation function as specified in the SAR. This sampling system is not part of the Post Accident Sampling System (PASS).

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

There are no new credible failures associated with this activity and the benchtop analyzers are not part of any SSC important to safety. Therefore, it cannot increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

There are no new credible failures associated with this activity and, since the analyzers are not credited for mitigation of any malfunction of equipment important to safety previously evaluated, their failure cannot increase the consequences of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

There are no new failure modes created by this modification and no new interfaces with any SSC. Any pressure boundary failure of the new tubing to these analyzers can be quickly isolated and vented through the sample hood's exhaust and drain systems. These releases would then be contained within the Auxiliary Building. Since any pressure boundary failure can be quickly isolated, it does not represent a new or different type of accident. The cylinders are seismically mounted to prevent fall down or becoming a missile and therefore will not create a different type of accident.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This activity does not introduce any new failure modes. The pressure boundary of the RCS is maintained through upstream isolation valves, both automatic and manual. Any pressure boundary loss through the tubing to the analyzers can be quickly isolated and vented through the sample hood's exhaust and drain systems. These releases would then be contained within the Auxiliary Building. Since any pressure boundary failure can be quickly isolated, this does not represent a new or different type of equipment failure. The cylinders are seismically mounted and therefore do not create the possibility of becoming a missile for damaging adjacent safety related equipment.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

These benchtop analyzers are not part of the ITS and are not part of the Post Accident Sampling System. No system parameters or setpoints are affected by this activity. As such, there will be no reduction in the margin of safety as defined in the ITS Bases.

SA/USQD Number: 98-0407, Revision 0

FSAR Change(s): Figure 9-7; Figure 9-8; and Figure 9-10

SA/USQD Title: MAR98-05-01-01; FSAR Change 1999-0006
RW/SW/DC Flow Meter Permanent Installation

Description

This activity will seismically mount the non-safety related local flow indicators, and install conduits and cables that will be used to power the In-Service Testing flow indicators associated with the Decay Heat Closed Cycle Cooling (DC), Nuclear Services & Decay Heat Sea Water (RW), and the Nuclear Services Closed Cycle Cooling (SW) systems. These Panametric ultrasonic flow sensors, and model DF868 local indicators with LCD displays, were procured as 2% tolerant instruments and tested at Alden Laboratories to ensure the 2% accuracy as installed in the plant RW, SW, and DC process geometry (MARs 97-08-09-01 and 97-10-08-01). However, due to 11D restart commitments, permanent mounting and power was not completed at that time.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The ongoing In-Service Testing (IST) program is not changed by this modification. The permanent installation of IST instruments for the DC, RW and SW systems will provide real-time measurement during the operating cycle and not just during testing. The instruments are maintained within the instrument calibration program; therefore, confidence is maintained regarding the accuracy of the measurement. The flow elements are non-intrusive and do not impact the systems' pressure boundary. Since the conduits and instruments are seismically mounted, the installation will not impact safety related equipment located in the vicinity. Since these elements are non-intrusive and are considered non-accident initiators, the proposed modification does not increase the probability of occurrence of an accident that has been previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The seismic mounting of the flow instruments, DC-75-FI, DC-76-FI, RW-94-FI and SW-232-FI, and conduits and the powering of these instruments from ACDP-21, a non-safety related AC lighting distribution panel, will not interfere with any safety system's accident mitigation function. These instruments are used for IST testing and do not perform any trip or control functions. The indication from these instruments is read locally in the seawater room. Therefore, the implementation of this modification will not increase the consequences of the accidents previously evaluated in the SAR.

3. Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR? No

This modification can be installed in any plant mode. It is expected that the modification will be installed while the plant is at power. Scaffolding will be necessary to install the conduits that will be run from the lighting panel to the flow indicators. Since the scaffolding will be installed and seismically restrained in accordance with AI-1803, equipment damage will be prevented.

The flow elements are non-intrusive and do not impact the systems' pressure boundary. Since the conduits and instruments are seismically mounted, the installation will not impact safety related equipment located in the vicinity.

The power for the instruments is from a non-safety related power distribution panel. The cables are being routed to the end devices exclusively in conduits and are designed in accordance with the electrical design criteria to ensure separation requirements are met between other safety related conduits.

In conclusion, the proposed activity does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR? No

The ultrasonic flow transducers are non-intrusive; therefore, the pressure boundary of the associated systems is not affected by this installation. The indicators are locally mounted and are used for periodic IST testing. These devices do not provide any trip or control functions. The electric power is from a non-safety AC source and the cables and conduits are designed in accordance with the electrical design criteria. The devices installed by this activity are seismically mounted to prevent them from becoming missiles during a seismic event. Therefore, it is concluded that the implementation of this modification will neither compromise any equipment important to safety, nor will it increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR? No

The permanent installation of IST instruments for the DC, RW and SW systems provides real-time local flow indication during the operating cycle and not just during testing. The instruments are maintained within the instrument calibration program; hence, maintaining confidence in the accuracy of the measurement. These instruments are used to detect degradation of the associated DC, RW and SW pumps as part of the IST program.

The flow transducers are non-intrusive and do not impact the systems' pressure boundary. Since the conduits and instruments are seismically mounted, the installation will not impact safety related equipment located in the vicinity.

Since these elements are non-intrusive and are considered non-accident initiators, the proposed modification does not create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The permanent installation of IST instruments for the DC, RW and SW systems will provide real-time measurement during the operating cycle and not just during testing. The instruments are maintained within the instrument calibration program; hence, maintaining confidence in the accuracy of the measurement.

The flow elements are non-intrusive and do not impact the systems pressure boundary. Since the conduits and instruments are seismically mounted, the installation will not impact safety related equipment located in the vicinity. Therefore, since these elements are non-intrusive and are considered non-accident initiators, the proposed modification does not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The modification is designed in accordance with engineering design criteria. The support structures have been analyzed to ensure the weights being added by the conduits and instruments do not exceed any loading limits.

The instruments, as well as the power sources, are non-safety related; however, the added availability of the local indication provides an additional measure of system performance. The modification can be considered an enhancement and does not reduce, in any way, the margin of safety as defined in the basis for any Improved Technical Specifications.

SA/USQD Number: 98-0410, Revision 0 **FSAR Change(s):** Section 4.2.2.6

SA/USQD Title: MAR92-01-02-02; MAR92-01-02-03; FSAR Change 1998-0164 Replacement of RCP-1D Motor

Description

This USQD covers the installation of the RCP motor which was removed from the RCP-1A slot and refurbished and modified per MAR92-01-02-01, and replaced by a new GE motor. The spare motor (Serial Number 8367242) now has only a DC powered lift oil pump. Therefore, the FSAR requires revision because Section 4.2.2.6 is serial number specific for the RCP motors and implies the spare has two lift oil pumps. The other changes as a result of the refurbishment and redesign of the RCP motor do not require an FSAR change.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

The spare RCP motor (Serial Number 8367242) as the motive force for RCS circulation is a like-for-like replacement for the installed RCP motors. The only accident evaluated in the SAR which concerns the operation of the RCP motor as a possible event initiator is the Loss-of-Coolant-Flow accident (LOCF) of FSAR Section 14.1.2.6. There are two separate events evaluated in the FSAR; Four Pump Coastdown and Locked Rotor. Currently, the most limiting coastdown loss of flow event is a single pump coastdown per Reference A.2.5. The most limiting loss of flow event overall is the Locked Rotor event. The results of each LOCF event are primarily controlled by the rate of reduction in RC flow.

Four Pump Coastdown:

The true event initiator is not specified. "Mechanical failure" and "loss of electrical power" are two possible event initiators identified early in the discussion. Further on, it is stated that "Although a complete loss of forced flow is very unlikely, it would most likely occur if all off-site power were lost ... the simultaneous mechanical failure of all four RCPs is extremely unlikely and is not considered credible." The motors themselves are not specified, however the verbiage indicates that the RCPs and their motors are considered as a whole for the purposes of the identification of cause. The spare motor (Serial Number 8367242) itself will be mounted and electrically connected in the same manner as the currently installed RCP motors, therefore the installation of the spare motor cannot increase the probability of simultaneous mechanical failure or loss of power to all four RCP motors resulting in the LOCF Four Pump Coastdown accident.

The RCP motor AC lift oil pumps are not in service during normal RCP operation. The lift oil systems on each RCP are independent of each other. The removal of an AC lift oil pump from one RCP has no means to affect the other three RCPs. Therefore, the removal

of an AC lift oil pump cannot increase the probability of simultaneous failure of all four RCP motors.

One Pump Coastdown:

"Mechanical failure" or "loss of electrical power" are two possible event initiators for this event. The spare motor (Serial Number 8367242) itself will be mounted and electrically connected in the same manner as the currently installed RCP motors, therefore the installation of the spare motor cannot increase the probability of a mechanical failure or loss of power to a RCP motor resulting in the LOCF One Pump Coast Down accident.

An AC lift oil pump is not in service during normal RCP operation. It would normally be started by an operator prior to shutting down an RCP or would automatically start following a trip of its respective RCP motor. In the prior case, removal of the AC lift oil pump requires the DC lift oil pump to fulfill the function. Starting of a DC lift oil pump prior to RCP shutdown introduces no new means to cause a premature trip of an RCP. In the latter case, a failure of the DC lift oil pump to start would be subsequent to the initiating event. Therefore, the removal of an AC lift oil pump could not increase the probability of a single RCP coastdown event.

Locked Rotor:

The Locked Rotor event is the limiting LOCF accident because the reduction in RC flow is more rapid than that of the Four Pump Coastdown.

The Identification of Cause states there is nothing in the design of the motor that could possibly cause the rotating elements to come to an instantaneous stop. This statement will continue to remain true following installation of the spare motor (Serial Number 8367242). The only feature of the spare motor which differs from the motors installed in RCP-1B, 1C, and 1D is the absence of an AC lift oil pump. There are no significant differences between the spare and the motor installed in RCP-1A. As the lift oil pump is not necessary during operation of the RCP motor at normal rotational speed, the absence of the AC pump cannot in any way cause the motor to seize and cause a Locked Rotor LOCF accident.

The RCP motor Lube Oil and Lube Oil Collection Systems are not accident initiators for any accidents previously evaluated in the SAR. The interaction of these SSCs with other SSCs is not changed such that any accident initiators can be affected by the installation of the spare (Serial Number 8367242). Therefore, the probability of occurrence of an accident previously evaluated in the SAR cannot be increased for installation of the spare motor in any of the four RCP motor slots.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

As stated in the response to item 1, the accident previously evaluated in the SAR relating to RCP motors as an event initiator is the LOCF accident of Section 14.1.2.6.

Four Pump Coastdown LOCF

The Four Pump Coastdown accident assumes as the most credible initiator a loss of off-site power. The removal of the AC powered lift pump motor does not affect this accident, as it assumes that all non-vital power is lost. GE has confirmed the coastdown characteristics of the RCPs are not affected by the loss of the high pressure lube oil system following the loss of all RCPs. The consequences of this accident are therefore not increased.

One Pump Coastdown LOCF

The removal of the AC powered lift pump motor does not affect this accident, as the AC lift pump is not credited for accident conditions. GE has confirmed the coastdown characteristics of an RCP is not affected by the loss of the high pressure lube oil system following the loss of an RCP. The consequences of this accident are therefore not increased.

Locked Rotor LOCF

The Locked Rotor accident postulates the seizure of a RCP during normal operation. Following RCP seizure, RCS flow is assumed to decrease from 100% to 0% in 2 seconds in the RCS leg of the faulty RCP. During this rapid, catastrophic reduction in RCS flow, the availability or unavailability of lift oil is of no consequence.

In addition, the following accidents take credit for the coastdown of the RCPs:

Station Blackout Accident (SBO) of Section 14.1.2.9 assumes that AC power is lost, placing the DC motor as the sole means of supplying lift oil for coastdown. Since the DC power to the motors is not credited for accident mitigation, the DC pumps must be assumed to not operate. However, GE has determined the coastdown characteristics to be unaffected for at least the first 20 seconds of such an event. This extends significantly beyond the DNB critical time period of 7.3 seconds (Reference A.2.5). This assumption does not change for installation of the spare (Serial Number 8367242) in any of the four RCP motor slots.

Loss of Coolant Accident (LOCA) of Section 14.2.2.5 assumes non-vital power is lost as well.

The RCP flow coastdown curves are unaffected by this modification during the critical first 20 seconds. Therefore, the consequences of the accidents previously evaluated in the FSAR are not increased by the absence of the AC lift pump on the spare motor (Serial Number 8367242) in any of the RCP motor slots.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The RCP motors are listed in NOD-31 as equipment required for normal reactor heat removal. Removal of the AC lift oil pump will not increase the probability of occurrence of a malfunction of a RCP motor which would prevent the motor from performing this NOD-31 function or the other functions as stated in the FSAR. The Lube Oil Collection

System is a passive system which does not interact with the RCP motor, and cannot increase the probability of occurrence of a malfunction of the RCP motors.

The changes to the Lube Oil System (upgrade to seismic, removal of AC lift pump) do not in any way degrade the self lubricating design of the RCP motor during operation at normal rotational speed.

Lift oil pumps are not in service during normal (power) operation, and therefore the number of lift oil pumps on any given motor cannot increase the probability of occurrence of this malfunction previously evaluated in the FSAR.

Faults in individual RCP motors could cause a reduction in RCS flow, however the SAR evaluation concludes that a complete loss of forced flow due to this is "very unlikely." Lift oil pumps are not in service during normal operation, and therefore the number of lift oil pumps on any given motor and the type of power supply they receive cannot affect the normal operation of the pump motor, or create faults resulting in a reduction in flow.

There are no malfunctions previously evaluated in the FSAR which concern the lift oil pump.

The installation of the spare motor (Serial Number 8367242) with the single DC powered lift pump in any of the RCP motor slots cannot therefore increase the probability of occurrence of the malfunction of any equipment important to safety previously evaluated in the FSAR.

4. Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR? No

The installation of a RCP motor with only a DC powered lift oil pump has no affect on the consequences of any malfunction evaluated in the FSAR. The lube oil lift pumps are not credited for accident conditions. Therefore, the removal of the AC powered lift pump cannot increase the consequences of this malfunction.

5. Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR? No

The basic design of the spare RCP motor (Serial Number 8367242) does not change. The function of all associated equipment during normal operation does not change. Because lift oil pumps do not operate during normal power operation, and there is no interaction between lift oil pumps and the other portions of the RCP motor which could effect RCP motor operation, the possibility of an accident of a different type is not created.

RCP Motor Startup:

A lift oil pump is required to operate 2 minutes prior to and during RCP motor starting to supply oil to the thrust bearing and various other rotating components. The absence of an AC lift oil pump on the spare motor (Serial Number 8367242), and therefore the inherent reliance on the remaining DC powered lift pump for all lift oil, does not create the possibility of an accident not evaluated in the FSAR. Failure of the DC motor prior to attempted RCP motor startup would prevent the RCP motor from starting. Failure of the

DC motor once the RCP motor breaker was closed would not prevent its start. The lube oil system would already be at pressure and providing lubrication as the RCP accelerated to full speed. RCP startup can occur during one of the three (3) following conditions:

- The reactor is safely shutdown which would prevent reactor startup;
- The plant is operating at power with three RC loops in service in accordance with ITS;
- The RCS is in an inadequate core cooling condition.

This is a beyond design basis event. EOP-07, "Inadequate Core Cooling," currently permits the restart RCPs under certain conditions to move any water trapped in the J legs to give more time to re-establish injection. EOP-07 is being revised in the near future (December 1998) to remove this option for reasons outside the scope of this modification and SA/USQD. For the plant to be in this condition, an accident event would already have occurred and progressed to a condition beyond the design basis. The option to start RCPs in this condition is for defense in depth and is not for the mitigation of any design basis event.

DC pump failure prior to RCP start for Conditions 1 and 2 would therefore maintain the reactor in a safe condition. The dependence upon the DC powered motor during RCP motor start does not create any new accidents, as the safe outcome of the DC motor driven lube oil lift pump failure prior to RCP motor startup is the same regardless of the number of lift oil pumps and their respective power supplies. Revision of OP-302 ensures any failure of the RCP lube oil system is reported. Additionally, revision of the applicable procedures will ensure testing of the automatic start of the DC lube start upon opening of the RCP motor breaker.

Condition 3 is a beyond design basis event and failure of the DC lift pump in this condition may reduce the available defense in depth (Under certain conditions all start permissives are bypassed and the RCP is started). However, an accident of a different type is not created as an accident would have precipitated this condition.

Normal Operation:

During normal RCP motor operation, the thrust bearings carry their own oil film and the motor provides its own oil circulation through the oil cooler. The lift oil pumps are secured, and the absence of the AC lift pump cannot create an accident.

Coastdown:

Lift oil pumps are also relied upon during RCP motor coastdown when the RCP motors are no longer able to provide sufficient motive force for self lubrication. Sole reliance upon and subsequent failure of the DC lift pump upon coastdown may result in increased bearing wear and subsequent shortened bearing life. However, per the manufacturer, the loss of high pressure lube oil during coastdown is not expected to result in thrust bearing damage, as sufficient oil film is maintained during the slowing process to prevent metal to metal contact. While some probability exists for ARD bearing damage for a coastdown without lube oil lift pump operation, this damage does not create the possibility of an accident of a different type.

6. Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR? No

The RCP motors are listed in NOD-31 as equipment required for normal reactor heat removal. One of two lube oil lift pumps used to provide lubrication to the RCP motor thrust bearings on the original RCP motors is not installed/available on the refurbished/redesigned spare RCP motor (Serial Number 8367242). This single-pump configuration is similar to the design of the motor currently installed as RCP-1A. Failure of the single DC motor powered lift oil pump would result in loss of lift oil pressure. This malfunction is not addressed in the FSAR; however, this malfunction is also possible on the original motors due to high pressure lube oil pipe or component failure. This type of failure could occur in any mode of operation in which high pressure lube oil is in service, which includes design basis accidents and licensing basis events (e.g. LOCF, Station Blackout, Safe Shutdown Earthquake). The upgraded seismic design of the Lube Oil System has not increased the likelihood of Lube Oil System failure.

The installation of the spare motor (Serial Number 8367242) in any of the four RCP motor slots therefore does not create the possibility of a different type of malfunction than any previously evaluated in the FSAR.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

The ITS bases do not discuss the RCP motor design in any detail, nor do they discuss the Lube Oil and Lube Oil Collection Systems. The ITS sections which deal with RCPs/RCP motors are primarily concerned with pump operation during various plant conditions, the ability to accurately monitor their performance for reactor protection, and the InService inspection of the safety-related RCP motor flywheel. These ITS requirements for RCP operation, monitoring, and inspection do not change as a result of the installation of the spare (Serial Number 8367242) in any of the four RCP motor locations. The margin of safety defined in the bases for these ITS are not affected/reduced by the installation of the spare RCP motor in any of the RCP motor locations.

SA/USQD Number: 98-0430, Revision 0 **FSAR Change(s):** Section 9.7.4.2.c

SA/USQD Title: CP-148, Ventilation Filter Testing Program; License Amendment 185 (3N0899-13); FSAR Change 1998-0149; Auxiliary Building Ventilation System Iodide Removal Efficiency

Description

The proposed change revises the acceptance criteria for the laboratory methyl iodine removal efficiency from 95% to 87.5% for the Auxiliary Building Exhaust Ventilation charcoal filters. This efficiency will ensure the 75% removal efficiency assumed in control room habitability dose calculations. No credit is taken for these filters in calculating the public dose from design basis accidents.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The Auxiliary Building Exhaust Ventilation filters (ABVEFs) are a design feature installed to reduce radioactive releases from normal operation of the plant, and will be effective in reducing post accident releases only if offsite power is available.

   A review of FSAR Chapter 14 verified there is no impact on current licensing basis accidents. The design basis accidents which could be affected by filter performance were reviewed and in each instance there was clear documentation which confirmed that the filters are not required to meet the regulatory requirements of 10 CFR 50 GDC 19, and 10 CFR 100. The ABVEFs are used specifically to reduce releases to the atmosphere consistent with the ALARA concept. There are no physical changes to plant equipment; only changes to test acceptance criteria to make them consistent with design calculations. Therefore, the changes addressed herein will not increase the probability of occurrence of an accident previously analyzed.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Reducing the ABVEF carbon adsorber laboratory test acceptance criterion may result in higher releases for a specific accident scenario, if offsite power is available and the AB fans are placed in service. However, design basis accidents evaluated in the SAR assume bounding values for analysis inputs and assume that the AB ventilation system and ABVEFs are not operating. Therefore, operation of the ABVEFs at a removal efficiency of 75% cannot increase the consequences of design basis accidents evaluated in the SAR.

   A 1987 analysis of control room dose consequences resulted in issuance of a Safety Evaluation Report (SER) for control room habitability in 1989. That analysis postulated

an MHA with LOOP and took no credit for ABVEFs. In 1990, the NRC accepted a revised MHA control room dose analysis that credited the ABVEFs at 75% efficiency as an interim solution to increased control room doses due to reactor building flooding concerns. Credit for ABVEFs was necessary to ensure control room doses did not exceed 10 CFR 50, Appendix A, GDC 19 limits. Following resolution of the flooding issue, the limiting analysis again became the 1987 analysis.

Current control room habitability analyses following design basis accidents credit the ABVEFs with 75% iodine removal when offsite power is available, and 0% efficiency following a LOOP. Both analyses demonstrate operator dose remains within regulatory limits. These analyses use actual leak test results and an approach to evaluating the effects of unfiltered leakage that differs from published staff guidance. There is no historical CR-3 analysis based on the same set of assumptions; therefore, no direct comparison of the calculated consequences can be made. However, in letter 3N0298-04, the NRC accepted the leakage test results and CR-3's method of interpreting and applying the test results to current control room dose analyses for an MHA. The current control room dose analyses for an MHA without LOOP is bounding, and results in control room doses that are less than the doses in the SAR for the bounding design basis accident.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The function of the ABVEFs is to reduce releases to the atmosphere consistent with the ALARA concept. The ABVEFs are essentially the last component in a plant process and no other equipment relies on the ABVEFs for its operation. There are no physical changes to plant equipment, only changes to test acceptance criteria to make them consistent with design calculations. Therefore, changes discussed herein will not increase the probability of an occurrence of malfunction of equipment important to safety previously evaluated in the FSAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The function of the AB carbon filters is to reduce releases to the environment consistent with the ALARA concept. Releases from these filters are continuously monitored so that any degradation in filter performance would be quickly identified. The factor of safety applied to establish filter test acceptance provides assurance that degradation will not reduce protection to control room operators unacceptably.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The ABVEFs are a design feature installed to reduce radioactive releases from normal operation of the plant, and will be effective in reducing post accident releases only if offsite power is available.

The Auxiliary Building Ventilation Exhaust System filters are used specifically to reduce

releases to the atmosphere consistent with the ALARA concept. There are no physical changes to plant equipment, only changes to test acceptance criteria to make them consistent with design calculations. Therefore, the changes addressed herein will not create the possibility of an accident of a different type than any previously evaluated.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The function of the ABVEFs is to reduce releases to the atmosphere consistent with the ALARA concept. The ABVEFs are essentially the last component in a plant process and no other equipment relies on the ABVEFs for its operation. Therefore, changes discussed herein will not create the possibility of a different type of malfunction of equipment important to safety previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The general basis for any Technical Specification is as defined in 10 CFR 50.36, which defines the four criteria for inclusion as a Technical Specification LCO. Criteria 1, 2 and 3 apply to plant features provided to protect principal fission product barriers or to mitigate the effect of design basis accidents. Criterion 4 applies to features that have been shown to be significant to public health and safety. Since the ABVEFs are not currently credited for operation in any design basis accident evaluation, they cannot be considered to be a part of the bases of any Technical Specification.

SA/USQD Number: 98-0432, Revision 0 **FSAR Change(s):** Table 4-21

SA/USQD Title: Calculation M98-0028; FSAR Change 1998-0145
Main Feedwater Nozzle Allowable Loads

Description

This USQD evaluates the impact of the generation of a new set of Main Feedwater (MFW) Nozzle allowable loads for CR-3. These new MFW Nozzle allowable loads are 40% higher than the previously documented allowable loads. The resulting calculated stress ranges and cumulative usage factors require a change to the maximum MFW Nozzle primary plus secondary stress intensity range and cumulative usage factor values reported in FSAR Table 4-21, "Steam Generator Stress Ranges and Usage Factors."

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The changes in calculated MFW Nozzle allowable loads, stress ranges, and usage factors cannot increase the probability of occurrence of any accident, does not initiate any accident, nor does it change any accident initiator for any accident previously evaluated in the FSAR. The accident scenarios (loss of main feedwater) are evaluated in Chapter 14 of the FSAR. All calculated stress ranges and component cumulative usage factors are less than ASME Code allowables. All fatigue and stress analyses were performed consistent with the original stress reports using the ASME Section III, 1965 Edition, with Addenda through Summer 1967, and transients from the latest CR-3 RCS functional specification. Therefore, the secondary side pressure boundary will be maintained to minimize the possibility of a loss of main feedwater.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The changes in calculated MFW Nozzle allowable loads, stress ranges, and usage factors cannot increase the consequences of an accident previously evaluated in the SAR. There are no challenges to product barriers and all credible failures are bounded by the accident scenarios (loss of main feedwater) previously evaluated in Chapter 14 of the FSAR. All calculated stress ranges and component cumulative usage factors are less than ASME Code allowables. All fatigue and stress analyses were performed consistent with the original stress reports using the ASME Section III, 1965 Edition, with Addenda through Summer 1967, and transients from the latest CR-3 RCS functional specification. Therefore, the secondary side pressure boundary will be maintained, the assumptions made in the accident analysis remain valid, and the consequences associated with a loss of main feedwater accident will not be increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The changes in calculated MFW Nozzle allowable loads, stress ranges, and usage factors cannot increase the probability of occurrence of a malfunction of equipment important to safety. All credible failures are bounded by the accident scenarios (loss of main feedwater) previously evaluated in Chapter 14 of the FSAR. All calculated stress ranges and component cumulative usage factors are less than ASME Code allowables. All fatigue and stress analyses were performed consistent with the original stress reports using the ASME Section III, 1965 Edition, with Addenda through Summer 1967, and transients from the latest CR-3 RCS functional specification.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The changes in calculated MFW Nozzle allowable loads, stress ranges, and usage factors cannot increase the consequences of a malfunction of equipment important to safety previously evaluated in the FSAR. The mitigation of all credible failures are bounded by the accident scenarios (loss of main feedwater) previously evaluated in Chapter 14 of the FSAR. All calculated stress ranges and component cumulative usage factors are less than ASME Code allowables. All fatigue and stress analyses were performed consistent with the original stress reports using the ASME Section III, 1965 Edition, with Addenda through Summer 1967, and transients from the latest CR-3 RCS functional specification. Therefore, the possibility of malfunction or failure of the secondary side pressure boundary (loss of feedwater) is not increased.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The changes in calculated MFW Nozzle allowable loads, stress ranges, and usage factors cannot create the possibility of an accident of a different type, nor does it change any accident initiator for any accident previously evaluated in the FSAR. The accident scenarios (loss of main feedwater) are evaluated in Chapter 14 of the FSAR. There are no operational changes or physical plant modifications. No changes to any RCS Functional Specification is required. The number of design transients are not affected. All calculated stress ranges and component cumulative usage factors are less than ASME Code allowables. Therefore, the structural integrity of the secondary side pressure boundary is maintained, and all credible failure modes are bounded by previous accident analysis.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The changes in calculated MFW Nozzle allowable loads, stress ranges, and usage factors cannot create the possibility of a different type of malfunction of equipment important to safety previously evaluated in the FSAR. There are no new induced equipment failures. There are no operational changes or physical plant modifications. No changes to any RCS

Functional Specification are required. The number of design transients is not affected. All calculated stress ranges and component cumulative usage factors are less than ASME Code allowables. Therefore, the structural integrity of the secondary side pressure boundary is maintained.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The changes in calculated MFW Nozzle allowable loads, stress ranges, and usage factors does not reduce the margin of safety as defined in the bases for any Improved Technical Specification (ITS). The ITS bases do not specifically address a margin of safety other than the maximum allowable stress levels and usage factors established by the ASME Code. There are no operational changes or physical plant modifications. No changes to any RCS Functional Specification is required. The number of design transients are not affected. All calculated stress ranges and component cumulative usage factors are less than ASME Code allowables. All fatigue and stress analyses were performed consistent with the original stress reports using the ASME Section III, 1965 Edition, with Addenda through Summer 1967, and transients from the latest CR-3 RCS functional specification. Therefore, the structural integrity of the secondary side pressure boundary is maintained, and the existing code margin of safety is not reduced.

SA/USQD Number: 98-0436, Revision 0 **FSAR Change(s):** Section 11.4.2.1.2

SA/USQD Title: MAR98-08-12-01; PC97-7660; FSAR Change 1998-0153; PC98-1466, CA Steps 17 and 21; FSAR Change 1999-0042 Radiation Monitor Motor Replacements

Description

This activity documents in-plant replacement equipment (motors for radiation monitors RM-A1, A2, A3, A4, A5 and A15) which differ from that shown on design documents. This activity will also install correctly sized overload heaters for the existing (in-plant) motors of radiation monitors RM-A1, A2, A3, A4, A5 and A15 in safety related motor control centers MTMC-3-11B, 11C; MTMC-5-10A, 10B and MTMC-6-6D, as well as inside portable monitor RM-A15.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Documentation of in-plant motors for RM-A1, A2, A3, A4, A5 and A15; the installation of correctly sized motor overload heaters in MTMC-3, 5 and 6 for the affected RMAs; and the resultant decrease in load to EGDG-1A and 1B are not accident initiators. Therefore, the proposed activity does not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The activities associated with this modification do not challenge any existing fission product barriers. This activity does not change or impact the way radiological information is transmitted to or processed by operations personnel, and equipment reliability is unaffected.

   This activity does not change or impact valve closure signals from RM-A1 and RM-A2; therefore, the ability of these valves to prevent radioactive releases is not affected. Also, there is no change or impact to fan closure signals from RM-A5; therefore, the function of these fans and their associated function with CREVs to ensure control room habitability is not affected.

   This activity is not capable of invalidating assumptions used in evaluating radiological consequences in any safety analysis or procedures which may reduce the effectiveness of a system used to mitigate the radiological consequences of an accident in the SAR. Therefore, the proposed activity does not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The replacement equipment affecting RM-A1, A2, A3, A4, A5 and A15 and MTMC-3, 5 and 6 for the affected RMAs meets the original design specifications.

A decrease in load to EGDG-1A and 1B results from documenting in-plant equipment. The reliability of the diesels is not degraded by this activity. A diesel generator loading evaluation has been completed which documents this position. This activity does not remove any automatic signals associated with the RMAs, MTMCs or EGDGs.

Therefore, the proposed activity does not increase the probability of the occurrence of a malfunction of: the RMAs to monitor radiation and provide equipment shutdown and closure signals; the MTMCs to provide power to their safety related loads during normal or accident conditions; or the EGDGs to start and supply emergency power during ES actuation or a Loss of Offsite Power (LOOP).

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

AC electrical systems and the radiation monitoring system are affected by this activity. The AC electrical systems directly affected are emergency diesel generators EGDG-1A and EGDG-1B. Load is reduced to the EGDGs by this activity. This reduced load has been evaluated by the diesel generator loading engineer and poses no increase for failure of the diesels. Therefore, there is no potential for increased consequences associated with the malfunction of EGDG-1A or 1B.

RM-A1, A2, A3, A4, A5 and A15 of the radiation monitoring system are affected by this activity. The installed motors and change in motor overload heater elements do not affect the function, or method of performing the function, of this equipment. Therefore, there is no potential for increased consequences associated with the malfunction of the RMAs.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed activity does not challenge fission product barriers or fuel integrity. The resultant decrease in emergency diesel generator load of EGDG-1A and 1B has been evaluated as having no adverse affects on the diesel generators to perform their safety function. Therefore, this activity is not an accident initiator.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

A decrease in load to EGDG-1A and 1B results from documenting the in-plant motors for RM-A1, A2, A3, A4, A5 and A15. The new motors and overload heaters for the associated RMAs are "like kind" replacements and have no different type of malfunction. The equipment important to safety affected by this activity are MTMC-3, 5 and 6 and

EGDG-1A and 1B. This equipment is upstream from RMAs and is protected by the safety related circuit breaker in the MTMCs. Therefore, the proposed activity does not create the possibility of a different type of malfunction of equipment important to safety than previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The installed motors and replacement motor overload heaters for the affected RMAs are transparent to system and equipment operation, except for the reduced load to the EGDGs. The decrease in loading to EGDG-1A and 1B has been evaluated by the emergency diesel generator loading design engineer. The reduced load increases the kW margin to the limits of the auto connected plus manual essential loads and during block loading as defined in ITS B3.8.1. No separate case study is required for this activity and the emergency diesel loading calculations, E-91-0026 and E-91-0027, will be revised accordingly during their next scheduled revision. Therefore, the proposed activity does not reduce the margin of safety as defined in the bases for any ITS.

SA/USQD Number: 98-0446, Revision 0

FSAR Change(s): Sections 1.5.8; 4.3.10; 4.5; 6.1.3.1; 14.2.2.5; and 14.3

SA/USQD Title: Calculation F98-0008; ITS Bases Change B98-34; FSAR Change 1998-0161 Change in Analysis of Record for SBLOCA Event from CRAFT2 to RELAP5

Description

This activity is a change in methodology utilized to evaluate Small Break Loss of Coolant Accidents (SBLOCAs). In particular, the current Analysis of Record (AOR) is based on a CRAFT2 based Evaluation Model (EM). This activity would generate a new AOR based on RELAP5.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   This activity is an analytical effort that does not affect the function of any structure, system, or component that is an accident initiator. Since this activity does not affect any such elements, there can be no increase in the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The basic functions of the Emergency Core Cooling System (ECCS) are not affected by this activity. As demonstrated by analysis, an increase in High Pressure Injection (HPI) delay time and other conservative input assumption changes were accommodated without any adverse results. In fact, the calculated peak clad temperature was reduced. Thus, this activity will not result in an increase in consequences previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The probability of equipment malfunction is most likely impacted by different system interactions or by operation under different, more challenging conditions. No changes in system interactions are introduced by or result from this activity. All structures, systems and components will respond exactly as before. While some system parameters (flow, time response, temperature, setpoint) are modeled more conservatively, their actual performance in the field is not altered by this activity. Thus, there is no increase in the probability of equipment malfunction.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The consequences of malfunctions are generally limited to adverse impacts on other structures, systems or components or by a direct impact to one of the primary fission product barriers. No changes in system interactions are introduced by or result from this activity. All structures, systems and components will respond exactly as before. The primary variable relative to one of the fission product barriers addressed by this activity is the peak clad temperature of the reactor fuel. The calculated results indicated it is less than was previously calculated. Thus, even with more conservative assumptions, the consequences of component malfunction are lessened or remain unchanged.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

No changes in system interactions are introduced by or result from this activity. All structures, systems and components will respond exactly as before. While some system parameters (flow, time response, temperature, setpoint) are modeled more conservatively, their actual performance in the field is not altered by this activity. Thus, there is no possibility of an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Different types of equipment malfunction would most likely be caused by operating structures, systems and components outside their existing operating conditions. While some system parameters (flow, time response, temperature, setpoint) are modeled differently, the actual environment in the field is not altered by this activity. Thus, no different types of malfunctions can result from this activity.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The analytical effort actually demonstrates the existence of as much safety margin as previously calculated. Even with an increased conservatism (HPI delay, 20% tube plugging and consequent decrease in minimum RCS flow) and the retention of other conservative assumptions (i.e. 2568 MWt), the resulting peak clad temperature is lowered. Thus, the margin of safety for any Improved Technical Specification is not decreased.

SA/USQD Number: 98-0456, Revision 0 **FSAR Change(s):** Section 8.2.1.3 and Figure 8-3

SA/USQD Title: MAR95-09-03-02; PC97-3623; FSAR Change 1998-0192
Power System Stabilizer (PSS) Commissioning

Description

This USQD is being performed for the commissioning of the CR-3 Power System Stabilizer (PSS). A PSS modifies the main generator voltage regulator response to power transmission grid transients, to effectively dampen out generator power swings. The PSS is currently installed but not inservice. The commissioning of the CR-3 PSS is composed of gathering online performance data from the main generator system, using the data to tune the PSS, verifying proper tuning, and placing the PSS inservice (including required Operating Procedure revisions).

The special testing for the commissioning of the PSS is not described in the SAR. The testing is unique and will be performed on an operating system with the CR-3 generator near full power.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   FSAR Chapter 14 accidents and the Licensing Basis Events were reviewed. The only accident/event relevant to the commissioning of the PSS is the Load Rejection Accident and Station Blackout Accident (SBO). The Load Rejection Accident occurs under circumstances where the external transmission system deteriorates, as indicated by unit frequency deviation.

   The load rejection accident is initiated by problems external to CR-3. The voltage/power oscillations induced during PSS testing will be too small and will be carefully monitored to ensure an external transmission system deterioration is not created. The System Planning and Energy Control Center will be notified about the PSS testing and will ensure the transmission system is in an operating mode that is not susceptible to sustained power oscillations as indicated by system studies. Therefore, the commissioning of the PSS will not increase the probability of a Load Rejection Accident. In addition, once in service, the PSS will reduce the probability of a Load Rejection Accident by acting to dampen generator power swings caused by transmission system disturbances.

   A trip of CR-3 due to plant work activities does not increase the probability of a load rejection accident due to the nature of the load rejection accident (load rejection caused by external disturbances). However, this aspect of the commissioning of the PSS will be discussed below under Station Blackout Accident.

   A Station Blackout Accident, a complete loss of all unit AC power, is a hypothetical case where all unit power is lost except the unit Class 1E DC system batteries. Commissioning

of the PSS has the potential to trip the turbine-generator near full power. Hypothetically, a trip of CR-3 could cause a transmission system disturbance and cause a loss of offsite power to CR-3, which is a factor for the probability of an SBO. The commissioning of the PSS cannot affect the Emergency Diesel Generators. Human error during the connection and disconnection of test equipment during functional testing of the PSS is what creates the potential for a turbine-generator trip during the testing. In addition, the connection and disconnection of test equipment is no different than maintenance activities that could conceivably be performed while the plant is on line with the potential for a plant trip. In addition, once in service, the PSS will reduce the probability of a transmission system collapse by acting to dampen generator power swings caused by transmission system disturbances. Therefore, the probability of an occurrence of an accident previously evaluated in the SAR is not increased.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The PSS only has the ability to directly affect the main generator and associated voltage regulator. The commissioning of the PSS does not have the ability to affect SAR accident analysis assumptions or methodology. The commissioning of the PSS cannot directly challenge fission product barriers (fuel cladding, the Reactor Coolant System, or the containment structure). The main generator is not used to limit the consequences of any accident evaluated in the SAR. The commissioning of the PSS will not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The commissioning of the PSS does not degrade (electrically or physically) equipment previously evaluated in the SAR for mitigation of accidents. The turbine-generator trips for many SAR evaluated accidents. The PSS does not have the ability to interfere with any turbine-generator trip circuits or mechanisms. No new manual operator actions during accident conditions are being created by the commissioning of the PSS. The commissioning of the PSS cannot increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Commissioning of the PSS does not degrade any systems used to mitigate radiological dose consequences received by onsite or offsite personnel. The PSS does not have the ability to provide a new radiological material release path. Therefore, commissioning the PSS cannot increase the consequences of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The worst case scenario for the commissioning of the PSS would be a near full power trip

of the CR-3 turbine-generator due to human error during the testing. The turbine-generator trip would result in a reactor trip. A plant trip is not considered a new accident and is within the design capabilities of the plant systems. Therefore, the commissioning of the PSS cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The PSS and main generator voltage regulator are both located in the Turbine Building 6900V/4160V Unit Switchgear Room. The Turbine Building is a non-seismic structure. Neither unit is seismically qualified or seismically mounted. The PSS and main generator voltage regulator are not train specific. Therefore, electrical train separation does not apply to either the PSS or voltage regulator. The PSS and main generator voltage regulator are not located in an Environmental Qualification (EQ) harsh zone. Therefore, 10 CFR 50.49 does not apply to the PSS or voltage regulator. However, the PSS is designed for the environment that it is located in. The PSS is not located in an area where it is more susceptible to flooding or fire than the main generator voltage regulator.

The commissioning of the PSS does not degrade (electrically or physically) equipment previously evaluated in the SAR for mitigation of accidents. Therefore, the commissioning of the PSS cannot create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There is no margin of safety associated with the main generator or the associated voltage regulator in the ITS Bases or the SAR. There are no ITS LCOs associated with the main generator or associated voltage regulator.

However, there is an implicit margin of safety associated with ensuring safe operations of CR-3. The testing of the PSS would potentially reduce this implicit margin if proper precautions were not executed during the testing. The advantages of having the PSS inservice outweigh the potential human error risk during performance of the testing. Therefore, the implicit margin of safety will not be reduced.

SA/USQD Number: 98-0457, Revision 0 **FSAR Change(s):** None

SA/USQD Title: EM-225E, Revision 1, Emergency Plan Implementing Procedure, Guidelines for Long Term Cooling

Description

This 50.59 analyzes the acceptability of proposed changes to Emergency Plan Implementing Procedure, EM-225E, Guidelines for Long Term Cooling. The proposed revision to EM-225E will add a new accident mitigation alignment, ensuring that HPI flow rates are controlled within a proper range to adequately provide core cooling while maintaining the pump(s) within analyzed flow limitations pertinent to pump qualification.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed changes to the EM-225E do not incur physical change to the Plant. No credible failure modes can be attributed to the proposed changes. These changes to EM-225E impart limitations on pump operations 64 hours or later post-LOCA to protect qualification of the pump(s) and ensure at least one pump is available for maintenance of long term core cooling. Those required actions specifically credited for mitigation of the accident will not change. Therefore, the proposed changes do not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The analyses performed which determine the consequences of the LOCA have no means of being affected by the proposed changes to EM-225E. The system alignments for Piggyback operation as presently described in the SAR and EM-225E are not altered with the proposed changes. The changes are necessary to ensure the core is adequately cooled as well as the qualification of the pump(s) maintained post-accident. The proposed changes enhance long term core cooling, ensuring at least one Makeup Pump is available for this purpose. Therefore, an increase of the consequences of an accident previously evaluated in the SAR is not credible.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The proposed changes to EM-225E will not result in any modification to Plant equipment. No new failure modes may be attributed to this activity. Throttling HPI is an activity with which Operators are familiar; the changes to EM-225E do not introduce a new operator action, just the scope of when throttling may occur now has been analyzed to be acceptable

with inadequate sub-cooling margin (SCM). The changes are necessary to ensure adequate decay heat removal and qualification of the Makeup Pumps. Therefore, a malfunction of equipment important to safety previously evaluated in the SAR is not credible.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This activity does not result in any physical change to the Plant. No additional burdens are being imposed on Plant equipment due to the proposed changes to EM-225E. Throttling HPI flow is intended to ensure the capability of the HPI Pumps to perform the required safety function. Existing accident analyses are not impacted. Therefore, an increase in consequences due to a malfunction of equipment important to safety is not feasible.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Analyses have been performed to ensure throttling of the HPI pumps post-LOCA will provide adequate decay heat removal. The alignment of the Makeup System for Piggyback operations is unchanged. The proposed changes ensure the System is operated within the limitations posed by the Vendor for pump qualification while adequately maintaining the core covered. The intent of long term core cooling is not altered and no new accident scenario is possible as a result of this activity. Therefore, the proposed changes have no means to create an accident of a different type than previously evaluated.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed changes to EM-225E resulting from limitations imposed by the Vendor for qualification of the pump(s) and analyses to ensure adequate core cooling do not require physical change to the Plant. No new failure modes are created by this activity. The only mode of operation affected is the Piggyback mode of operation for long term cooling post-LOCA. Therefore, the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR does not exist.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The Improved Technical Specifications (ITS) govern the operation of the High Pressure Injection Mode of the Makeup and Purification System. Neither the ITS nor the Operating License mandate specific requirements for the Piggyback Mode of HPI operation. While ITS establishes minimum performance requirements of some Makeup System components, the proposed changes to EM-225E in no way prevents the components from satisfying ITS requirements.

Maintaining operation of the HPI Pumps within limitations posed by the vendor for qualification will ensure performance of the safety function of the pump(s) post-accident.

Margins of safety found in other SERs or other commitment documents such as implied commitments to the Standard Review Plan (SRP), Nuclear Regulations (NuRegs), Offsite Dose Calculation Manual (ODCM), Core Operating Limits Report (COLR), etc. cannot be reduced as a result of this activity. Therefore, the margin of safety as defined in the bases for any Improved Technical Specification will not be reduced by the implementation of the proposed changes.

SA/USQD Number: 98-0458, Revision 0 **FSAR Change(s):** Sections 11.4.2.1.1 and 11.4.3

SA/USQD Title: PC98-3894; REA97-1236; FSAR Change 1998-0158
Removal of Batteries From RM-G20 through RM-G24

Description

This work activity acknowledges that Drumming Area Radiation Monitors RM-G20, RM-G21, RM-G22, RM-G23 and RM-G24 are abandoned in place and are to be deleted from the description of the Radiation Monitoring system in the FSAR.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed activity does not affect reactivity control, the primary pressure boundary or primary containment. None of the affected channels of the Radiation Monitoring System are an initiator for any analyzed accident. Accident probability is not affected by this FSAR change.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The affected channels of instrumentation were installed to support solidification and drumming of radwaste in the Drumming Area of the Auxiliary Building. There are no FSAR analyzed accidents which are mitigated in any way by these instruments nor are the consequences of any accident affected by these instruments. These channels do not affect accident consequence and thus removal of the instruments cannot increase the consequences of any accident.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The Drumming Area radiation monitors are not and never were considered equipment important to safety as evaluated in the FSAR. They do not affect or contribute any equipment important to safety. Abandoning the instruments cannot increase the probability of a malfunction of equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The affected channels of area radiation monitor were never used to monitor activity for radiological releases. Abandoning the Drumming Area radiation monitors does not increase the consequences of malfunction of equipment used to mitigate events or

accidents as described in the FSAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

There are no credible failure modes for the removal of the Drumming Area radiation monitors. No conditions for an accident different than any previously analyzed in the SAR are created.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The Drumming Area radiation monitors were designed as stand-alone channels which provide strictly local indication and alarm of radiation levels in the Drumming Area. There never was any protective trip associated with these channels. All five channels are powered by the same breaker from a non-safety electrical supply. There is no proximity or interfacing with any equipment credited with accident mitigation. No conditions for malfunction of equipment important to safety than any previously analyzed in the SAR are created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The Drumming Area radiation monitors are not in any way associated with any Technical Specification related equipment. The Drumming Area radiation monitors are not used in the basis for any Improved Technical Specifications and, therefore, their removal cannot reduce the margin of safety in any way.

SA/USQD Number: 98-0461, Revision 1 **FSAR Change(s):** Section 11.2.7

SA/USQD Title: HPP-305 Procedure Revision; FSAR Change 1999-0024
Storage of Reusable Radioactive Material in Converted Oil Storage Tank 4

Description

The purpose of this assessment is to evaluate the conversion of a portion of the "D" warehouse (converted oil tank) for the purpose of storing reusable radioactive material, and the associated procedure changes required to support the conversion. The converted oil tank will be used as the low-level, short-term radioactive materials storage area for materials and equipment that are subject to reuse during normal operations and outage conditions. The "D" warehouse will not be used for long-term storage of radioactive waste.

An additional paragraph (11.2.7) will be added to FSAR Chapter 11. The change describes provisions for the storage of reusable radioactive material, which is normally stored within an oil tank that had been converted to a warehouse facility.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The FSAR does not analyze any events involving release of activity from stored reusable radioactive material to members of public. A waste gas decay tank rupture is the accident analyzed in the FSAR that is most analogous to a release of activity from stored reusable radioactive material. The waste gas system releases are typically analyzed as the bounding Chapter 14 waste/rad material accidents as the potential for gaseous releases is significantly greater than the potential to release solid radioactivity and the potential dose consequences of a gaseous release are expected to be bounding. The amount of activity released in a waste gas decay tank rupture clearly bounds the impact of the plausible accidents affecting the "D" warehouse (converted oil storage tank). The impact of credible accident scenarios is analyzed in the safety analysis section. Since the converted oil tank storage facility is well outside the protected area, it could not increase the probability of occurrence of an accident previously evaluated in the SAR including the waste gas decay tank rupture.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The "D" warehouse is outside the protected area. It is unrelated to, and could not have any impact on, the consequences of an accident previously evaluated in the FSAR. The "D" warehouse (converted oil tank) would have no impact on accident initiation, nor would it affect the SSCs used to mitigate an accident. The consequences of the credible

accident scenarios analyzed in the safety analysis section are clearly bounded by the waste gas decay tank rupture as analyzed in the FSAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The use of a portion of the "D" warehouse for reusable radioactive material storage has no impact on the operability or reliability of the equipment important to safety as evaluated in the FSAR. The converted oil tank is far removed from any equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Since the storage of reusable radioactive material in the "D" warehouse has no impact on the operability or reliability of equipment important to safety, it could not increase the consequences of a malfunction of said equipment. The distance from the converted oil tank to the equipment important to safety makes it impossible to increase the consequences of the malfunction of such equipment.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The credible accidents (fire, flooding, and violent weather) are analyzed in the safety analysis section. Their impact on dose to members of the public is inconsequential. A waste gas decay tank rupture (analyzed in the FSAR) clearly bounds any credible occurrence at the converted oil tank. This validates the logic that the waste gas system failure was chosen as the bounding waste/rad material accident. The scenarios evaluated in the safety analysis are not accidents of a different type, just accidents that were not evaluated in detail before as they were assumed to be bounded by the waste gas decay tank rupture accident. An accident at the converted oil tank would not impact the plant and would therefore not result in an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The storage of reusable radioactive material at the converted oil tank has no impact on the operability of equipment important to safety. Therefore the activity could not create the possibility of a different type of malfunction of equipment important to safety.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The storage of reusable radioactive material is not addressed in the improved technical specifications. As discussed in the safety analysis, radiation protection procedures will control the activities at the facility and will ensure radiological conditions are controlled in accordance with applicable regulations.

SA/USQD Number: 98-0467, Revision 0 **FSAR Change(s):** Appendix 14B.3.2.2

SA/USQD Title: MAR96-06-03-01, FSAR Change 1998-0167
Control Rod Drive Spare Cables

Description

This activity will install spare Control Rod Drive (CRD) power and position indication cables (10 each, with connectors) from the penetrations inside the Reactor Building (RB) to the termination shelves at the reactor vessel head structure. The spare circuits will be available to replace existing circuits in case of failure.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

The circuits being installed are dedicated spare circuits. They will have no function (and therefore no impact on any accident scenarios) until they are used as spares for existing Control Rod Drive (CRD) circuits. The spare circuits are identical to the existing CRD circuits, and if used in replacement, will have no impact on the function or method of performing the function of the CRDs.

A review of FSAR Chapter 14 accidents showed that the only accident which can be caused by CRD cable failure is the dropped rod accident. The installation of spare circuits in the same tray as the existing "in-service" CRD power circuits will add a small amount of thermal blanketing to the tray, having some effect on their operating temperature. Thermal modeling has determined that the temperature rise caused by the installation of 5 random lay spare power circuits (worst case, in tray 460, coordinates 3 and 4) is very small, on the order of 1 degree Fahrenheit. An evaluation was performed using Arrhenius equations demonstrating that service life is not impacted by these additional spares since, at the operating temperatures experienced in the cable tray after installation of the proposed spare circuits, the service life of the cables should still be well over the life of the plant. Any reliability problems should be caused by radiation and extreme conditions encountered at the service structure end of the circuits, rather than by thermal aging in the cable trays; this is supported by plant operating history. Therefore, the probability of occurrence of a dropped rod accident is not increased by this modification.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The aluminum connectors being installed by this activity will increase the amount of reactive metal in the Reactor Building (RB) by about 10 lbs., thus slightly increasing hydrogen generation after an accident(assuming Building Spray actuation). This slight increase is acceptable since it is bounded by the latest revision of the Mechanical

calculation for hydrogen generation, M85-1004.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The installation of spare control and power circuits for the CRDs can only affect them by affecting the service life of the "in-service" power cables as described in Question 1 above. Thus, this Question 3 is answered "No" for the same reasons. Note that control cables do not carry enough current for appreciable thermal effects.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The installation of spare CRD circuits does not change any parameter of any malfunction of equipment important to safety. It does not affect or create any radiological release pathways. As noted above, hydrogen generation will be minimally increased, still within the bounds of existing evaluations. Therefore, this activity cannot increase the consequences of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The installation of spare CRD circuits only interfaces with the existing CRD circuits as noted in Question 1 above. When placed in service, they will perform the same function in the same manner as the existing circuits. Since no change is being made to any existing system, and no new system is being placed in service, an accident of a different type cannot be created.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This MAR does not introduce any new fluid, electrical, control or instrument interfaces or increase operator burden, and does not introduce any new failure modes. The function and operation of the control rod drives has not been changed in any way. No other plant systems are affected. The potential increase in hydrogen generation and possibility of circuit malfunction is evaluated above; however, this is not a new type of malfunction and does not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR. This is true for all modes of operation, abnormal operation, and design/licensing basis events.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

None of the LCO descriptions or parameters described in the ITS Bases are affected by the installation of spare circuits for the CRDs. The installation of spare circuits does not affect limiting conditions for operations relating to reactor power distribution or Departure from Nucleate Boiling Ratio (DNBR) as described in ITS Bases Sections B3.1, B3.2,

B3.4, B3.7, or B3.9. The parameters for a dropped rod accident are not changed by this activity. The installation of spare circuits does not affect the reliability of the existing CRD circuits. Therefore, the margin of safety as defined in the ITS Bases is not reduced by this activity.

SA/USQD Number: 98-0478, Revision 0

FSAR Change(s): Sections 5.2.5.2.3.2.k; 5.3.1; 5.7; Table 5-4 and Table 5-9

SA/USQD Title: MAR98-08-02-01; FSAR Change 1998-0177
Replace Rupture Discs with Relief Valves

Description

This modification replaces the rupture discs with relief valves in penetrations 314, 318, 339, 352, 374, 440 and 441. It also removes the expansion chambers from penetrations 339, 352, 374, 440 and 441 and routes the relief valve discharge to the Auxiliary Building floor (352), an Auxiliary Building floor drain (339 and 374), or the Intermediate Building floor (440 and 441).

FPC Letter 3F0197-05 submitted a response to Generic Letter 96-06. Table 2 in that response identified the relief devices for the respective penetrations. The relief devices for penetrations 314, 318, 339, 352, 374, 440 and 441 are being changed from rupture discs to relief valves.

FPC Letter 3F0798-07, Attachment B addressed modifications to rupture disc pressure settings for penetrations 314, 318, 352, 440 and 441. These rupture discs are being replaced with relief valves.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   None of the accidents previously evaluated in the SAR are initiated directly or indirectly by a failure or malfunction of the penetration overpressure relief devices. Therefore, changing the devices from rupture discs to relief valves will have no effect on the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The modification does not alter the function of the penetrations to isolate the Reactor Building (RB) and prevent post-accident contamination from being released to the atmosphere. Should the relief valves open, the fluid will be contained within the RB or routed to the Auxiliary Building floor, an Auxiliary Building floor drain, or the Intermediate Building floor for subsequent processing as normal waste. The respective systems are not relied upon for accident mitigation; hence, the containment isolation valves are not re-opened. Therefore, should the relief valves not re-seat, no additional fluid would be lost from the isolated process lines inside containment. As a result, the modification will not increase offsite or control room post-accident radiation doses. Therefore, the proposed modification will not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The modification makes no changes to the manner in which the affected systems function to isolate the Reactor Building on a containment isolation signal. The modification does change the overpressure relief method (rupture discs to relief valves) in the penetrations following a LOCA or MSLB. However, this change has no effect on the ability of the penetration to perform its isolation function. Therefore, the proposed modification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The relief valves' function and interaction with other plant equipment is identical to that of the rupture discs, with the exception of the disposition of discharges from the valves. Discharges from the valves associated with penetrations 339, 352, 374, 440 and 441 are no longer contained in expansion chambers. Instead, these discharges are piped to suitable disposal points (i.e., the Auxiliary Building floor [352], an Auxiliary Building floor drain [339 and 374], or the Intermediate Building floor [440 and 441]) for subsequent handling in accordance with approved waste disposal procedures. The design adequately addresses concerns associated with the added piping such as seismic support, pipe whip, and jet impingement effects. Therefore, the modification does not increase the consequences of an equipment malfunction previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Since the modification does not change the required safety functions of the RB penetrations following a LOCA or MSLB, any potential accident which this modification might cause or affect is enveloped by the current accident analyses. Since the relief valves are considered passive components, they cannot create an accident. During the LOCA or MSLB, after the inboard and outboard isolation valves close, the relief valves are relied upon to open should excess pressure build up in the process pipe. These systems are not required to be used following the Design Basis Accident to mitigate the accident. If the relief valves do not re-seat, containment is still isolated. Therefore, the modification does not create the possibility of a different type accident than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Since the relief valves perform an identical function as the rupture discs, and also meet the same qualifications, their impact on other plant equipment is unchanged. The safety function of the relief valves is to open if pressure builds up in the process pipe. If they do not re-seat, containment is isolated by the inboard isolation valve and pressure cannot build up in the process line, thereby assuring the integrity of containment and the pipe.

Therefore, the modification cannot create the possibility of a different type of equipment malfunction than previously analyzed.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?**

No

The relief valves will perform all safety functions of the rupture discs, will relieve at the same setpoint, and will be required for operation under identical scenarios. Differences in physical characteristics of the relief valves have been addressed in the design (i.e., support and routing of the new drain piping) and disposition of the relief valve discharge. Therefore, the modification will not reduce the margin of safety as defined in the bases for any Improved Technical Specification.

SA/USQD Number: 98-0479, Revision 1

FSAR Change(s): Sections 7.3.2.2.3; 7.3.3.2.1; 7.3.4.1; 7.3.4.2.2; Table 7-12; and Figure 7-25

SA/USQD Title: MAR96-11-03-0; License Amendment 174 (3N0499-14); FSAR Change 1999-0056
Subcooling Margin Monitor Upgrade

Description

This modification upgrades the subcooling margin indication to meet most, but not all, of the requirements for a Reg. Guide 1.97, type A, category 1 parameter. The indication of subcooling margin will be provided by the Safety Parameter Display System (SPDS). The plant changes implemented by this modification are:

- Separation of the 16 environmentally qualified core exit thermocouples (CETs) into two qualified channels of 8 CETs each (2 CETs/quadrant). These signals will be input to both SPDS channels, with 8 of the 16 CETs to each channel.
- Replacement of the three existing CET recorders with two 1E qualified recorders - one for each channel of 8 CETs.
- Redistribution of the AC power to the SPDS so that channel A and B SPDS are powered by ES buses A and B, respectively.
- Provide physical restraints to the major SPDS components.
- Removal of the existing dedicated Tsat indicators and associated equipment.
- Replace the existing Tsat indicators with Slave Tsat indicators driven by SPDS.
- Provide labels on the SPDS displays indicating that the subcooling margin Reg. Guide 1.97 indicator is the SPDS display.
- Revision of the SPDS display curves.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   This activity modifies instrumentation and its associated indication. None of the equipment initiate any of the events described in Chapter 14 of the FSAR. Therefore, this activity cannot increase the probability of occurrence of a previously analyzed accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The upgrade of the 16 qualified CET monitoring loops and upgrade of the SPDS does not change the basic function of the SPDS. Similarly, the SPDS calculation of subcooling margin is not changed. The improvements of this modification will make the SPDS the

Reg. Guide 1.97 indicator of subcooled margin as a type A, category 1 parameter with some exceptions as defined in the FPC LAR 246. The reliability of subcooled margin indication available to the operators is enhanced. Also, as a backup method subcooled margin can be trended by manually plotting RCS pressure and temperature on instrument error corrected figures using data obtained from Reg. Guide 1.97 category 1 instruments.

Since the basic function of the SPDS is not changed, and the modifications actually enhance the reliability of indications used by the operators, the consequences of an accident previously analyzed cannot be increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This modification upgrades the qualified incore CETs and the SPDS into two channels that display subcooling margin in the control room. Subsequent to the modification, the SPDS will be the Reg. Guide 1.97, type A, category 1 instrument for display of subcooling margin. An instrument that displays a category 1 parameter normally requires full 1E qualification. However, in License Amendment Request 246 (subsequently approved by the NRC as via License Amendment 174, dated 4/20/99, TAC No. MA4147), FPC proposed that for the SPDS subcooling margin parameter all requirements would be met for full 1E qualification except for the following:

- Partial compliance to seismic qualification criterion. The SPDS is not fully qualified, but physical restraints on critical equipment will be added.
- Partial compliance to redundancy criterion. The SPDS does not have independent inputs and has other cross channel connections.
- Partial compliance to equipment quality assurance criterion. The SPDS will not be 1E but all the CET input signals and CET recorders will be 1E.
- No compliance for input signal isolation criterion. Isolation is provided between safety systems and SPDS, however no isolation is provided on inputs from non-safety systems.

Subcooling margin is a type A variable because it is used by the operator to perform manually controlled actions for which no automatic control is provided and is required for safety systems to accomplish their safety functions for design basis events. The actions to be performed by the operator based on subcooling margin are:

- manual initiation of high pressure injection
- tripping of the reactor coolant pumps
- selection of the steam generator high level setpoint on the Emergency Feedwater Initiation and Control (EFIC) system during LOCAs.

The subcooling margin, in conjunction with operator action, is important to safety. However, the modification changes cannot increase the probability of loss of subcooling margin indication over the existing instrumentation by:

- Separating the existing 16 CET inputs into two independent channels
- Providing dual channel display of subcooling margin
- Improved seismic resistance of the SPDS
- Use of fully 1E qualified, redundant input instrumentation into the SPDS.

Lastly, it is recognized that a seismic event could disable the entire SPDS even after the addition of seismic restraints. However, in this unlikely event, both 1E-qualified CET recorders should remain functional and allow the operator to determine subcooling margin without the SPDS by manually plotting RCS pressure and temperature from Reg. Guide 1.97 category 1 instruments on instrument error corrected figures.

With some exceptions, all the criteria for Reg. Guide 1.97 are met. The exceptions have been evaluated and approved by the NRC to be acceptable based on the expected continued functionality of the SPDS. In fact, the activity as a whole will improve the reliability of the SPDS. Therefore, this activity cannot increase the probability of malfunction of equipment.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The modification will enhance the reliability of the subcooling margin indication on the SPDS by providing two redundant channels with exceptions as described above. The subcooling margin indication is important to safety because the operator needs subcooling margin to make operational decisions important to plant safety. The modification cannot increase the probability of the subcooling margin not being available. The proposed activity will have no effect on the consequences of a malfunction of equipment (namely loss of subcooling margin) important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The modification will upgrade the qualified CETs and the SPDS system to provide a redundant (i.e., two channels of SPDS) subcooling margin indication in the control room. The SPDS calculation of subcooling margin will remain unchanged. The subcooling margin indication, as well as the entire SPDS, is an information only system with no control or protective functions and as such is not an accident initiator There are no credible failures in the modification tasks which could result in a different type of accident that has not already been analyzed. Therefore, the activity cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This modification will upgrade the CETs and SPDS into two redundant channels. However the SPDS calculation of subcooling margin remains unchanged. The reliability

of the subcooling margin indication will be enhanced by this upgrade. A review of credible failures did not reveal a different type of malfunction of equipment important to safety. The use of 1E power is protected by isolation devices (fuses), all safety related equipment will be seismically mounted and all non-safety related equipment, such as the SPDS, will be mounted to ensure that no hazard exists to nearby safety related equipment. Therefore, no credible failure of CETs or SPDS can create a different type of equipment malfunction than previously analyzed in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Subcooling margin is a necessary input to the operator for performance of manually initiated safety related operations. The ITS bases discuss the bases for the LCOs for the safety related CETs and for the subcooling margin display. Due to the redundancy of the safety related CETs and the SPDS channels, these LCOs have been revised and approved by the NRC letter to FPC (TAC No. MA4147), dated 4/20/99, Subject: CR-3 - Staff Evaluation and Issuance of Amendment Regarding Subcooling Margin Monitoring Using SPDS. By upgrading the environmentally qualified CETs and the SPDS display of subcooling margin into two redundant channels, these modifications will improve the reliability of the subcooling margin indication to the operator. None of the modifications of this modification reduce the margin of safety described in the ITS bases.

SA/USQD Number: 98-0495, Revision 0

FSAR Change(s): None

SA/USQD Title: MAR83-08-21-02; PC97-2047; PC98-1163
Hydrogen Recombiner Containment Isolation Valves

Description

MAR83-08-21-02 called for replacing 6 manual containment isolation valves serving the hydrogen recombiners with 8 remote-manual valves, ensuring compliance with 10 CFR 50.44 "Standards for Combustible Gas Control System in Light Water Cooled Power Reactors." Since these valves also perform a containment isolation function, they were added to the Former Technical Specification Table 3.6-1 "containment Isolation Valves." NRC License Amendment 76, dated July 3, 1985 (3N0785-10) approved addition of these remote-manual valves to Table 3.6-1. PC97-2047 and PC98-1163 identified that the valves actually installed were manual, in lieu of remote-manual.

There was an apparent FPC internal miscommunication regarding this modification. The modification documentation identifies that manual valves were being installed and a safety evaluation was performed at that time. The evaluation identified the need for both an FSAR and Technical Specifications change. The changes were submitted and approved; however, the terminology sent to the NRC by FPC and reiterated in the NRC approval of the change identified the valves as remote-manual.

These valves are no longer in the Technical Specifications. The specific table in which they were listed was removed from Technical Specifications and relocated to FSAR Table 5-9 via a later License Amendment. The Improved Technical Specifications are not impacted by this nonconformance. This SA/USQD is being performed to address the issue of the installation of manual valve versus the remote-manual valves specified in NRC License Amendment 76, to ensure compliance with CR-3's licensing basis and to notify the NRC of the discrepancy.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Containment isolation valves are not assumed to be the initiator of any design basis accident. Revision of these valves from remote-manual to manual has no means to alter the probability of occurrence of an accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   These containment isolation valves are maintained closed during normal plant operations, with the valves nearer containment being locked closed. Following a LOCA (up to 1500 hours later, once the recombiners were installed), these valves would be opened to permit

operation of an external hydrogen recombiner. The external system provides redundant capability to ensure a supply and return line is available in the event of a single failure. This capability is unchanged by the revision of these valves from remote-manual to manual operation. Operation of the hydrogen recombiner would be assured and, therefore, containment hydrogen concentration would be reduced as required for accident mitigation.

Remote operated valves would reduce exposure to the individual operating the valve. However, a preliminary dose calculation prepared for the MAR determined the dose to be 0.6 Rem for manual valve operation at 1500 hours. A recent calculation, M93-0006, which assumes these same valves are opened for purging at 14.8 days following a Maximum Hypothetical Accident (MHA), determined the dose to be 110 mRem. This dose rate is well below the requirements of NUREG-0737, Item II.B.2.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Revision of the hydrogen recombiner containment penetration isolation valves from remote-manual to manual would have no means to increase the probability of valve failure. If the valve was remote-manual, removal of the operator should reduce the probability of valve failure, as there are less components which could cause the valve to fail. In any case, the system is designed against single failures and the system would be capable of performing its function regardless of a single components failure.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Whether remote-manual or manual, the valves can only fail in a similar manner; i.e., closed, throttled or open. For normal plant operations, the use of double isolation valves in each line ensures the penetration is isolated. This change does not reduce that capability. The consequences on the operation of the external hydrogen recombiner system would also be unchanged. The system is designed against single failure and therefore any one failure would not reduce the capability of the system to perform its design function.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Whether remote-manual or manual, the valves can only fail in a similar manner; i.e., closed, throttled or open. Therefore, no new mechanism has been introduced whereby an accident of a different type could be created.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Whether remote-manual or manual, the valves can only fail in a similar manner; i.e., closed, throttled or open. Therefore, no new mechanism has been introduced whereby a malfunction of a different type could be created.

Remote-manual valves would assume the operator manually actuates a switch to open each of the eight valves. Manual valves would assume the operator goes to each valve to manually open each of the eight valve. In both cases, the operator is performing manual actions. In the prior case, the operator must locate the switch and then correctly actuate the switch. In the latter, the operator must locate the valve and then correctly operate the valve. While the means to open the valves are different, the result of human error would be the same: a misaligned valve. Therefore, a malfunction of a different type is not created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Containment integrity requirements and permissible containment leak rates are unchanged. Therefore, the margin of safety is not reduced.

SA/USQD Number: 98-0502, Revision 0 **FSAR Change(s):** Figure 8-12 and Figure 8-14

SA/USQD Title: MAR98-06-04-01, FCN 1; FSAR Change 1996-0165
Emergency Diesel Generator (EGDG) Vent Tubing

Description

The jacket coolant and air cooler coolant vent tubing will be modified to allow the air to naturally vent during the fill/vent process and during system operation. This will be accomplished by moving the vent points to high points on the main process lines, as determined by engineering judgment, using the data provided in REA 98-0640 and field walkdowns. Tubing supports will be added as necessary, in accordance with seismic Class I support criteria. The change will not affect the overall ability of the respective systems to provide coolant to the designated areas. The systems are shown on the respective flow diagram drawings. FSAR Figures 8-12 (Drawing 302-283) and 8-14 (Drawing 302-284) will be revised to show the configuration.

The installation of the new vent paths will not affect the capability of the pumps to circulate fluid through the radiators providing the necessary heat sink. Proper venting will minimize the loss of coolant that is being displaced by air because of the improper slope in the lines.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?**

   No

   The loss of coolant from the jacket coolant and air cooler coolant systems is not an accident evaluated in the SAR. The emergency diesel generators are the backup sources of power following a Loss Of Offsite Power (LOOP) or degraded grid voltage condition. The EGDG system cannot initiate a LOOP or degradation of the grid system or any other accident in the SAR. The vent tubing modification will not increase the probability of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?**

   No

   The EGDGs provide a backup source of power to components relied upon to mitigate a LOOP to safely shutdown the plant. Some of these features minimize the consequences of an accident by performing their design function. Sudden significant fluid losses could affect the ability of the system to cool the engine, thereby affecting EGDG performance. Proper venting will assure that air pockets are effectively removed during both the normal fill/vent process and air accumulation caused by other sources. This will eliminate the sudden level changes in the fluid and assure that coolant is available for the engines.

   The installation of the new vent paths will not affect the capability of the pumps to circulate fluid through the radiators providing the necessary heat sink. Proper venting will

minimize the loss of coolant that is being displaced by air because of the improper slope in the lines. The modification will not affect the ability of the EGDGs to start and perform their function. Therefore, the consequences of an accident previously evaluated in the SAR are not increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The EGDGs are relied upon to provide backup power following a LOOP and degraded grid voltage condition. The modification will improve the venting system of the cooling systems. Proper venting will assure that air pockets are effectively removed during the normal fill/vent process, as well as air accumulation caused by other sources. This will eliminate the sudden level changes in the fluid and assure that coolant is available for the engines. The installation of the new vent paths will not affect the capability of the pumps to circulate fluid through the radiators providing the necessary heat sink. These systems will be seismically supported to assure no loss of integrity during a seismic event, therefore the loss of pressure boundary is not considered a credible failure. The modification cannot increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

As long as the EGDGs start, load and continue to run the equipment relied upon to minimize the consequences of an accident is not affected. Proper venting will assure that air pockets are effective removed during the normal fill/vent process and air accumulation caused by other sources. This will eliminate the sudden level changes in the fluid and assure that coolant is available for the engines. The installation of the new vent paths will not affect the capability of the pumps to circulate fluid through the radiators providing the necessary heat sink. The modification will not affect the ability of the EGDGs to perform their safety function. Based on this, the consequences of a malfunction of equipment important to safety previously evaluated in the SAR are not increased.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The EGDGs provide a backup source of power upon receipt of a signal to start. The EGDGs are not accident initiators. The modification will not affect the ability of the EGDGs to start, load and continuously run. Based on this, an accident of a different type than any previously evaluated in the SAR is not created.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The loss of fluid could cause the electrical equipment in the radiator room to be sprayed, resulting in their inability to perform their function. This could eventually lead to overheating of the diesel and subsequent loss of backup power to essential equipment.

However, the tubing will be installed as a safety related modification and supported to meet seismic Class I criteria. This will assure the integrity of the system during a seismic event. With the pressure boundary being maintained, the loss of fluid cannot occur, thereby eliminating the potential for loss of equipment relied upon to support the operability of the diesel. Hence, the modification will not create an accident of a different type than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Surveillance Requirement 3.8.1.2 discusses surveillance run times for the diesels. There are limited run times for the diesel with Notes associated with the Surveillance Requirement. Note 1 indicates that diesel engine runs for the surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. The mechanical stress usually applies to moving parts. There are no moving parts associated with this modification; however, the tubing will be supported to assure that mechanical stresses are minimal during run times. The margin of safety for this modification will be to limit the mechanical stresses such that no pressure boundary failure occurs, thereby assuring that no margin is reduced. This can be accomplished by meeting the Class I seismic support criteria.

SA/USQD Number: 98-0519, Revision 1 **FSAR Change(s):** Section 9.7.2.1.h.6

SA/USQD Title: MAR98-08-04-01, FCN 2; Deficiency Report for PC97-8499; Calculation M97-0020, Revision 0; FSAR Change 1999-0134 Vital Bus Regulating Transformer Replacement

Description

This modification replaces Vital Bus Voltage Regulating Transformers VBTR-4A, VBTR-4B, VBTR-4C, and VBTR-4D in the EFIC Rooms A, B, C, and D, respectively. The regulating transformers are being replaced because they were found to be operating below the nominal transformer 0.9 lagging power factor (Reference Deficiency Report DR97-8499 Rev. 0). Furthermore, the OEM no longer supplies technical support or spare parts. The new transformers will be mounted in the same location, are the same approximate size, and perform the same function as the existing transformers. Their additional weight has been evaluated as acceptable. The new transformers are rated for 30 kVA at 1.0 to 0.65 lagging power factor which matches the specifications of the new vital bus inverters.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Review of the accidents analyzed in Chapter 14 of the FSAR, as well as the licensing basis events, has determined that the vital bus regulating transformers are not credited to initiate or cause any of the cited accidents or events. Therefore, replacing the regulating transformers with similar equipment will not increase the probability of occurrence of such accidents.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The new regulating transformers perform the same function as the existing transformers which is to provide reliable, regulated, 120 VAC power to the vital buses when the associated inverters are not available. The new transformers do not affect the operation or function of equipment powered by the vital buses. No new failure modes are created by this modification activity. The new transformers will be located in the same location as the existing transformers. No new system interfaces are created by this replacement. The new transformers are heavier than the existing transformers, but are not excessively heavy for the Control Complex structure.

   Additional heat loading in the EFIC rooms has been evaluated. The Appendix R Fire Study and OP-880 will be revised to ensure all equipment in the EFIC Rooms will still function and remain operable and available as required. Additional Emergency Diesel

Generator loading for transformer standby operation has been evaluated as acceptable. Operating procedures will be revised to properly address the new transformer integral AC input and AC output circuit breakers, to ensure they are closed when the transformers are in service and to ensure a transformer fan is operating.

This transformer replacement activity does not require more operator actions during accident conditions or require different or unusual power source alignments. Because the regulating transformers were manufactured to fulfill the vital bus requirements with a higher reliability than the existing regulating transformers, and because the impacts of the new transformers will not prevent other equipment from operating when required or to operate less effectively, the consequences of an accident cannot be higher than for the existing regulating transformers. Hence, replacement of the regulating transformers will not increase the radiological consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The new regulating transformers perform the same function as the existing transformers. The new transformers are a simpler design, with no new failure modes being created by the replacement of the previous transformers. This simpler design of the new transformers with no electronic controls (reduction of failure mechanisms) more than offsets the added circuit breakers, forced cooling fans, and voltmeter (increase in failure mechanisms) in the area of failure probability. Therefore, the new transformers do not increase the probability of failure of the vital bus loads due to power quality or reliability.

No new system interfaces are created by this replacement. The new transformers are heavier than the existing transformers, but are not excessively heavy for the Control Complex structure. Additional heat loading in the EFIC rooms has been evaluated. The Appendix R Fire Study and OP-880 will be revised to ensure all equipment in the EFIC Rooms will still function and remain operable and available as required. Additional Emergency Diesel Generator loading for transformer standby operation has been evaluated as acceptable. The new transformers will have a net improvement in reliability.

Therefore, these replacement transformers will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The new regulating transformers perform the same function as the existing transformers. As such, a failure of an inverter should not de-energize the associated vital buses, as long as 480 VAC is available to the new transformers. There are no new or common mode failure modes associated with the new transformers. A failure of the EFIC Rooms floor structure due to the heavier transformer is not considered credible. Additional heat loading in the EFIC rooms has been evaluated should a failure occur in the Control Complex Emergency Ventilation System (CREVS) due to a LOCA/LOOP or Appendix R fire. The Appendix R Fire Study and OP-880 will be revised to ensure all equipment in

the EFIC Rooms will still function and remain operable and available as required. Additional Emergency Diesel Generator loading for transformer standby operation has been evaluated as acceptable, even if only one Emergency Diesel Generator is operable due to a failure.

Therefore, the new replacement transformers cannot increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Normally, the vital bus transformers operate in standby. Their function is to energize the associated vital buses in case of an inverter failure, or when an inverter is removed from service for maintenance. The function of the transformers clearly limits the possibilities for a new type of accident initiation. The new transformers do not have any new failure modes or new equipment interfaces. Therefore, the new transformers will not create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The new regulating transformers perform the same function as the existing transformers and are manufactured by the same company as the inverters, with the same type of self-regulated ferroresonant transformer design. The self-regulated ferroresonant type transformers are much simpler in design than the existing transformer. The electronic control circuitry has been eliminated, thereby improving equipment reliability. Because the new regulating transformers perform the same function, have no new failure modes, have no new system interfaces, will not adversely impact existing functional and physical interfaces, and operate the same equipment as the existing regulating transformers, the new regulating transformers cannot create a malfunction of a different type. Therefore, this activity will not create the possibility of a malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There are no margins of safety that are defined in the bases of the Improved Technical Specification for this equipment. Other licensing documents and the Design Basis Documents were researched, with no reference to any margins of safety found.

The FSAR describes the regulating transformers as an alternate source for supplying 120 VAC to the vital bus. In a normal alignment, a failure of an inverter would have to occur before the regulating transformers are required to perform their safety function. An inverter can be removed from service and the applicable LCO entered. A vital bus transformer energizing the associated vital buses allows the vital bus inverter to remain out of service for a longer period of time for maintenance. The vital bus transformer is performing a safety function in this extended maintenance period. The new transformers

add to the total vital bus system reliability and, therefore, increase the inherent margin of safety of the vital bus system.

SA/USQD Number: 98-0520, Revision 6

FSAR Change(s): Chapters 1, 2, 4, 5, 7, 8, 9, 10 and 14

SA/USQD Title: MAR98-03-01-01 through MAR98-03-01-07;
License Amendment 182 (3N0899-05); FSAR Change 1999-0077
Diesel Driven Emergency Feedwater Pump (EFP-3)

Description

This activity involves installation of a diesel driven emergency feedwater pump (DDEFWP) to functionally replace the motor driven emergency feedwater pump. The SA/USQD includes Revision 0 through 5, summarized as follows:

- Revision 0 of this SA/USQD addressed the building construction activities associated with MAR 98-03-01-03.

- Revision 1 addressed the pre-outage construction and testing activities described by MARs 98-03-01-01, 98-03-01-02, 98-03-01-04 and 98-03-01-07 that could be conducted with the plant operating at power. It also included the expanded scope of core drilling penetrations through the Intermediate Building west wall and annulus floor described by MAR 98-03-01-03. For the purpose of preparing the work package associated with MAR 98-03-01-06, Revision 1 also described the modification of the proposed EFP-1 start circuitry, but did not evaluate any pre-outage work in connection with that modification.

- Revision 2 addressed the design (to support construction) and the fabrication activities described by MAR 98-03-01-05, "Diesel Driven Emergency Feedwater Pump (EFP-3) Activities that are Electrical/I&C, Safety-Related." Revision 2 also addressed pre-outage testing for MAR 98-03-01-05 (assuming that the new electrical equipment was not connected in any manner to existing plant equipment) and evaluated movement of the crane boom and wave step sections in proximity to the EFT-2 building (from a heavy load lift perspective).

- Revision 3 considered the activities described by MAR 98-03-01-06, as well as the final design configuration of the systems, structures, and components of the DDEFWP modification proposed by MARs 98-03-01-01 through 98-03-01-05 and MAR 98-03-01-07. It did not address pre-outage or pre-operational testing, as these were evaluated under separate assessments. NRC approval of the DDEFWP modification was provided by License Amendment 182. Since the associated safety evaluation report (SER) did not address all aspects of the proposed facility changes described by MARs 98-03-01-01 through 98-03-01-07, Revision 3 addressed those changes which otherwise did not screen out within the body of the safety assessment. These changes included the following:

  - the installation of fire detection and suppression equipment for the diesel driven emergency feedwater pump building (EFPB);
  - the installation of heating and ventilation equipment for the EFPB;

- the replacement of emergency feedwater (EFW) system blocking valve EFV-33;
- the installation of a main condenser hotwell swing check valve between the manual isolation valve and the piping tee to emergency feedwater pumps 1 and 2;
- the installation of missile shields for exterior EFW system piping;
- the reconfiguration of ES actuation logic for the decay heat removal pump DHP-1A from "energize-to-actuate" to "de-energize-to-actuate";
- the increase in design pressure of EFW system pump discharge piping; and
- the use of later code versions for EFPB construction than those delineated by the SAR for Class 1 structures.

- Revision 4 considered the effects associated with incomplete construction activities as they related to the EFP-3 systems, structures, and components not yet functional, and the effects of continued construction activities following the pump's affirmation of operability.

- Revision 5 provided further assessment of incomplete construction activities intended to support freeze protection for EFP-3 and associated ancillary systems, but which could not be completed by the conditional date of acceptability delineated by Revision 4.

- Revision 6 provides an option to allow alternate means of preventing flow from both EFP-1 and EFP–3, when EFP-1 is in service.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed facility changes either support or directly apply to the installation of the new diesel driven emergency feedwater pump and associated EF system piping. The emergency feedwater system is not considered to be an initiator or precursor of any accident previously evaluated by the SAR. Therefore, any failure of the EFPB mechanical facilities (i.e., fire service water or heating and ventilation system) that could cause failure of the diesel driven emergency feedwater pump or piping would also not be considered an initiator or precursor of any accident previously evaluated. The scope of its failure would be limited only to the emergency feedwater system that primarily functions for accident mitigation. As such, no increase in the probability of occurrence of an accident previously evaluated is possible.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The proposed facility changes will not affect any of the accident analyses assumptions or methodology, nor will they provide any correction for any analysis error. Described changes to the fire service, building heating and ventilation, and emergency feedwater systems, as well as reconfiguration of ES actuation logic for DHP-1A, will not create any potential challenge of fission product barriers or pressure boundaries addressed by the

SAR. Similarly, the class 1 structures addressed by these activities (i.e., the EFPB and missile shield for exterior EF system piping) do not constitute any of the fission product barriers also referred to therein. In the absence of these effects, the proposed activities cannot affect change to any of the values in calculated radiological dose to either onsite or offsite personnel from that previously reviewed and approved by the NRC.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed facility changes were evaluated for all credible failure modes and determined to meet or exceed the requirements for existing plant equipment. Failure of the fire service system to detect or suppress a fire within the EFPB could potentially result in loss of the "A" train emergency feedwater pump. Likewise, an inadvertent sprinkler actuation could result in a loss of the pump. These failure induced malfunctions, however, are bounded by the existing system configuration and associated analysis. For example, a fire in the Intermediate Building or inadvertent sprinkler actuation could cause loss of the "B" train pump. Failure of the building heating and ventilation exhaust fans are also not considered to increase the probability of occurrence of a malfunction since any one failure would not preclude the pump from performing its intended safety function.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed facility changes either support or directly apply to the installation of the new diesel driven emergency feedwater pump and associated EF system piping. The consequences from any failure of the EFPB mechanical facilities (i.e., fire service water or heating and ventilation system) that could cause failure of the diesel driven emergency feedwater pump would be bound by the consequences of a similar equipment failure on the redundant "B" train pump. Therefore, no increase in the consequences of a malfunction of equipment important to safety will result.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

None of the proposed facility changes are considered to be initiators or precursors for the possibility of accidents of a different type. The proposed modifications will not introduce any new technology or other credible failure mechanisms that have not previously been anticipated or analyzed. The installation of all equipment, structures, piping, supports, and equipment anchorage will be in accordance with applicable codes, standards, and regulatory requirements. Since all credible failure modes are bounded by previous accident analyses, the proposed facility changes or application of later code editions will not introduce the possibility of an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed facility changes affect both directly and indirectly the emergency feedwater system, which is credited for accident mitigation. The credible failure modes considered by this evaluation will not affect any other equipment important to safety. Since the existing failure mechanisms are bounded by current analyses, and no new failure mechanisms are introduced, then the possibility of a different type of malfunction of equipment important to safety is not postulated.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS Bases provide no specific requirements for class 1 structures other than the Reactor Building. For purposes of assessment, various aspects of EFPB construction were evaluated against similar aspects specified for the Emergency Feedwater Tank enclosure. Specifically, such aspects included Structural Design Parameters (FSAR section 5.4.6.1), Materials, Specifications and Quality Control (FSAR section 5.4.6.2), and Structural Design Criteria (FSAR section 5.4.6.3). This type of comparison is considered both reasonable and appropriate for this activity since the emergency feedwater tank enclosure represents a class 1 structure previously approved, is located in proximity to the proposed EFP-3 building site, and offers similar functions as the EFP-3 building. Although design and construction of the EFP-3 building uses later code editions than those delineated by the SAR, the parameters and criteria specified for structural design and material meet or exceed those specified for the emergency feedwater tank enclosure. This effectively represents no reduction in margin of safety.

No specific credited margin of safety for the proposed EF system modifications is provided by the bases of the ITS; however, the EF system is designed to provide water flow to the steam generators to remove decay heat from the reactor coolant system in the event the normal feedwater source is unavailable. The design pressure increase of the EF system discharge piping, as well as the installation of the hotwell check valve and blocking valve replacement, will not prevent the system from performing this, or any other, intended safety function. Additionally, the design pressure increase of the discharge piping will remain within code allowables for affected piping and components. Therefore, proposed changes to the EF system will not effect a reduction in the margin of safety.

The ITS bases also provide no specific requirements for the ES actuation logic state for the decay heat removal pump DHP-1A; however, by restoring the "de-energize-to-actuate" ES logic state, the desired "fail-safe" condition for pump actuation will be consistent with the criteria developed for ES system design. In effect, margin of safety will be enhanced.

The proposed fire service system modifications, installation of missile shields for exterior EF system piping, and addition of new heating and ventilation equipment to support operation of the new diesel driven emergency feedwater pump provide new systems,

structures, and components for which no defined ITS bases exist. The proposed modifications and/or additions will not affect functionality of existing plant systems or encroach upon any design failure point of these systems. For the installation of exterior EF system piping missile shields, EF system functionality will actually be preserved. Therefore, no discernable reduction in margin of safety will be affected by these facility changes.

SA/USQD Number: 98-0524, Revision 0

FSAR Change(s): Sections 10.5.1; 14.2.2.9; Table 14-63; Table 14-65; Figures 14-60 through 14-64

SA/USQD Title: PC97-8188; Calculation F98-0004, Revision 0; FSAR Change 1998-0190 Loss Of Feedwater Analysis With 20% OTSG Tube Plugging

Description

The proposed activity is a change of CR-3's analysis of record (AOR) for the Loss of Feedwater (LOFW) Accident, to account for 20% Once Through Steam Generator (OTSG) tube plugging. The results of the new AOR verify all of the LOFW acceptance criteria are satisfied and the minimum Emergency Feedwater (EFW) flow requirement can be reduced to 475 gpm.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   This activity is an analytical effort with associated documentation changes and does not affect the function of any structure, system, or component (SSC) that is an accident initiator. Since this activity does not affect any such elements, there can be no increase in the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Since Departure from Nucleate Boiling (DNB) does not occur (and therefore no fuel failure occurs) for a LOFW event, the dose consequences associated with a LOCA bound a LOFW event. Therefore, the consequences are inherently less than the limits specified in 10 CFR 100, even though LOFW analyses do not perform a specific dose consequence analysis. Additionally, the basic functions of SSCs are not affected by this activity. The new AOR still provides a conservative LOFW response and shows that all acceptance criteria are satisfied. As demonstrated by the new LOFW analysis, 20% OTSG tube plugging along with other conservative input assumption changes were accommodated without any adverse results. In fact, the results of the analysis showed that all of the acceptance criteria would be satisfied with a reduced minimum EFW flow rate. Thus, this activity will not result in an increase in consequences previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The probability of equipment malfunction is most likely impacted by different system interactions or by operation under different, more challenging conditions. No changes in system interactions are introduced by or result from this activity. All structures, systems and components will respond exactly as before. While some system parameters (EFW

flow, reactor trip delay, OTSG tube plugging) are modeled more conservatively, their actual performance in the field is not altered by this activity. Thus, there is no increase in the probability of equipment malfunction.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The consequences of malfunctions are generally limited to adverse impacts on other structures, systems or components or by a direct impact to one of the primary fission product barriers. No changes in system interactions are introduced by or result from this activity. All structures, systems and components will respond exactly as before. The calculated results for the new LOFW AOR indicate that even with more conservative assumptions, the results are acceptable and therefore, the consequences of component malfunction remain unchanged.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

No changes in system interactions are introduced by or result from this activity. All structures, systems and components will respond exactly as before. While some system parameters (EFW flow, reactor trip delay, OTSG tube plugging) are modeled more conservatively, their actual performance in the field is not altered by this activity. Since no additional interactions or new failure modes are introduced by this activity, there is no possibility of an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Different types of equipment malfunction would most likely be caused by operating structures, systems and components outside their existing operating conditions. While some system parameters (valve closure time, EFW flow, reactor trip delay, OTSG tube plugging) are modeled differently, this is done to ensure the analysis is conservative. The actual environment in the field for any SSC is not altered by this activity. Thus, no different types of malfunctions can result from this activity.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The new LOFW analytical effort actually ensures that the margin of safety and ITS assumptions are not impacted. The new LOFW AOR shows that even with increased conservatism (decreased EFW flow, 20% OTSG tube plugging and consequent decrease in modeled RCS flow, longer reactor trip delay time, modeling of the Power Operated Relief Valve and pressurizer spray), the LOFW acceptance criteria are satisfied.

SA/USQD Number: 98-0527, Revision 0 **FSAR Change(s):** Table 3-50

SA/USQD Title: PC98-3391; FSAR Change Number 1998-0180
Cycle 11 Reload Report and Core Operating Limits Report (COLR)

Description

The proposed change corrects the Linear Heat Rate (LHR) to Centerline Fuel Melt (CFM) limits for fuel rods containing 6 weight percent gadolinium. The change revises FSAR Table 3-50 to include the limits for fuel rods containing uranium and gadolinium, in addition to the limits for fuel rods containing only uranium. The effects of this change were analyzed to determine that the fuel rods containing 6 weight percent gadolinium exhibit substantial margin in power peaking, which offsets the effect of the error. The previously established Reactor Protection System (RPS) offset limits and corresponding trip setpoints are not affected.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The changes in input assumptions leading to revised LHR-to-CFM limits for fuel rods containing 6 weight percent gadolinium for Cycle 11 only affect the results of the calculation and not the probability that the accident will or will not occur. These changes cannot increase the probability of occurrence of an accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Since the Cycle 11 maneuvering analysis was re-performed and the results established that substantial margin exists in power peaking for the fuel rods, this change in LHR-to-CFM limits cannot increase the consequences of an accident. The consequences are bounded by previous analysis evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The change cannot directly or indirectly affect plant configuration or system/component operation such that safety related systems/components could be challenged. No new failure modes are introduced by this change. Therefore, the probability of occurrence of equipment malfunction is not increased.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The change cannot increase the consequences of equipment important to safety since the Cycle 11 maneuvering analysis was re-performed, resulting in verification that there is a

substantial margin to Cycle 11 limits which were previously evaluated. Dose consequences are not changed.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The change in LHR-to-CFM limits cannot create the possibility of an accident of a different type because the failure mode associated with this limit is not changed from that which was previously evaluated in the FSAR. The nuclear overpower trip provides protection of the CFM limit. The accidents for which the nuclear overpower trip provides protection are the startup accident, the rod withdrawal accident, the rod ejection accident and the steam line break accident. The accidents selected for analysis are independent of the LHR-to-CFM limit.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The change cannot directly or indirectly affect the plant configuration or system/component operation such that a different type of malfunction of equipment could be created. No new failure modes are introduced, consequently the possibility of a different type of malfunction is not created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The change in LHR-to-CFM limit does not reduce the margin of safety as defined in the basis for any Improved Technical Specification. The Cycle 11 maneuvering analysis was re-performed and demonstrated that the change had no impact on the results and conclusions of the original Cycle 11 maneuvering analysis. Reactor Protection System offset limits and corresponding trip setpoints are not affected and the margin of safety is not reduced.

SA/USQD Number: 98-0541, Revision 0 **FSAR Change(s):** Sections 9.3.1 and 9.3.2

SA/USQD Title: PC99-1556; PC99-1468, PC98-4801; PC97-7011;
Calculations F97-0014, Revision 1 and M96-0014, Revision 1;
FSAR Change 1999-0079
Spent Fuel Pool Heat Loads and Temperature Changes

Description

Calculation F97-0014, Revision 1 corrects an error found in calculation M96-0014, which was documented on PC97-7011. This precursor found an error in the implementation of ANS 5.1 1979 that resulted in an increase in the calculated spent fuel pool heat load from 24.4 to 31.1 million BTUs per hour. Despite this increase, the maximum pool temperature remains below 160°F and the time to reach 190°F with only one spent Fuel Pool (SFP) heat exchanger remains greater than 8 hours. The time after shutdown when two SFP cooling trains can cool a full core off-load, without the help of the decay heat system, has increased from 150 to 156 hours, when the decay heat will be 29.6 million BTU/hr.

This proposed FSAR change also corrects a discrepancy in the current FSAR. In paragraph 9.3.1, it is stated that two SFP trains are required to cool the 24 million BTU/hr, yet paragraph 9.3.2.6 allows one SFP train to cool a full core off-load with the other train in backup. This was documented in PC99-1468.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The only accident analyzed for the spent fuel pool that results in fission product releases is a fuel handling accident. The possibility of an accident resulting from the loss of the SFP water inventory is not considered to be credible. However the loss of one train of SFP cooling results in SFP temperatures in excess of 160°F. The result of these calculations show an increase in the total amount of decay heat, but the time available to restore a spent fuel pool cooling train before the temperature reaches 190°F degrees is still greater than 8 hours. The alignment analyzed in these calculations of one pump and two heat exchangers will also keep the spent fuel pool at a temperature less than 190°F. Therefore the probability of occurrence of an accident that would result in the loss of the spent fuel pool inventory or structural integrity remains the same.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   There would be no increase in the consequences of a fuel handling accident. The time operators have to restore cooling before the temperature reaches 190°F remains greater than 8 hours. This affords adequate time to align supplemental cooling to the spent fuel

pool or repair the malfunction.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

These calculations do not alter the way any equipment operates. A new alignment of one spent fuel pool pump and two heat exchangers has been analyzed for 271 hours after shutdown. At that time after shutdown the lower decay heat load still afford over 8 hours to align the other SFP pump before the temperature increases to 190°F.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The loss of one train of spent fuel cooling is postulated in these calculations and the resulting heat-up time from 160°F to 190°F remains greater than 8 hours. This affords the operators adequate time to align supplemental cooling to the spent fuel pool. Therefore the affect on the consequences of a malfunction of equipment important to safety has not changed.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The possibility of an accident resulting from the loss of SFP cooling is not considered to be credible. However, the loss of one train of SFP cooling results in SFP temperatures in excess of 160°F. This is considered to be an accident condition for the criticality analysis of the spent fuel pool. While in this condition, credit can be taken for soluble Boron. The result of these calculations increases the total amount of decay heat, but the time available to restore a spent fuel pool cooling train before the temperature reaches 190°F degrees is still greater than 8 hours. The alignment analyzed in these calculations of one pump and two heat exchangers will keep the spent fuel pool at a temperature less than 190°F. Therefore, the probability of occurrence of an accident resulting from the loss of the spent fuel pool inventory or structural integrity remains the same.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

There has been no change in equipment itself, only the calculated heat load has changed. The spent pool cooling system can adequately handle this increased heat load. Therefore the possibility of creating a different type of malfunction of equipment important to safety than previously evaluated in the SAR is not postulated.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The Technical Specification that deals with the decay heat of the fuel assemblies when they are outside the core is sections 3.9.4 and 3.9.5. These Technical Specifications address refueling activities, which does not require the SFP cooling system. Other SFP related

Technical Specifications deal with criticality issues that are not affected by these calculations. The decay heat removal system is designed to backup the spent fuel cooling system and is capable of handing the heat loads developed in these calculations. Therefore, no margin of safety in the Technical Specification is lost.

SA/USQD Number: 98-0549, Revision 0

FSAR Change(s): Sections 7.2.4.2; 7.2.4.3; and Figure 7-26

SA/USQD Title: MAR98-07-11-01; Design Basis Document Temporary Change 1047; ITS Bases Change B99-12; FSAR Change 1999-0060 Bypassing Feed Only Good Generator from the Control Room

Description

This modification provides the operators with a means of bypassing the Emergency Feedwater Initiation and Control (EFIC) system Feed Only Good Generator (FOGG) function. The operators would use the same pushbuttons that are presently available, which inhibit actuation of Emergency Feed Water (EFW) INITIATE, Main Steam Line Isolation (MSLI) and Main Feed Water Isolation (MFWI). Minor wiring changes to the EFIC cabinets are also involved.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The modification would install an operator-selected bypass, administratively controlled so that FOGG availability could be restored or its function alternately achieved when required. This would not impinge upon the ability of FOGG to perform as described in FSAR Chapter 14.2.2.1.3. FOGG is part of the EFW system and, as such, it does not create an accident; it is a mitigating action in response to an accident. Therefore, there would be no increase in probability of occurrence of an evaluated accident. The probability of occurrence of an accident would be constrained to that previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The accident considered in this evaluation is described in FSAR Chapter 14.2.2.1.3, Main Steam Line Break Accident. The design of FOGG Bypass will not function when OTSG pressure is >750 psig. If the FOGG system is in bypass during a main steam line brea, operators would be able to determine the existence of a steam line break by loss of inventory/level. The operators' response would be to remove the FOGG bypass or manually close appropriate control or block valves from the main control room to the faulted OTSG, if necessary. Therefore, this activity would not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   None of the equipment necessary to respond in kind to an accident is any more likely to malfunction as a result of installing and implementing this modification. Probability of

occurrence of a malfunction of the equipment will not increase due to implementation of the modification. This modification adds minor wiring changes to the EFIC cabinets. The additional wiring will not cause the failure of any of the associated circuitry, because all of the components will continue to operate in the same manner, under the same conditions. Therefore, this activity will not increase the probability of a malfunction of equipment important to safety previously evaluated in the SAR. The impact on electronic components has been evaluated; all components will be operated well within their design ratings.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This activity will not increase the consequences of a malfunction of equipment important to safety as previously evaluated in the SAR. The modification installs an operator-selectable FOGG bypass. This change allows an operator to bypass FOGG logic actuation from the control room. It is a bypass only and does not remove the potential for use of FOGG or EFW, which is always available to the operators if required. Equipment failure would also be the same. Consequences of a malfunction of such equipment could not be increased due to implementation of this change. Therefore, the activity will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Any credible failures resulting from this modification of the FOGG system will not create the possibility of an accident of a different type than any previously evaluated in the SAR. The result of a failure that occurred as a result of implementation of this change would be the loss of the FOGG bypass potential. Such an event would simply remove an administratively controlled logic inhibit, of which operators currently operate without. Plant procedures would direct operations personnel to the correct response to such an event. Therefore, this activity does not create the possibility of an accident of a different type than previously evaluated in the SAR. Failure of the FOGG bypass permissive, as configured by this change, will not create a loss of MFW or Main Steam Flow or other OTSG cooling and thus will not create an accident.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The activity is limited to installation of an administratively controlled bypass of the FOGG logic during certain plant evolutions. The result of a malfunction of the equipment involved in such an activity would be to remove the ability to bypass FOGG. Such an instance would only make the bypass function unavailable, which would effectively be a return to pre-bypass conditions. It would only make unavailable an item of operator burden reduction, which would have no bearing on safe operation of the plant. Therefore, the activity does not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR. The new design retains

single failure proof criteria. For FOGG, MSLI, MFWI, or EFW to be defeated from the EFIC system would require simultaneous failures in two EFIC cabinets (as is present design). Potential failure mechanism hasn't changed. With this new design, a specific failure of initiate module failing low (at new design connection pin input to bistable) would bypass/defeat MSLI, MFWI, EFW, and FOGG but existing bistable design failure would have provoked same MSLI, MFWI, EFW, FOGG failures. Hence, there is no different type of malfunction.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Margins of safety, as defined in Improved Technical Specification Bases, are not reduced in any amount by the implementation of this activity. The activity amounts to an operator-selected bypass of FOGG initiation. The potential to implement FOGG, or any part of EFW system, or EFIC, is not removed. These safety systems are still available. The decision to institute an operator-selected (and within administratively controlled circumstances) bypass is predicated on reduction of burden, and is not a response to a need for greater safety, or an inadequate line of defense. The safety-related items are not affected; they remain available for use. ITS 3.3.11 explicitly allows bypass of these features below 750 psig . This activity does not reduce the margin of safety as defined in the bases for any Improved Technical Specification.

SA/USQD Number: 98-0551, Revision 1 **FSAR Change(s):** None

SA/USQD Title: MAR98-10-03-01; ITS Bases Change B99-02
Installation of Auxiliary Battery Carts

Description

The purpose of MAR98-10-03-01 is to fabricate and install the physical plant hardware that is necessary to facilitate electrically replacing a failed or degraded station battery cell in the Class 1E station batteries. Maintenance Procedure (MP)-401 will provide the required instructions for electrically disconnecting the failed or degraded battery. MP-401 will also provide the instructions for electrically connecting a spare battery cell assembly to the station. In addition, the ITS Bases will be revised to detail how cell-to-cell cable assemblies will be defined with respect to the existing allowable ITS resistance/milli-volt (mV) values.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The FSAR Chapter 14 accidents and Licensing Basis Events were reviewed. Only accidents or events that could be induced by a station battery transient or failure could have their probabilities affected by this activity. A station battery is not a directly credited accident/event initiator for any of the accidents or events. This modification does not increase the probability of a station battery transient or failure. There are no new failure modes or failure mechanisms, and no existing failure mechanism will be facilitated to occur. Therefore, the probability of occurrence of an accident previously evaluated in the SAR is not increased.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   This activity does not increase the probability of a station battery transient or failure. There are no new failure modes or failure mechanisms, and no existing failure mechanism will be facilitated to occur.

   Calculation Case Study CSE-98-0009A for the battery voltage drop, including the increased resistance from the added connecting cables, concludes that the expected voltage drop is within the existing design margin of the station batteries. The Class 1E batteries will provide voltages in excess of the minimum allowable load voltage during each step of the batteries' load sequence with a spare battery cell assembly connected into the station battery by MP-401.

   Therefore, the proposed activity does not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This activity does not increase the probability of a station battery transient or failure. There are no new failure modes or failure mechanisms, and no existing failure mechanism will be facilitated to occur.

Modification installation work will be conducted using existing procedural guidance. The use of a spare battery cell assembly per MP-401 will be conducted with the main battery disconnect switch open and the appropriate LCO entered. Therefore, this activity will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

No common mode failure mechanism is being created by this activity. No new failure mode is being created by this activity. The only failure mode of a station battery post installation of a spare battery cell assembly is still to provide inadequate voltage to the required loads. Therefore, the proposed activity does not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

No new failure mode or mechanism of a station battery has been created. No credible new accident could be postulated. No "loss of both station batteries accident" or event is created, since no common mode failure mechanism has been created. Therefore, the proposed activity does not create the possibility of an accident of a different type than any previously evaluated in the SAR

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

No new failure mode or mechanism of a station battery has been created. Therefore, the proposed activity does not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

ITS 3.8.4, DC Sources - Operating, requires two operable station batteries for plant Modes 1 through 4.

ITS 3.8.5, DC Sources - Shutdown, requires one operable station battery for plant Modes 5 and 6.

ITS 3.8.6, Battery Cell Parameters, specifies the battery cell parameters which must be maintained for an operable battery.

Surveillance Requirement 3.8.4.2 and 3.8.4.5 ensure battery connection resistances are maintained below acceptable values (listed in milli-volts (mV) at maximum expected discharge current in the ITS for each standard type of station battery connection). The battery manufacturer established the acceptable values.

The above requirements will be maintained.

Calculation Case Study CSE-98-0009A, for the battery voltage drop including the increased resistance from the added connecting cables, concludes that the expected voltage drop is within the existing design margin of the station batteries. The Class 1E batteries will provide voltages in excess of the minimum allowable load voltage during each step of the batteries' load sequence, with a spare battery cell connected into the battery by MP-401. Therefore, the activity described in this USQD will not reduce the margin of safety defined in the ITS Bases.

SA/USQD Number: 98-0563, Revision 0 **FSAR Change(s):** Figure 1-2

SA/USQD Title: MAR98-07-02-01; MAR98-07-02-02; PC97-4114; FSAR Change 1999-0075 Emergency Feedwater Security Enhancement

Description

This modification will relocate the Protected Area Security Fence and Perimeter Detection Zones located on the southwest corner of the plant. The fence and zones will be relocated to ensure proper coverage is maintained. Vital Access control will be provided for the southwest side perimeter around the new Emergency Feedwater Pump Building (EFP-3) and the Emergency Feedwater Tank facility (EFT-2).

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The Protected Area Fence configuration, along with the supporting Security equipment, will be relocated and reconfigured near the new EFP-3 building to maintain the security requirements of CR-3. This new configuration will continue to allow Security to monitor the Protected Area boundary effectively. The components associated with this modification are not associated with any accident initiators. The system provides maximum security and ensures the integrity of CR-3 by detecting unauthorized intrusions for purposes of radiological sabotage or malicious acts as described in 10 CFR Part 73. The new Security fence configuration does not increase the probability of any accident as evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The changes required to the plan views of CR-3 located on FSAR Figure 1.2 only depict an overview of the site layout and do not affect any SSC design or function, therefore not increasing the consequences of a radiological dose accident as previously evaluated in the SAR. Radiological dose to the public will not be increased by relocation of a Protected Area Fence and the supporting equipment. The system provides maximum security and ensures the integrity of CR-3 by detecting unauthorized intrusions for purposes of radiological sabotage or malicious acts as described in 10 CFR Part 73.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The change to FSAR Figure 1.2 has no impact on SSC supporting equipment important to safety. Relocation of the Protected Area Fence is outside the vital area boundary of equipment important to safety. Any malfunction of Security equipment is addressed in the

CR-3 Physical Security Plan.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The change to FSAR Figure 1.2 showing the new fence location will not jeopardize equipment important to safety. Relocating the Security Fence due to the installation of EFP-3 and installing the associated perimeter intrusion equipment will allow Security to monitor the Plant Perimeter more effectively, thereby ensuring safe operation of plant equipment.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The change to FSAR Figure 1.2 showing the new fence location does not create an accident of a different type as evaluated in the SAR. There are no changes to the design or function of any SSC required mitigating an accident as evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The change to FSAR Figure 1.2 showing the new fence location does not induce equipment malfunction for accident mitigation in the SAR. Relocating the Security Fence due to the installation of EFP-3 and installing the associated perimeter intrusion equipment provides maximum security and ensures the integrity of CR-3 by detecting unauthorized intrusions for purposes of radiological sabotage or malicious acts as described in 10 CFR Part 73. Security activities during all modes are addressed within the CR-3 Physical Security Plan.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Changes to Security operation or design functions are not mentioned in the ITS or the ITS Bases. The FSAR Figure 1.2 change, which relocates the Protected Area Fence due to the installation of EFP-3, will not reduce the margin of safety as defined in any Improved Technical Specification.

SA/USQD Number: 98-0565, Revision 0 **FSAR Change(s):** Section 8.2.2.6

SA/USQD Title: PC99-1338; OP-703, OP-703A, SP-321, EOP-14, AP-770, EOP-9, AP-404 and AR-305; FSAR Change 1999-0068 Use Of 480V Tie Breakers To Cross Tie ES Busses, and To Tie ES Busses To Non-ES Busses

Description

Procedure changes are being made to place loading restrictions on the use of 480V cross ties during various Modes of Plant operation. Cross ties connect 480V ES busses together or connect non-ES busses to ES busses. The operator can manually close these cross tie breakers. The current design of these cross tie breakers is to trip on Undervoltage (UV) "OR" if both UV "AND" ES were present, "OR" on ES alone when a given ES bus is powered by its Diesel Generator. The cross tie breakers do not trip on ES alone if ES busses are powered from offsite power sources. Therefore, with offsite power available, under degraded grid conditions, with an ES actuation occurring, the loading of non-safety related 480V busses and loading of cross connected 480V ES busses brought on by the manual closure of the cross tie breakers does not strip and adds to the accident conditions loading.

Changes are being proposed to revise existing procedures OP-703, OP-703A, SP-321, EOP-14, AP-770, EOP-9, AP-404 and AR-305. These changes will place loading restrictions when cross ties are being used. The procedure changes being proposed are administrative in nature designed to ensure that we continue to operate the plant power distribution system within acceptable loading limits during all Modes of Plant operation. No equipment important to safety is removed or impacted by these changes. As a result of these procedure changes, revision to FSAR section 8.2.2.6 is also being proposed to better reflect restrictions on the alignment of non safety related battery chargers from emergency power sources.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR? No

The proposed procedure changes will revise existing procedures OP-703, OP-703A, SP-321, EOP-14, AP-770, EOP-9, AP-404 and AR-305. The changes will place additional loading restrictions on the use of 480V cross ties. These changes are administrative in nature designed to ensure that we continue to operate the plant power distribution system within acceptable loading limits during all Modes of Plant operation. The 480V cross ties are atypical line-ups. Limiting atypical line-ups and controlling loading during these atypical line-ups does not increase the probability of an accident previously evaluated in the SAR. No equipment important to safety is removed or impacted by these changes, therefore probability of occurrence of an accident previously evaluated in the SAR is not increased.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The proposed procedure changes will place additional loading restrictions on the use of 480V cross ties. These changes are administrative in nature designed to ensure that we continue to operate the plant power distribution system within acceptable loading limits during all modes of Plant operation. However, it is essential that the Operator follows procedures to maintain loading limits when cross ties are in use. The revised procedural controls and operator training are deemed adequate to provide reasonable assurance that the design limits of the plant will be maintained and these changes will not potentially reduce the level of safety or lead to an event that impacts safe operation. This will assure that safety related end devices will receive adequate voltage and safety related equipment ratings are protected. No equipment important to safety is removed or impacted by these changes. The activities being proposed by these changes are administrative in nature and do not lead to or exaggerate the initiating events for any accidents previously evaluated in the SAR. Therefore the consequences of an accident previously evaluated in the SAR are not increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The procedural changes being proposed are administrative in nature designed to ensure that we continue to operate the plant power distribution system within acceptable loading limits during all Modes of Plant operation. However, it is essential that the Operator follows procedures to maintain loading within acceptable limits when cross ties are in use. The revised procedural controls and operator training are deemed adequate to provide reasonable assurance that the design limits of the plant will be maintained and these changes will not potentially reduce the level of safety or lead to an event that impacts safe operation. This will assure that safety related end devices will receive adequate voltage and safety related equipment ratings are protected. No equipment, important to safety, is being removed, disabled or impacted by these changes. Therefore the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR is not increased.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The procedure changes being proposed are administrative in nature designed to ensure that we continue to operate the plant power distribution system within acceptable loading limits during all Modes of Plant operation. However, it is essential that the Operator follows procedures to maintain loading within acceptable limits when cross ties are in use. The revised procedural controls and operator training are deemed adequate to provide reasonable assurance that the design limits of the plant will be maintained and these changes will not potentially reduce the level of safety or lead to an event that impacts safe operation. This will assure that safety related end devices will receive adequate voltage and safety related equipment ratings are protected. No equipment important to safety is

being removed, disabled or impacted by these changes. Therefore the consequences of a malfunction of equipment important to safety previously evaluated in the SAR is not increased.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed procedural changes will revise existing procedures OP-703, OP-703A, SP-321, EOP-14, AP-770, EOP-9, AP-404 and AR-305. The changes will place additional loading restrictions on the use of 480V cross ties. These changes are administrative in nature designed to ensure that we continue to operate the plant power distribution system within acceptable loading limits during all Modes of Plant operation. The 480V cross ties are atypical line-ups. Limiting atypical line-ups and controlling loading during these atypical line-ups does not increase the probability of an accident of a different type than previously evaluated in the SAR. No equipment important to safety is removed or impacted by these changes, therefore probability of occurrence of an accident of a different type than previously evaluated in the SAR is not created.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The procedural changes being proposed are administrative in nature designed to ensure that we continue to operate the plant power distribution system within acceptable loading limits during all Modes of Plant operation. No equipment important to safety is being removed, disabled or impacted by these changes. These changes will be invisible to equipment important to safety. It will continue to receive motive electrical power at adequate voltage levels as before. Loss of voltage to equipment, or receiving unacceptable voltage at equipment terminals, is not a new type of malfunction. However, such a malfunction is not expected. The various equipment failure modes have been described above and no new failure modes or malfunctions were discovered. The revised procedural controls and operator training are deemed adequate to provide reasonable assurance that the design limits of the plant will be maintained and these changes will not potentially reduce the level of safety or lead to an event that impacts safe operation. This will assure that safety related end devices will receive adequate voltage and safety related equipment ratings are protected. Therefore the possibility of a different type of malfunction of equipment important to safety is not created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The procedural changes being proposed are administrative in nature designed to ensure that we continue to operate the plant power distribution system within acceptable loading limits during all Modes of Plant operation. The margin of safety is unaffected by the proposed changes. The revised procedural controls and operator training are deemed adequate to provide reasonable assurance that the design limits of the plant will be maintained and these changes will not potentially reduce the level of safety or lead to an event that impacts safe operation. This will assure that safety related end devices will

receive adequate voltage and safety related equipment ratings are protected. ITS 3.4.8 requires ≥ 252 kW of Pressurizer heater capacity to be capable of being powered from each emergency power source. The procedure changes being proposed ensure that these requirements will continue to be met. Therefore, the proposed changes do not reduce the margin of safety as defined in the basis for any ITS.

SA/USQD Number: 99-0006, Revision 0 **FSAR Change(s):** Section 10.5.2.3

SA/USQD Title: MAR98-07-12-01; FSAR Change 1999-0061
Motor Operated Valves Control Circuit Modification

Description

The EFP-2 Steam Supply valves from each of the two main steam lines, MSV-55 and MSV-56, are being modified to provide the operators the capability to readily close either of these motor operated valves (MOVs) from the Control Room. This modification enables the operators to override the auto open signal upon a "B" EFW actuation in the event of a main steam line break, steam generator tube rupture, or Appendix R fire, and stroke the valve(s) closed in such a scenario. This will be accomplished by modifying the control switches, which currently are spring return to auto type, to 3 position "maintain" control switches. Operations will then be able to stroke the valves closed from the Main Control Board. The operators would thus be able to focus on other aspects of accident mitigation. In short, the modification is simply a switch replacement, performed for the purpose of operator burden reduction.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The purpose of this modification is to offer operator burden reduction by changing control switch types for MSV-55 and MSV-56 at the Main Control Board from spring return to auto type to 3 position "maintain" control type. This activity will allow operators to close these valves from the Main Control Board. Operators are required to manually close these valves after an EFIC actuation, in accordance with approved plant procedures. This modification is just a switch replacement and does not remove the ability to close these valves. As such, it does not increase the probability of an accident. The switch replacement does provide for the ability to close these valves from the Main Control Board. The proposed activity is not an initiator of an accident previously evaluated in the SAR. For these reasons, the addition of the ability to close the subject valves from the Main Control Board does not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The consequences of an accident previously evaluated in the SAR will not increase as a result of this modification. The modification is limited to the replacement of spring return to auto position switches with 3 position "maintain" switches, and associated wiring changes necessary to affect replacement. This limits the failure associated with this modification to switch failure. The consequences of failure of the 3 position switches are no different than the consequences of failure of the currently installed switches.

Therefore, the proposed activity does not increase the consequences of an activity previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The modification is limited to replacement of spring return to auto switches with 3 position "maintain" control switches for valves MSV-55 and MSV-56 at the Main Control Board. Failure as a result of this modification is limited to switch failure, which is already considered in any evaluation of a possible malfunction of equipment important to safety. The new switch is procured and installed in accordance with the same codes and standards as the original, so is no more susceptible to failure. Therefore, the proposed activity does not increase the probability of occurrence of a malfunction of equipment previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The modification is limited to switch replacement. Failure of the new type switch will not be any different than failure of the previously installed switch. The consequences of switch failure are already part of any evaluation of failure of components served by the switch, i.e., the valves themselves. This will not further affect the ability of the valves to close. The valves are not physically altered or changed. The ability of the valves to close, as impacted by this modification, rests solely on the switches. The consequence of the failure of the switches yields no different consequences than those previously evaluated.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This modification is limited to switch replacement on the Main Control Board. The switches being replaced will allow closure of MSV-55 and MSV-56 valves from the Main Control Board. Failure as a result of this modification is limited to switch failure, which is already considered in any evaluation of a malfunction of equipment important to safety.

To ascertain that the valves are in the correct position (open), operators must perform a deliberate physical act; that is, take the switch position to open. This is no different than what is currently done with the "spring return to auto" switches presently installed. Additionally, operator training, alarms and indications and daily surveillances will be employed to ensure that the switches are not mispositioned. The activity does not create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The switches operate valves MSV-55 and MSV-56. The switches themselves will either operate correctly when required to operate, or they will fail. The effect of failure of the

switches to operate in the open position is considered in the failure of the valves to be in the correct position. Effects of the valves to operate when the switches are now taken to close are the same as before the performance of the modification. The switches can still be closed as they were before the modification was performed, which is certainly acceptable. Hence, the switches cannot fail in any way that is not previously evaluated in the SAR.

The possible misposition of the switches is not likely, as operator training, operating procedures, alarms and indications and daily surveillances would serve to ensure that unintentional mispositioning would not be likely to occur. Furthermore, it takes a deliberate, conscious act to operate a switch on the Main Control Board, especially one that has a preposition of "open" in normal circumstances. Because the activity is limited to the switches for MSV-55 and MSV-56, the possibility of a different type of malfunction of equipment than any previously evaluated in the SAR does not exist.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

Margins of safety are not impacted by this modification. This modification has two potential effects: failure of the switches to perform as intended, or operator misposition of the switches. If the switch fails to open, this condition has been considered as part of the original failure analysis of the pump. If the switch fails to close, the consequence is no different than pre-modification circumstances. It is highly unlikely the operator will misposition the switches, as operator training, daily surveillances, alarms and indications, and the fact that the switches are normally maintained in the open position, ensures against mispositioning. Since the margins of safety of plant equipment are not impacted by this switch replacement, reduction of margins of safety as defined in the ITS are not reduced.

SA/USQD Number: 99-0009, Revision 0 **FSAR Change(s):** None

SA/USQD Title: MAR96-07-17-04; ITS Bases Change B99-05
Low Pressure Injection (LPI) Indication Upgrade

Description

This modification upgrades the Decay Heat, or Low Pressure Injection (LPI), flow indication displayed on the Main Control Board. The changes include:

- Replacement of the Bailey RY analog indicator on both loops with a Dixson digital indicator for improved accuracy and readability.
- Upgrade the Decay Heat (DH) flow loop used by the Dixson indicator from the non-qualified transmitter to the qualified transmitter. This will be done by installing new cabling from the Remote Shutdown Auxiliary Cabinet to the Main Control Board.
- Change the Regulatory Guide 1.97 instrument designation from the current Foxboro controller indicator to the new Dixson indicator.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The activity upgrades two existing decay heat (LPI) flow indicators by installing digital Dixson indicators in place of the existing analog Bailey RY indicators and connecting the safety related flow transmitters. No automatic DH system controls are affected; the LPI system actuation or automatic operation is unaffected by this change. These systems are used to mitigate the accidents evaluated in the SAR and are not initiators of any such accidents. Therefore, this change does not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The proposed activity does not increase the consequences of an accident previously evaluated in the SAR. The LPI system logic, automatic actuation and automatic operation is unaffected by the proposed activity. Only the indication of flow from an operating LPI pump (which an operator would use to control the LPI pump output during post-accident mitigation) is changed, from a analog indicator to a digital bar graph indicator. This is an enhancement to the indication and makes no difference in the consequences of an accident.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The net result of this activity is the enhancement of indication used by operators to adjust and maintain output flow from LPI pumps during and after an accident. No logic, automatic actuation or automatic operation is affected by this activity. The affected components are LPI flow indicators on the Main Control Board, which are enhanced by the activity and reclassified as Regulatory Guide 1.97 type A, Category I, safety related. The specific LPI flow indicators are not discussed in the FSAR. Therefore, this activity does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This activity does not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR. The FSAR states that the decay heat (LPI) flow indication is provided. The failure of the new digital indicator would result in no more severe failure than that of the previous analog indicators and, therefore, the consequences are no more severe with the new indicators than with the old.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed activity does not create the possibility of an accident of a different type than any previously evaluated in the SAR. The activity is limited solely to upgrading the flow indication of the LPI pump output. Any resulting failures of the new indicators will not be of a type different than those already addressed in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The consequences of failure of indication during these evolutions are not any different with the new indicators than they were with the old indicators. No additional failure modes are introduced to the LPI system with the introduction of the enhanced indicators. Therefore, the proposed activity does not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The only function affected by this activity is the flow indication for the LPI system pumps. This functions is enhanced by the modification and the consequence of the new indicators' failure is no different than these of the originals. As such, the proposed activity does not reduce the margin of safety identified in the ITS Bases.

SA/USQD Number: 99-0010, Revision 4 **FSAR Change(s):** Chapters 1, 4, 5, 6, 7, 9, 14

SA/USQD Title: MAR97-02-12-01; License Amendment 178 (3N0599-11);
FSAR Change 1999-0115
High Pressure Injection (HPI) Upgrade Project

Description

The HPI Upgrade Project will alter the method by which HPI flow is directed to the core for small break LOCAs. The system reconfiguration will provide higher core cooling flows earlier in the transient for some SBLOCAs as compared with the existing configuration that requires several operator actions to ensure HPI flow through all four injection lines, isolate normal makeup/seal injection, and to identify and isolate an HPI line break. The changes associated with this project will deliver HPI flow to all four injection paths without the need for manual operator actions. These planned changes will also reduce peak cladding temperatures (PCTs) for the spectrum of small break LOCAs by providing additional core cooling flow earlier in the transient.

To maximize flow to the core during consideration of all failures and break locations, cross tie lines between the four injection lines will be added. These cross-tie lines will serve to provide additional flow to the core during single failure scenarios in which only one HPI train is operating and the break location reduces the HPI flow available for core cooling. The resultant configuration provides HPI flow through all four injection lines considering all single failures. In addition to the cross-tie lines, the Reactor Protection System (RPS) trip setpoint and Engineered Safeguards (ES) initiation setpoint on low RCS pressure will be raised to increase the likelihood that ES will be automatically actuated early in the SBLOCA transient. These setpoint changes were approved by the NRC in Amendment 178 to the CR-3 Operating License.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The accidents credited with HPI injection are SBLOCAs, steam line failures, steam generator tube ruptures, loss of feedwater, and feedwater line breaks. HPI is used to mitigate the effects of these accidents and is not an accident initiator. With the exception of the new isolation valve being added (MUV-596), the piping runs impacted by these modifications are within the RCS pressure boundary as defined by 10 CFR 50.2. However, 10 CFR 50.55(a) exempts the piping and components from meeting Class 1 requirements since there are two check valves between the RCS and HPI lines.

   An HPI line break is an accident evaluated in the SAR. Consideration of HPI line breaks are limited to downstream of the in-board containment check valves (MUV-36, 37, 42 and 43) as a break upstream of these valves would not result in a loss of reactor coolant. This modification does not impact that portion of the HPI injection lines. The piping impacted

by this USQD is outside the reactor building and is isolated from the reactor coolant system by two in series check valves in each flow path. A failure of this modified piping would not result in an HPI line break as the two check valves would prevent a loss of RCS fluid. The portion of the HPI system impacted by this modification is an accident mitigating system and is not an initiator or precursor to any accident previously evaluated in the SAR. This modification, therefore, will not increase the probability of an HPI line break as described in the SAR.

The accidents that could be impacted by this modification involve a loss of reactor coolant while the plant is shutdown. During the installation phase of this modification, freeze seals will be installed in the HPI lines to provide additional assurance against loss of RCS fluid from the open HPI system. This added precaution is primarily to protect workers from contaminated fluid since there are two in-line check valves that provide isolation of these lines. Failure of the freeze seals will not represent a flooding hazard nor will it result in a loss of RCS fluid. They are intended to only "contain" any check valve "leakage." Failure of two in-line check valves is not considered a credible event.

The testing to demonstrate adequate HPI flows will occur during a refueling outage with the vessel head removed. Under these conditions the HPI system will be tested in its emergency system lineup, providing flow to the RCS from either the BWST or in the "piggy-back" mode with the HPI pump suction lined up to the LPI pump discharge lines and recirculating fluid from the decay heat drop line. The only accident that could result is the loss of reactor coolant fluid as a result of valve misalignment or through a leak in the flow path. RCS inventory will be continuously monitored during this testing process to assure that there is no loss of inventory. Valve lineups will be reviewed and approved at various levels and the test procedure will be reviewed and approved to assure that the required flow path is provided. The probability of a loss of reactor coolant during this testing will not be increased.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The accidents previously evaluated in the FSAR that apply to this change are;

- SBLOCA
- Steam Line Failure
- Steam Generator Tube Rupture accidents
- Loss of Feedwater and Main Feedwater Line Break Accident
- Letdown Line Rupture (LLR)

The modifications included in this HPI upgrade project will enhance the delivery of HPI borated fluid to the RCS to assist in core cooling for a variety of small break LOCAs. All piping modifications will be completed in accordance with the required piping codes and standards. The piping and components will be fabricated and installed to the required applicable codes and requirements, and the stress analysis will verify that the piping integrity will be maintained. This stress analysis will also assure that the penetration

loading has not increased. Therefore, the potential for any loss of the HPI pressure boundary is not impacted by this change. The accident analysis for some SBLOCAs conservatively assume that the flow through one HPI line is lost out of the break and is not available for core cooling. This modification will change the flow paths by which HPI is delivered to the core for such accidents, which results in more flow earlier during some SBLOCA transients. This modification will have no impact on core protection for those accidents in which only the total delivered flow is important while the specific delivery path is not.

Main Steam Line Failure, Steam Generator Tube Rupture, Letdown Line Rupture, Feedwater Line Break and Loss of Feedwater Accidents.

The addition of borated water to the RCS is not impacted by these changes. These modifications will change the method of delivery of flow at the elevated RCS pressures experienced during these events. It will not invalidate the assumptions used in the accident analyses for these events. All the HPI flow is available for core cooling for these events, unlike for SBLOCAs in the cold leg pump discharge piping region for which some portion of the HPI flow goes out through the break and does not contribute to core cooling. Any changes to the HPI system configuration and delivered flows are bounded by the existing accident analyses for those events. The Reactor Building pressure and integrity are also not affected by HPI flow for those accidents, therefore, for the Steam Line Break, Steam Generator Tube Rupture, Feedwater Line Break and Loss of Feedwater accidents, no increase in consequences will occur as a result of these modifications. The impact of the changes to the ES and RPS setpoints has been evaluated and no increase in consequences occurred as a result of these changes. The letdown line rupture is an isolable letdown line break outside the reactor building. HPI is initiated on low reactor coolant system pressure and at the same time, the break is isolated as a result of a containment isolation signal. As for the above listed accidents, the total integrated flow to the core and not the flow path by which it is injected is important. Therefore, this modification does not increase the consequences of an accident previously evaluated in the SAR.

Small Break LOCAs

The method of mitigation of Small Break LOCAs is changed as a result of these modifications. The installation of cross-tie lines between the A1 to B2 and the A2 to B1 injection lines, as well as the inclusion of assured seal injection and makeup isolation in response to an ES actuation signal change the flow paths for HPI injection. These changes will result in assuring adequate HPI flow for all small break LOCAs while eliminating required operator actions early in the accident. A hydraulic calculation for the HPI system has been completed using a FATHOM model that determined the flow rates and required throttle valve positions to balance HPI flow for various break locations. A spectrum of SBLOCA cases was analyzed using these HPI flow rates. The RELAP5/MOD2-B&W code was used to calculate the PCTs and core conditions for these scenarios. Detailed system testing will be completed prior to declaring this system operable to assure that the delivered flow rates with the modified configuration are bounded by the accident analyses.

The results of the accident analyses for the spectrum of small break LOCAs indicate that the consequences for the bounding SBLOCA have not increased as a result of these proposed modifications. The PCTs for the spectrum of SBLOCAs are actually lower as a result of this modification, therefore, the consequences of an accident previously evaluated in the SAR are not increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The pre-outage installation for this HPI upgrade will involve work activities on and around safety-related equipment. Although at a more significant pace, work activities in these areas are ongoing during plant operation and precautions are taken to assure that safety-related equipment is not damaged due to these work activities. During completion of the pre-outage work, additional safeguards and controls will be in place to provide added assurance that equipment will be protected. Procedures will be in place and work packages will be prepared and reviewed to assure that adequate precautions against equipment damage are taken. Due to the additional controls and supervision of work activities in these areas, the probability of occurrence of a malfunction or damage to equipment important to safety in this area will not be increased.

During system connection and tie-in to existing equipment, the affected portions of the HPI system are not required to be operable. These activities will be coordinated within the outage schedule to assure that all operability requirements during the outage are met. The only impact of the outage construction to equipment important to safety is potential piping deadweight and "spring" of the existing piping after cutting. All cut piping will be temporarily supported where necessary and the containment penetrations protected from potential piping "spring" after cutting. The response to REA 99-0479 will develop maximum piping movement and loading for fit-up to the added equipment to assure that piping stresses and containment penetration loadings are not exceeded.

The equipment important to safety previously evaluated in the FSAR that is affected by this MAR is the HPI system and its physical interfaces. The changes that could affect this question are the physical modifications that could create a reduction in HPI flow to the core. A major focus of these modifications is to replace required operator actions with automatic actions. The potential for inappropriate operator actions are, therefore, reduced by these modifications. The addition, removal of mechanical equipment and the change in pre-set positions of valves related to this MAR will not increase the probability of a malfunction of equipment as discussed below. This MAR also affects the safety related electrical and I&C systems, control circuits of the motor operated valves, the ES and RPS setpoints and actuated equipment, and the diesel generator loadings. Section A-1 of the Safety Assessment provides design details and provides an assessment of various failure modes and effects for the proposed modifications.

Mechanical Failures

All piping, mechanical equipment, and structural modifications addressed within this

modification will be erected, fabricated, tested and examined in accordance with the required and applicable piping codes and standards as outlined in Section A-1 of this Safety Assessment. This modification will reclassify several portions of the HPI system from N1 to N2. Piping and components will be fabricated, erected, tested and examined in accordance with ASME Section III requirements for Class 2 components and reconciled to the original construction code (ANSI B31.7). The design and stress analysis will be in accordance with the original design code (ANSI B31.1). This change essentially reclassifies the equipment in accordance with 10 CFR and ASME regulations and requirements. All installed equipment will be in accordance with the required Codes and Regulations as described above, therefore, the probability of occurrence of a loss of system pressure boundary is not increased.

The addition of numerous valves provides additional potential leakage paths. However all vent and drain valves will be capped to eliminate leakage and all stem leakoffs, if installed in the valves, will be capped. Packing leakage may occur, however, gross packing leakage is not expected. All valves will be installed in open areas in which packing leakage is easily detectable during system walk-downs. FSAR Table 6-11 contains a summary of potential quantities of equipment leakage into the auxiliary building during LOCA recovery situations in which reactor coolant is circulated outside containment. The majority of this leakage occurs through valve seats and pump seals. The only additional flow paths added by this modification are several process valves that could potentially leak past the packing. Such leakage represents a small percentage of the total allowed leakage. Additionally, per the FSAR Table, the Dose Rate Calculation for auxiliary building leakage has assumed a higher (more conservative) value of leakage for its calculation basis.

Interfaces evaluated are the HPI piping through the containment penetration and the piping supports interface with the Auxiliary Building and Reactor Building walls. The stress analysis confirms that the penetration loading has not increased. Piping supports have been added as needed to assure that piping and equipment meet the stress limits per B31.1.

MUV-23, 24, 25 and 26 currently open to pre-set throttle positions. This modification eliminates these pre-set stops and the valves will go wide open on receipt of an ESAS signal. This change involves only a reconfiguration of the valve limit switch settings and does not result in any additional malfunction of these valves.

The installation of MUV-596 and the reconfiguration of power supplies to MUV-27 and MUV-18 results in assured isolation of seal injection and normal makeup. The isolation of seal injection has been evaluated as to its impact on RC pump seal integrity. This modification results in the addition of an automatic actuation of seal injection isolation where manual action may have previously been required. Administrative controls for reactor coolant pump operation and loss of subcooling margin provide adequate direction for operation/shutdown of the reactor coolant pumps on a loss of seal injection and/or a loss of seal cavity cooling. If reactor coolant pumps are operating due to a high void content in the primary system, core protection will take priority over potential seal damage, as is the current direction. There is no increase in the probability of reactor

coolant pump seal failure due to this automatic isolation feature.

This modification provides automatic isolation of the seal injection flow path. With the existing configuration, this penetration (Penetration 338) is exempted from leakage testing of the system isolation valves since during accident mitigation this line is pressurized to greater than the maximum reactor building pressure after an accident. MUV-18 will now be included in the MOV program to assure that it will perform its required function during an accident. This modification will result in Penetration 338 being specified as a Type I containment penetration. Local Leak Rate Testing (LLRT) of these containment isolation valves will now be required to assure that they meet leakage limits. As a result of an additional penetration in the LLRT program, a reduction in the allowable leak rates for all penetrations will be reduced.

Installation of Freeze Seals

The installation of freeze seals inside containment will prevent any leakage past the in containment HPI injection lines check valves. It is not required for isolation and in the case of failure the loss of fluid is limited to the minor leakage that may occur past the check valves. The only malfunction of equipment that could occur is a breach of the pressure boundary during installation of the freeze seals. The freeze seals will be installed in accordance with appropriate procedures to preclude damage to the piping. Therefore, the installation of these freeze seals will not increase the probability of occurrence of a malfunction of equipment important to safety.

Electrical/I&C Failures

The power and control to the valves will meet the design requirements of IEEE standards for Class 1E circuits and equipment, precluding the potential for an electrical failure from propagating through the electrical or control systems to other components. The load changes on the electrical buses and equipment are within the equipment's design ratings. Setpoint changes are associated with reducing the time of HPI delivery to the core. The design and function of the RPS and ES protection systems remain unchanged. The modifications to the motor control centers, auxiliary relay racks, ES actuation cabinets, RSP and MCB meet with the applicable electrical separation and seismic criteria.

Based on the above discussions, this modification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the FSAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The pre-outage installation work involves working in or around safety related equipment in the auxiliary building. A malfunction of equipment due to work in this area could render safety-related equipment inoperable as a result of such damage. However, the CR-3 ITS sections governing the operability of safety-related equipment consider operability for a variety of malfunctions, damage during work activities included in them. If HPI

equipment required for safe shutdown is damaged or otherwise rendered inoperable, the CR-3 ITS will require that the equipment be repaired or the plant shut down in a timely fashion. The consequences of this damage to equipment have already been addressed during establishment of the plant operability requirements, therefore there can be no increase in the consequences of a malfunction of equipment important to safety as a result of the pre-outage installation activities.

The outage construction activities will occur when the affected HPI train is not required to be operable. The only impact to important to safety equipment is the potential impact on containment penetration integrity as a result of the piping cuts. The consequences of a failed containment penetration during refueling activities is included in existing plant operability requirements and restrictions on fuel movement under such conditions. Since such failures have already been considered, this activity will not increase the consequences of such a malfunction.

The consequences of a malfunction of the HPI equipment and interfacing equipment are those that would impact the fuel cladding and the reactor containment building integrity. The HPI equipment being modified cannot result in a loss of reactor coolant, as there are two check valves in each flow path that would prevent such a loss of coolant. The only consequences to be considered are, therefore, those that could reduce HPI flow to below the minimum flows assumed in the accident analyses. This modification results in the inclusion of Containment Penetration No. 338 in the LLRT Program. This penetration was previously excluded from LLRT since this line was pressurized and not isolated after ES actuation. The "new" containment isolation valves are the outboard isolation MOV (MUV-18) and the inboard containment check valve (MUV-162). Local leak rate testing (LLRT) of the new containment isolation valves (MUV-18 and MUV-162) will assure that the containment integrity is maintained. The addition of this penetration to the LLRT Program will reduce the leakage limits for the other penetrations thus assuring that the existing leakage limits are maintained and the off-site dose release is not increased due to this change.

The realignment of the HPI injection flow path, addition of cross-tie lines, and the addition of assured makeup and seal injection isolation provide adequate HPI flow for the range of SBLOCAs and consideration of all single failures. Overall PCTs for the spectrum of SBLOCAs will be reduced, and the resultant system configuration will eliminate several existing operator actions required.

Failure of the other existing HPI motor operated valves has previously been addressed using single failure logic from both a mechanical and electrical power supply and control perspective. Failure of these valves, either singly or all those powered from an electrical power supply train, result in flow through at least two injection flow paths. This modification results in flow through all four injection lines using similar single failure logic. This results in better core protection than with the pre-modification configuration and lower PCTs for the spectrum of SBLOCAs. Therefore, this modification will result in a decrease in the consequences of such a malfunction.

The HPI/makeup pumps provide flow at high pressures into the reactor coolant system. The current configuration limits pump maximum flow (and prevents pump deadhead for two pump operation) by using pre-set throttle positions on the pump discharge stop-check valves (MUV-2, 6, 10). After completion of this modification a majority of the system throttling will occur in the injection line throttle valves (MUV-590, 591, 592 and 593). The stop-check valves will not be throttled for the two weaker pumps. However, during two-pump operation at high RCS pressures, the strong pump could potentially result in a weaker HPI pump flowing below the minimum required flow for that pump. The "strong" pump discharge stop check valve will be pre-throttled to maintain equivalent performance with all of the HPI/makeup pumps.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The credible failure modes included above were evaluated against the accidents listed above. The credible failure modes do not initiate a different type of accident.

The credible failure modes of equipment resulting from this modification have all been addressed previously and are bounded by discussions above. The added HPI components and cross-connect piping will be added to assist in accident mitigation. The added equipment is not an accident initiator (i.e. it's failure cannot result in a LOCA or adversely impact any fission barrier). Consideration of passive failure of the added piping and/or equipment is outside the CR-3 licensing basis.

The installation of freeze seals in the HPI lines will be performed in accordance with plant procedures to minimize any potential for damage to plant equipment. Even if equipment were to be damaged, the two in series check valves will maintain reactor coolant system isolation capability. Since the HPI system train containing the freeze seals is not required to be operable, no possibility of an accident of a different type will have been created by this activity. During the time these freeze seals are installed, the HPI system will not be operating and the reactor vessel head will be removed. Even if the freeze seals were to "escape" to the reactor coolant system, they would subsequently melt at the refueling temperatures and would not impact core cooling.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The changes to the RPS and ESAS setpoints are equipment calibration changes only and do not create any additional malfunctions of equipment. The design, operating and accident pressures for these instruments will not be changed as a result of these modifications. The setpoint changes have been considered and are used as an input to the accident analyses and result in lower PCTs for the spectrum of SBLOCAs. These setpoint changes have been approved as License Amendment 178 to the CR-3 Operating License. The actuation setpoints provide trip and initiation signals to equipment that are well within the design parameters of the affected equipment.

Several new components are added to the plant with this modification. These new components are manual throttle valves, new motor operated valves (MOVs), new air operated valves (AOVs) and new manual gate, check and stop check valves. The discussions in the previous sections adequately deal with the pressure boundary considerations of the mechanical equipment. This discussion will focus on the active malfunctions of equipment.

Throttle Valves (MUV-590, 591, 592, 593)

Failure Modes and Effects of the Safety Assessment addresses plugging of the throttle valves as a result of entrained particles when in the "piggy-back" mode with suction from the reactor building emergency sump. This failure was considered not credible.

Cavitation and the resulting vibration downstream of the new throttle valves is precluded by design. The new valves contain special trim and other design features to provide throttling capability throughout the range of expected differential pressures without cavitation. The successful testing of these valves at high differential pressures has confirmed that these valves will not cavitate at these high differential pressures. The design features and laboratory testing assure that any potential vibration will not be significant and can be easily accommodated by the design margins. (It should be noted that the currently installed motor operated valves provide similar throttling service and no cavitation or extreme piping vibrations have been noted during testing of this existing configuration. Therefore, no malfunctions of a different type will result from the installation of these manual throttle valves.

Motor Operated Valves (MUV-18, 27 and 596)

This modification will result in a new configuration for automatic isolation of normal seal injection and normal makeup. MUV-18 and MUV-27 and the new MUV-596 will result in added redundancy to assure that seal injection and makeup are isolated on an ES signal. These are normally open valves and require power to close to their safety related ES isolation and containment isolation position. These valves are controlled from the safety related power supplies similar to numerous other safety related valves and will function in a similar manner. The proposed modifications will isolate the seal injection flow path whereas the existing configuration does not. With no other actions, an ES actuation in Mode 4 with LTOP implemented would result in deadheading the operating MU pump. As discussed in Section A.1 of the Safety Assessment, the makeup pump recirculation isolation valves (MUV-53 and MUV-257) will be procedurally controlled to remain open during such conditions. No malfunction of equipment of a different type will result from the changes to these valves.

Motor Operated Valve MUV-596

Spurious closure of MUV-596 will result in the isolation of both seal injection and normal makeup flow. This failure is similar to the failure of a makeup pump in the existing plant configuration. If MUV-596 cannot be re-opened, normal makeup flow can be provided

through any of the four injection isolation valves MUV-23, 24, 25 or 26. Seal injection is not required as long as the nuclear services closed cooling system (SW) is available. The makeup pump minimum recirculation flow path is maintained during normal operation, therefore the closure of MUV-596 will not damage the pump. Therefore, no new failure mechanisms will be introduced by this modification.

Air Operated Valves (MUV-586, 587)

These valves are air operated with a piston operator that requires venting of the air supply to open. Opening is a result of spring pressure against a piston that raises the valve stem and thus opens the gate valve. The air supply arrangement is such that a single failure in either the controls or the air solenoids will not prevent venting of the air supply assuring that the valve will go to its safety related open position. The malfunction of these valves is the failure to open under the spring pressure when required to do so. The standard CR-3 application of this type of valve is to close under spring pressure, with air required to open the valve. The letdown outboard containment isolation valve (MUV-49) is designed in such a manner. The difference in orientation of the piston and the spring/air motive power arrangement for the cross-tie valves is not considered to create a malfunction of a different type. These valves are designed and specified to open/close under the applicable differential pressures, and will be periodically cycled to verify their operability. No new malfunctions of a different type are considered applicable for these valves.

Manual Gate, Check and Stop Check Valves

All these added valves are similar in design and function to those currently installed in the HPI system. No additional failure mechanisms or different malfunctions will occur as a result of adding these additional valves.

Based on the discussions above, this proposed activity does **not** create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The HPI system provides cooling to the core to limit core heatup for the accidents discussed above. The modifications included in this HPI upgrade task will result in a different flow path for providing HPI flow to the reactor coolant system during the mitigation of SBLOCAs. Whereas the existing HPI configuration requires several manual operator actions to ensure HPI flow through all four injection lines, to isolate normal makeup and RCP seal injection, and to identify and isolate a broken HPI line, this change provides adequate flow for all break sizes and locations with no operator actions required. The HPI flow rates that are available with the new configuration were used in the accident analyses to establish peak cladding temperatures (PCTs) for an array of SBLOCA sizes and locations.

The margin of safety that relates to this modification is the maximum PCT for small break

LOCAs. As discussed in several of the previous answers, these HPI system modifications will maximize core cooling flows for the spectrum of small break LOCAs. The resultant PCTs for the array of SBLOCAs is reduced by these changes, therefore, the margin of safety is increased.

SA/USQD Number: 99-0017, Revision 0 **FSAR Change(s):** Figure 10-4

SA/USQD Title: MAR99-01-03-01; FSAR Change 1999-0036
Replacement Of Pneumatic Operators With Manual Handwheel Actuators

Description

This activity replaces pneumatic operators on MSV-49, 50, 51 and 52 (Moisture Separator Reheater 3A/3B/3C/3D inlet control valves) with manual handwheel operators. The valve controller performs poorly in automatic and introduces an undesirable failure mode (all four valves fail closed on loss of controller output). The change impacts FSAR Figure 10-4, which shows these valves as air-operated control valves.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   This activity replaces MSV-49 through 52 pneumatic operators with manual handwheel operators. These valves control inlet steam to Moisture Separator Reheaters (MSRs) 3A/3B/3C/3D respectively, and are not themselves initiators of any accident. However, the valves are located in piping within the scope of evaluation for Steam Line Failure Accidents. Replacement of the operator has no impact on the pressure retention capability of the valves. Installation of the new operators is in accordance with the same codes and standards governing the original installation, and has no adverse impact on secondary piping systems. Installation has been evaluated and determined to be acceptable. Therefore, this activity cannot increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   While the MSR control valves are classified as "essential equipment," they are not required to function and are not relied upon in any Emergency Operating Procedure (EOP) or Abnormal Procedure (AP). Isolation of the MSRs during a Steam Generator Tube Rupture is performed by upstream isolation valves, MSV-29, 30, 31 and 32. Isolation is necessary to limit the indirect release of radioactivity (via condenser air removal system) and help control secondary heat removal. Classification of MSV-49, 50, 51 and 52 as "essential equipment," is erroneous, since they are not required to function. Therefore, replacing pneumatic operators with manual handwheels cannot increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Replacement of the pneumatic operators with manual handwheels does not make MSV-49 through 52 any more susceptible to failure. The existing operators have a manual mode, enveloping the proposed configuration. Furthermore, the activity does not challenge any other SSCs, nor does it create any new interfaces. Instrument air lines are disconnected and capped in accordance with standard maintenance practices. Associated circuits are de-terminated and spared. The controller and its associated E/P converter are dedicated to the four valves and have no interface with any other control circuits. Therefore, this activity does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

As indicated previously, upstream isolation valves MSV-29, 30, 31 and 32 are used to isolate non-essential flow paths from their associated steam generator during a tube rupture event. The classification of MSV-49, 50, 51 and 52 as "essential equipment" is erroneous, since they are typically gagged open, and not required to operate. This activity is limited to MSV-49, 50, 51 and 52, and has no impact on the upstream isolation valves. The upstream isolation valves remain available to isolate their respective steam generators, thereby limiting the release of radioactive material via the condenser air removal system. Therefore, the proposed change does not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

As currently configured, the valves may be operated either pneumatically, or by manual handwheel. This change only removes the pneumatic operating mode from each of the valves. Removal of the pneumatic operators creates no new interfaces and has no impact on any system operating parameters. The proposed activity creates no new failure modes, nor does it cause the system to be operated outside of existing assumptions or analyses. Therefore, the proposed changes cannot create the possibility of an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

As indicated previously, this activity removes pneumatic operators and disables the associated controller and E/P converter for valves MSV-49 through 52. The revision does not modify plant configuration in such a way that new interfaces with equipment important to safety are created, nor does it change any maintenance practices. Installation of the new operators is in accordance with applicable codes and standards. As a result, no new failure modes of equipment important to safety are introduced by this activity. Therefore,

the possibility of a different type of malfunction of equipment important to safety than previously evaluated in the SAR is not created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There are no Technical Specification requirements governing the operation of the MSR control valves. As indicated previously, current analyses assume either pneumatic or local manual operation of MSV-49 through 52. This activity modifies the valves so that only local manual operation is possible. The change is consistent with current operating procedures (once positioned, the valves are mechanically gagged so that failure of the controller does not result in all four valves closing). Therefore, the margin of safety as defined in the bases for the Improved Technical Specifications is not reduced.

SA/USQD Number: 99-0018, Revision 0 **FSAR Change(s):** Figure 9-3

SA/USQD Title: MAR96-04-06-01; REA96-0439; PC96-5314; PC97-2952; PC98-2492; FSAR Change 1999-0047 Replacement of Obsolete Controlotron Flow Measuring Equipment With Panametrics Ultrasonic System

Description

This modification will remove the existing obsolete Controlotron flow measuring equipment used for flow measurement of the Boric Acid Pumps CAP-1A and CAP-1B discharge (CA-44-FE) and recirculation (CA-45-FE), and replace it with a Panametrics ultrasonic system. Flow indication will be provided only for the Boric Acid Pump recirculation.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The flow measuring equipment is a non-intrusive system that provides local flow indication. This indication is not an accident initiator, nor does it provide any accident mitigation. Therefore, it cannot increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Since this system neither initiates or mitigates any accident previously evaluated in the SAR, the proposed activity cannot increase the consequences of an accident.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   Replacement of the flow measuring equipment will not increase the probability of occurrence of an equipment malfunction. The associated circuit will still be isolated through Breaker 15 of VBDP-3 and the equipment will be seismically mounted. Flow instrumentation is non-intrusive and the component interfaces remain the same.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   This non-intrusive flow measuring equipment will not increase the consequences of a malfunction of equipment since there are no breaches of any pressure boundary, nor are there any system operating parameters or characteristics changed by this modification.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This modification will replace an existing non-intrusive flow measuring system with a newer design. Since the existing interfaces are not changed and no new system interfaces are created, this activity cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The existing system is a non-intrusive flow measuring device that does not initiate or mitigate an accident. This modification will replace the existing obsolete equipment with a new ultrasonic system. There are no new failure modes created and therefore this activity will not create the possibility of a different type of equipment malfunction.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The margin of safety will not be reduced by this modification. A more reliable system for non-intrusive flow measurement is being installed and will result in increased reliability and system performance. This flow measurement system is classified as non safety related. Additionally, the Boric Acid Pump discharge flow indication is not relied upon to determine pump performance or operability.

SA/USQD Number: 99-0019, Revision 0 **FSAR Change(s):** Section 7.4.3

SA/USQD Title: MAR94-05-04-01; FSAR Change 1999-0035
Annunciator Audible Alarm Modification

Description

The modification adds a Global Annunciator Silence feature with a time delay to the plant annunciator system. This feature will permit the Balance of Plant operator to silence all annunciator audible alarms for a period up to ten (10) minutes, in the event that numerous annunciator alarms are received as a result of a reactor trip.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The affected system, plant annunciator, is not an initiator of any accidents evaluated in the SAR. This system performs a passive monitoring function only.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The Moderator Dilution Accident at Shutdown credits the availability of the audible alarms for accident mitigation. The Global Annunciator Silence feature would not be used during this event. The silence feature will only be used during a reactor trip, not during a slow progressing event like the moderator dilution accident. There are no credible failures that would cause the silence feature to "energize," blocking the audible portion of the system. Therefore, the consequences of an accident previously evaluated in the SAR would not be increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The proposed modification affects the non-safety related portion of the plant only. There exists approved isolation between the safety related power supply and the non-safety related loads being installed. Therefore, a failure of the non-safety related installation, (i.e., short circuit condition) will not affect the safety related power distribution system.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The proposed modification affects a non-safety related plant system. Electrical isolation exists to prevent a failure of the global annunciator silence feature from affecting the performance of any safety-related system. Since the safety related systems are unaffected, they will be able to perform their accident mitigation function. Therefore, the

consequences of a malfunction of equipment important to safety is not increased.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The only credible failure mode would be the failure of the relay to reset after timing out. However, this failure would not initiate a different type of accident. The only accident that credits the use of the audible annunciator alarms is the Moderator Dilution Accident during shutdown. The Global Annunciator Silence feature will not be used during this accident. Therefore, the failure identified above is not credible for the Moderator Dilution event. For the event that will use the Global Annunciator Silence push button, post reactor trip, the accident mitigation does not credit the use of the audible annunciator alarms. Therefore, a failure of the proposed modification will not create the possibility of an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed modification installs a push-button and control relay to permit the audible portion of the annunciator system to be inhibited. This installation affects the non-safety related plant annunciator system only. The annunciator system does not have an active role in any plant initiating event. Failure of the new control relay will not affect the safety-related systems at the plant, nor will it affect the way any of the safety related systems respond during an accident. Therefore, the proposed modification will not create the possibility of a different type of malfunction of equipment important to safety.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The plant annunciator system is not a Technical Specification system. This system has no accident mitigation functions, active trip or isolation functions. The installation of the Global Annunciator Silence feature will not inhibit any safety-related system from performing its intended function. Therefore, the margin of safety is not reduced.

SA/USQD Number: 99-0033, Revision 0 **FSAR Change(s):** None

SA/USQD Title: PC98-2897; ITS Bases Change B99-20
Remote Shutdown System Instrumentation

Description

The ITS Bases for LCO 3.3.18 were clarified by way of a note that addressed the inappropriateness of the LCO requiring Decay Heat Removal Temperature instrumentation. The plant is precluded by way of existing plant procedures from placing Decay Heat in service until MODE 4. The LCO is only applicable in MODES 1, 2 and 3, making the DH instrumentation unnecessary (from a practical standpoint). The requirement of the ITS will, however, continue to be followed.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The addition of the note in the ITS bases will simply be for the edification of the ITS bases users. The actual requirements of the ITS, including compliance with the LCO requirements will be unaffected. As the LCO requirements are unaffected, the availability of plant equipment will be unaffected, resulting in no increase in the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The addition of the note in the ITS bases will simply be for the edification of the users of the ITS bases. The actual requirements of the ITS, including compliance with the LCO requirements will be unaffected. As the LCO requirements are unaffected, the plant's response to any accident previously evaluated in the SAR will be unaffected, resulting in no increase in the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The addition of the note in the ITS bases will simply be for the edification of the users of the ITS bases. The actual requirements of the ITS, including compliance with the LCO requirements will be unaffected. As the LCO requirements are unaffected, the plant's available equipment will not be impacted, and the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR is unaffected.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The addition of the note in the ITS bases will simply be for the edification of the users of the ITS bases. The actual requirements of the ITS, including compliance with the LCO requirements will be unaffected. As the LCO requirements are unaffected, the plant's available equipment will not be impacted, the consequences of a malfunction of equipment important to safety previously evaluated in the SAR will be unaffected.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The addition of the note in the ITS bases will simply be for the edification of the users of the ITS bases. The actual requirements of the ITS, including compliance with the LCO requirements will be unaffected. As the LCO requirements are unaffected, the plant's available equipment will not be impacted, nor will the operation of the plant. Therefore, proposed activity cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The addition of the note in the ITS bases will simply be for the edification of the users of the ITS bases. The actual requirements of the ITS, including compliance with the LCO requirements will be unaffected. As the LCO requirements are unaffected, the plant's available equipment will not be impacted, nor will the operation of the plant. Therefore, the addition of the NOTE to the ITS basis will not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The addition of the note in the ITS bases will simply be for the edification of the users of the ITS bases. The actual requirements of the ITS, including compliance with the LCO requirements will be unaffected. As the LCO requirements are unaffected the margin of safety as defined in the bases for any Improved Technical Specification is unchanged.

SA/USQD Number: 99-0036, Revision 0

FSAR Change(s): Sections 3.1.2.4.2; 3.2.4.2.1.1; Section 14.0.1; and Table 3-20,

SA/USQD Title: MAR98-12-03-01; FSAR Change 1999-0030
Mark B10 Fuel Assembly Intermediate Spacer Grid Restraint

Description

Following removal from the core, some Mark-B10 Fuel Assemblies (FAs) have shown signs of excessive Intermediate Spacer Grid (ISG) movement. Abrasions, such as scrapes and scratches, found on some ISGs of these assemblies, indicated that excessive ISG movement occurred as a result of mechanical interference with adjacent fuel assemblies. It has been determined that this interference happened during refueling operations when FA lifting loads were maintained within prescribed limits. Because of this, a design change is being made to the FA ISG restraint system to increase its ability to accommodate compressive loads associated with refueling operations

This modification of the FA ISG restraint system is uniquely associated with the Mark-B10 fuel assemblies. Its facility lies in its ability to prevent movement of ISGs beyond prescribed limits during all phases of FA life including refueling operations. This design change does not affect any other component including any SSCs, safety or non-safety related, in the plant licensing or design basis.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?**

   No

   The proposed activity is not an accident initiator. It neither affects, nor is it associated with, any accident initiator. For these reasons, the proposed activity cannot increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?**

   No

   The associated SSC of the proposed activity, the FA ISG restraint system, uniquely affects only the FAs. It is not associated with, nor does it affect, any SSC that prevents or mitigates the consequences of an accident evaluated in the SAR.

   The previous ISG restraint system did adequately preclude Loss of Coolant Accident (LOCA) associated ISG movement beyond prescribed limits. However, it is worth noting that the new system provides a more robust restraint for downward ISG loads associated with cold leg breaks. This can only serve to reduce any consequences associated with fuel rod clad to ISG mechanical interface related scraping.

   Hydrogen generation during LOCA events occurs as a result of fuel rod clad Zircaloy-Water reaction. The amount of hydrogen generation from this reaction is limited

to predetermined volumes by 10 CFR 50.46 criteria. These volumes are uniquely associated with fuel rod clad Zircaloy and not other FA Zircaloy components, such as spacer grids and spacer sleeves. Hence, the addition of ~ 0.05 in^3 of Zircolay per FA associated with this change will not lead to additional volumes of hydrogen generated during LOCA events.

Relative to the rod ejection accident, decreases in departure from nucleate boiling ratio (DNBR) can lead to an increase in gap release. However, the SAR evaluation of this accident is grossly over conservative in that any fuel rod undergoing DNB is assumed to release its gap activity (based on end of life conditions). Actually, most of the fuel rods would recover from DNB and no fission product release would occur. Hence, any increase in gap release resulting from this change, i.e., predicted DNBR decrease of 0.01, would be very small and remain within previously reviewed and approved NRC limits.

For these reasons, the proposed activity cannot increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed activity is associated only with the ISG restraint system of the FAs. It does not affect any other SSCs, safety related or non-safety related, in the plant licensing or design basis. Hence, it cannot increase the probability of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed activity affects only the FA ISG restraint system. This restraint system SSC has no effect on, nor is it in any way associated with, any SSC that prevents or mitigates the consequences of an accident. For this reason, it will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed activity does not affect any SSC (safety related or non-safety related) in the plant licensing or design basis other than the FA ISG restraint system. Analysis indicates that it will not fail under normal or accident conditions. Hence, it cannot be an accident initiator or the precursor of an accident initiator. Because of these considerations, the proposed activity cannot create the possibility of an accident of a type different than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed activity is uniquely associated with the ISG restraint system of the FAs. It

does not affect (directly or indirectly) any other SSCs, safety related or non-safety related, in the plant licensing or design basis. For this reason, the proposed activity cannot create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The minimal computed DNBR effects associated with the proposed activity are relevant to several ITS Bases. However, analysis indicates that these effects are so small that they may be considered to be of no consequence. This is supported by the ability to offset these predicted small changes (i.e., 0.01 in DNBR) by the large magnitude of design margins to DNBR reference values afforded by existing SAR evaluations. Further, the predicted 0.01 decrease in DNBR, associated with this change, will not cause any ITS DNBR related limit (approved NRC acceptance limit) to be approached. Hence, no decrease in the margin of safety, as defined in the bases for any ITS, will occur.

SA/USQD Number: 99-0037, Revision 0 **FSAR Change(s):** Section 11.2.2.2; Table 11-7

SA/USQD Title: PC97-4753; FSAR Change 1999-0025
Gas Waste Disposal System

Description

This USQD analyzes the acceptability of proposed changes to the FSAR to update design data for the Waste Gas Compressors WDP-001A/B, which is required due to replacement of the compressors. The specific changes to FSAR Section 11.2.2 and Table 11-7 include correction of the capacity of the compressors based on the actual performance curve supplied by the manufacturer, clarification of the unloader relief path of the Waste Gas Decay Tank relief valves, and correction of the design pressure of the Waste Gas System. The numerical values to change in the FSAR are design values that exceed the Waste Gas Compressor original design requirements, but remain in compliance with the ANSI B31.1 Code.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed changes to the FSAR do not incur physical change to the Plant. The proposed changes update design values for the Waste Gas Compressors that exceed the original design requirements but remain in compliance with the ANSI B31.1 Code. No credible failure modes can be attributed to the proposed changes. Therefore, the proposed changes do not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The proposed FSAR changes are text changes to descriptions of the Gas Waste Disposal System components and do not involve a physical change to the Plant. The Gas Waste Disposal System is designed to provide a means to store and holdup radioactive gas waste as a means to control releases, but is not required to be functional during an accident. The proposed changes have no means to impact the consequences of any analyzed accident. Therefore, an increase of the consequences of an accident previously evaluated in the SAR is not credible.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The proposed changes to the FSAR will not result in any modification to Plant equipment. No new failure modes may be attributed to this activity. The text changes are necessary to align the design and licensing bases of the Waste Gas Compressors, but have no means to

cause a malfunction of equipment. The design values being updated in the FSAR exceed the original design requirements of the compressors yet are well within the B31.1 piping system design parameters. Therefore, a malfunction of equipment important to safety previously evaluated in the SAR is not credible.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This activity does not result in any physical change to the Plant. The FSAR text changes have no means to pose any burden on Plant equipment. Existing accident analyses are not impacted. Therefore, an increase in consequences due to a malfunction of equipment important to safety is not feasible.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed changes update the FSAR with correct design information for the Waste Gas Compressors. These changes do not physically alter the Plant in any manner. The design values requiring update exceed the requirements of those originally specified yet remain in compliance with the ANSI B31.1 Code. Therefore, the proposed changes have no means to create an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed changes to the FSAR are required due to oversights when the Waste Gas Compressors were replaced. These changes bring into agreement all design and licensing documentation. There is no means of creating new failure modes as a result of this activity. Therefore, the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR will not occur.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The Improved Technical Specifications do not govern the operation of the Gas Waste Disposal System. The former Technical Specifications for liquid and gaseous radiological effluents were moved to the Offsite Dose Calculation Manual (ODCM) in January 1989. The release of radioactive effluents are also now governed by the ODCM. The subject compressors are not specifically addressed in the ODCM. Therefore, no margin of safety found in the ODCM is impacted. Margins of safety found in other SERs or other commitment documents such as implied commitments to the Standard Review Plan (SRP), Nuclear Regulations (NuRegs), Core Operating Limits Report (COLR), etc. cannot be reduced as a result of this activity. Therefore, the margin of safety as defined in the bases for any Technical Specification will not be reduced by the implementation of the proposed changes.

SA/USQD Number: 99-0045, Revision 0 **FSAR Change(s):** Sections 5.4.4 and 5.4.5.2

SA/USQD Title: FSAR Change 1999-0028; PC99-0686; NOCS 62616;
Design Basis Document Temporary Change 1017
Licensing Basis Criteria For Large Bore Piping Program

Description

This SA/USQD evaluates the impact of updating the applicable seismic piping design basis document (DBD 2/1) and applicable FSAR Sections (5.4.4 and 5.4.5.2) to clarify CR-3's design and licensing basis criteria for vital piping system seismic dynamic analyses. These FSAR and DBD changes clarify some of the details of CR-3's existing piping design and evaluation criteria, which are currently only found within the body of individual pipe stress analysis calculations and docketed NRC correspondence. These criteria limit pipe stresses within Code allowables and are either in accordance with industry and NRC accepted practices or previously approved analysis techniques for CR-3.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Updating the applicable seismic piping design basis document (DBD 2/1) and applicable FSAR Sections (5.4.4 and 5.4.5.2) to clarify CR-3's design and licensing basis criteria for vital piping system seismic dynamic analyses cannot increase the probability of occurrence of any accident, does not initiate any accident, nor does it change any accident initiator for any accident previously evaluated in the SAR. Pipe stresses are limited to Code allowable limits to ensure that piping system pressure boundaries are maintained considering normal and occasional loading conditions including Design Basis Earthquake (DBE) and Maximum Hypothetical Earthquake (MHE) loads.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Updating the applicable seismic piping design basis document and FSAR Sections cannot increase the consequences of an accident previously evaluated in the SAR. The FSAR accident analysis requires that the pressure boundary integrity and pipe system flow characteristics are maintained. Since the calculated pipe stresses remain below the USAS B31.1.0-67 Code with Code Cases N-7 & 70 pipe stress allowables, there is no increase in radiological challenges to product barriers and all credible failures are bounded by the accident scenarios previously evaluated in Chapter 14 of the FSAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Code qualification of the Seismic Class I piping ensures that piping systems remain structurally adequate during Design Basis seismic events. Since piping systems are qualified to Seismic Class I Code requirements, the passive failure of the pressure boundary and impacts to system operability are bounded by the accident scenarios previously evaluated in Chapter 14 of the FSAR. Therefore, these changes will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The safety function of the piping is to maintain pressure boundary and system characteristics. Piping that is assumed to fail as a LOCA or MSLB initiating event could lead to component malfunctions due to adverse system interactions. However, updating the applicable seismic piping design basis document and FSAR Sections does not increase the possibility of such interactions or worsen their consequences, since the design basis accidents are mitigated and bounded by the accident scenarios previously evaluated in the FSAR. Also, there are no operational changes or physical plant modifications related to these changes. Therefore, updating the applicable seismic piping design basis document and FSAR Sections will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The accident scenarios for a loss of pressure boundary such as Loss Of Coolant Accident (LOCA) and Steam Line Failure Accident are evaluated in the FSAR. Updating the applicable seismic piping design basis document and FSAR Sections cannot create the possibility of system interactions or worsen their consequences, since there are no operational changes or physical plant modifications required by these changes. No changes to any Seismic Class I piping Functional Specifications are required. The allowable pipe stresses remain below USAS B31.1.0-67 Code with Code Cases N-7 & 70 pipe stress allowable limits and are consistent with the requirements of the SER. Therefore, updating the applicable seismic piping design basis document and FSAR Sections cannot create the possibility of an accident of a different type, nor does it change any accident initiator for any accident previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The Design Basis accident associated with updating the applicable seismic piping design basis document and applicable FSAR Sections is a loss of piping pressure boundary integrity. The seismic qualification of piping systems to Code allowable stress limits will

ensure that piping system structural integrity is maintained, thereby minimizing the potential loss of critical system characteristics. Updating the applicable seismic piping design basis document and applicable FSAR Sections cannot induce a different type of equipment failure, nor does it require any operational changes or physical plant modifications. Therefore, the possibility of a different type malfunction of equipment important to safety other than any previously evaluated in the SAR cannot be created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The margin of safety is defined as the margin between the NRC acceptance limit and the design failure point. The bases for the Improved Technical Specifications do not define the margin of safety as related to pipe stress allowable limits. The qualification of piping systems to Seismic Class I Code requirements consistent with the SER provides assurance that they will continue to perform their intended design function during normal operation as well as during emergency conditions. Therefore, the piping systems reliability, operability, and availability is maintained and the margin of safety is not reduced.

SA/USQD Number: 99-0050, Revision 1 **FSAR Change(s):** Section 10.6 and Figure 10-2

SA/USQD Title: MAR99-01-02-01; FSAR Change 1999-0041
Appendix R Auxiliary Feedwater Flowpath Upgrade

Description

The Auxiliary Feedwater (AFW) system provides a feed source redundant to the Emergency Feedwater (EFW) system. In its current configuration, prevention of the loss of EFW to the AFW system is accomplished by sealed closed isolation valves FWV-222/223. With this configuration, initiation of AFW to Once Through Steam Generators (OTSGs) requires a combination of Main Control Board (MCB) remote manual operations and local manual operations. This change provides for addition of two swing check valves which replace the isolation function currently afforded by maintaining FWV-222/223 closed, and re-alignment of FWV-222/223 from sealed closed to normally open. These changes allow for initiation of AFW flow to the OTSGs with only remote manual operations from the MCB.

Included in this AFW system change is an increase in the maximum allowable total EFW system flow rate to any one OTSG. It was assumed there would be a need for this increased EFW system flow to support this evaluation. While this assumption was not correct, it is appropriate to reflect the more revised limits in the FSAR.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed activity, upgrading the AFW flow path via the addition of swing check valves and realignment of isolation valves, affects only the AFW system. The AFW system is not an initiator of any accident previously evaluated in the SAR. The AFW system interfaces with the EFW system. However, the EFW system is also not an initiator of any accident previously evaluated in the SAR. For these reasons, the proposed activity cannot increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The proposed activity provides for an AFW system interface with the EFW system at a Seismic Class I ES boundary (upstream of the new swing check valves). This boundary will not fail by any means previously evaluated in the SAR and, therefore, will not adversely affect EFW performance during the mitigation of any accident previously evaluated in the SAR, e.g., Small Break Loss of Coolant Accident (SBLOCA). Hence, the consequences of such accidents will not increase as a result of the proposed activity.

Proposed increases in total allowable EFW/AFW flow to any one OTSG have been analyzed and found acceptable. For all EFW pump alignments, total EFW/AFW system flow to any one OTSG will be less than the proposed higher limits. Other than these interface (SSC) considerations, the proposed activity does not affect any other plant SSCs, directly or indirectly, that prevent or mitigate the consequences of an accident previously evaluated in the SAR. For these reasons, the proposed activity will not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed activity provides for an AFW system interface with the EFW system at a Seismic Class I ES boundary (upstream of the new swing check valves). This boundary will not fail by any means previously evaluated in the SAR and, therefore, will not increase the probability of occurrence of a malfunction of the EFW system.

Situations that might be postulated to initiate unwanted AFW flow would provide flow rates less than the proposed higher limits for maximum EFW system flow to any one OTSG. That is, for all EFW pump alignments, total EFW/AFW system flow to any one OTSG will be less than the proposed higher limits. Hence, any postulated unwanted AFW flow will not increase the probability of occurrence of a malfunction of the EFW system or the OTSGs.

Other than these EFW system equipment and process considerations, the proposed activity does not affect any plant SSCs, directly or indirectly, that mitigate any accidents previously evaluated in the SAR. For this reason, the proposed activity will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed activity provides for an AFW system interface with the EFW system at a Seismic Class I ES boundary (upstream of the new swing check valves). This boundary will not fail by any means previously evaluated in the SAR and, therefore, will not affect EFW system performance during the mitigation of any accident previously evaluated in the SAR.

Situations that might be postulated to initiate unwanted AFW flow would provide flow rates less than the proposed higher limits for maximum EFW system flow to any one OTSG. That is, for all EFW pump alignments, total EFW/AFW system flow to any one OTSG will be less than the proposed higher limits. Because of this, any postulated unwanted AFW flow will not affect the EFW system or OTSG performance during the mitigation of any accident previously evaluated in the SAR.

Other than these EFW system equipment and process considerations, the proposed activity

does not affect any plant SSCs, directly or indirectly, that mitigate the consequences of accidents previously evaluated in the SAR. For this reason, the proposed activity will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed activity includes an AFW system interface with the EFW system. This interface provides for a Seismic Class I ES boundary that has been extended to include the new check valves. The seismic design criteria applied to this extended system piping, additional support and check valves is that currently described in the SAR for Seismic Class I ES equipment. For this reason, failures associated with this boundary cannot occur due to any means other than those previously evaluated in the SAR.

The proposed activity provides for a re-alignment of AFW system valves. With this re-alignment, situations might be postulated that could cause unwanted AFW flow. However, any such postulated flow will be less than the proposed higher limits for maximum EFW system flow to any one OTSG. These proposed higher limits have been analyzed and found acceptable. For this reason, this mechanism will not cause failure of any SSC. Other than these considerations, the proposed activity does not affect any other SSCs, directly or indirectly. For this reason, the proposed activity cannot create the possibility of an accident of a type different than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Relative to equipment important to safety, the AFW system interfaces with the EFW system. This interface provides for a Seismic Class I ES boundary that has been extended to include the new check valves. The seismic design criteria applied to this extended piping, additional support and check valves is that currently described in the SAR for Seismic Class I ES equipment. For this reason, failures of this boundary, i.e., malfunction of this equipment important to safety, cannot fail by any means other than those previously evaluated in the SAR.

The proposed activity leads to AFW system interfacing with the EFW system in a process alignment where previously isolated valves have been aligned to open. This could cause situations that might be postulated to initiate unwanted AFW flow due to AFW operations. Such postulated situations would result in flow rates less the proposed higher flow limits for maximum EFW system flow to any one OTSG. These higher limits have been analyzed and found acceptable. Hence, any postulated unwanted AFW flow cannot cause malfunction of equipment important to safety.

The proposed activity does not affect any plant SSCs, other than those discussed here, directly or indirectly; this includes explicit and implicit considerations. For this reason, the proposed activity cannot create the possibility of a different type of malfunction of

equipment than any previously evaluated in the SAR

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The proposed activity is associated with the AFW system. The AFW system interfaces with the EFW system at a Seismic Class I ES boundary (upstream of the new swing check valves). ITS, ITS Bases and other germane information, such as NRC correspondence and docket information, were reviewed for potential impact of the proposed activity on related safety margins. This review included consideration of the impact of the AFW system on the EFW system due to the interface delineated here.

The proposed activity does not lead to reduction in any safety margin and does not impact any ITS assumptions. It was determined that the AFW system is not safety related and is neither included in ITS nor considered in design basis mitigation analyses. Also, this review found no impact to other margins of safety, at the system or component level, as a result of the proposed activity. For these reasons, the proposed activity cannot reduce the margin of safety as defined in the bases for any ITS.

SA/USQD Number: 99-0051, Revision 0 **FSAR Change(s):** Section 6.1.2.1.2; Table 6-6

SA/USQD Title: PC99-0386; PC99-0544; FSAR Change 1999-0045;
OP-404, Decay Heat Removal System, Revision 116;
OP-880, Fire Service System, Revision 19
Changing Normal Position of DHV-34/-35 to Open

Description

The stand-by position of the common Borated Water Storage Tank (BWST) suction valves for each train of the Low Pressure Injection (LPI) and Reactor Building (RB) Spray valves (DHV-34 and DHV-35) is being changed from closed to open. They are in the primary flowpath for any Engineered Safety Features system operation involving these systems. Positioning the valves open places them in the post-accident position, thereby eliminating the failure-to-open failure mode. No other failure modes are impacted by this change in valve position.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The Low Pressure Injection and Reactor Building Spray systems are not initiators of any Design Basis Accidents evaluated in the SAR. The Borated Water Storage Tank common suction valves are being placed in their post-accident position and thus are more reliable. This cannot increase the probability of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The change in these valve's position enhances the system's reliability in mitigating design basis accidents for which it is credited because it places the valves in the required post-accident position. This will not increase the consequences of accidents previously evaluated.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   This change places the valves in their post-accident position. They do not have to change state in response to the Engineered Safety Features Actuation System signal which they will still receive. Therefore, since the active function is eliminated, this change decreases the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This change places the valves in their post-accident position. They do not have to change state in response to the Engineered Safety Features Actuation System. Therefore, this change does not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This change places the valves in their post-accident position. They do not have to change state in response to an Engineered Safety Features Actuation System. Therefore, this change does not create the possibility of an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This change places the valves in their post-accident position. They do not have to change state in response to an Engineered Safety Features Actuation System signal which they will still receive. Therefore, since the valves will no longer have an active function this change cannot create the possibility of a different type of malfunction.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

This change places the valves in their post-accident position. They do not have to change state in response to an Engineered Safety Features Actuation System. The effectiveness of the Engineered Safety Features Systems is an essential contributor to the margin of safety established by the Improve Technical Specifications. This improves their reliability and thus increases the margin of safety.

SA/USQD Number: 99-0061, Revision 0

FSAR Change(s): Section 5.2.5.2.3.2.k; and Table 5-4

SA/USQD Title: MAR96-10-04-01, FCN 11; FSAR Change 1999-0038
MURS-1 Pressure Increase Setting

Description

This SA/USQD provides documentation and justification for a change to the pressure setting for rupture disc MURS-1 from 2500 psi to 2795 psi. The change was made in order to establish a margin between the current design pressure of the system and the rupture pressure. This accommodates increases in system pressure above the design pressure of the system, as allowed by USAS B31.1-1967, paragraph 102.2.4, without jeopardizing the integrity of the piping system. USAS B31.1 paragraph 102.2.4 allows the system pressure to be exceeded by increasing the allowable stress by a maximum of 20% for short term events. However, the pressure increase to 2795 psi did not use this 20% increase in the allowable stress, therefore there is additional margin between the disc setting and the system allowable stress. The maximum allowable working pressure for the respective components, within the boundary of the closed containment isolation valves, is documented in FPC Calculation S-96-0137. An increase of the pressure setting to 2795 psi does not result in system components being stressed beyond the code allowables (without taking credit for the 20% increase allowed by USAS B31.1, paragraph 102.2.4).

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The activity changes the pressure setting of rupture disc MURS-1. The rupture disc and expansion chamber are passive devices which provide protection against overpressurization of containment penetration 333. Thermal expansion of the letdown fluid can occur during a design basis accident (LOCA or MSLB). The rupture disc and expansion chamber are accident mitigators and cannot affect the initiators of the design basis accidents. The change to the pressure setting has no effect on this function. Since the initial conditions assumed for all design basis accidents are unchanged, the probability of occurrence of an accident previously evaluated in the SAR is not increased.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The expansion chamber is designed to collect and hold the letdown fluid, should the rupture disc perform its design function. If the pressure reaches the rupture disc setting, the disc will rupture allowing the fluid to be contained within the expansion chamber. Although this activity changes the pressure setting at which the rupture disc fails, it has no effect on the ability of the expansion chamber to perform its containment function. Since there is no release of letdown fluid to the environment, the activity cannot increase the

consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The rupture disc and expansion chamber are designed to prevent a malfunction of the process piping through penetration 333. Although the activity increased the pressure setting at which the rupture disc fails, the pressure is still below the pressure corresponding to the code allowable stress of the piping materials, i.e., the structural integrity is not challenged. Therefore, since the probability of occurrence of a malfunction of the piping system is not increased, the activity does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Pressure boundary failure of containment penetrations has not been previously evaluated in the SAR. The rupture disc and expansion chamber are designed to provide protection against such failure by providing a surge volume capable of containing the thermally expanded containment fluid without exceeding the code allowable stress. The change to the pressure setting for the rupture disc does not affect the ability of the rupture disc and expansion chamber to carry out this function. Since stresses are maintained below code allowables, and the device does not interface with other plant systems, no malfunctions are created. Therefore, the activity cannot increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The rupture disc and expansion chamber are passive devices that act as an accident mitigator. They are designed to prevent a malfunction of the process piping through the containment penetration, thereby preventing the possibility of an accident of a different type than previously evaluated in the SAR. Since the new pressure setting does not result in stresses that exceed code allowables, the change cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The change to the rupture disc pressure setting changed the pressure at which overpressurization protection occurs. The stresses induced in the process piping remain below code allowables, thereby ensuring that malfunction of the containment penetration will not occur. In addition, the fact that the rupture disc and expansion chamber do not interface with other plant systems ensures that the possibility of malfunction of other SSCs is not created. Therefore, the activity cannot create the possibility of a different type of malfunction of equipment important to safety that any previously evaluated in the SAR.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

The margin of safety for the Makeup system is the margin between the acceptance limit (code allowable stress) and the failure point. The code allowable stress could have been increased by 20% for short duration events. However, the additional margin was not used to determine the increase in the pressure setting of the rupture disc. The change has been evaluated such that the pressure stresses in the system are maintained below code allowable stresses, as documented in FPC Calculation S-96-0137. Therefore, the activity does not reduce the margin of safety as defined in the basis for any Improved Technical Specification or the design basis for the plant.

SA/USQD Number: 99-0062, Revision 0 **FSAR Change(s):** None

SA/USQD Title: MAR99-03-01-01
Radiation Monitor Pump Motor Replacements

Description

This activity allows for the replacement of the pump motors for radiation monitors RM-A7 and RM-A15. Also, correctly sized overload heaters will be installed for these replacement motors in safety related motor control center MTMC-3-12B and inside portable monitor, RM-A15. As an outcome of the motor replacements for RMP-A7 and RMP-A15, changes to plant drawings, calculations and configuration management information are also accomplished by this activity.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Replacement of RM-A and RM-A1 pump motors, the installation of correctly sized motor overload heaters in MTMC-3-12B and RM-A15, and the resultant decrease in load to EGDG-1A and EGDG-1B are not accident initiators. Therefore, the proposed activity does not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Replacement of RM-A and RM-A1 pump motors, the installation of correctly sized motor overload heaters in MTMC-3-12B and RM-A15, and the resultant decrease in load to EGDG-1A and EGDG-1B does not challenge any existing fission product barriers. This activity does not change or impact the way radiological information is transmitted to or processed by operations personnel, and equipment reliability is unaffected.

   This activity is not capable of invalidating assumptions used in evaluating radiological consequences in any safety analysis or procedures which may reduce the effectiveness of a system used to mitigate the radiological consequences of an accident in the SAR. Therefore, the proposed activity does not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The replacement equipment affecting RM-A7 and RM-A15 and MTMC-3 and MTMC-6 meets the original design specifications. A decrease in load to EGDG-1A and EGDG-1B results from this activity. The reliability of the diesels is not degraded by this activity. A diesel generator loading evaluation has been completed which documents this position.

This activity does not remove any automatic signals associated with the RM-A7, RM-A15, MTMC-3, MTMC-6, EGDG-1A or EGDG-1B.

Therefore, the proposed activity does not increase the probability of the occurrence of a malfunction of: (a) RM-A15 to monitor radiation for the fuel and spent fuel handling and radiochemical laboratory areas; (b) RM-A7 to monitor radiation and access habitability of the Nuclear Sample Room; (c) MTMC-3 and MTMC-6 to provide power to their safety related loads during normal or accident conditions; or (d) EGDG-1A and EGDG-1B to start and supply emergency power during ES actuation or a LOOP.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

AC electrical systems and the radiation monitoring system are affected by this activity. Load to the diesels (EGDG-1A and EGDG-1B) is reduced by this activity. This reduced load has been evaluated by the emergency diesel generator loading engineer and poses no increase for failure of the diesels. Therefore, there is no potential for increased consequences associated with the malfunction of the diesels.

The replacement motors for RM-A7 and RM-A15 and associated change in motor overload heater elements in MTMC-3 and RM-A15 does not affect the function or method of performing the function of this equipment. Therefore, there is no potential for increased consequences associated with the malfunction of either RM-A7, RM-A15 or MTMC-3.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed activity does not challenge fission product barriers or fuel integrity. The resultant decrease in emergency diesel generator loading has been evaluated as having no adverse affects on the diesel generators to perform their safety function. Therefore, this activity is not an accident initiator.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

A decrease in load to EGDG-1A and EGDG-1B results from the replacement of RM-A7 and RM-A15 motors. The new motors and motor overload heaters are like kind replacements and have no different type of malfunctions. The equipment important to safety affected by this activity is MTMC-3, MTMC-6, EGDG-1A and EGDG-1B. This equipment is electrically upstream from RM-A7 and RM-A15 and is protected by the safety related circuit breaker in MTMC-3-12B, MTMC-3-1BR and MTMC-6-1AB. Therefore, the proposed activity does not create the possibility of a different type of malfunction of equipment important to safety than previously evaluated in the SAR.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

The replacement motors and motor overload heaters for RM-A7 and RM-A15 are transparent to system and equipment operation except for the reduced load to EGDG-1A and EGDG-1B. The emergency diesel generator loading design engineer has evaluated the decrease in diesel loading. The reduced load increases the kW margin to the limits of the auto-connected plus manual essential loads and during block loading as defined in ITS B3.8.1. No separate case study is required for this activity and the emergency diesel loading calculations, E-91-0026 and E-91-0027, will be revised accordingly during their next scheduled revision. Therefore, the proposed activity does not reduce the margin of safety as defined in the bases for any ITS.

SA/USQD Number: 99-0064, Revision 0

FSAR Change(s): Sections 11.1.1; 11.2; Table 11-2; and Table 11-5

SA/USQD Title: PC 97-8632; FSAR Change 1999-0039
Administrative Changes to FSAR Chapter 11

Description

This change adds clarifying information to Chapter 11 of the FSAR. It explains the historical nature of the information in Chapter 11 related to the assumed operation of the radwaste systems, in order to estimate the radioactive effluent levels and subsequent public dose consequences. It clarifies how actual plant operation regarding radioactive effluent controls is performed in accordance with the requirements of the Technical Specifications and Offsite Dose Calculation Manual, and not the historical assumptions in Chapter 11 of the FSAR. It also presents calculated reactor coolant activity based on the Technical Specification reactor coolant activity limit and an extended operating cycle of 700 effective full power days. This reactor coolant activity is presented with the original design basis activity, which is based on operation with one percent degraded fuel cladding. The original design basis activity is higher and, hence, conservative.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed change is administrative in nature as it provides clarifying information to the FSAR. There are no physical or procedural changes to the plant. Therefore, the changes cannot initiate an accident and hence cannot increase the probability of an accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The proposed change does provide information which could be used in calculating the consequences of Chapter 14 accidents that use the reactor coolant activity as the source. However, any such reevaluation would be part of a different change and the SA/USQD for that change would have to address the use of a revised source term. Using a different source term would have to be justified and the effect on the consequences of using a different source term, in combination with the effects of other changes being made at the time, would have to be evaluated. The new source term information results in lower concentrations of all iodines and noble gases compared to the existing source term. Therefore, the effects of this change alone would be to reduce the calculated consequences. The addition of source term information or information related to radioactive effluent controls for normal operation has no effect on any accident consequences.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed change is administrative in nature, as it provides clarifying information to the FSAR. There are no physical or procedural changes to the plant. Therefore, the changes are not related to equipment malfunctions and hence cannot increase the probability of a malfunction.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed change is administrative in nature as it provides clarifying information to the FSAR. There are no physical or procedural changes to the plant. Therefore, the changes are not related to equipment malfunctions. Most of the information is related to normal effluent controls and public dose from expected releases, not those related to malfunctions or accidents. The only information related to consequences of potential accidents or malfunctions is the reactor coolant source term information. This dose calculation assumption is unrelated to equipment malfunctions. Therefore, the proposed change cannot affect the consequences of a malfunction of equipment.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed change is administrative in nature as it provides clarifying information to the FSAR. There are no physical or procedural changes to the plant. Therefore, the changes cannot initiate an accident and, hence, cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed change is administrative in nature as it provides clarifying information to the FSAR. There are no physical or procedural changes to the plant. Therefore, the changes cannot create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Regarding normal effluent control, the proposed changes are consistent with the Bases provided in the Offsite Dose Calculation Manual (ODCM). They both recognize that the requirements of the ODCM ensure normal effluents remain within applicable limits. Regarding reactor coolant activity, the proposed addition of activity levels based on the Technical Specification limits is consistent with the bases for the reactor coolant Technical Specification limit in that the limit is based on maintaining the dose from applicable accidents within an acceptable dose. Since the changes are consistent with existing bases,

there can be no decrease in the margin of safety defined in these bases.

SA/USQD Number: 99-0069, Revision 0 **FSAR Change(s):** None

SA/USQD Title: Temporary MAR99-00-00-03
CWP-1C Pump Bearing Low Flow Alarm

Description

Reactor Building temperatures, as tracked by Systems Engineering, have been trending upwards. The Reactor Building (RB) is approaching maximum allowable temperatures and there are concerns that the temperatures will get even hotter in upcoming summer months. This may cause equipment concerns at higher elevations in the RB. Currently fan AHF-3A, which helps provide cool air to the upper regions of the RB, is out of service. The motor needs to be rebuilt. It is desired that the fan repair occur online. Fan AHF-3A is located on the 119' Elevation near the personnel hatch. Repair of AHF-3A would involve building a rigging scaffold beside the fan. This SA/USQD discusses issues of unqualified coatings on the scaffolding being present in the RB and also discusses associated NUREG-0612 issues.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The activity of building a scaffold in the RB while at power cannot, in any way, initiate an accident previously evaluated in the SAR. The issue of failed coatings on scaffolding cannot increase the likelihood of clogging the sump since we are outside of the "near field" and "far field" areas. Scaffold building in the RB will not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Since coating failure cannot clog the sump, the proposed activity cannot, in any way, affect accidents previously evaluated in the SAR. Since accident scenarios are not affected, the amount of dose releases from these accidents is also not affected.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   FPC calculations show that a coatings failure in the area proposed for scaffold erection will not clog the sump on the 95' of the RB. Coatings failure on scaffolding could not in any way impact any other equipment important to safety. Therefore, there is not an increase in the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Activities will have no impact on any equipment important to safety. Therefore, dose releases resulting from a malfunction of equipment important to safety evaluated in the SAR are not increased.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Debris from failed coatings on scaffold could cause no accident other than the clogged RB sump scenario which is already described in the SAR. Therefore, this activity will not create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Failed coatings on scaffolding in the RB will not adversely impact any equipment important to safety. Therefore, the possibility of different type of malfunction of equipment important to safety than any previously evaluated in the SAR has not been created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There are no Technical Specifications applicable to coatings in Class II Service Level areas. Therefore, the margin of safety as defined in the bases for any Improved Technical Specifications has not been impacted.

SA/USQD Number: 99-0071, Revision 0 **FSAR Change(s):** Sections 11.4.2.1.1 and 11.4.3

SA/USQD Title: MAR86-09-22-14, FCN 7; PC96-3575; PC97-4661; PC97-4662; PC98-5657; Design Basis Document Temporary Change 514; MAR86-09-22-08; FSAR Change 1999-0040 Radiation Monitor Upgrade

Description

This activity revises FSAR Sections 11.4.2.1.1 and 11.4.3, as well as Design Basis Document (DBD) 5/10 to reflect the configuration and performance characteristics of Atmospheric Dump Valve (ADV) and Main Steam Line radiation monitors. These instruments were replaced by MARs 86-09-22-08 (ADV monitors RM-G25 and RM-G28) and 86-09-22-14 (Main Steam Line monitors RM-G26 and RM-G27). The changes consist of correcting detector service descriptions, ranges, specifications, sensitivities and calibration methods.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   This activity revises FSAR Sections 11.4.2.1.1 and 11.4.3 and DBD 5/10 to properly reflect the function, configuration, design and operational characteristics of RM-G25, RM-G26, RM-G27 and RM-G28, following the upgrade/replacement accomplished by MARs 86-09-22-08 and 86-09-22-14. These instruments perform monitoring functions only (indication and alarm); there are no automatic actuations or interlocks. These instruments are not themselves initiators of, nor could they precipitate conditions leading to, any accident. The proposed FSAR and DBD changes are required to correct aspects of the instrument design currently described. No new functions are included in the revision. Therefore, this activity cannot increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   As indicated previously, none of the instruments affected is relied upon in the mitigation of any design basis accident. RM-G25 and RM-G28 are Reg. Guide 1.97 Type E, Category 2 instruments. As such, they provide information for use in determining the magnitude of and assessing the release of radioactive materials. The changes to RM-G25 and RM-G28 are consistent with the requirements of and FPC's commitments to Reg. Guide 1.97. RM-G26 and RM-G27, on the other hand, are non-safety related and have no accident mitigation or post accident monitoring function.

   FSAR Chapter 14 was reviewed for information relative to the use of main steam line and atmospheric dump valve monitors. Section 14.1.2.9.5.1 describes the events following a

Station Blackout. Section 14.2.2.2 describes a Steam Generator Tube Rupture Accident. During both scenarios, radioactivity released is assumed to be discharged to the atmosphere through the main steam safety and atmospheric dump valves, or to the condenser through the turbine bypass valves and then out the condenser vacuum pump exhaust. Use of RM-G25 and RM-G28 is not described in either section.

The proposed FSAR and DBD revisions have no impact on fission product barriers, any equipment credited with mitigating functions, or any assumptions contained in the analyses. Therefore, this activity cannot increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The only aspect of the FSAR/DBD changes that has the potential for impacting previous assumptions regarding a malfunction of RM-G25, RM-G26, RM-G27 and RM-G28 is the change in detector temperature and pressure ratings. As described previously, the ratings are more restrictive, but remain consistent with the intended service environment. Other changes (detector range and type) make the instruments no more susceptible to failure, since applicable codes and standards have been maintained. Furthermore, these instruments do not interface with any other equipment important to safety. Therefore, this activity does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

As indicated previously, none of the instruments affected by this activity are credited with any mitigating function. Their only purpose is to monitor gamma release to the environment through the ADVs (RM-G25 and RM-G28) and to the secondary system (RM-G26 and RM-G27). The monitoring function is required for release assessment and system diagnostic purposes, only. In addition, the credited means of detecting primary to secondary leakage (Condenser Air Removal System monitor – RM-A12) is unaffected by this activity. Therefore, proposed changes do not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

RM-G25, RM-G26, RM-G27 and RM-G28 are not accident initiators, nor do they interface with any structures, systems or components capable of initiating an accident. The instruments provide indication and alarm functions only and are used to monitor gamma release to the atmosphere (RM-G25 and RM-G28) and to the secondary system (RM-G26 and RM-G27). The FSAR/DBD changes are a result of upgrades performed on the instruments to provide improved reliability, and in the case of RM-G26 and RM-G27, increased detectability. These changes do not imply any new functions or interfaces. Therefore, the proposed changes cannot create the possibility of an accident of a different

type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This activity revises FSAR and DBD descriptions of ADV and Main Steam Line radiation monitors to reflect upgrades performed under MARs 86-09-22-08 and 86-09-22-14. The changes only revise aspects of the design currently described. However, the revisions do not imply the creation of any new interfaces with equipment important to safety or modification of any operational or maintenance practice that could impact component function. As a result, no new failure modes of equipment important to safety are introduced by this activity. Therefore, the possibility of a different type of malfunction of equipment important to safety than previously evaluated in the SAR is not created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There are no Technical Specification requirements governing the operation of the ADV or Main Steam Line radiation monitors. RM-G25 and RM-G28 are Reg. Guide 1.97 Type E, Category 2 instruments and are therefore not included in ITS 3.3.17 (Post Accident Monitoring Instrumentation). However, as indicated previously, the change in the FSAR and DBD description of these instruments has no impact on their ability to support radiation monitoring system functions. The FSAR and DBD changes reflect modifications and upgrades made to enhance instrument reliability and, in the case of RM-G26 and RM-G27, detection capability. Therefore, the margin of safety as defined in the bases for the Improved Technical Specifications is not reduced.

SA/USQD Number: 99-0085, Revision 0 **FSAR Change(s):** Table 5-4

SA/USQD Title: REA99-0125; OP-411; OP-417; SP-324; SP-381; FSAR Change 1999-0049 Containment Mini-Purge Valve Inside Containment

Description

This evaluation justifies leaving the containment mini-purge air inlet valves inside containment in the OPEN position. The valves in question are SAV-21, SAV-51, SAV-415, SAV-416 an SAV-420. This change will cause required revisions to the following procedures: OP-411, OP-417, SP-324 and SP-381.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Opening these valves cannot increase the probability of occurrence of an accident previously evaluated in the SAR. The only valve qualified to satisfy its safety function for containment penetration 110 is SAV-24. SAV-24 is the "outside containment, normally locked closed" isolation valve for containment penetration 110, and is qualified to perform this function by being tested via the Leak Rate Program. Leaving SAV-21 normally open will not affect the containment penetration's ability to satisfy its safety function.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Opening these valves cannot increase the consequences of an accident previously evaluated in the SAR. Opening these valves has no effect on maintaining containment integrity. The only valve qualified to satisfy its safety function for containment penetration 110 is SAV-24. SAV-24 is the "outside containment, normally locked closed" isolation valve for containment penetration 110, and is qualified to perform this function by being tested via the Leak Rate Program. Leaving SAV-21 normally open will not affect the containment penetration's ability to satisfy its safety function.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   Opening these valves cannot increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR. The only valve qualified to satisfy its safety function for containment penetration 110 is SAV-24, the "outside containment, normally locked closed" isolation valve for containment penetration 110. Leaving SAV-21 normally open will not affect the containment penetration's ability to satisfy its safety function.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Opening these valves cannot increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR. Opening these valves has no effect on maintaining containment integrity. The only valve qualified to satisfy its safety function for containment penetration 110 is SAV-24. SAV-24 is the "outside containment, normally locked closed" isolation valve for containment penetration 110, and is qualified to perform this function by being tested via the Leak Rate Program. Leaving SAV-21 normally open will not affect the containment penetration's ability to satisfy its safety function.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This change does not create any new failure modes; nor does it alter how containment integrity is maintained. With containment integrity intact, this change cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This change does not create any new failure modes; nor does it alter how containment integrity is maintained. With containment integrity intact, this change cannot create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Opening these valves has no effect on maintaining containment integrity. The only valve qualified to satisfy its safety function for containment penetration 110 is SAV-24. SAV-24 is the "outside containment, normally locked closed" isolation valve for containment penetration 110, and is qualified to perform this function by being tested via the Leak Rate Program. Leaving SAV-21 normally open will not affect the containment penetration's ability to satisfy its safety function. Therefore, this change cannot reduce the margin of safety as defined in the bases for any Improved Technical Specification

SA/USQD Number: 99-0088, Revision 0 **FSAR Change(s):** None

SA/USQD Title: PC98-5169; PC98-5224; PC98-5241; ITS Bases Change 99-005 Correcting Differences in ITS Bases Surveillance Requirements for Valve Position Verifications

Description

The root cause of the deficiencies documented in PCs 98-5169, 98-5224, and 98-5241 was the lack of clear guidance for determining which valves require periodic verification of their correct positions to satisfy ITS Surveillance Requirements (SRs). This resulted in personnel error in that Surveillance Procedures (SPs) created to implement the original technical specification surveillance requirements did not consider branch lines as part of the system flow path. Therefore, the original SPs did not include all valves necessary to ensure the proper flow paths existed for system operation and valves added by later plant modifications were not incorporated into relevant SPs as appropriate.

To foster continued satisfaction of the specific ITS SRs, criteria was established for which valves were required to satisfy ITS SRs:

3.5.2.1, Emergency Core Cooling System
3.6.6.1, Building Spray System
3.7.5.1, Emergency Feedwater System
3.7.7.1, Nuclear Services Closed Cycle Cooling Water System
3.7.8.1, Decay Heat Closed Cycle Cooling Water System
3.7.9.1, Nuclear Services Seawater System
3.7.10.1, Decay Heat Seawater System

The ITS SR BASES were used to determine which valves were required to be in their correct positions. The BASES are being aligned so that they will be consistent.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Revising these ITS SR Bases cannot increase the probability of occurrence of an accident previously evaluated in the SAR. This change does not alter the plant's configuration, just the ITS Bases document that clarifies the intent of the SR. Ensuring correct system alignment is not discussed in the SAR. This revision does not change the scope of the valves to be verified by the SRs. This revision merely aligns these similar ITS SR Bases so that they are consistently applied

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

Revising these ITS SR Bases cannot increase the consequences of an accident previously evaluated in the SAR. Aligning the ITS Bases has no effect on how the affected systems perform their safety functions which were previously evaluated by the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Revising these ITS SR Bases cannot increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR. This change does not alter the plant's configuration, just the ITS Bases document that clarifies the intent of the SR. Ensuring correct system alignment is not discussed in the SAR. This revision does not change the scope of the valves to be verified by the SRs. This revision merely aligns these similar ITS SR Bases so that they are consistently applied.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Revising these ITS SR Bases cannot increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR. Aligning the ITS Bases has no effect on how the affected systems perform their safety functions which were previously evaluated by the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This change does not create any new failure modes. This change does not alter how the affected systems perform their safety functions. With the safety functions unchanged, this change does not create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This change does not create any new failure modes. This change does not alter how the affected systems perform their safety functions. With the safety functions unchanged, this change does not create the possibility of an accident of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

Revising these ITS Bases does not affect how the systems perform their safety functions. These changes clarify the intent of the affected SRs.

SA/USQD Number: 99-0090, Revision 1 **FSAR Change(s):** Table 7-10 and Figure 9-6

SA/USQD Title: MAR98-12-04-01; FSAR Change 1999-0050
Low Pressure Injection Upgrade Project

Description

This activity installs two new motor operated control valves (DHV-110/111), repowers two existing flow control valves (renumbered) DHV-210/211, maintained in a full open position (except during surveillance testing or component isolation using these valves) and adds five vent valves to improve system venting. These modifications improve reliability by eliminating the use of gate valves DHV-5/6 for throttling during various scenarios and reduce operator burden (continuous throttling) during these activities. Existing controls and Remote Shutdown Panel (RSP) capabilities are maintained and transferred to DHV-110/111. Jog controls are provided in the Main Control Room (MCR) to allow for throttling of DHV-210/211 when required for surveillance testing, etc.. No ITS changes are required. Minor FSAR changes are required due to the identification and nomenclature changes.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The decay heat removal system through the low pressure injection mode of operation is part of the Emergency Core Cooling Systems (ECCS). The system is an accident mitigation system. The system does not initiate any design basis accident or licensing basis event.

   Pre-outage installation activities are performed with administrative controls in place, similar to controls in place during system maintenance activities. When the work schedule requires that one of the DH trains be protected, work is conducted on the other train (identified for maintenance work) and no modification work is performed on the "protected" train. Precautions are implemented for working around plant equipment and the protected train. No piping tie connections are made with the unit online.

   Outage installation work is performed on a single train, not required to be in operation. This is in Mode 6 with the RCS level > 156', with one decay heat removal train in service (ITS requirement). The only exception to this may be the installation of DHV-135, the vent valve upstream of the DHV-91, Auxiliary Pressurizer Spray isolation valve unless CR-3 is defueled, then system outages in accordance with AI-502 will be allowed. This may be performed during Mode 5 or 6, as this line can be isolated from the operable decay heat removal loop without impact to system/train function. The valve/line is not required for decay heat removal.

   The installation of the control valves and vent valves is performed within administratively

controlled (tagged) boundaries. Provisions are in place to allow for alternate means of system isolation should inadequate isolation of the work area be indicated by excessive leakage past the closed boundary valves. These provisions are controlled in accordance with existing plant programs and procedures. Such provisions could include the use of freeze sealing or mechanical plugs to provide adequate isolation.

The proposed MAR activities, addition of the two control valves, vent valves or repowering of the existing valves, installation, or testing, do not initiate an accident, therefore the probability of occurrence of an accident is not increased due to installation of the MAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The accidents previously evaluated in the FSAR that apply to the DH (LPI) system are:

Large Break Loss of Coolant Accidents (LOCA) – Coolant injection from the BWST and recirculation of the Reactor Building Emergency Sump (RBES)

Small Break LOCA – Provision for supplying HPI suction from LPI (Piggyback Operation)

Steam Line Break – Long term cooling following stabilization, depressurization and cooldown to DH initiation point

Steam Generator Tube Rupture (SGTR) - Long term cooling following stabilization, depressurization and cooldown to DH initiation point

The modifications provided through the installation of this MAR do not affect the DH/LPI systems ability to meet the design basis functions. Flow from the system is throttled from the new valves, however the flowrate has not been affected by this change. System hydraulic analysis indicates the changes to the system have minimal affect on the overall system function and no affect on the ability to provide ECCS flow, through LPI.

Since this system is an accident mitigation system and the capability of the system to provide that function has not changed there is no increase in the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The design, fabrication installation and testing of this MAR is performed in accordance with Codes, standards and regulatory requirements, applicable to CR-3. The new valves have been designed and fabricated in accordance with ASME Section III, 1989, no Addenda, Nuclear Class 2 components. The valves are seismically designed/qualified and the piping is seismically supported. Modifications required to the supports as a result of the new valves are designed and installed in accordance with the original construction

codes/standards. The new valve operators are seismically and environmentally qualified in accordance with the seismic/EQ requirements of CR-3.

The power/controls of the new valves are being rolled from the existing valves. The design, separation and installation requirements are the same as the original design. The repowering of the existing valves is in accordance with the original design requirements. Circuit isolation and separation has been provided, in accordance with existing plant programs and procedural requirements. Where analysis has indicated support modifications are required, the supports are designed, fabricated and installed in accordance with the original design requirements.

No modification to the control functions for DHV-110/111 have been made. Function of DHV-110/111 remains the same as the existing design/configuration. The existing valves throttle for normal shutdown cooling control, LPI injection and in conjunction with DHV-5/6 provide HPI piggyback suction flow control. The new valves perform both normal shutdown cooling flow control and LPI injection flow control and provide throttling for HPI piggyback without the use of DHV-5/6. No automatic functions have been added, deleted or modified. Manual controls of DHV-210/211 from the MCR and the Motor control Center (MCC) have been provided.

Failure of one of the valves (DHV-110/111 or DHV-210/211 inadvertent closure) would constitute the single failure and would not impair the systems ability to meet the design basis function of LPI. System flow is controlled to design basis requirements through the existing flow control loop (rolled to DHV-110/111). Additionally, handwheels are provided at the valve.

Pre-outage installation activities will involve work around energized, safety related Systems, Structures and Components (SSC). Work activities on and around this equipment is similar to maintenance work conducted throughout the plant on a regular basis. During pre-outage installation, additional precautions are provided to minimize the impact on plant SSC. Work will not be performed on DH system components when the applicable train is "protected" due to maintenance activities on the opposite train.

Similar work controls are in place during outage installation due to the proximity of the operable DH train, required to be in-service. Procedural changes as a result of this MAR ensure system operation and periodic testing are conducted to prevent equipment malfunction.

Due to the design, fabrication and installation requirements and the additional controls imposed during the pre-outage and outage installation phases there is no increase in the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The installation activities of this MAR, pre-outage and outage is conducted in and around safety related equipment and equipment important to safety. A malfunction of equipment important to safety in the areas where installation activities are conducted could impact operability of safety related equipment. Since work activities is conducted on one train of equipment at a time, a malfunction of equipment important to safety would not challenge the minimum equipment required for accident mitigation.

All work around equipment important to safety is conducted within the auxiliary building. The modification does not create any new release paths or release potential. Therefore, the consequences of malfunction of this equipment are not increased.

This MAR interfaces with the HPI system, by providing piggyback suction flow and interfaces with the plant electrical system through ES MCCs. The modification maintains single failure design requirements. All tie in work is conducted on de-energized equipment or is conducted one train at a time when ITS allows single DH system operation and when HPI is not required to be operable (Mode 6). Design considerations provide assurance that no malfunctions of equipment important to safety occur, therefore, the consequences of these malfunctions are not increased.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

All credible failure modes of this modification, previously analyzed, are bounded by previous accident analysis. These failure modes do not initiate a different type of accident.

The controls for the new valves have been rolled from the existing valves. No automatic functions have been added, deleted or modified. No new failure modes have been introduced, due to this modification. This system is an accident mitigation system and does not initiate an accident. Basic system operation, required safety system design basis flowrates and single failure analysis have not changed due to this modification.

Improved system reliability and operation ensure that different types of accident do not occur. Therefore, the modification, installation, testing and procedure/programmatic changes do not create the possibility of an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The design fabrication installation and testing of this modification ensures that the system will function as designed and the system will meet the original design basis requirements. Operation of the new flow control valves is essentially the same as the function and operation of the existing valves. The existing valves (DHV-210/211) are normally opened, have no automatic function and are not required to perform any active safety function.

Failure of one of the valves (DHV-110/111 or DHV-210/211 inadvertent closure) would constitute the single failure and would not impair the systems ability to meet the design basis function of LPI. System flow is controlled to design basis requirements through the existing flow control loop (rolled to DHV-110/111). No new failures have been introduced.

The procedural changes as well as the other programmatic changes (FSAR, EDBD, etc) will ensure the system is operated and periodically tested to ensure system operational readiness and function.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS bases establish minimum system/component requirements to meet the system design basis. The ITS defines the DH/LPI system as being required for LOCA scenarios to meet ECCS requirements established in 10 CFR 50.46. Although not explicitly established, the ITS bases discusses LPI minimum flow requirements to mitigate LOCA and meet the 10 CFR 50.46 requirements. Installation of this design change does not invalidate or change the design basis of the system. Emergency Core Cooling System minimum required flowrates are not affected by the new control valves. No new or previously analyzed single failure will prevent the system function as required by ITS.

Although minimum system requirements change based on the plant mode the installation of this modification does not affect the systems ability to meet these requirements. Pre-outage installation activities will not affect system operability and therefore will not affect the minimum system requirements in ITS.

Outage installation activities are conducted on one train at a time, leaving the required operable system in operation as required by ITS. This maintains the ITS bases of decay heat removal capability.

System/component surveillance requirements are not changed based on this modification. The surveillance requirements will continue to be met.

SA/USQD Number: 99-0118, Revision 0

FSAR Change(s): Section 9.9, Table 9-19, Figure 1-11 and Figure 9-17

SA/USQD Title: MAR97-10-04-01; PC98-1483, CA 14; FSAR Change 1999-0066
Changing Spent Fuel Pool Gate Seal Backup Tank from Nitrogen to Air

Description

This modification will change the existing Spent Fuel Gate Seal Backup Supply from a compressed nitrogen cylinder to a compressed breathable air cylinder. The physical location of this installation is on the 162' elevation of the Auxiliary Building, next to the spent fuel pool

Compressed air from the Instrument Air System is provided as the primary air supply to the seals on Spent Fuel Pool Gates FHX-2 and FHX-3. A "T"-sized high pressure cylinder of nitrogen connected to a pressure regulator was provided by previous MAR93-02-09-01 to function as a backup in case of a loss of instrument air event while the gates are in service.

As indicated in the EDBD for the IA system the air quality is required to meet grade D breathable air parameters as the Instrument Air System is used as a breathable air supply on occasion. It is postulated that a back flow of nitrogen into the Instrument Air system could reduce the oxygen to an unsafe level. This item was being tracked by PC98-1483, Corrective Action 14. To mitigate this concern, the scope of MAR97-10-04-01 will change the nitrogen cylinder to a Grade D breathable air cylinder along with replacing the regulator IA-192-FR.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The Instrument Air System is not a precursor or initiating event for any accident previously evaluated in the SAR. Changing an existing compressed nitrogen cylinder to a compressed air cylinder connected to the Instrument Air System cannot increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   No direct role is played by the instrument or station air systems in mitigating the radiological consequences of any accident described in the SAR, and these systems do not affect any fission product barriers. Components supplied by these systems do have roles in mitigating the radiological consequences of an accident, but these components fail closed, or are locked in position upon a loss of air, or have air receiver tanks as required to provide the necessary compressed air to function to its safety condition. These functions are not changed as a result of changing an existing compressed nitrogen cylinder to a compressed air cylinder. Therefore, this modification will not increase in consequences of an accident previously described in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

As described in Section 9.10 of the FSAR, pneumatic equipment required for safe shutdown or reactor building isolation are valves which have been designed to fail closed, and those valves required for safe shutdown fail or lock in position in the event of air failure. Therefore, the potential for loss of instrument and service air has been previously evaluated. Plant modifications were also previously installed that ensured the operability of equipment required for the Station Blackout accident. Changing the existing compressed nitrogen cylinder to a compressed air cylinder does not affect the operation of any pneumatically supplied equipment; and the air quality of the bottled air meets or exceeds the IA/SA air quality required in the EDBD.

Changing the existing compressed nitrogen cylinder to a compressed air cylinder does not affect the operation of the spent fuel pool gates. Currently, the nitrogen cylinder is held in place by a fall-down protection chain type of restraint. The same restraint will be used for the compressed air cylinder and thus the potential for a missile does not change by implementation of this modification. Hence, the implementation of this modification cannot increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Components supplied compressed air by IA/SA systems do have roles in mitigating the radiological consequences of an accident but, as previously stated, these components fail closed, or are locked in position upon a loss of air, or have air receiver tanks as required to provide the necessary compressed air to function to its safety condition. The functions of these systems are not changed as a result of the implementation of this modification.

As indicated in section AB-162-6AD.1 of the CR-3 fire hazard analysis, the design basis fire is postulated to be a fast burning fire that reaches a maximum temperature of 750°F and would involve oil, wood, clothing, paper, plastic, and rubber. This fire is postulated to last only .07 hours, due to the small quantity of combustible material in the area. The presence of the compressed air cylinder will not increase the consequences of a fire in this area. The compressed air cylinder has the same stored energy as a compressed nitrogen cylinder and, as such, the postulated missile remains the same and is not changed by implementation of this modification. Thus, there can be no increase in the consequences of malfunction of equipment previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Operation, performance, or failure of the Instrument Air System is not a precursor or initiating event for any challenge to a fission product barrier. Implementation of this modification does not change the overall operation, performance, or failure of Instrument

Air System. A fire in this area has been evaluated in the Fire Hazard Analysis. Therefore, changing of the existing compressed nitrogen cylinder to a compressed air cylinder cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

FSAR Section 9.10.1 states that all pneumatic equipment required for safe shutdown, or reactor building isolation, are valves which have been designed to fail closed and that those valves required for safe shutdown fail or lock in position in the event of air failure. The installation of a backup air supply for the instrument and service air systems does not degrade, change or prevent these actions or any other action described or assumed in an accident addressed in the SAR.

No direct role is played by the instrument or service air systems in mitigating the radiological consequences of any accident described in the SAR and these systems do not affect any fission product barriers. Components supplied by these systems do have roles in mitigating the radiological consequences of an accident but, as previously stated, these components fail closed or locked in position upon a loss of air. These functions are not changed as a result of the continued presence of an air supply.

Although implementation of this modification does not change the function of the spent fuel pool gates, the failure of the spent fuel pool gates to seal could result in a lowering of the spent fuel pool water level. FSAR section 9.3.8 spent fuel pool cooling addresses the required water levels and discusses the possibility of a loss of water level. Therefore, the implementation of this modification does not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The air systems were mentioned in ITS Bases for Section 3.7 when addressing the operation of the MSIVs, ADVs, and Containment Purge Valves. The implementation of this modification does not affect the operation, failure position, or stroke times of these safety related valves as addressed in these Bases, nor does it make a failure of the IA/SA system more likely.

ITS Bases section B.3.9 requires a minimum plant water level of 156 ft "plant datum" to maintain sufficient water level above the fuel contained in the vessel and the bottom of the fuel transfer canal, and the spent fuel pool to ensure iodine fission product activity is retained in the water in the event of a fuel handling accident. Implementation of this modification does not affect this water level. Therefore, the margin of safety is not reduced as a result of the implementation of this modification.

SA/USQD Number: 99-0134, Revision 0 **FSAR Change(s):** None

SA/USQD Title: PC97-1515; NOTES 27310; LER 97-038; FSAR Change 1999-0063 Seismic Classification Clarification for Liquid Waste Disposal System

Description

The commitment under LER 97-038 is being changed for the liquid waste disposal (LWD) system. It was determined that the original design basis for these systems was not seismic Class I through the second valve. Amendment 39 and SER dated July 5, 1974 addressed the seismic components based on information in the FSAR. FSAR Section 5.1.1.1.i stated that the liquid piping downstream of the respective tanks was Class I through the second valve. Based on a review of the configuration of the LWD system downstream of WDT-4, WDT-6, and WDT-9 shown in Amendment 39 (FSAR Figure 11-1), and the seismic classification for the intervening pumps (FSAR Table 11-5), the system does not meet the criteria for a Class I system.

The "piping" was supported in accordance with small bore seismic support criteria, however the "system" through the second valve could not be considered as meeting the seismic Class I criteria in the strictest sense. This was noted and corrected on FSAR Figure 11-1 under the 10 CFR 50.59 process but it failed to address FSAR Section 5.1.1.1.i. The respective piping systems are ASME Section XI, Class 4, non-safety related and serve no safety function. The current seismic design boundary is through the first isolation valve downstream of the respective tanks, except for the new piping system that was added by MAR85-05-02-01 which is seismic Class III. This is reflected in the current FSAR Figure 11-1. The system installed under MAR85-05-02-01 will be upgraded, by analysis, to seismic Class I for pressure boundary through the first valve, which is a manual ball valve.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The liquid waste disposal system is not associated with a design basis accident (DBA) evaluated in the SAR. The Waste Gas Decay Tank rupture is the only DBA associated with the radioactive waste disposal system, which is not affected by this activity. DBAs requiring containment isolation send a signal to the containment isolation valves to close. This activity will not affect the ability to close any of the containment isolation valves. The liquid outlet piping is neither an initiator nor required for mitigation of a DBA. The probability of a WGDT rupture is not increased by this activity. The ability to isolate containment is not affected by this activity.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The consequences of a WGDT rupture are outlined in the SAR. A pressure boundary

failure of the pipe due to a seismic event could occur in the non-seismic portion of the system. The valves are normally closed, therefore there would be no loss of fluid from the respective tanks. Moving the seismic boundary to the first normally closed valve also provides assurance that there is no loss of fluid from the tanks due to a seismic event. The only difference is the amount of fluid in the pipe between the first and second valve, which is less than 5 cubic foot, including the pumps and cross-tie pipe. The fluid would be retained within the AB and processed regardless of the break location. Any minor gaseous loss, due to degassing of the liquid, would be processed through the AB filtration system regardless of the break location.

By comparison, the liquid volume between the valves is much less than the total liquid volume of WDT-4 (2750 cubic feet). If the contents of WDT-4 were released into the auxiliary building, the gaseous release would be about 19,000 Ci, which is bounded by the WGDT rupture consequences of 39,000 Ci. Based on this comparison, the consequences due to degassing of the liquid from the pipe volume is bounded by the total loss of WDT-4, which is bounded by the WGDT rupture. Based on this, there is no increase in the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The liquid outlet piping systems downstream of WDT-4, WDT-6, and WDT-9 are non-safety related, based on the ASME Section XI boundaries shown in FSAR Figure 11-1. The EDBD states that the liquid waste disposal system is not required to function during an emergency condition. Also, upon review of NOD-31, the liquid outlet piping is not one of the systems included in the equipment reliability listings. Since the liquid outlet piping is non-safety related, is not required to function during an emergency, and is not relied upon for accident mitigation, there is no increase in the probability of a malfunction of equipment important to safety as previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The portions of the WD system important to safety are the containment isolation valves. The consequences associated with a WGDT rupture are addressed in the SAR. Clarifying the seismic boundaries does not affect the containment isolation valves or the WGDT rupture. Therefore, there is not an increase in the consequences of a malfunction of equipment important to safety as previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

A pressure boundary failure of the pipe due to a seismic event could occur in the non-seismic portion of the system. The valves are normally closed therefore there would be no loss of fluid from the respective tanks. Moving the seismic boundary to the first normally closed valve also provides assurance that there is no loss of fluid from the tanks due to a seismic event. The only difference is the amount of fluid between the first and second

valve, which is less than 5 cubic feet, including the pumps and cross-tie pipe. The fluid would be retained within the AB and processed regardless of the break location. Any minor gaseous loss, due to degassing of the liquid, would be processed through the AB filtration system regardless of the break location. Changing the seismic boundaries to the first normally closed valve cannot create the possibility of an accident of a different type than any previously evaluated in the SAR since the integrity and contents of the tanks are preserved.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The liquid outlet piping downstream of WDT-4, WDT-6, and WDT-9 is not important to safety as shown on FSAR Figure 11-1. A pressure boundary failure of the system downstream of the first normally closed valve is no different than that which was in Amendment 39 or Figure 11-1 of the FSAR. This activity only clarifies the boundary for consistency. Based on this, the activity cannot create the possibility of a different type equipment malfunction important to safety as previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The limitation associated with consequences for normal releases is outline in the Off-Site Dose Calculation Manual (ODCM). The seismic design basis for waste disposal system components are not a part of the dose calculations associated with effluent control since these are for normal controlled releases. The ODCM basis is the maintenance of radioactive effluent releases to be within prescribed limits after processing of any upstream radioactive waste. The pipe stress limitations are based on the allowable stresses in the design code. The pipe stress limits are maintained within the allowable code stresses. The location of the seismic boundary will not reduce the margin of safety for normal releases as defined in the ITS.

SA/USQD Number: 99-0137, Revision 0

FSAR Change(s): None

SA/USQD Title: ITS Bases Change B99-18
Diesel Fuel Oil Testing Program

Description

This document evaluates a revision to ITS Bases SR 3.8.3.3 to clarify ASTM Standard applicability, provide an option to use equivalent or better ASTM approved methods for performing specific tests, and make ITS Bases time limits for ITS SR 3.8.3.3 consistent with the time limit specified in ITS 5.6.2.14.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed changes are to a program in place to assure that the quality of stored fuel for the diesels (including the emergency diesel generators) is not compromised. The effectiveness of the program is not diminished by the proposed changes, but enhanced. The changes consist of clarifications and the addition of the option to perform equivalent (better, more quantitative) testing methodology for the detection of water, sediment and particulates in new fuel deliveries, prior to addition to the onsite fuel tanks. The proposed changes do not remove any existing ITS requirements, or reduce the effectiveness of the Diesel Fuel Oil Testing Program.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The only potential vulnerability of accident consequences to fuel oil testing would involve, in the extreme case, a failure to detect poor quality oil, causing the failure of both emergency diesels to perform during an accident requiring the Emergency AC System. The diesel fuel oil testing methods are not specified in the SAR, and the proposed revisions to the ITS Bases do not decrease the level of protection against acceptance of reduced quality diesel fuel.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   Consideration was made of increased potential for common mode failure of the Emergency Diesel Generators, due to inadvertent reduction in fuel oil protection as a result of this change. No plausible scenario for this to occur was discovered, however, as the optional testing methods specified are ASTM-approved test standards. The proposed revisions do not decrease the level of protection against acceptance of reduced quality diesel fuel.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The diesel fuel testing methods are not compromised, but enhanced, by the proposed revisions. The proposed changes do not affect any equipment condition or configuration in any operating mode and, therefore, cannot affect the consequences of a malfunction.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The changes are restricted to diesel fuel testing activities, ensuring the quality of stored and delivered diesel fuel. No identified means exist for the associated activities to become accident initiators.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The revisions do not alter any operating practice, or equipment configuration, or status for any operating condition or event. As such, they cannot create the possibility of a different type of malfunction of equipment important to safety.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The proposed ITS Bases revisions do not alter any practice or any acceptance criteria within ITS or the ITS Bases, except to provide the alternative to perform an equivalent (better, more quantitative) check for water, sediment, or particulates for new diesel fuel deliveries prior to acceptance for addition to the onsite storage locations. Therefore, the proposed revision do not reduce the margin of safety as defined in the Bases for any Improved Technical Specification.

SA/USQD Number: 99-0140, Revision 0

FSAR Change(s): None

SA/USQD Title: ITS Bases Change B99-08
Axial Power Imbalance Surveillance

Description

The ITS Bases discussion for the low thermal power exception to the frequency of Surveillance Requirement 3.3.1.3 was changed from 15% of rated thermal power to 30% of rated thermal power. This change makes the Bases consistent with the Surveillance Requirement itself. The Surveillance Requirement (SR) allows a delay in the comparison of the Axial Power Imbalance in-core to ex-core measurements until 24 hours after power is greater than 30%. The Bases had described this delay as starting at 15% rather than 30% power.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   This is an administrative change only. It makes the descriptive documentation (ITS Bases) consistent with the requirements documentation (ITS SR). Surveillance testing of the Reactor Protection System (RPS) Nuclear Overpower RCS Flow and measured Axial Power Imbalance trip function is scheduled and conducted at the same frequency and in the same manner as before this change. Since there is no change to any plant component and since the RPS measured Axial Power Imbalance function is not identified in any accident analysis as a trip initiator; there cannot be any increase in the probability of occurrence of an accident already evaluated.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   This is an administrative change only. It makes the descriptive documentation (ITS Bases) consistent with the requirements document (ITS SR). There is no change to plant components, operation, or testing.

   The capability of the RPS Nuclear Overpower RCS Flow and measured Axial Power Imbalance trip function to prevent core damage by ensuring that a trip occurs when core power, axial power peaking, and reactor coolant flow conditions indicate an approach to DNB or fuel centerline melt limits is therefore not changed. Since the steady state operating limits are properly constrained, the FSAR Chapter 14 assumptions for the initial conditions for each analyzed reactor accident are not changed. Therefore, there cannot be any increase in the consequences of any accident previously evaluated.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This change is an administrative change only. It makes the descriptive documentation (ITS Bases) consistent with the requirements document (ITS SR). The change does not affect the design or operation of any component. It does not affect the method or frequency of RPS Nuclear Overpower RCS Flow and measured Axial Power Imbalance trip testing.

Therefore the Nuclear Overpower RCS Flow and measured Axial Power Imbalance trip remains operable to perform its intended functions as described in the FSAR. Thus, the change does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This change is an administrative change only. It makes the descriptive documentation (ITS Bases) consistent with the requirements document (ITS SR). The change does not affect the design or operation of any component. It does not affect the method of performance of testing the Nuclear Overpower RCS Flow and measured Axial Power Imbalance trip. Therefore, the RPS Nuclear Overpower RCS Flow and measured Axial Power Imbalance trip function remains operable to perform its intended function. And the change does not add any credible failure mode nor affect the probability of malfunction of the Reactor protection system. So there cannot be any increase in the consequences of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This change is an administrative change only. It makes the descriptive documentation (ITS Bases) consistent with the requirements document (ITS SR). The RPS Nuclear Overpower RCS Flow and measured Axial Power Imbalance trip function is not changed in any way. No other plant component or procedure is changed. Therefore, there cannot be a possibility of an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This change is an administrative change only. It does not change any component nor does it change the method of testing or operating any component or function during any mode of operation. All equipment continues to function and continues to be operated exactly as before this change. Therefore, there is no possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the FSAR.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

This change ensures testing in accordance with the ITS Surveillance Requirement. This maintains the operability of the Nuclear Overpower Based on flow and Imbalance RPS trip function in accordance with the LCO. Therefore the margins of safety as defined for the Axial Power Imbalance in Bases for SL 2.1 and for the RPS Nuclear Overpower RCS Flow and measured Axial Power Imbalance trip function of the Bases for ITS 3.3.1 are not reduced.

SA/USQD Number: 99-0144, Revision 0 **FSAR Change(s):** Section 5.3.3.3

SA/USQD Title: MAR99-03-07-01; FSAR Change 1999-0088
Removal of Reactor Building Purge Valve Opening Limitation

Description

This modification removed the opening limitation on the 48 inch Reactor Building (RB) Purge Valves AHV-1A, AHV-1B, AHV-1C, and AHV-1D while in Modes 5 or 6. The valve open position indication is also returned to its full travel limit. These were accomplished by resetting the limit switches on the Motor Operated Valves AHV-1B and AHV-1C from 40 degrees to 90 degrees open. The Air Operated Valves AHV-1A and AHV-1D required a change in their air supply pressure for opening, and a change in limit switch cam, to give indication at 90 degrees open vs. 55 degrees. The restriction on opening these valves in Modes 1 through 4 is not changed.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   These valves are locked closed during operation in Modes 1 through 4 and only opened in Mode 5 or 6. This is not changed by this modification. Changing the open position to full travel has no effect on accident probability, because these valves have no mechanism for creating a accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   These valves are locked closed during operation in Modes 1 through 4 and only opened in Mode 5 or 6. This is not changed by this modification. Changing the open position to full travel has no effect on offsite dose because the Mode 5 or 6 accident analysis used the original nominal follow rate of 50,000 CFM rather than valve position. The original plant discharge flow rate is not changed by this modification.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   These valves are locked closed during operation in Modes 1 through 4 and only opened in Mode 5 or 6. This is not changed by this modification. Changing the open position to full travel only affects these valves. Valve closure from full open has no increased failure probability over that of closing from partially open, as long as system conditions are within design limits of the valve, which they are in Modes 5 or 6.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

These valves are locked closed during operation in Modes 1 through 4 and only opened in Mode 5 or 6. This is not changed by this modification. Changing the open position to full travel only affects these valves. Valve closure from full open has no increased consequences over that of closing from partially open because offsite dose analysis used the original nominal flow value of 50,000 CFM.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

These valves are locked closed during operation in Modes 1 through 4 and only opened in Mode 5 or 6. This is not changed by this modification. Changing the open position to full travel provides no mechanism for accident initiation, because these valves are not accident initiators.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

These valves are locked closed during operation in Modes 1 through 4 and only opened in Mode 5 or 6. This is not changed by this modification. Changing the open position to full travel only effects these valves and valve closure from full open has no mechanism to expand the valves influence for causing different types of failures. The valves were originally designed for full open operation. The present partial opening is only tied to potential failures due to high RB pressures. Since operation is limited to Modes 5 and 6 the original purpose for partial opening is no longer applicable.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS Bases 3.9.3 only addresses RB Purge flow rate of 50,000 CFM, which is the original nominal full open valve and not changed by this modification. Therefore, the proposed modification does not reduce the margin of safety as defined in the bases for any Improved Technical Specification.

SA/USQD Number: 99-0148, Revision 0

FSAR Change(s): Sections 9.7.2 and 14.2.2.3; Tables 14-31, 14-32, 14-33 and 14-34

SA/USQD Title: PC98-3993; FSAR Change 1999-0069
Fuel Handling Accident Radiological Consequences Case Analysis.

Description

In FSAR Section 9.7.2, clarification of one of the bases statements for the acceptability of having four 25% capacity auxiliary building exhaust filter banks. The change provides a more general conclusion related to the ability to meet assumed filter efficiencies, even with only 3 of 4 filter trains in service. Hence, there is no effect on any design basis accident or any failure modes

In FSAR Section 14.2, deletion of any reference to or information related to a "realistic" case analysis of the Fuel Handling Accident (FHA) radiological consequences. There are no changes to the design basis case, which is the design basis accident relied upon for the NRC's SER and for SSC required functions. Hence, there is no affect on the design basis accident or failure modes.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed change is administrative in nature as there are no changes to actual plant design or operation. The changes to Chapter 14 are simply to remove information that is unrelated to the design basis fuel handling accident. This information is not relied on for any NRC SER or for the required design or operation of any plant systems. The change to Chapter 9.7.2 clarifies the basis behind a design parameter of the auxiliary building exhaust filters. The intent of the basis statement is unchanged. Given the administrative nature of the change, the change cannot affect the probability of an accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The proposed change is administrative in nature; there are no changes to actual plant design or operation. The changes to Chapter 14 simply remove information that is unrelated to the design basis fuel handling accident, and not relied upon for any NRC SER or for the required design or operation of any plant systems. The change to Chapter 9.7.2 clarifies the basis behind a design parameter of the auxiliary building exhaust filters. The intent of the basis statement is unchanged. Given the administrative nature of the change, and the fact that the design basis fuel handling accident consequences are unchanged, the change does not increase the consequences of a previously analyzed accident.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed change is administrative in nature as there are no changes to actual plant design or operation. Since there are no changes to any plant equipment, or the operation of any equipment, there can be no probability of a malfunction of equipment.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed change is administrative in nature as there are no physical or procedural changes to the plant. Therefore, the changes are not related to equipment malfunctions. There are no changes to the design basis analysis for the FHA. Hence, there is no effect on the consequences of any equipment malfunctions.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed change is administrative in nature as there are no changes to actual plant design or operation. The changes to Chapter 14 are simply to remove information that is unrelated to the design basis fuel handling accident. This information is not relied on for any NRC SER or for the required design or operation of any plant systems. The change to Chapter 9.7.2 clarifies the basis behind a design parameter of the auxiliary building exhaust filters. The intent of the basis statement is unchanged. Given the administrative nature of the change, the change cannot create the possibility of a new accident.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed change is administrative in nature as there are no changes to actual plant design or operation. The changes to Chapter 14 are simply to remove information that is unrelated to the design basis fuel handling accident. This information is not relied on for any NRC SER or for the required design or operation of any plant systems. The change to Chapter 9.7.2 clarifies the basis behind a design parameter of the auxiliary building exhaust filters. Given the administrative nature of the change, the change cannot create the possibility of a new malfunction.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The fuel handling accident is discussed in the bases of the Technical Specifications. However, all such references are to the design basis case, which is not being changed. The design basis case is bounding compared to the "realistic" case and provides a sufficient safety margin. The changes proposed here do not decrease the margin of safety.

SA/USQD Number: 99-0149, Revision 0 **FSAR Change(s):** Section 9.6.1.5.a.7

SA/USQD Title: PC98-1483, CA Step 154; FSAR Change 1999-0070
1.5 Ton Hook On FHCR-5

Description

FSAR 9.6.1.5.a.7 requires the use of the main fuel hook for handling new fuel. An allowance is made for use of the 1.5 ton auxiliary hook, but over the new fuel pit only. The change to this section will permit the 1.5 ton auxiliary hook to be used for handling of new fuel, subject to the limitations of safe load paths and a load height limitation. The prohibition against using the 1.5 ton auxiliary hook to move fuel to or away from the spent fuel pools is preserved. Safe load paths restrict the occurrence and duration of lifts over equipment important to safety. The load height limitation prevents damage to the important equipment located beneath the Spent Fuel area floor should a load drop occur.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

Only two accidents are discussed/evaluated in the FSAR that are potentially related to use of FHCR-5, and a load drop occurrence. The first is the shipping of spent fuel and the drop of a spent fuel cask, discussed in FSAR sections 9.6.3 and 9.6.3.1. Because of the weight of a spent fuel cask, the 1.5 ton auxiliary hook would not be involved. Therefore, the change being made to the FSAR to allow the 1.5 ton hook to be used outside the new fuel pit for new fuel handling would have no affect on this accident mode.

The second accident to consider is the fuel handling accident, described in section 14.2.2.3. This accident is postulated as the dropping of a fuel assembly (irradiated) into the Spent Fuel Pool such that damage results to the fuel assemblies and fission product gases are released. The original concept was that an irradiated fuel assembly was dropped. Irradiated fuel assemblies are not handled by the auxiliary fuel hook. However, damage to irradiated fuel assemblies in the spent fuel racks could produce the same results. This is the reason for the prohibition of carrying loads greater than 2750 lbs. over irradiated fuel in the pools (FSAR 9.6.2.7.4).

Since the prohibition against using the 1.5 ton hook to handle new fuel assemblies over the spent fuel pools is maintained, the 2750 lb. restriction is maintained, and there is no increase in the probability of a fuel handling accident. Furthermore, should a new fuel assembly drop occur, no equipment damage will occur that could act as an initiator of the accidents evaluated in the FSAR. Therefore, there is no increase in the probability of the occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The 1.5 ton hook cannot be used for moving new fuel over the spent fuel pools and will not be used for moving the spent fuel cask because of its low load rating. Therefore, the fuel handling accident and spent fuel cask drop concern cannot be directly affected in such a way that an increase in consequences could result. Additionally, the bottom of the fuel assembly shall be maintained within 2.5 feet of the floor so that a new fuel assembly drop will not adversely effect equipment on the floor below. No equipment that might be relied upon to mitigate or terminate an accident is affected, therefore there is no increase in consequences due to damage to accident required equipment due to the drop of a new fuel assembly. The required compliance with safe load paths likewise helps ensure no equipment needed to mitigate the consequences of an accident is affected.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Compliance with safe load paths limits the occurrence and duration of new fuel assembly handling over equipment important to safety. The load drop analyses stated that no adverse effect upon equipment located beneath the spent fuel floor would result as long as the bottom of the fuel assembly was maintained within 2.5 feet of the floor. Therefore, though the 1.5 ton hook has a lower weight rating than the main hook and there is a minor increase in the probability of dropping a new fuel assembly, there is no increase in the probability of the occurrence of a malfunction of equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Neither the FHCR-5 nor the 1.5 ton hook is required to mitigate the consequences of an accident. The only way in which the consequences of a malfunction of equipment could be increased would be if an accident or event occurred that required the equipment important to safety located beneath the SF floor to mitigate the event, and the required equipment was damaged by the drop of a new fuel assembly. The use of safe load paths and height limitations prevents damage to the equipment important to safety. Therefore, there is no increase in the consequences of handling fuel with the 1.5 ton hook.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

FHCR-5 and the 1.5 ton hook are not directly coupled to, nor does it affect, any SSC that could result in a radiological release. The only possible effect would be the result of a dropped load. This would require dropping the load on an item that could result in a release, such as irradiated fuel assemblies, or damaging equipment that is needed to mitigate a release or accident. Such accidents/events are already addressed in the SAR. The use of safe load paths, load height restrictions and the restriction against new fuel handling over the SF pools by the 1.5 ton hook prevent the damaging of SSCs that could

result in a radiological release. Therefore, the change to use the 1.5 ton hook outside the new fuel pit, but not over the SF pools, will not create the possibility of an accident of a different type than that evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

ES MCC 3B1, the makeup tank and the emergency boration equipment (Boric Acid Storage Tanks, boric acid pumps, etc.) are located beneath the SF floor. The compliance with safe load paths, required by the proposed FSAR change, prevent handling new fuel with the 1.5 ton hook over ES MCC 3B1 and the makeup tank. Safe load paths for the SF floor are shown in OP-421C. Therefore, damage by load drop is prevented and no possibility for a different type of malfunction of equipment important to safety is created for these components.

Safe load paths limit the occurrence and duration over the emergency boration equipment required/described in sections 4.2.5.5 and 9.2 of the SAR, but it does not prevent them entirely. However, load drop studies performed as part of NUREG 0612 Phase II work, state that no adverse effects on the equipment below the SF floor will occur as long as the load height limitation (2.5 ft) is maintained. This limit is controlled in plant procedures (FP-302). Therefore, even if the drop of a new fuel assembly occurs, no possibility for a different type of malfunction of equipment important to safety is introduced by this change. This height limitation likewise provides additional assurance for the ES MCC 3B1 and the makeup tank.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

FHCR-5 and the 1.5 ton hook are not mentioned in, nor can they effect, the margin of safety as defined in the bases of any ITS. Likewise, this change to allow use of the 1.5 ton hook outside the new fuel storage area (but not over the spent fuel pools) is in compliance with the load drop analyses and docketed correspondence associated with compliance with the intent of NUREG 0612. Therefore, the margin of safety inherent in those commitments is also unaffected.

Indirectly, the margin of safety could be affected if a new fuel assembly was dropped and equipment important to the margin of safety of an ITS bases was damaged or made inoperable. Equipment of concern is: ES MCC 3B1, the makeup tank and the BASTs and boric acid pumps. However, the restrictions of using safe load paths and load height limitations have been shown to provide adequate protection, such that there will be no adverse affects upon this equipment even if the drop of a new fuel assembly was to occur.

Therefore, since equipment important to the margin of safety will not be damaged or made inoperable, the proposed change to the FSAR will not reduce the margin of safety as defined in the bases of an Improved Technical Specification.

SA/USQD Number: 99-0193, Revision 0 **FSAR Change(s):** Appendix 14B

SA/USQD Title: EM-225A, Rev 2; FSAR Change 1999-0085
FSAR Changes to Appendix 14B

Description

Changes are made to FSAR Appendix 14B, the Engineering Design Basis Document (EDBD), "Reactor Building Air Handling System" and to Procedure EM-225A, "Post Accident RB Hydrogen Control." The changes modify some of the controls and calculated consequences of performing a hydrogen purge.

The intent changes to the above three documents are:

- Increased hydrogen flow meter uncertainty resulting in higher design basis flows. Incorporated higher flows into the purge procedure.
- Decreased reactor building purge charcoal filter efficiency and test acceptance criteria.
- Revised dose calculation results.
- Modified the guidance on when and how to perform the intermittent purge and on when and how to perform continuous purging. For example: deleted the 312 hour time criteria for starting an intermittent purge, converted the table of design minimum flow requirements to a graph that already incorporates instrument uncertainty, deleted the 120 minute maximum time for an intermittent purge, added a criteria of 3.25% for stopping the purge, and added a 24 hour period to wait for favorable meteorological conditions prior to initiating the purge.
- Deletion of detail on aluminum inventory.
- Specification that EM-225A guidance does not apply under severe accident conditions and cautions about higher doses at earlier times after reactor shutdown.
- Revision of the values for design basis minimum purge flow rate, including flow meter uncertainty.
- Modified the designation of the wind directions corresponding to offshore winds.
- Specified that control complex breaches should be closed prior to purging.
- Deleted reference to LRV-24 as a supply air flow control valve.
- Deleted requirement to install pre-staged lead shielding.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   No aspect of hydrogen purging is related to initiation of a design basis accident. The proposed changes are only related to assumed design requirements and procedures used after a significant event (LOCA) has already occurred. None of the changes affect design or procedural requirements during normal or transient conditions. The changes do not

affect any equipment that would be a precursor to an event. Hence, the changes cannot affect the probability of an accident occurring.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?**

No

The proposed changes directly affect the calculated consequences of a previously analyzed accident. The changes include assumptions that are used in the calculation of the dose from an assumed hydrogen purge following a LBLOCA.

Two cases were evaluated for dose consequences. The first case assumes a continuous purge at a flow rate sufficient to maintain hydrogen concentrations less than 3.5 volume % based on the design basis hydrogen generation rate at 3.1% to account for uncertainties. In order to bound any potential flow rate from an intermittent purge, a second case also conservatively assumed maximum release rates, with similar meteorological dispersion to a continuous purge, even though the intent of an intermittent purge would be to release under favorable meteorological conditions.

The changes that affect these dose calculations are a more conservative consideration of flow meter uncertainty and a decrease in the assumed purge effluent filter iodine removal efficiency. The dose results changed as follows:

Continuous Purge Case

LPZ thyroid dose increased by 0.5 rem, bringing the total purge dose to 0.86 rem and the total LOCA dose (i.e., includes dose from activity released from all pathways) to 24.5 rem.

LPZ whole body dose increased by 0.024 rem bringing the total purge dose to 0.041 rem and the total LOCA dose (i.e., includes dose from activity released from all pathways) to 0.45 rem.

Intermittent, High Flow, Case

LPZ thyroid dose increased by 1.8 rem, bringing the total purge dose to 3.6 rem and the total LOCA dose (i.e., includes dose from activity released from all pathways) to 27.2 rem.

LPZ whole body dose increased by 0.089 rem bringing the total purge dose to 0.18 rem and the total LOCA dose (i.e., includes dose from activity released from all pathways) to 0.59 rem.

The dose increase due to these changes is less than 1% of the acceptance criteria of 10 CFR 100 of 300 rem thyroid and 25 rem whole body. The total resulting dose remains less than 10% of the 10 CFR 100 acceptance criteria.

Due to the insignificant change in the calculated dose, the changes do not fall within the intent of 10 CFR 50.59 as an increase in consequences. The Licensing Group and Safety Analysis Group have discussed the new dose results and concur that they do not represent

an increase in consequences that would require NRC review and approval.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

No actual changes to equipment are made as a result of the proposed changes. The only change to equipment capabilities is the required filter efficiency for the RB purge filters. This change is not related to a malfunction of equipment. The changes to flow meter uncertainty and the ultimate flow that will be established are well within the flow capability of the RB purge system and hence would not result in any malfunctions. Therefore, these changes cannot affect the probability of a malfunction of equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed change is related to the actions and consequences following an accident, not a direct malfunction. Therefore, the discussion on increased consequences of an accident above would bound any consequence effect from a specific malfunction. As such, there would be no increase in consequence of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed changes are only related to assumed design requirements and procedures used after a significant event (LOCA) has already occurred. The only change that affects components used during normal operation is a change to the RB purge filter efficiency criteria. The RB purge filter is not a component that can initiate an accident. The changes do not affect any equipment that would be a precursor to an event. Hence, the changes cannot create the possibility of a different type accident.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

No actual changes to equipment are made as a result of the proposed changes. The only change to equipment capabilities is the required filter efficiency for the RB purge filters. This change is not related to a malfunction of equipment. The changes to flow meter uncertainty and the ultimate flow that will be established are well within the flow capability of the RB purge system and hence would not result in any malfunctions. Therefore, these changes cannot create the possibility of a new malfunction.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There are ITS sections for which the bases are to control the releases from the containment post-LOCA to meet the acceptance criteria of 10 CFR 100. The proposed changes maintain the dose consequences from a LOCA to less than 10% of these acceptance

criteria. Hence, there is no decrease in the margin of safety for these ITS sections. The proposed changes are unrelated to any other bases.

SA/USQD Number: 99-0194, Revision 0 **FSAR Change(s):** None

SA/USQD Title: OP-406-02 Temporary Instructions, Revision 2
Operation of Boric Acid Recovery System (BARS™)

Description

The purpose of the subject temporary instruction and associated activities is to temporarily install and operate a silica removal system to expedite clean-up of the Spent Fuel Pools.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The only Design Basis Accident (DBA) impacted by this activity is the Fuel Handling Accident in the Spent Fuel Pool. This activity will not be done in conjunction with spent fuel handling operations within the spent fuel pool so the likelihood of a fuel handling accident is substantially reduced. The load paths chosen for installation and removal of the skid assure that this equipment will not be dropped into the pool. Thus, the probability of a fuel handling accident is not increased by this activity.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The only DBA impacted by this activity is the fuel handling accident in the Spent Fuel Pool. Maintenance of the required level (through hose length, alarms and auto-shutdown feature) in the pool assures the assumptions of a fuel handling accident are met. Thus, the consequences of a fuel handling accident are not increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   This activity only interfaces with plant equipment via temporary power, the flow to and from the pool and the effluent path via the Decon Pit drain. The interfaces with the pool and pit are passive having no impact on plant equipment. The potential for draining the pool and flooding are already addressed in the SAR. Thus, probability of malfunction of plant equipment is not increased.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   This activity only interfaces with plant equipment via temporary power, the flow to and from the pool and the effluent path via the Decon Pit drain. The interfaces with the pool and pit are passive, having no impact on plant equipment.

One failure potentially related to this activity would be failure of the spent fuel cooling system. The consequences of a cooling loop failure would only be impacted if it were to be concurrent with the failure of the equipment resulting in a partial drain of the pool. The water inventory would be lessened increasing the rate of heat-up. However, this is more than compensated for by the fact that the limiting heat-up calculations use conditions soon after fuel is discharged to the pool. This is not the condition under which this equipment is operated. Other failures would involve drainage of the pool and flooding due to line breaks. The consequences of these events are not increased by the operation of this equipment.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Credible failures are summarized as follows:

- The skid meets the definition of a heavy load. Engineering has evaluated the capability of the floor to withstand the drop of the skid. By limiting the load height it can be assured that, even if the load were to be dropped, it will not penetrate the floor and damage equipment on lower elevations. An AI-604 evaluation also concluded the location of the skid is appropriate from a floor loading perspective.

- This equipment interfaces with the spent fuel pool through hoses placed directly in the pool. Failures of this system could reduce levels in the pool and cause some flooding. The vertical extent of the hose is limited to assure approximately 23' of water above stored fuel even if all of the water above the hose is removed from the pool. This is the level credited for shielding and scrubbing releases from a Fuel Handling Accident in the FSAR (References 1h and 1i) which are evaluated under much worse conditions (recent fuel discharge). The potential for flooding due to a failure of the external hoses is less than that already addressed in the FSAR 9.6.3.1 (Reference 1g). As noted in the SA there are a number of alarms, auto-shut-off and administrative controls to reduce the likelihood of extensive drainage or flooding.

- There is an impact on boron concentrations in the pool although the specified recovery rate for the system is over 96%. More frequent monitoring of Boron in the pool will assure adverse trends are detected and corrected. Furthermore, FPC does not take credit for boron in the pool under normal conditions. This temporary instruction (IT) will not be used during refueling operations. Therefore, if boron levels are adversely impacted there is no safety concern.

All are typical of similar, more limiting events already addressed in the SAR. Thus, there are no accidents of a different type created by this activity.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This activity only interfaces with plant equipment via temporary power during operation

of the skid, the flow to and from the pool and the effluent path via the Decon Pit drain. The interfaces with the pool and pit are passive having no impact on plant equipment. Such passive interfaces do not create the possibility of a different type of malfunction than previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There are no margins of safety defined in the associated ITS Bases. The limit on boron concentration is there to assure no criticality in case of fuel mispositioning. No fuel handling operations will be occurring concurrent with this activity. The alarm limits on potential drain down are consistent with that afforded by the permanently installed plant equipment. Thus, any implied margin of safety is not reduced.

SA/USQD Number: 99-0202, Revision 0 **FSAR Change(s):** Section 8.4

SA/USQD Title: PC98-5297; FSAR Change 1999-0091
Clarify Quality Assurance Requirements of Offsite Power Supply

Description

FSAR Section 8.4 is being revised to clarify that the quality program associated with Regulatory Guide 1.30 is applicable to Class 1E systems only, and to clarify the Class 1E boundary applicable to the CR-3 offsite power sources.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   These FSAR clarification changes do not change or affect the physical design, function, or operation of any systems or their safety functions. The Loss of Offsite Power (LOOP) and Station Blackout (SBO) event scenarios previously evaluated in the SAR are unchanged, therefore, the probability of occurrence of previously evaluated accidents is not increased.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   These FSAR clarification changes do not change or affect the physical design, function, or operation of any systems or their safety functions. The consequences of a LOOP or SBO event are unchanged, therefore, the proposed changes do not increase the consequences of an accident previously evaluated.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   These FSAR clarification changes do not degrade or affect the physical design, function, or operation of any equipment. The Onsite Power and Offsite Power circuits are unaffected. The probability of occurrence of equipment malfunctions is unchanged.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   Since these FSAR clarification changes do not change or affect the physical design, function, or operation of any equipment, the previously evaluated consequences of equipment malfunctions such as breaker, cable, or relay failure are unaffected.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

These FSAR clarification changes are essentially a documentation change only, and do not change or affect the physical design, function, or operation of any systems or their safety functions. All credible failure modes are bounded by previous analyses, therefore, these changes could not introduce the possibility of an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

There are no new equipment interfaces or modifications associated with these FSAR clarification changes, and all credible failures are bounded by previous analyses, therefore, these changes do not create the possibility of a different type of equipment malfunction.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

No specific credited margin of safety is addressed in the bases of the ITS, however the intended function of the Offsite Power system is to provide two independent sources of power to the plant for normal operation. These FSAR clarification changes do not prevent these circuits from performing this function, therefore the margin of safety is not reduced.

SA/USQD Number: 99-0210, Revision 0 **FSAR Change(s):** Sections 4.3.2, 9.2.1 and 9.2.2

SA/USQD Title: OP-403H, Revision 0; PC99-2014; FSAR Change 1999-0095
Plant Shutdown Chemical Optimization Plan

Description

As part of the plant shutdown chemical optimization plan, 30% hydrogen peroxide will be added to the Reactor Coolant System (RCS), via the installed chemical addition system. Following a period of acid reducing conditions in the system, hydrogen peroxide is added to create an acid oxidizing condition in the coolant system, which increases the dissolution rate for nickel, iron, and cobalts. This releases more of the material from the "crud" layers, in a soluble form, that can be removed by demineralization and filtration. Removal of this material is the goal of the shutdown chemical plan. This same type of oxidation takes place when the RCS is opened up to atmosphere during the refueling operation with a dissolved oxygen concentration reaching ≈ 3 ppm. This hydrogen peroxide addition will allow the controlled oxidation to occur at a time when the cleanup of the released material by the in plant systems will be most effective.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?**

   No

   Review of the accident scenarios found that the addition of the hydrogen peroxide to the RCS at this concentration and system temperature will have no effect on the evaluation performed on these accident scenarios. The performance of Temporary Instruction 209-02 will control the addition of hydrogen peroxide during shutdown conditions into the RCS, Makeup and Decay Heat systems at a reduced temperature and pressure, and with the reactor sub-critical. Because of these conditions, there will be no impact on the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?**

   No

   Review of the accident scenarios found that the addition of the hydrogen peroxide to the RCS at this concentration and system temperature will have no effect on the evaluation performed on these accident scenarios. The increase in the crud radioactivity will not exceed any dose projections that are used as a basis on the accidents evaluated in the SAR. Because the radioactivity will remain in the liquid form and will be processed by the liquid radioactive waste disposal system, it will not impact any evaluation performed on any Mode 1 through No-Mode accident.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The RCS, Makeup and Decay Heat systems equipment were originally designed to operate at the elevated dissolved oxygen conditions, at the temperature and pressure the hydrogen peroxide injection is to take place. The increase in crud activity in the RCS will not impact the assumptions made concerning radioactivity level, thus the effect from the hydrogen peroxide will not change this evaluation.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Because the RCS, Makeup and Decay Heat systems equipment were originally designed to operate at the elevated dissolved oxygen conditions, at the temperature and pressure the hydrogen peroxide injection is to take place, there will be no effect on these systems or their components. The increase in crud activity in the RCS will not impact the assumptions made during the evaluation of malfunction of equipment important to safety found in the SAR, in that the radioactivity increase does not approach the level found during any of the FSAR Chapter 14 accidents.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The addition of the hydrogen peroxide is performed when the dissolved oxygen limit is removed from the RCS, Makeup and Decay Heat systems and components. Therefore, they will not be affected. The system chemical parameters will not be exceeded and no accident of a different type than any previously evaluated in the SAR will transpire.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The dissolved oxygen concentration that will be achieved in the RCS during the evolution will not change any chemical characteristics of the system that will have a detrimental effect on the system and components. The concentration of dissolved oxygen will be the same as when the RCS is open to atmosphere during refueling.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

ITS Section 5.6.2.13 (which does not have a Bases section) addresses the waste gas tank hydrogen/oxygen monitoring. The degassing operation that will take place prior to the addition of the hydrogen peroxide will segregate the hydrogen and oxygen so that an explosive mixture will not be created in the RCS or waste gas system. In addition, continuous monitoring of the Waste Gas System and the RCS during the degassing operation will ensure the limits for an explosive mixture will not be exceeded. Thus, no reduction in the margin of safety will result.

SA/USQD Number: 99-0214, Revision 0 **FSAR Change(s):** Section 3.2.2.1 and Table 3-51

SA/USQD Title: PC99-1926; SP-101, Revision 24;
ITS Bases Change B99-16; FSAR Change 1999-0100
Revised MTC Determination and Cycle 11 COLR (F96-0001) Limits

Description

This activity revises Surveillance Procedure SP-101, "Moderator Temperature Coefficient at 300 ppmb" and the End of Cycle Moderator Temperature Coefficients (MTC) specified in the Crystal River Cycle 11 Core Operating Limits Report (COLR), Cycle 11 Reload Report, and FSAR Table 3-51. The changes to SP-101 are in accordance with changes to its basis document, Framatome Cogema Fuels Technical Document, Test Specification 62-5004640-00, "Temperature Reactivity Coefficient at Power Measurement by Boron Exchange." The change to the MTC limit is in accordance with BAW-2262 Revision 3

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The probability of occurrence of an accident previously evaluated in the SAR can only increase if precursors to such an accident are made more likely. Neither the performance of SP-101 nor a change to the MTC limit is a precursor to any of the accidents described in the SAR. Therefore, this activity cannot result in an increase in the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The consequences of an accident previously evaluated in the SAR can only increase if an input or assumption to the analysis of such an accident are altered and result in an increase. Although the MTC limit is revised to be more negative, the current input to the limiting cooldown event (MSLB) remains bounding. Moreover, MTC is not a significant factor in the release calculations associated with the Main Steam Line Break (MSLB). Therefore, this activity cannot result in an increase in the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR can only increase if the equipment, or its interfaces with other equipment are adversely affected (i.e., increase in single failure vulnerability, etc.) by an activity. The steps of SP-101 which alter the plant's condition remain the same.

Only calculation details are changed. None of these details affect a structure, system, or component already in operation. The change to the MTC limit in the affected documentation (FSAR, Cycle 11 COLR and Reload Report) does not introduce any mechanisms that would increase the probability of a malfunction of equipment. Therefore, this activity cannot result in an increase in the probability of occurrence of equipment important to safety previously evaluated in the SAR.

4. Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR? No

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR can only increase if the probability of malfunction of equipment, or its interfaces with other equipment, is increased by an activity. The changes to SP-101 do not increase the probability of a malfunction of equipment important to safety. Plant equipment will operate in the same way as before the change to SP-101, and therefore, the consequences will remain unchanged. The same applies to the change in the MTC limit shown in the affected documentation (FSAR, Cycle 11 COLR and Reload Report). Moreover, the change to the limit has been shown not to cause an increase in the releases from an MSLB. Therefore, this activity cannot result in an increase in the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR? No

The possibility of an accident of a different type is created when a new accident initiator is introduced by an activity either directly or through the creation or alteration of SSC interfaces. The changes to SP-101 do not increase the probability of a malfunction of equipment important to safety. Plant equipment will operate in the same way as before the change to SP-101. The same applies to the change in the COLR MTC limit. Therefore, this activity cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR? No

The possibility of a different type of malfunction is created when new credible failure modes or common failure modes result from the activity. The changes to SP-101 do not affect any SSC, or any interfaces thereto. The same applies to the change in the COLR MTC limit. Therefore, this activity cannot create the possibility of a different type of malfunction of equipment important to safety previously evaluated in the SAR.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

The margins of safety which must be examined are the subcritical margin and the radiological dose. The change in MTC does not alter the radiological release rate resulting from a MSLB. Thus, the existing radiological doses will remain bounding.

Additionally, the revised MTC limit is shown to remain less limiting than that assumed in the current MSLB analysis. Consequently, subcritical margins will be preserved. Therefore, this activity cannot reduce the margin of safety as defined in the bases for any Improved Technical Specification.

SA/USQD Number: 99-0215, Revision 0 **FSAR Change(s):** Section 4.2.2.6

SA/USQD Title: License Amendment Request 232 (3F0498-06)
License Amendment 170 (3N0898-13); FSAR Change 1999-0098
Reactor Coolant Pump Flywheel Inspection

Description

This USQD evaluates FSAR Change 1999-0098, which is necessary in order to implement License Amendment 170. Based on the evaluation provided by FPC in License Amendment Request #232, Revision 0, the NRC issued the Safety Evaluation Report (SER) for License Amendment 170. This change modified the frequency and scope of Reactor Coolant Pump Motor flywheel inspections.

Westinghouse Topical Report WCAP-14535A provided the basis for License Amendment 170. WCAP-14535A separates the different flywheel designs (which were analyzed based on geometry and material properties) into sixteen groups. If a licensee elects to submit plant-specific application of this topical report, the NRC SER for the topical report states that the licensee must verify that the flywheels are made from SA 533B or A516 material. Further actions for licensees having Group 15 and Group 10 flywheels are required. Additionally, licensees who planned to submit a plant-specific application of the topical report for their flywheels that are not made of SA 533B or A516 material must demonstrate that their flywheel material properties are bounded by those of SA 533B material, or provide minimum specified ultimate tensile stress, the fracture toughness and the reference temperature. For the latter, the licensee should employ these material properties, and use the methodology in the topical report, to provide an assessment to justify a change in inspection schedule for their plant. The SER for WCAP-14535A concluded that licensees meeting the above provisions can safely change the frequency and scope of flywheel inspections from the Regulatory Guide 1.14 prescribed values.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR? No

Reducing the frequency of the Reactor Coolant Pump (RCP) motor flywheel inspection, as proposed by the FSAR change, will not significantly increase the probability of occurrence of an accident previously evaluated.

CR-3 is not specifically analyzed for a flywheel failure accident. The design, fabrication and testing of the flywheels in accordance with the guidance found in Regulatory Guide 1.14, minimizes the potential for flywheel failure. The maximum loading on the RCP motor flywheel results from an overspeed following a large loss of coolant accident (LOCA). Reduced coastdown times due to a single failed flywheel is bounded by the locked rotor analysis. Therefore, it will not place the plant in an unanalyzed condition.

The topical report indicates that the flywheels could be operated for forty years without inspection, and there would be no significant increase in the probability of failure of the flywheel. However, inspections are required to continue at a frequency of once every ten years as a conservative measure. Therefore, these changes do not involve a significant increase in the probability of occurrence of an accident previously evaluated.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The proposed FSAR change does not increase the consequences of an accident previously evaluated in the SAR. CR-3 is not specifically analyzed for a flywheel failure accident. The design, fabrication, and testing of the flywheels, in accordance with the guidance found in Regulatory Guide 1.14, minimizes the potential for flywheel failure. The topical report indicates that the flywheels could be operated for forty years without inspection, and there would be no significant increase in the probability of failure of the flywheel. However, inspections are required to continue at a frequency of once every ten years as a conservative measure. Therefore, this change does not involve an increase in the radiological consequences of an accident previously evaluated.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The purpose of the RCP motor flywheel inspection is to identify flaws that could lead to failure of the flywheel. The design, fabrication, and testing of the flywheels in accordance with the guidance found in Regulatory Guide 1.14, minimizes the potential for flywheel failure. No new failure mode is introduced due to the change in flywheel inspection frequency since the required changes do not involve the addition or modification of equipment, nor alter the design or operation of affected plant systems, structures or components. Therefore, these changes do not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

In the SER for License Amendment 170 issued by the NRC, the NRC staff determined that this change involves no significant increase in the amounts, nor any significant change in the types, of any effluents that may be released offsite. Additionally, there is no significant increase in individual or cumulative occupational radiation exposure.

The purpose of the RCP motor flywheel inspection is to identify flaws that could lead to failure of the flywheel. The design, fabrication, and testing of the flywheels in accordance with the guidance found in Regulatory Guide 1.14, minimizes the potential for flywheel failure. Since the required changes do not involve the addition or modification of equipment, nor alter the design or operation of affected plant systems, structures or components, no new failure mode is introduced due to the change in inspection frequency.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The purpose of the RCP motor flywheel inspection is to identify flaws that could lead to failure of the flywheel. The design, fabrication, and testing of the flywheels in accordance with the guidance found in Regulatory Guide 1.14, minimizes the potential for flywheel failure. No new failure mode is introduced due to the change in flywheel inspection frequency since the required changes do not involve the addition or modification of equipment, nor alter the design or operation of affected plant systems, structures or components. Therefore, these changes do not create a possibility of a new or different kind of accident from any previously evaluated.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The purpose of the RCP motor flywheel inspection is to identify flaws that could lead to failure of the flywheel. The design, fabrication, and testing of the flywheels in accordance with the guidance found in Regulatory Guide 1.14, minimizes the potential for flywheel failure. No new failure mode is introduced due to the change in flywheel inspection frequency since the required changes do not involve the addition or modification of equipment, nor alter the design or operation of affected plant systems, structures or components. Therefore, these changes do not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

RCP motor flywheels have been inspected for twenty years without any service induced flaws being identified. Additionally, the analyses demonstrated that the flywheels are manufactured from excellent quality steel, have a high fracture toughness, and have a very high flaw tolerance. The topical report indicates that the flywheels could be operated for forty years without inspection, and there would be no significant increase in the probability of failure of the flywheels. However, inspections are required to continue at a frequency of once every ten years as a conservative measure. The non-destructive examination acceptance criteria has not changed as a result of License Amendment 170. Thus, the margin of safety is not reduced significantly by the proposed change.

SA/USQD Number: 99-0221, Revision 0 **FSAR Change(s):** None

SA/USQD Title: ITS Bases Change B99-14
Reactor Coolant Pump Power Monitor (RCPPM)

Description

Clarifying information was added to the Improved Technical Specification (ITS) Bases 3.3.1, Reactor Protection System (RPS) Instrumentation, and the ITS Bases 3.3.11, Emergency Feedwater Initiation and Control (EFIC) Instrumentation. Both the RPS and EFIC use signals from the Reactor Coolant Pump Power Monitors (RCPPM). The clarifying information was added to the ITS to reduce operator burden and ensure consistent and appropriate entry into ITS Conditions when RCPPMs are inoperable.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The RCPPM function of RPS can only be considered an accident initiator if an equipment failure or personnel error in the RPS initiates an inadvertent plant trip. Inadvertent scrams from any cause are bounded in the accident analysis.

   The EFIC is an accident mitigation system. There are no credible mechanisms by which EFIC RCP Status function can initiate an accident.

   This change is an administrative change only. It adds descriptive information to the ITS Bases to ensure that plant conditions are operated as designed and as prescribed. It does not physically change the plant, its operation, or its operating envelope. Therefore, there cannot be any increase in the probability of occurrence of an accident already evaluated.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   This is an administrative change only. It adds clarifying information to the ITS Bases. There is no change to plant components, operation, or testing. The RCP Status function of both EFIC and RPS are needed to mitigate accidents. The consequences of an accident could only be increased by this change if this change in some way degraded the capabilities of the systems. But this change ensures that the capabilities of the systems are not inadvertently degraded. Therefore, there cannot be any increase in the consequences of any accident previously evaluated.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This change is an administrative change only, adding clarifying information to the ITS Bases to ensure that neither the RPS nor the EFIC RCP Status function is inadvertently degraded. There is no change to plant components, operation, or testing. Therefore, the RCPPMs remain operable to perform their intended RPS and EFIC functions as described in the SAR. Thus, the change does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This change is an administrative change only, adding clarifying information to the ITS Bases to ensure that no component required to ensure the RPS and the EFIC RCP Status function is inadvertently degraded. There is no change to plant components, operation, or testing. All the components associated with the RCPPMs remain operable to perform their intended function. This change does not add or change any credible failure mode nor does it increase at all the probability of malfunction of any component in either the RPS or the EFIC system. So there cannot be any increase in the consequences of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This change is an administrative change only, adding clarifying information to the ITS Bases to ensure that neither the RPS nor the EFIC RCPPM function, is inadvertently degraded. There is no change to any plant component, operation, or testing. The RPS and EFIC RCP status functions are not changed, nor is any other plant component or procedure. Since there is no change to the plant or its operation, there cannot be a possibility of an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

This change is an administrative change only, adding clarifying information to the ITS Bases to ensure that neither the RPS nor the EFIC RCP Status function is inadvertently degraded. There is no change to plant components, operation, or testing. All equipment functions and is operated exactly as before this change. Therefore, there is no possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

This change ensures compliance with ITS. This change maintains the operability of the RPS and EFIC RCP status functions in accordance with appropriate LCOs. It minimizes

the possibility of errors in applying ITS Conditions. Therefore, the margins of safety as defined for the RCPPM RPS trip function in the Bases for ITS 3.3.1 and for the EFIC RCP status function in the Bases for ITS 3.3.11 are not reduced.

SA/USQD Number: 99-0226, Revision 1 **FSAR Change(s):** None

SA/USQD Title: MAR97-02-12-01, TP-1 Functional Test Procedures
High Pressure Injection (HPI) Upgrade Project

Description

The proposed activity is a functional test for the HPI Upgrade Project. The test will measure performance characteristics and will establish throttle positions of certain valves associated with the high pressure injection, normal makeup and seal injection functions of the Makeup system.

The test will be conducted in two Phases. The first Phase will be performed with the HPI pumps taking suction from the Decay Heat (DH) system return line flow to the Reactor Coolant (RC) system, and pumping to the RC system. The second Phase will be performed with the HPI pumps taking suction from the Borated Water Storage Tank (BWST) and pumping to the RC system.

Revision 1 to this SA/USQD was performed to evaluate Revision 2 to the Test Procedure. The revision impacts Phase II of the testing only. In the revised test, the BWST will no longer be relied upon as the source of emergency boration. This will allow BWST inventory to only be limited by pump requirements (i.e., Net Positive Suction Head, vortexing and gas entrainment).

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Based on a review of the following SAR accident scenarios and the initiating events leading to the accidents, it has been concluded that the proposed activity will not increase the probability of occurrence of any of the accidents.

   Moderator Dilution Accident (during shutdown)

   The accident is initiated by accidentally filling the Makeup Tank (MUT) with dilution water and then pumping the entire volume of the MUT into the RC system. The test is designed to prevent this from happening. The test procedure isolates the letdown line going to the MUT. Therefore, the MUT will be isolated from sources of dilution water. This will prevent the MUT from being inadvertently filled with dilution water.

   In addition, the test has a precaution that, if fuel is in the reactor vessel, then the MUT boron concentration shall be equal to or greater than that required in the RCS. Therefore, during the test, the MUT will not be intentionally filled with dilution water.

   The test configuration is such that the Makeup Pumps cannot pump water from the Makeup Tank. During testing, the HPI pump suction will be lined up to either the BWST or the DH pump discharge flow. The DH System pump discharge flow will be at the

DHRS pump discharge pressure, which is much higher than the MUT pressure.

Fuel Handling Accident (inside reactor building)

This accident is initiated by dropping a fuel assembly. Fuel movements can be made during Phase 1 testing. The only potential mechanism assumed for causing a fuel assembly to be dropped, which could be related to the test, would be flow induced forces on the fuel assembly attached to the fuel handling mechanism. During the test, the MU pumps will pump water to the reactor vessel. The water from the MU pumps will combine with the DH system flow to the reactor vessel in the reactor vessel downcomer. The flow from the DH system is limited to 3100 gpm; while the flow from the HPI pump is limited to approximately 557 gpm. This combined flow rate is less than the DH System high flow rate alarm of 3750 gpm. Therefore, the DH system flow will be within the normal flow range, so that the test will not increase the probability of occurrence of a fuel assembly drop due to flow induced forces.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

Based on a review of the following accident scenarios and their consequences, it has been concluded that the proposed activity will not increase the consequences of any of the accidents.

Moderator Dilution Accident (during shutdown)

This accident is mitigated by emptying the MUT, which depletes the source of dilution water. The testing will isolate the MUT from sources of dilution water to the MUT. Therefore, during the test, the maximum volume of dilution water that could be added to the RCS is the volume of the MUT, which is the same volume assumed in the accident analysis. The accident also assumes that the maximum water volume being diluted is the volume of the reactor vessel. The testing will be performed with the reactor vessel head removed and the refueling canal at least partially filled with water and the DH system circulating the reactor vessel water. Therefore, the water volume to which the dilution water is being added is larger than just the reactor vessel as assumed in the accident analysis. Since the maximum dilution volume possible during the test is the MUT volume and the refueling canal water volume is greater than the reactor vessel volume, the consequences of the accident during testing are bounded by the SAR analysis.

Fuel Handling Accident (inside reactor building)

The accident mitigation assumes the water level above the damaged fuel assembly is 23 feet to reduce airborne activity. Fuel movements will be allowed during Phase 1 testing. During Phase 1 testing, the refueling canal water level will be maintained above the ITS minimum allowable water level and therefore, the 23 feet of water assumption will be preserved. During Phase 1, the refueling canal water is only circulated and not removed from the canal. In addition, ITS 3.9.4 requires stopping all fuel movement if the water level drops below the water level assumed in the analysis. Since the refueling canal water level is maintained above the level assumed in the SAR, the SAR analysis bounds the

consequences of a dropped irradiated fuel assembly during the proposed test.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Portions of the DH, MU and RC Systems are within the test boundary. These systems and their components will be operated within their design limits. Therefore, the test will not increase the probability of previously evaluated equipment failures of these systems used in mitigating accidents evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Portions of the DH, MU and RC Systems are within the test boundary. These systems and their components will be operated within their design limits. Therefore, the test will not increase the consequences from previously evaluated equipment failures of these systems used in mitigating accidents evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Portions of the DH, MU and RC Systems are within the test boundary. These systems and their components will be operated within their design limits. The test will control system valve alignments to prevent interactions with systems outside the test boundary and to prevent any system configurations that could create the possibility of an accident of a different type than any previously evaluated.

Maintaining the integrity of the RCPB components provides the RC system barrier function. These components include the RC pipes, the HPI injection nozzles, the HPI injection line check valves, the DH injection nozzle, the DH injection line check valves and the DH drop line. The testing will not create any condition that causes the design conditions of the RCPB components to be exceeded. The design pressure cannot be exceeded because the reactor vessel closure head will be removed. The test will not produce any thermal cycles. The temperature of the RCPB components will be similar to the test injection water. The test flow rates will be maintained within design flow rates.

The reactor coolant serves as a neutron poison. This safety function is maintained as long as the boron concentration is not reduced. There are no equipment malfunctions that can cause a larger boron dilution than the boron dilution accident discussed in the SAR. The only source of radioactive release associated with the systems within the test boundary and for the test conditions would be from fuel cladding failure. The cladding failure could be caused by inadequate fuel cooling, a loss of shutdown margin or mechanical damage to the fuel.

Inadequate Fuel Cooling

Inadequate fuel cooling would be due to a failure of the DH system cooling or a loss of

refueling canal water.

a. *Failure of DH System Cooling*

During the test, the DH System will be operated within applicable operating limits. These limits include operating procedure limits and improved technical specification limits. The test will not present any conditions that exceed the design conditions of these components which could cause equipment failure. In addition, a loss of decay heat system cooling is evaluated and addressed by ITS 3.9.4 and 3.9.5

b. *Loss of Canal Inventory*

The test procedure has a valve lineup procedure that assures the systems operated during the test will not have a valve lineup that can inadvertently decrease the refueling canal water level.

The test will not increase the probability of occurrence of a malfunction of any RC System barrier component or any RC System component that maintains refueling canal inventory. These components are those of the RC Pressure Boundary, which includes the RC System piping, other system piping which interconnects with the RSC and RCPB isolation valves. The test will not present any conditions that exceed the design conditions of these components. The design conditions include the temperature, pressure, thermal cycles and chemistry. The fluid pipes used in the test which are connected to the RCS below the refueling canal water level (i.e., the HPI injection lines) each have two check valves in series. Therefore, one check valve will close to retain the refueling canal inventory should the other fail open.

In addition, the water level is monitored so that a decrease in level will be stopped before the level decreases to the volume assumed in the accident analysis.

Loss of Shutdown Margin

A loss of shutdown margin would be caused by a moderator dilution. Moderator dilution is addressed by the moderator dilution accident in the SAR. The accident assumes a complete MUT-1 volume non-borated water added to the reactor vessel. During the test, the MU system will be isolated from all sources of non-borated water. Therefore, the moderator dilution accident is encompassing. In addition, ITS 3.9.1 requires maintaining appropriate refueling canal boron concentration to assure a 5% shutdown margin.

Mechanical Fuel Damage

A mechanical failure would be from a fuel handling accident resulting in a damaged fuel assembly lying on the bottom of the refueling canal. The design basis fuel handing accident is evaluated in the SAR. The accident assumes 23 feet of water over the damaged fuel assembly. The test procedure and ITS 3.9.4 require that the fuel transfer canal water level be above that assumed in the accident analysis and fuel movements are not made should the water level be less than assumed in the SAR accident analysis.

6. Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR? No

The test is conducted in MODE 6 or NO MODE. Portions of the DH, MU and RC Systems are within the test boundary. These systems and their components will be operated within their design limits. Therefore, the test will not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The following ITS Bases were reviewed to determine if the proposed testing would reduce the margin of safety.

- ITS 3.7.13 Fuel Storage Pool Water Level
- ITS 3.7.14 Spent Fuel Pool Boron Concentration
- ITS 3.9.1 Boron Concentration
- ITS 3.9.3 Containment Penetrations
- ITS 3.9.4 Decay Heat Removal (DHR) and Coolant Circulation-High Water Level
- ITS 3.9.5 Decay Heat Removal (DHR) and Coolant Circulation-Low Water Level
- ITS 3.9.6 Refueling Canal Water Level
- ITS 3.8.2 AC Sources - Shutdown
- ITS 3.8.10 Distribution Systems - Shutdown
- ITS 5.6.2.5 Component Cyclic or Transient Limit
- ITS 5.6.2.9 Inservice Testing Program

The testing will be conducted within the limiting conditions specified in the ITS LCOs. Therefore the margins of safety associated with the LCO will not be reduced. The only applicable margin noted which does not have a corresponding LCO was the maximum RCS temperature limit of 200°F discussed in ITS bases 3.9.4 and 3.9.5. The bases states that if the RC temperature is not maintained below 200°F, the margin to boiling of the reactor coolant would be reduced to an unacceptable level. The test specifies a DH flow rate which will be sufficient to maintain the RC temperature below approximately 145°F.

SA/USQD Number: 99-0237, Revision 0 **FSAR Change(s):** Sections 8.2 and 8.3

SA/USQD Title: PC96-5608 (CA Step 2); FSAR Change 1999-0104; Design Basis Document Change 1080; Enhanced Design Basis Document Change 1081; Administrative Changes to FSAR Chapter 8

Description

This USQD is being performed to address FSAR Chapter 8 changes and Design Basis Document (DBD) and Enhanced Design Basis Document (EDBD) changes. The changes are associated with the power distribution systems in or interfacing with CR-3. The changes are corrections or clarifications of the contents of the FSAR and DBD/EDBD. A significant change to FSAR Section 8.2.2.5 is being proposed. The existing section indicates that an "ES actuation trips and blocks closing" of the safety related to non-safety related load isolation breakers. The proposed text of Section 8.2.2.5 correctly states that an "ES actuation coincident with an Emergency Diesel Generator powering the associated 4160 volt bus" trips and blocks closing of the safety related to non-safety related load isolation breakers.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?**

No

Most of the proposed FSAR and DBD/EDBD changes are simple clarifications of the existing documents and clearly will not increase the probability of occurrence of an accident previously evaluated in the SAR. The de facto modification being proposed is only affecting "stand-by" logic circuits associated with 480 volt ES bus relaying. The logic circuits do not perform a "normal" operational function. The logic circuits are not associated with the initiation of any accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?**

No

Most of the proposed FSAR and DBD/EDBD changes are simple clarifications of the existing documents and clearly will not increase the consequences of an accident previously evaluated in the SAR. The de facto modification affects logic circuits associated with the mitigation of accidents previously evaluated in the SAR. Modifications to equipment required for the mitigation of accidents have the capacity to increase the radiological consequences of the SAR accidents by causing the equipment (emergency power supplies in this case) to be unavailable for accident mitigation.

The de facto modification does not affect the capability of the emergency power supplies to perform their function. The net effect of the modification will be additional load on the ES busses during an accident when the 4160 volt busses are powered from offsite sources.

This additional loading condition was recently analyzed by Engineering Evaluation EEE 99-008 and SA/USQD 98-0565. The current plant design with procedural controls was considered acceptable. An ES actuation occurring with the 4160 volt ES buses powered from the offsite power transformer or backup ES transformer, will not trip the safety to non safety load isolation breakers. The 4160 volt and 480 volt ES buses will not be overloaded.

The de facto modification does not challenge the fission product barriers. The modification does not invalidate any assumptions used in evaluating the radiological consequences of accidents evaluated in the SAR. As such, the de facto modification will not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Most of the proposed FSAR and DBD/EDBD changes are simple clarifications of the existing documents and clearly will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

The de facto modification will install a new "Emergency Diesel Generator breaker closed" contact, in series with each ES actuation contact in the 480 volt ES bus lockout relay circuits. The post modification circuits will only trip the 480 volt ES bus lockout relays if an ES actuation occurs and the associated Emergency Diesel Generator breaker is closed. The net effect of the modification will be additional load on the ES buses during an accident when the 4160 volt busses are powered from offsite sources. This additional loading condition was recently analyzed by Engineering Evaluation EEE 99-008 and SA/USQD 98-0565. The current plant design with procedural controls was considered acceptable. An ES actuation occurring with the 4160 volt ES buses powered from the offsite power transformer or back-up ES transformer, will not trip the safety to non safety load isolation breakers. The 4160 volt and 480 volt ES busses will not be overloaded.

The Emergency Diesel Generator breaker closed contacts are identical to other contacts used in the Class 1E power system logic circuits. An Emergency Diesel Generator "A" breaker auxiliary contact is used for the 480 Volt ES "A" Bus lockout logic. An Emergency Diesel Generator "B" breaker auxiliary contact is used for the 480 Volt ES "B" Bus lockout logic. The new contacts meet all quality, seismic and electrical separation requirements. The de facto modification will not make the 480 volt ES buses more susceptible to design basis events, such as flooding or fire. The de facto modification will not reduce system redundancy or independence, nor will it require more severe or more frequent testing of equipment. No automatic functions are being replaced by manual operator actions. Therefore, the de facto modification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The de facto modification affects logic circuits associated with the mitigation of accidents previously evaluated in the SAR. Modifications to equipment required for the mitigation of accidents have the capacity to increase the radiological consequences of the SAR accidents by causing the postulated equipment malfunctions (emergency power supplies in this case) to be more severe, and have a negative impact to the successful and expedient mitigation of the accident. One emergency power train is assumed unavailable for SAR accidents after taking a single failure. The de facto modification does not create any common mode failure mechanisms, nor was any mechanism created which makes the failure of both power trains credible for SAR accidents (Station Blackout is postulated with or without the de facto modification being discussed here). The de facto modification does not affect fission product barriers or create any new radiation leak paths and will not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The de facto modification being proposed is only affecting "stand-by" logic circuits associated with 480 volt ES bus relaying. The logic circuits do not perform a "normal" operational function. Unless an ES actuation is present, the new Emergency Diesel Generator breaker contacts cannot initiate any action whether the contact is failed open or failed closed. The logic circuits cannot be credited with creating an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The net effect of the de facto modification will be additional load on the ES buses during an accident when the 4160 volt buses are powered from offsite sources. This additional loading condition was recently analyzed by Engineering Evaluation EEE 99-008 and SA/USQD 98-565. The current plant design with procedural controls was considered acceptable. An ES actuation occurring with the 4160 volt ES buses powered from the offsite power transformer or back-up ES transformer, will not trip the safety to non safety load isolation breakers. The 4160 volt and 480 volt ES buses will not be overloaded.

The Emergency Diesel Generator breaker closed contact is identical to other contacts used in the Class 1E power system logic circuits. There are two failure modes for the contact. They are failed open or failed closed. If the new contact were to fail closed when it should have been open, the logic circuit would function as it had before the modification. The affected 480 volt ES bus lockout relay would trip on an ES actuation alone. This would isolate loads from the safety related power system upon an ES actuation. The ES actuation and lockout relay would have to be reset before the loads could be energized as before the modification.

If the new contact were to fail open when it should have closed, the associated Emergency Diesel Generator could have loads that were not intended to be on the generator. However, an Emergency Diesel Generator is considered "inoperable" per plant procedures when manually paralleled with offsite power sources. If the Emergency Diesel Generator had not been previously paralleled with offsite power sources, then an undervoltage condition must have occurred on the 4160/480 volt buses to connect the Emergency Diesel Generator to the 4160 volt bus. This undervoltage signal, coincident with an ES actuation, will also trip the 480 volt ES bus lockout relays. Therefore, the lockout functions will still occur even with the failed open contact.

No other failure modes exist. The de facto modification does not replace any automatic functions with manual operator actions. The de facto modification will not create the possibility of a different type of malfunction of equipment than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS bases only address load shedding in conjunction with a undervoltage condition on the ES buses. The ITS bases do not credit any type of load shedding on the ES buses due to an ES actuation alone.

The applicable margin of safety for the de facto modification is that at least one complete 4160 volt and 480 volt ES power train be available for accident mitigation when a single safety related failure is postulated. One power train will be available after the postulated single failure. The de facto modification will not reduce the margin of safety as defined in the bases for any Improved Technical Specification.

SA/USQD Number: 99-0255, Revision 0 **FSAR Change(s):** Sections 7.3.4.1, 9.11.2.6 and Table 7-1

SA/USQD Title: Deficiency Report for PC98-0044; ITS Bases Change B99-17
Design Basis Document Temporary Changes 1086, 1087, 1088, 1089 and 1093; FSAR Change 1999-0110
Evaluation of High Energy Line Break (HELB) Targets Inside Containment

Description

Deficiency Report (DR) for PC98-0044 identified numerous plant systems, structures, and components (SSCs) located inside containment that would suffer consequential failure due to the pipe whip and/or jet impingement effects of postulated ruptures of certain Reactor Coolant System (RCS) high energy lines (i.e., LOCA). Among these targets are instruments credited with a Post Accident Monitoring (PAM) function in accordance with Regulatory Guide 1.97, instruments and instrument functions that are identified in the Improved Technical Specifications (ITS) and ITS Bases, and/or instrument tubing whose failure would result in an additional RCS leakage path. DR98-0044 established the acceptability of these consequential failures using operability criteria.

In order to use the justifications in the DR as a permanent basis for plant operation, changes to Design Basis Documents (DBDs), the ITS Bases, and the FSAR are necessary to achieve full compliance. As part of the final resolution of the issues associated with high energy line breaks inside containment identified in DR 98-0044, FPC committed to changing any applicable design and licensing basis documents and evaluate these changes in accordance with 10 CFR 50.59. To that end, various Temporary Changes (TCs) against impacted DBDs were initiated, along with changes to the FSAR and the ITS Bases which are evaluated herein.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?**

   No

   This activity is associated with post-LOCA events only. It makes no physical changes to the plant or to the way the plant is operated, and does not change any of the initial conditions for any accidents evaluated in the SAR. The activity only involves making changes to the associated Design Basis Documents, the FSAR and to the ITS Bases to identify the SSCs that would be impacted by the postulated SBLOCAs and to provide justification that the failure of these SSCs is acceptable. Therefore, the activity cannot increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?**

   No

   The HELBs causing the consequential failure of the subject components are LOCAs. The

radiological consequences of LOCAs have been evaluated as part of the Chapter 14 accident analyses. None of the affected components have a safety function associated with the mitigation of the specific accidents causing their failures. Since there is no impact on any SSC required for mitigation of these specific LOCAs, there can be no increase in the consequences of the accident.

Any increase in the release of radiological material to the Reactor Building or rate of Reactor Building pressurization due to the additional RCS leakage sources created by the subject HELBs is bounded by the current Chapter 14 analyses. Therefore, there is no increase in the consequences of any accident previously evaluated in the SAR

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This activity evaluates the impact of identified consequential failures of specific components due to HELBs inside containment on accident mitigation and recovery. Since consequential failure of these components due to a LOCA from which they were previously thought to be protected represents a new possible failure mode, it does effectively represent an increased failure probability. However, since the none of the affected components have a safety function associated with the mitigation of the specific accident causing their failures, they are not considered equipment important to safety for these particular accidents. Therefore, there would be no increase in the probability of occurrence of a malfunction of equipment important to safety previously evaluated.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The malfunction of the subject components as consequential failures due to LOCAs has not been previously considered in the SAR. Several of these interactions result in a loss of function of instrumentation associated with reactor coolant inventory and pressurizer level indication, and pressurizer water space sampling capability. However, none of the affected components have a safety function associated with the mitigation of the specific accidents causing their failures. Since there is no impact on any component required for mitigation of these specific LOCAs, there can be no increase in consequences due to their failure. Therefore, there is no increase in the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

This activity is associated with post-LOCA events. It makes no physical changes to the plant or to the way the plant is operated, and does not change any of the initial conditions for any accidents evaluated in the SAR. The only accidents that could be associated with this activity are LOCAs which have already been evaluated in the SAR. Therefore, the activity cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The malfunction of the subject components as consequential failures due to LOCAs has not been previously considered in the SAR. Therefore, the consequential failure of these components due to a LOCA from which they were previously thought to be protected represents a new type of failure mechanism. However, none of the affected components have a safety function associated with the mitigation of the specific accidents causing their failures. Any increase in the release of radiological material to the Reactor Building or rate of Reactor Building pressurization due to the additional RCS leakage sources created by the subject HELBs is bounded by the current Chapter 14 analyses. Therefore, although consequential failure is new failure mechanism for these components, it does not represent a new type of malfunction of equipment important to safety.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

This activity evaluates the impact of identified consequential failures of specific components due to specific HELBs inside containment on accident mitigation and recovery. No physical modifications are being made that would alter the operating conditions of any plant system. There are no changes being made to any instrument setpoints.

The subject HELBs result in the loss of selected PAM instruments and a PASS sample line that were previously expected to be available post-LOCA. Failure of these components is acceptable since they perform no safety function in the mitigation of the accident causing their failure. The impacted PAM instruments do not monitor Regulatory Guide 1.97 Type A variables. As such, they do not provide the primary information that permits the operator to take specific manually controlled actions that are required when no automatic control is provided and that are required for safety systems to accomplish their safety functions for DBAs. It does not include those variables associated with contingency actions. Per Section B3.3.17 of the ITS Bases, this group of instrumentation is retained in the Technical Specifications because it is considered important to reducing risk to the public. As for the impact to the PASS, there is no specific requirement that specifically mandates the pressurizer water space as one of the sources for sampling the reactor coolant system. Several other sources from which sampling could be accomplished would still be available. Therefore, there is no reduction in the margin of safety.

SA/USQD Number: 99-0276, Revision 0 **FSAR Change(s):** None

SA/USQD Title: PC99-2346
Small Pressure Boundary Breach on the Raw Water System

Description

A non-conforming condition exists, in the form of a small through-wall hole in the Raw Water (RW) piping. This condition is in direct contradiction with the rules of ASME Section XI, but Generic Letters 91-18 and 90-05 provide guidance for evaluation until relief from the rules is granted by the NRC. It would be impractical to perform a repair at the time the condition was identified, because the plant must be shutdown to restore the piping in accordance with ASME Code rules. The impact of the hole, caused by a failure in the protective urethane lining bond, has been determined to be acceptable from structural, flooding, spraying, and safety function (cooling) perspectives.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The RW/SW system is relied upon for accident mitigation and cannot contribute to the probability of an accident occurrence. Therefore, a change to this system configuration cannot increase the probability of an occurrence of an accident evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   If the temporary housekeeping seal/plug being used to minimize leakage were to fail during accident mitigation and recovery, it would be necessary to access the seawater room area to stop the leak. Normal access may not be available through the Auxiliary Building, due to post-accident dose. Therefore, it might be necessary to access the area through the seawater room ceiling plugs, where dose rates are acceptable. This will take some time to execute, but it has been determined that adequate time is available to accomplish leak isolation, for hole sizes up to 2" equivalent diameter.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   Adequate time exists to recognize and correct a leak that could occur from a hole size of up to 2" in diameter in this location. Operating with a leak is bounded by the description in section 9.5.2.1.6, which discusses the failure of an RW system piping expansion joint. The flooding concern created by this hole allows much more time for corrective action than the thirty minutes described for isolating an expansion joint failure and, more important, before the critical flood elevation of seven inches in the Auxiliary Building is

reached. Even though this portion of the line cannot be isolated, the leak can be stopped or controlled by plugging or patching.

Water spray has also been determined to be insignificant for the duration of the leak. Flooding, water spray, structural integrity of the piping, and safety function of the RW system have been determined not to compromise the ability of any equipment to function as designed. Additionally, the temporary plug is not expected to eject and become a missile, due to the low pressure in the system and a lanyard attached for controlling and minimizing the potential flight path.

Therefore, there is no increase in the probability of a malfunction of any equipment important to safety as evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The only potential consequences associated with any situation that could arise are dose to the operator or mechanic responsible for accessing and stopping the leak, should the temporary plug fail post-accident. Since ample time is afforded to plan, access and execute the repair, and since the post-accident dose to the personnel involved is within those evaluated and approved, if the RW piping hole should leak, it cannot increase the consequences of a previously evaluated malfunction of equipment.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Housekeeping problems that could arise, should the temporary plug fail, cannot create unexpected equipment malfunctions. The effects of spraying water and accumulation of water are manageable in the time it would take to recognize and correct the leak. The piping has been evaluated to be structurally sound with a hole size of up to 2" and a minimum perimeter thickness of 0.076". Because of the downstream hole location, cooling water flow is not bypassed around the heat exchanger. Therefore, the possibility of a new or different type of accident is not created.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The effects of spraying water and accumulation of water are manageable in the time it would take to recognize and correct the leak. Therefore, housekeeping problems that could arise, should the temporary plug fail, cannot create unexpected or different types of equipment malfunctions from those already evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS bases assume SW heat loads can be transferred to the Ultimate Heat Sink, or RW, system. This change does not affect the ability of the SW, RW, or Ultimate Heat Sink (or

any other system) to perform as designed. Therefore, the margin of safety is maintained.

SA/USQD Number: 99-0292, Revision 0 **FSAR Change(s):** None

SA/USQD Title: MAR98-03-01-01, FCN 2
Pre-Outage Functional Test Procedure for Diesel Driven Emergency Feedwater Pump (EFP-3) Project

Description

The proposed activity involves a permanent connection for EFP-3 suction from the existing CDT-1 and FST-1A and 1B flow path to EFP-1 and EFP-2, as well as a temporary modification to CDT-1. This temporary modification will facilitate a discharge flow path for testing the newly installed emergency feedwater pump (EFP-3) without affecting the existing Emergency Feedwater System. The temporary flow path will connect the discharge of EFP-3 downstream of pressure breakdown orifices and isolation valves to CDT-1 via the manhole opening on top of the tank. The temporary flow path will allow engine/pump run times with limited interfacing to other plant systems. The permanent connection will provide the water source, which will be CDT-1, for a complete flow path.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The Condensate System components and the fire service tanks are not considered initiators of any accidents. No other piping systems will be affected by these modifications to the Condensate System and fire service tanks supply line to emergency feedwater pumps. Therefore, these activities will not represent an increase in the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   These activities will not affect the functionality of any existing systems required for accident response and mitigation. It specifically involves the tie-in of a connection to a normally isolated flow path to the emergency feedwater pumps from CDT-1 and FST-1A and 1B (but does not remove these tanks from service) and the routing of a temporary pump discharge line to the non-safety related CDT-1. These activities will bear no influence on calculated radiological doses. The proposed activity will not affect any of the accident analyses assumptions or methodologies, nor will it provide correction for any analyses errors. Therefore, the proposed activities cannot change any of the values in calculated radiological doses to either onsite or offsite personnel from that previously reviewed and approved by the NRC, and will not increase the consequences of any accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

These activities involve the permanent tie-in of EFP-3 suction to the normally isolated flow path for the emergency feedwater pumps from CDT-1 an FST-1A and 1B, and a temporary inlet to CDT-1. The suction connection is a permanent connection made pursuant to codes and standards applicable to that system. Construction pursuant to applicable piping codes ensures there will be no malfunction of piping other than those previously evaluated.

The CDT-1 inlet is for a temporary flow path which will enter at the top of CDT-1 and, therefore, cannot drain the tank. The suction from the tank will have isolation valves available to provide isolation capability in the event any unexpected decrease in level occurs. The tank volume will remain available as an alternate source to the emergency and auxiliary feedwater pumps. The temporary flow path will have adequate restraints and supports to prevent movement.

The dead weight of the temporary pipe and water will be supported with a support on the berm with lateral movement of vertical sections being restrained by the permanent ladder and the top platform. The temporary pipe will not be attached to the tank, therefore the seismic qualification of the tank is unchanged. Hence, the proposed activities do not represent an increase in the probability of occurrence of a malfunction of equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

CDT-1 provides normal makeup water to the main condenser. FST-1A and 1B provide sources of water for the fire service system. All three tanks provide backup water sources for the emergency feedwater and auxiliary feedwater pumps. CDT-1 and FST-1A and 1B will continue to provide these functions during installation and after the proposed activities are completed.

Temporary piping will remain isolated except during actual use and any time it is being used the tank volume will be observed and controlled. The tank volume will be maintained above the surveillance level. If, however, failure of CDT-1 were to occur, sufficient alternate sources are available to provide plant cooldown. Since the volume of CDT-1 will be maintained available during modifications, and no other failures of equipment important to safety are considered credible, the consequences will remain unchanged.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

No new accidents or accident types are created by the proposed activities, because no new failure modes are presented and no new or different processes are introduced. Installation

of temporary flow path utilizes adequate restraints and supports with equipment anchorage to prevent movement during testing. The flow path is well marked and protected to prevent exterior damage. The flow path will be erected just prior to testing and immediately removed upon completion of testing. The components in this flow path are bounded by the missile sizes addressed in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed activity provides for a permanent and a temporary modification. The permanent modification involves the normally isolated emergency feedwater pumps suction piping from CDT-1 and FST-1A and 1B. The modification to this line will require it removal from service for a short period of time. The primary function of al three tanks will not be compromised in any way by this modification, and the volume in CDT-1 will be available via an alternate path for a backup source of water for emergency feedwater, if needed, during this time. The temporary modification introduces a temporary flow path inlet at the top of CDT-1 and will not prevent CDT-1 from performing any existing design function. The proposed activity will introduce no new technology or deviate from any of the approved codes and standards applicable to this modification. Therefore, any possible malfunctions of the temporary piping or components have been previously considered.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

There will be no reduction in functional capability of any component identified in the ITS or the ITS Bases by this permanent or temporary modification. The proposed activity will not involve any equipment that affects margin of safety as defined in the Bases for any Improved Technical Specification. No specific credited margin of safety is addressed in the bases of the ITS. The intended function of CDT-1 is to provide a backup source of water to effect the removal of decay heat and sensible heat from the Reactor Coolant System. This activity will not prevent CDT-1 from performing its intended function. Therefore, the margin of safety is not reduced.

SA/USQD Number: 99-0294, Revision 0

FSAR Change(s): None

SA/USQD Title: CP-148, SP-186, SP-187 and SP-189 Ventilation Filter Testing Program

Description

Ventilation Filter Testing Program procedures, as delineated under CP-148, as well as the surveillance procedures SP-186, SP-187 and SP-189, are being revised. This test program is related to the following systems: Reactor Building Exhaust, Control Room Emergency Ventilation, Auxiliary Building Ventilation Exhaust and Technical Support Center (TSC) emergency ventilation. The following are the intent changes to the procedures:

- Revising the laboratory test acceptance criteria for the RB purge filters from 99% to 95% minimum removal efficiency. This change results in a change to the assumed filter efficiency in the hydrogen purge dose calculation to the public from 95% to 90%.
- Revising the laboratory test acceptance criteria for the CREVS and TSC filters from 99% to 97.5% minimum removal efficiency.
- Revising the bypass leakage acceptance criteria for the ABVEF filters from < 0.05% to < 1.0%.
- Revising the airflow capacity for CREVS from "41,325-45,675 CFM" to "37,800-47,850 CFM".
- Revising the test method to D3803-89 (re-approved 1995) for the CREVS and TSC filters.
- Clarifying and simplifying the contingency actions for all four systems when the acceptance criteria are not met.
- Reducing the allowable filter delta p for the Auxiliary Building Exhaust filters and CREVS filters from 6 inches of water to 4 inches of water.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Most of the changes (filter efficiency and bypass test acceptance criteria, flow acceptance criteria) are related to assumed design requirements used after a significant event has already occurred. They are not related to precursors of an event. None of the changes affect design or procedural requirements during normal or transient conditions. Although the testing is performed during normal operation, the only change to the method is to the

laboratory testing performed offsite. Hence, such changes cannot affect onsite events. The changes do not affect any equipment that would be a precursor to an event. As such, the changes cannot affect the probability of an accident occurring.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The proposed changes in filter efficiency and CREVS flow range directly affect the calculated doses of previously analyzed accidents. The changes affect the filter efficiency assumptions that are used in the calculation of the public and Control Room dose from an assumed hydrogen purge following a LBLOCA, and in the calculation of Control Room habitability doses from the Maximum Hypothetical Accident (MHA), letdown line rupture, Steam Generator Tube Rupture (SGTR) and Fuel Handling Accident (FHA). The change in the CREVS airflow capacity also affects the iodine removal rates assumed in the Control Room dose calculations.

The changes to the test methodology and the clarification of contingency actions have no direct affect on the consequence calculations. The change to the filter delta P acceptance criteria is in the conservative direction, as it helps ensure adequate flow will be achieved. The test method could have an indirect effect if it was an inadequate test and did not ensure the assumed efficiency was met. However, per Generic Letter 99-02, the proposed test method is the preferred method, is more conservative and eliminates some potential problems with previously specified test methods. The clarifications to the contingency actions still ensure the same appropriate corrective actions, should the test results indicate the assumed efficiency cannot be met. The increase in the acceptance criteria for the ABVEF bypass leakage does not affect the calculated consequences, as the 1% bypass limit is a small fraction of the difference between the iodine removal test acceptance efficiency of 87.5% and the assumed removal efficiency of 75%. The bypass fraction is not directly included in the dose calculations based on the assumption that the bypass is small compared to the margin in the efficiency assumption. This assumption remains valid.

Regarding the control room habitability doses, the proposed changes to the procedure regarding filter efficiencies and system flows and delta p are all consistent with the dose assessments performed and submitted with License Amendment Request 222, Revision 1 on July 30, 1998. With the receipt of the NRC's SER on Amendment 185, the NRC has reviewed the assumptions on filter efficiency and testing criteria consistent with the changes in these procedures. The consequences have been determined to be acceptable. Therefore, the proposed changes will not increase the consequences from those previously reviewed and approved by the NRC.

Regarding the TSC test acceptance criteria of 97.5%, using the new test methods, allows the assumption of 95% filter efficiency. This efficiency is consistent with the existing TSC habitability dose calculation and, hence, does not increase the consequences of analyzed accidents.

Regarding the public dose due to a hydrogen purge, the dose will increase due to the decreased filter efficiency assumed in the calculation. The public dose due to a hydrogen purge is analyzed in calculation M-98-0014. Revision 0 of this calculation assumed an efficiency for the RB purge filters of 95%. Revision 1 reanalyzed the purge dose with an assumed efficiency of 90%. This is consistent with the proposed procedure change to reduce the test acceptance criteria to 95%. An additional change was also made to the assumptions between Revision 0 and 1 related to the flow rate of the purge. This was required due to a change in the purge flow instrument uncertainty calculation. Revision 1 assumed a higher flow rate, which also increases the dose. The dose information provided below represents the combined effect of both changes to the calculation assumptions and hence would bound the effect of looking at the filter efficiency by itself.

Two cases were evaluated for dose consequences. The first case assumes a continuous purge at a flow rate sufficient to maintain hydrogen concentrations less than 3.5 volume percent, based on the design basis hydrogen generation rate. In order to bound any potential flow rate from an intermittent purge, a second case also conservatively assumed maximum release rates, yet similar meteorological dispersion, even though the intent of an intermittent purge would be to release under favorable meteorological conditions. The dose results changed as follows:

- Continuous purge case

  LPZ thyroid dose increased by 0.5 REM, bringing the total purge dose to 0.86 REM and the total LOCA dose (i.e. - includes dose from activity released from all pathways) to 24.5 REM.

  LPZ whole body dose increased by 0.024 REM bringing the total purge dose to 0.041 REM and the total LOCA dose (i.e. - includes dose from activity released from all pathways) to 0.45 REM.

- Intermittent, high flow, case

  LPZ thyroid dose increased by 1.8 REM, bringing the total purge dose to 3.6 REM and the total LOCA dose (i.e. - includes dose from activity released from all pathways) to 27.2 REM.

  LPZ whole body dose increased by 0.089 REM bringing the total purge dose to 0.18 REM and the total LOCA dose (i.e. - includes dose from activity released from all pathways) to 0.59 REM.

The increase in doses due to these changes is less than 1% of the limits of 10 CFR 100 of 300 REM thyroid and 25 REM whole body. The total resulting dose remains less than 10% of the 10 CFR 100 acceptance criteria.

Due to the insignificant change in the calculated dose, the changes do not fall within the intent of 10 CFR 50.59 as an increase in consequences. FPC Licensing and Safety Analysis Group have discussed the new dose results and have concurred that they do not represent an increase in consequences that would require NRC review and approval.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

No actual changes to equipment are made as a result of the proposed changes. The only change to equipment capabilities is the required filter efficiency and bypass leakage acceptance criteria and to the test method. None of these changes is related to a malfunction of equipment. The change in the acceptance criteria for the CREVS flow rate is within the design specifications for system flow and, hence, would not cause any malfunctions. The change to the filter delta P acceptance criteria is in the conservative direction, as it helps ensure adequate flow will be achieved and, as such, is unrelated to malfunctions. There are no new contingency actions added. Therefore, these changes cannot affect the probability of a malfunction of equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed changes are related to consequences following an accident, not a direct malfunction. Therefore, the discussion on increased consequences of an accident above would bound any consequence effect from a specific malfunction and, hence, there would be no increase in consequence of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The proposed changes are related to assumed design requirements used after a significant event has already occurred. None of the changes affect design or procedural requirements during normal or transient conditions. Although the testing is performed during normal operation, the only changes to the method is to the laboratory testing performed offsite. The changes do not affect any equipment that would be a precursor to an event. Hence, the changes cannot create the possibility of a different type accident.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

No actual changes to equipment are made as a result of the proposed changes. Changes to equipment capabilities include the required filter efficiencies and Auxiliary Building ventilation exhaust filter bypass leakage, change to the flow acceptance criteria for CREVS, which is still within the design capabilities of the system, and change to the filter delta p for CREVS and ABVEF, which are in the conservative direction. These changes are not related to a malfunction of equipment. Therefore, these changes cannot create the possibility of a new malfunction.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The bases behind any of the specifications related to this change are to maintain doses within acceptable limits. As noted above, all doses remain well within acceptable limits.

Hence, there is no decrease in the margin of safety for related ITS sections.

SA/USQD Number: 99-0310, Revision 0 **FSAR Change(s):** 14.2.2 and 14.3

SA/USQD Title: Calculation F99-0001, Revision 2; FSAR Change 1999-0120
Transition to RELAP5-Based Evaluation Model for Large Break LOCA

Description

The proposed activity is a change of CR-3's analysis of record (AOR) for the Large Break Loss of Coolant Accident (LBLOCA), to account for 20% steam generator tube plugging and to transition from a CRAFT2-based evaluation model (BAW-10103A) to a RELAP5/MOD2-B&W based evaluation model (BAW-10192A). The results of the new analysis show that all of the 10 CFR 50.46 acceptance criteria are satisfied, and determine acceptable linear heat rate (LHR) limits for the Mark B9 fuel design for up to 20% tube plugging in the steam generators.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   This activity is an analytical effort with associated documentation changes and does not affect the function of any structure, system, or component (SSC) that is an accident initiator. Since this activity does not affect any such elements, there can be no increase in the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The source term associated with the fuel is not changing, and therefore, the calculated dose resulting from a LBLOCA is not impacted. Additionally, the functions of SSCs are not affected by this activity. The methodology used to perform the new LBLOCA analysis has been approved by the NRC , and all restrictions and requirements have been incorporated into Calculation F99-0001. The new AOR (F99-0001) still provides a conservative LBLOCA analysis and shows that all acceptance criteria are satisfied. In fact, the new LBLOCA analysis shows that up to 20% of the steam generator's tubes can be plugged without impacting the calculated linear heat rates or peak cladding temperature. Thus, this activity will not result in an increase in consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The probability of equipment malfunction is most likely impacted by different system interactions or by operation under different, more challenging conditions. No changes in system interactions are introduced by or result from this activity. All structures, systems and components will respond exactly as before. While system parameters are modeled for

a LOCA analysis, their actual performance in the field is not altered. Thus, there is no increase in the probability of equipment malfunction.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The consequences of malfunctions are generally limited to adverse impacts on other structures, systems or components or by a direct impact to one of the primary fission product barriers. No changes in system interactions are introduced by or result from this activity. All structures, systems and components will respond exactly as before. The new LBLOCA AOR (F99-0001) utilizes conservative assumptions in accordance with 10 CFR 50 Appendix K and BAW-10192A. The primary variable relative to one of the fission product barriers addressed by this activity is the peak cladding temperature of the reactor fuel. The calculated results indicate peak clad temperature is less than was previously calculated and satisfies the acceptance criteria of 10 CFR 50.46. Therefore, the consequences of component malfunction remain unchanged.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

No changes in system interactions are introduced by or result from this activity. The proposed activity is an analytical effort to change CR-3's analysis of record (AOR) for the LBLOCA to account for 20% OTSG tube plugging and to transition from the CRAFT2 based evaluation model (EM) to the RELAP5/MOD2-B&W EM. All structures, systems and components will respond exactly as before. While system parameters are modeled for this activity, their actual performance in the field is not altered. Since no additional interactions or new failure modes are introduced by this activity, there is no possibility of an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Different types of equipment malfunction would most likely be caused by operating structures, systems and/or components outside existing limits. While system parameters are modeled for this activity, their actual performance is not altered. Additionally, the modeled parameters are chosen to ensure a conservative analysis in accordance with 10 CFR 50 Appendix K and BAW-10192A and its associated SER. The actual environment in the field for any SSC is not altered by this activity. Thus, no different types of malfunctions can result from this activity.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The new LBLOCA AOR shows that with conservative input assumptions in accordance with 10 CFR 50 Appendix K and with the transition to the RELAP5/MOD2-B&W EM, the 10 CFR 50.46 acceptance criteria are satisfied. Thus, the margin of safety for any Improved Technical Specification is not decreased.

SA/USQD Number: 99-0335, Revision 0 **FSAR Change(s):** None

SA/USQD Title: Temporary MAR99-00-00-13
Temporary Gagging of Valve DHV-3, With DHV-4 Optional

Description

This Temporary MAR provides for the design, fabrication, installation, and removal of U-bolt and threaded square nut gags for valves DHV-3 and DHV-4 (optional). Both valves are being gagged full open in order to permit removal of their motor operators during Mode 6 with the fuel transfer canal (> 156'). Once their motor operators have been removed, and the vessel has been de-fueled, each valve can then be repaired while in the No Mode plant configuration.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

The plant is in Mode 6 at the time of the gag installation. There are no SAR evaluated accidents for loss of Decay Heat Removal in this plant condition; however, loss of Decay Heat (DH) Removal is described as an emergency condition in FSAR section 12.6. Assuming a loss of DH should DHV-3 or DHV-4 close, a discussion about the valve gag failing, allowing the valve stem to gravity close, is necessary for this question. A properly designed valve gag mechanically locking open a valve would not increase the probability of occurrence of a previously evaluated accident over the same valve held open by a motor operator (which is how these valves are normally opened). However, should a valve gag allow a valve stem to close, the mitigating steps ensure a cooling path for the DH system is readily attainable.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

This activity will not change consequences of loss of DH occurring for any reason. Failure of the lower gag(s) would cause the stem to go closed on either the DHV-3 or DHV-4 valve. Failure of the motor operator on either of the same valves would do the same (from a fully open position with the DH system in service). The primary difference would be the mitigating steps taken prior to gagging these valves open as opposed to those available in other plant shutdown conditions. The actions taken prior to gagging both valves serve to reduce the consequences compared to those that are possible during loss of DH event while at reduced RCS inventory (for example). Also, the valve stem is capped during the removal of the operator. This enables expedient re-opening of the valve with the operator hoist should it close.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

A valve gagged open does not increase the probability of occurrence of a malfunction over the same valve held open by a motor operator. Both mechanisms serve to keep the valve fully open. A properly designed and installed device will provide the adequate friction forces necessary to prevent the valve from closing, as would a properly designed motor operator. The gag uses a different application of a force (i.e., friction force applied by U-bolt gag at 30-35 ft-lb of torque value) to keep the valve stem open. However, when properly applied, this force is no less reliable than that of the motor stem nut thread strength to keep the stem raised. Either mechanism serves to prevent the stem from closing. Should the device fail and a valve inadvertently close, the pre-established safety measures taken will permit prompt cooling recovery (defense in depth).

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

A loss of DH event, due to valve closure or other reasons is always possible. Compensatory measures are in place at the time the valve is temporarily restrained open by a mechanical gag. These measures include a fuel transfer canal $>156'$ (heat sink inventory) and alternate Decay Heat cooling path (SF transfer tubes). These compensatory measures ensure that there is no increase in dose consequences should a gag fail and a valve close.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

There are no new accident scenarios not previously evaluated in the SAR that are created with the application of a gag to these valves. Structural integrity is maintained and the mitigating steps that take place prior to gagging these valves ensure reasonable capability of the DH system to continue performing its heat removal function even if a valve gag fails and a valve gravity closes. The previously discussed mitigating steps would ensure adequate water inventory for heat sink purposes provides adequate time to restore the valve to its full open position or to re-align the spent fuel system for heat removal. The loss of Decay Heat Removal has already been discussed in section 12.6 of the FSAR. Therefore, an accident not previously evaluated has not been created.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

Even though a different failure mechanism is possible with the application of a valve gag (as opposed to the use of the motor operator), a different type of equipment malfunction has not been created (Loss of DH Event). Compensatory measures (previously described) ensure that the heat removal function will be available whether or not a valve gag fails permitting the valve to go closed. Heat sink and alternate cooling paths, etc. provide adequate defense in depth mechanisms.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

The temporary condition of gagged open DH drop line valves (DHV-3,4) will occur only during high refueling canal water level implementation (LCO 3.9.6), both during fuel movement and periods when no fuel is being transferred to the Spent Fuel (SF) Pool. Ensuring these valves remain open via mechanical devices when the operators are removed, or being removed maintains the margin of safety described in this LCO. Should this flow path be temporarily lost, the water level affords adequate time to restore the valve position to open, or provide an alternate suction path through the SF Pool.

SA/USQD Number: 99-0336, Revision 0 **FSAR Change(s):** Table 4-10

SA/USQD Title: FSAR1999-0128
Increase in Reactor Coolant Boron and Lithium Limit

Description

The boron value of the Water Chemistry Table, FSAR Table 4-10, is being changed from a single value to multiple values at different conditions. This change supports boration for reactivity control, including refueling, while still preserving the assumptions and requirements of Chapter 14 accidents, post LOCA pH and post LOCA boron precipitation control.

Increasing the upper limit in Reactor Coolant System (RCS) chemistry for lithium also creates a change to FSAR Table 4-10. The change will adjust the high limit for lithium from 3.0 ppm to 3.5 ppm to ensure that the correct operating upper limit for lithium in the Reactor Coolant System is documented in the FSAR. The change in the upper limit of lithium concentration is needed for pH control considerations due to high boron concentrations. This change will not affect the assumptions and requirements of Chapter 14 accidents, post LOCA pH and post LOCA boron precipitation control.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The changes made to the FSAR address limiting RCS boron and lithium concentrations only. Boron and lithium are not accident initiators. Additionally, these changes do not require a change in system operations or lineups, nor will these changes result in substantially more corrosive environments that might fail equipment. Operational pH will remain within acceptable limits. No changes are being made to the boric acid tank or BWST concentrations so line blockage from boron precipitation is not a concern. The new boron concentrations are sufficient to provide needed reactivity control. Consequently, these changes in boron and lithium do not affect any accident initiators.

   Neither boron nor lithium are accident initiators. These changes do not affect any accident initiators, and no changes have been made to system operations. No new failure modes have been added and existing failure modes have not been challenged. Reactivity control is maintained. Therefore, the changes do not increase the probability of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The boron value in the key accident analyses parameters of FSAR Table 14-4 is preserved. In addition, post LOCA pH and boron precipitation requirements are preserved. The RCS

lithium concentration value is not described in the key accident parameters of FSAR Table 14-4. Lastly, since the FSAR Table 4-10 values are sufficient to maintain adequate reactivity control, including maintaining shutdown capability, all accidents assuming a starting point of 1% shutdown margin or shutdown value are likewise preserved. Any potential increase in tritium production resulting from the increase in lithium concentration is minimal, and is insignificant with respect to the bounding source term used to calculate the accident consequences in the FSAR.

Since the conditions of the accident analyses are preserved by the boron values listed in Table 4-10, the RCS lithium concentration value is not a key accident parameter. Since no changes in design or operation to the RCS, CA, RB spray or any ECCS have been made because of these changed boron and lithium values, the current accident analyses remain bounding and no additional dose would be released during an accident due to the changed boron and lithium concentrations.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

No changes to the existing boron concentration ranges and limits are required in the boric acid tanks, core flood tanks, BWST or SF pool to support the RCS boron values in the proposed FSAR Table 4-10. Therefore, there is no increased probability of failure due to precipitation and blockage, corrosion or any other mechanism.

RCS corrosion control is based on pH, not simply on boron levels, and pH control is maintained by the addition of lithium to the RCS. Lithium, boron and pH limits are in FSAR Table 4-10. Steady state operating conditions will be maintained within these pH requirements, hence resulting in no damage to the RCS from corrosion. The boron limits in FSAR Table 4-10 also remain within the ability of an RCP or a DHP to adequately circulate and mix the reactor coolant system.

Therefore, these changes to the boron and lithium values do not increase the probability of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Because the changes do not require a change in the concentration levels, pathways, operation or components of the emergency boration system, there are no dose release increases resulting from failure or malfunction of a component, valve, line or heat tracing. The accident analysis conditions are not altered by these changes, therefore the dose release associated with the malfunction of any equipment assumed to be an accident initiator or assumed for accident mitigation is unchanged.

Higher boron concentrations could lead to a more positive moderator temperature coefficient (MTC), which could affect plant response and consequences due to equipment malfunctions that affect core cooling. However, each cycle specific MTC must meet the accident analyses assumed MTC. As such, the MTC remains bounded and there is no

increase in the dose consequences of any accident affected by overcooling and MTC effects.

No changes to methods or equipment for boron addition to the RCS for reactivity control have been made, and a 1% minimum shutdown margin, with the highest worth rod stuck out, is still required at all times. Therefore, the release dose associated with malfunctions of boron addition capability or rod movement and their effect on reactivity control are unchanged.

Increasing the upper limit for lithium used for controlling the pH in the Reactor Coolant System will have no negative impact on the Reactor Coolant System, Decay Heat System, or Makeup System. This increase will have no impact on assumptions made during the evaluation of malfunction of equipment important to safety found in the FSAR . The methods or equipment used to perform lithium additions to the RCS is unchanged.

Therefore, the proposed activity does not increase the dose release (consequences) of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The purpose of adding boron to the RCS is for reactivity control. In this aspect, boron concentration can affect shutdown margin, rod position, moderator temperature coefficient, power level and imbalance (through rod position). Other concerns with boron are corrosion (pH effects), flow blockage through precipitation and fuel effects.

As previously stated, the boron concentrations in Table 4-10 are sufficient to cover the required ranges for reactivity control including shutdown margin, refueling, maintaining rod position and compensating for core burnup. The MTC is analyzed and ensured to be within acceptable ranges. Corrosion and precipitation concerns have also been addressed.

The primary preventative to the fuel effect of AOA and DCP CRUD is RCS water chemistry, predominately pH. Boron concentration itself is not the controlling factor as long as it is balanced with lithium to maintain the pH within acceptable ranges. The increase in the upper limit for lithium concentration will ensure that the operating pH in the Reactor Coolant System will be maintained due to the increased boron concentrations. However, even if fuel failure were to occur, fuel failure effects are considered in the FSAR, which assumes 1% failed fuel in the appropriate accident analyses. ITS limits (LCO 3.4.15) would require shutdown prior to operating with fuel failure greater than 1%.

Therefore, the proposed changes do not create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR? No

Possible ramifications of changing boron and lithium concentrations in the RCS have been addressed. These include: reactivity, corrosion, precipitation and fuel effects. All possible malfunctions and accidents associated with these areas are covered in the SAR.

Therefore, the proposed changes to the boron and lithium values do not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

The boron values in the proposed FSAR Table 4-10 are sufficient to meet reactivity and power distribution concerns such as shutdown margin (including raised OTSG levels), compensating for excess core reactivity, maintaining rods, APSRs and imbalance (by moving rods), and meeting refueling requirements and SF pool requirements (when interconnected with the RCS during refueling). The reactivity concern of a possibly positive MTC at high boron concentrations are met by the requirement that the MTC be both measured and predicted, and verified to meet accident assumptions no matter the RCS boron concentration. Therefore, the margin of safety is not affected for reactivity and power distribution concerns.

The boron values of the proposed Table 4-10 support the analyses and requirements for post LOCA pH and post LOCA boron precipitation. Therefore, the margin of safety for the ITS based upon these concerns, such as BWST boron, CFT boron and Containment Emergency Sump pH Control System (TSP) is unaffected.

Lastly, the boron concentration ranges of the proposed Table 4-10 are capable of being mixed by a single DHP or RCP. Therefore the margin of safety concerned with mixing the RCS and the prevention of stratification is not affected.

The RCS lithium increase is sufficient to maintain the pH in the system within the established control band to prevent RCS corrosion. pH control is maintained by the addition of lithium to the RCS. Lithium, boron and pH limits are in FSAR Table 4-10. Steady state operating conditions will be maintained within these pH requirements, therefore no unexpected damage to the RCS from corrosion will result. The ITS does not have a basis section defining the pH control in the Reactor Coolant System. The increase in the upper limit for lithium to adjust the pH based on the BOC boron values will have no impact on the margin of safety.

SA/USQD Number: 99-0341, Revision 1

FSAR Change(s): Section 3.13; Tables 3-54, 3-55, 3-56, 3-57 and 3-38; Figures 3-93, 3-94, 3-95, 3-96, 3-9, 3-98; Section 14.2.2.6.3; Tables 14-2, 14-3, 14-4 and 14-53

SA/USQD Title: Calculation F99-0006, Rev 0; FSAR1999-0130
Cycle 12 Reload Report and Core Operating Limits Report (COLR)

Description

This USQD evaluates the Cycle 12 Reload Report, and the Core Operating Limits Report (COLR). The core design was conducted utilizing the reload methodology in BAW-10179P-A, which is required by ITS 5.6.2.18. Certain changes occur specifically as a result of the new cycle design. These include changes in limits specified in the COLR, changes in various neutronics parameters, and changes to thermal-hydraulic parameters. These changes are primarily a result of changes to the core power distribution and core reactivity. In addition, other changes were introduced, including:

- Modified the batch 14 fuel assembly intermediate spacer grid restraints. This is bounded by the SA/USQD for MAR 98-12-03-01.
- Lowered the fuel rod pre-pressure for the batch 14 fuel assemblies. This is bounded by BAW-10179P-A Rev. 2.
- Adopted a low moisture pickup BPR pellet and implemented changes to the BPR upper and lower end caps.
- Applied increased uncertainties to account for heat balance errors at low power levels to regulating rod insertion limit curves specified in the COLR.
- Adopted RELAP5/MOD2-B&W to generate the nuclear heat flux hot channel factor limits, F_Q, (LOCA linear heat rate limits) utilized in the reload analysis and specified in the COLR. The use of RELAP is specified by BAW-10192P-A, BWNT LOCA for OTSG Plants.
- Added the allowable upper limits for MTC to the COLR which ensure that the validity of the ECCS analysis is preserved.
- Reduced the uncertainty assumed for rod worths from 10% to 6% in the shutdown margin and rod worth calculations. This is bounded by BAW-10179P-A Rev. 2.
- Delineated specific shutdown margin requirements for conditions when high steam generator water levels exist. This is bounded by existing ITS B3.1.1.
- Revised the uncertainty in the reload boron concentration analysis from 1% reactivity increase to +50 ppm boron. This is bounded by existing ITS B3.9.1.
- Calculated nuclide activities in lieu of dose consequences for cycle 12.

The analysis of the cycle 12 reload was conducted in accordance with approved methodology.

The core design has been demonstrated to meet all required safety limits and design/acceptance criteria. It is concluded from the examination of cycle 12 mechanical, core thermal, kinetics, and thermal-hydraulic parameters, with respect to the acceptable previous cycle values, that this core reload will not adversely affect the ability to operate safely during cycle 12. The accident source terms for cycle 12 are bounded by the cycle 11 values. The cycle 12 reload was determined to not result in a USQ.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

The reactor core itself is not an accident initiator. The accidents described above assume either a mechanistic or non-mechanistic failure of a supporting system or component (e.g., rod control system, makeup system, reactor coolant system, main steam system, main feedwater system, electrical system failures). Failure of these systems is not more likely due to the cycle 12 core. The core continues to operate within all the applicable design criteria specified in FSAR 1.4.

The only accident which could be affected is the Uncompensated Operating Reactivity Change event. This accident is defined as follows: During normal operation of the reactor, the overall reactivity of the core changes because of fuel depletion, burnable poison depletion, and changes in fission product poison concentration. These reactivity changes, if left uncompensated, can, in theory, cause the operating limits to be exceeded. The accident was analyzed assuming bounding values for Doppler and moderator coefficients as described above. The reactivity changes for the fuel depletion, xenon buildup, and xenon burnout and the corresponding changes in average moderator temperature are analyzed. The reactivity changes are extremely slow and provide sufficient time for the Integrated Control System or operator to detect and compensate for the changes. Since reactivity and temperature changes are slow, and the control system and operator have sufficient time to diagnose the changes and take action, the acceptance criteria for this accident are met. In addition, FSAR 14.1.2.1.1 states, "This accident was originally analyzed to demonstrate the slow evolution of this type of event. The ability of the control systems and operators to compensate for these changes was of prime importance in early licensing stages. Following many cycles of operation, the control systems and operators have demonstrated their capabilities to respond to these core reactivity changes." The cycle 12 neutronics parameters are bounded by the FSAR analysis. Therefore, the cycle 12 core does not increase the probability of accidents previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

Part of the normal reload methodology consists of re-calculating the nuclide activity inventories of the FSAR accidents using the cycle specific fuel parameters applicable to cycle 12. Analysis of the cycle 12 nuclide activity inventories also included confirmation of the key parameters which are core dependent and are design basis inputs for

radiological calculations. These core dependent values including core power, period of continuous operation, radial and assembly peaking factor, fraction of fuel rod experiencing DNB (for control rod ejection), and fraction of failed fuel during normal operation (for control rod ejection, steam generator tube rupture and fuel handling accidents) have been evaluated to ensure that they are not impacted by this reload and the listed parameters are bounded by the current FSAR analysis. All of the cycle 12 nuclide activities (curies and micro-curies/gram) decreased relative to those for cycle 11. These activities are representative of the accident source terms. Since the source term is decreased from that analyzed and approved for cycle 11, the cycle 12 reload cannot increase the radiological consequences of analyzed accidents

In addition, the reload methodology contained in BAW-10179P-A contains design criteria for the fuel assembly and reactor core design. These criteria are also contained in the ITS, ITS Bases and/or FSAR and consist of the following:

The mechanical design and operation of the fuel assembly and control components must ensure that under all operating conditions the maximum credible damage will not degrade the design below those capabilities assumed in the safety analysis. This is ensured when the following three conditions are met: i) fuel rod cladding integrity is maintained, ii) control rod insertion path remains open, and iii) a coolable fuel rod geometry is maintained.

The design of the core must ensure that the fuel will not sustain damage as a result of normal operation or anticipated operational occurrences. Therefore, the fuel and cladding must be designed and operated with appropriate thermal margin to ensure that specified acceptable fuel design limits are not exceeded. This is ensured when the following criteria are met: i) the maximum local linear heat rate anywhere in the core must be limited so that centerline fuel melting will not occur, ii) there must be at least a 95% probability at a 95% confidence level that the hottest fuel rod will not experience a departure from nucleate boiling (DNB) condition, and iii) the transient cladding strain must be less than or equal to 1%.

Core power distributions must be precluded that would violate the following fuel design criteria: i) during a LOCA, the peak cladding temperature must not exceed a limit of 2200°F, ii) during a loss of forced reactor coolant flow, there must be at least a 95% probability at a 95% confidence level that the hot fuel rod in the core does not experience a DNB condition, iii) during an ejected rod accident, the fission energy input to the fuel must not exceed 280 cal/g, and iv) the control rods must be capable of shutting down the reactor with a minimum required shutdown margin with the highest worth control rod stuck fully withdrawn.

Cycle 12 was designed and analyzed to meet all of the above criteria. Appropriate limits have been established in the COLR to ensure the operation of the core is consistent with all requirements for normal operation and anticipated operational occurrences and with all initial conditions assumed in the accident analysis. This includes adding the more restrictive partial power MTC limit and accounting for increased heat balance uncertainty

at low power level. Since the design criteria are met and the accident analysis remains bounding, the consequences of accidents previously analyzed in the SAR are not increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The cycle 12 reload does not result in fundamental changes to system or equipment operation nor result in revised accident mitigation strategies. All equipment will continue to be operated as during cycle 11.

The only component affected by specific changes for cycle 12 is the BPRA. A BP rod low moisture pickup pellet was adopted and the upper and lower end caps were modified. These modifications were made in order to facilitate manufacturing process changes. The changes do not affect the form, fit or function of the BPRA. Neither the reactivity holddown characteristics nor structural integrity of the BPRA are adversely impacted in any way. This change does not introduce any new failure modes for the BPRA.

The fuel assemblies are also affected by the reload design. The reload methodology ensures that the fuel assembly mechanical design criteria are met which ensures that the fuel assembly structural integrity is maintained. In addition, the linear heat rate limits ensure centerline fuel melting will not occur, thereby maintaining the integrity of the fuel pellet. The DNBR and transient cladding strain criteria ensure that the fuel cladding integrity is maintained. Limiting the fuel enthalpy/fission energy input during a rod ejection precludes prompt fuel failure with no significant fragmentation and dispersal of fuel and cladding into the coolant. This also ensures the integrity of the reactor vessel is maintained following a rod ejection precluding further RCS failure.

Therefore, the probability of equipment failure, especially in the form of fuel assembly damage or control component damage, is not increased.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

Consequences of equipment malfunction, namely control rod malfunctions including stuck, dropped or ejected rods are bounded for cycle 12 by the design criteria and FSAR accident analysis limits. Limiting the ejected rod worth to within the analysis limits ensures:

- that fuel fragmentation does not occur, which maintains the consequences of a rod ejection accident;
- the consequences of a rod withdrawal accident remain bounded; and,
- dropped rod DNBR limits are maintained.

In addition, ensuring the limits on shutdown margin are met prevents a return to critical during a main steam line break ensuring fuel damage does not occur and limiting accident consequences to those previously analyzed. Again, all core design criteria have been met

by the reload methodology. Therefore, the consequences of equipment failure are not increased

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The reactor core itself is not an accident initiator. The cycle 12 core design ensures that all accidents remain bounded by the current analysis and, hence, existing accidents are not exacerbated by the new core design such that a new or different accident is created. For instance, the MTC at BOC hot full power remains negative ensuring an inherently stable core. In addition, the core has been shown stable with respect to axial xenon oscillations.

The cycle 12 changes, including changes to the COLR and various neutronics and thermal-hydraulics parameters, have been evaluated in accordance with the approved reload methodology. All acceptance criteria for mechanical design, nuclear design, and thermal-hydraulic design have been met. In addition, the changes in neutronics and thermal-hydraulic parameters have been evaluated and demonstrated to be bounded by those parameters utilized in the accident analyses contained in the FSAR. Since these changes were processed in accordance with the approved reload methodology, there is no functional impact. The cycle 12 core will operate safely and within all acceptance criteria. No new accidents are created

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The cycle 12 reload does not result in fundamental changes to system or equipment operation nor result in revised accident mitigation strategies. All equipment will continue to be operated as during cycle 11. In addition, no new fuel failure mechanisms are created which were previously determined to be not credible. No common mode failure mechanisms are introduced. All acceptance criteria for mechanical design, nuclear design, and thermal-hydraulic design have been met. Therefore, no new equipment malfunctions are created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS Bases contain the following margins of safety:

ITS 2.0 requires that the maximum local fuel pin centerline temperature shall be $\leq$ 5080-(6.5E-3) x (Burnup). In addition, the DNBR shall be maintained greater than the limits of 1.3 for the BAW-2 correlation and 1.18 for the BWC correlation. Operation within these limits is ensured by compliance with the axial power imbalance protective limits provided in the COLR. ITS B2.0 states, "Crystal River Unit 3 FSAR Section 1.4 Criterion 6 requires that acceptable fuel design limits are not exceeded during normal operation and anticipated operational occurrences (AOOs). The reactor core SLs are established to preclude violation of the following fuel design criteria:

a. There must be at least 95% probability at a 95% confidence level (95/95 DNB criterion) that the hot fuel rod in the core does not experience DNB; and,

b. The hot fuel pellet in the core must not experience fuel centerline melting.

The restrictions of this SL provide a high degree of protection against overheating of the fuel and cladding that would result in possible cladding perforation. Overheating of the fuel is prevented by maintaining the steady state peak linear heat rate (LHR) below the level at which fuel centerline melting occurs. Overheating of the fuel cladding is prevented by restricting fuel operation to within the nucleate boiling regime, where the heat transfer coefficient is large and the cladding surface temperature is slightly above the coolant saturation temperature." The cycle 12 core design generated LOCA linear heat rate limits to ensure the centerline fuel melt margin is preserved. In addition, the cycle 12 DNB design criterion is 1.40 thermal design limit (TDL) based on the BWC CHF correlation. The DNB impact of both of the change in core bypass flow and the change in fuel assembly grid design was specifically evaluated and found to be acceptable and within the DNB margin built into the 1.40 TDL.

ITS 3.1.1 requires the minimum shutdown margin limit to be 1.0% $\Delta k/k$. The limit in the COLR is equal to this limit. ITS B3.1.1 states, "The minimum required SDM is assumed as an initial condition in safety analysis. The safety analysis establishes an SDM that ensures specified acceptable fuel design limits are not exceeded for normal operation and AOOs, with assumption of the highest worth rod stuck out following a reactor trip. The acceptance criteria for SDM requirements are established to ensure specified acceptable fuel design limits are maintained. The SDM requirements must ensure that:

a. The reactor can be made subcritical from all operating conditions, transients, and design basis events;

b. The reactivity transients associated with postulated accident conditions are controllable with acceptable limits; and,

c. The reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition."

The cycle 12 core design utilized a 1.0% $\Delta k/k$ shutdown margin requirement when generating the rod insertion limits and evaluating the reactivity holddown capability of the control rod and boron addition systems. Therefore, the margin of safety of 1.0% $\Delta k/k$ is preserved.

ITS 3.1.3 requires that the MTC be maintained within the limits specified in the COLR. In addition, the maximum positive MTC is limited to $\leq$ 0.0 $\Delta k/k/°F$ at $\geq$95% RTP and $\leq$+0.9E-4 $\Delta k/k/°F$ at <95% RTP.

The cycle 12 value is -0.33E-4 Δk/k/°F at HFP and +0.31E-4 Δk/k/°F at HZP. The negative MTC limit provided in the COLR is -3.58E-4 Δk/k/°F which bounds the cycle 12 value of -3.33E-4 Δk/k/°F. (The negative limit used in the safety analysis is -4.0E-4 Δk/k/°F.) The MTC limit vs. core power envelope which has been added to the COLR ensures that partial power operation is bounded by the full power linear heat rate limits. This MTC envelope has been incorporated into reload specific maneuvering analyses and Framatone Cogema Fuels verifies that the predicted MTC for each reload is bounded. This change is consistent with ITS Bases 3.1.3 which states, "LCO 3.1.3 requires the MTC to be within specified limits in the COLR to ensure the core operates within the assumptions of the accident analysis." In addition, ITS B3.1.3 states, "The acceptance criteria for the specified MTC are: a. The MTC values must remain within the bounds of those used in the accident analysis; and b. The MTC must be such that inherently stable power operations result during normal operation and accidents, such as overheating and overcooling events." Since the negative and positive values of MTC for cycle 12 are bounded by the limits provided in the ITS and safety analysis, the margin of safety is preserved.

ITS 3.2.1, 3.2.2, 3.2.3, 3.2.4, and 3.2.5 contain limits on core power distribution. The actual values of these limits are cycle-dependent and have been placed in the COLR. The ITS Bases for these specifications states, "The fuel cladding must not sustain damage as a result of normal operation (Condition I) or anticipated operational occurrences (Condition II). The LCOs governing regulating rod insertion, APSR position, axial power imbalance, and QPT [and FQ and FNΔH] and preclude core power distributions that violate the following fuel design criteria: a. During a large break LOCA, the peak cladding temperature must not exceed 2200°F; b. During a loss of forced reactor coolant flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 DNB criterion) that the hot fuel rod in the core does not experience a DNB condition; and c. During an ejected rod accident, the fuel enthalpy must not exceed 280 cal/gm." The cycle 12 core has met all of the above design criteria. Therefore, the margin of safety associated with the core power distribution is preserved.

ITS B3.9.1 states, "The boron concentration limit specified in the COLR is based on the core reactivity at the beginning of each fuel cycle (the end of refueling) and includes a conservative uncertainty allowance of 50 ppm." In addition, ITS B3.9.1 indicates that the refueling boron concentration is required to maintain an overall core reactivity of keff ≤ 0.95 even if all control rods are withdrawn from the core. The refueling boron concentration for cycle 12 has been calculated in accordance with the methodology described in the ITS Bases and the reload methodology to ensure that keff is maintained less than or equal to 0.95 assuming all rods out. Therefore, the margin of safety associated with the refueling boron concentration is preserved

SA/USQD Number: 99-0353, Revision 2 **FSAR Change(s):** None

SA/USQD Title: Condition Resolution Report for Restart Issue D-22, PC96-3705, PC97-6222 and PC97-6928 Interim Use-As-Is Disposition of Cable Ampacity Concerns

Description

This USQD has been prepared to evaluate a design change consisting of exceptions to FSAR criteria and plant Electrical Design Criteria resulting from an "Interim Use-As-Is" disposition of the Condition Resolution Report that addresses Restart Issue D-22, and Precursor Cards 96-3705, 97-6222 and 97-6928.

The Condition Resolution Report combines two existing ampacity concerns at CR-3:

- The ten cables identified in Calculation E-91-0020 by Extent of Condition Case Study CSEH-97-0012A as not meeting the minimum ampacity requirements described in Section 8.2.2.11 of the FSAR or which impose special restrictions on cable tray fill.
- The 1158 cables in cable tray segments whose operating temperatures may have exceeded the insulation temperature rating of 90°C. The 1158 cables are identified in the extent of condition report Electrical Cable Operability Evaluation (Cable Ampacity Concerns).

The purpose of the Condition Resolution Report is to establish a disposition for "Interim Use-As-Is" of the cables in the plant until the end of March, 2000. This will provide time to develop a permanent resolution of the concerns about cable sizing, including revision of the plant Electrical Design Criteria and FSAR.

A permanent Electrical Design Criteria change will be developed prior to the end of March 2000. When completed, this Electrical Design Criteria change will be evaluated by a separate SA/USQD and will be accompanied by appropriate changes to the FSAR. In the interim, a Justification for Continued Operation will be documented.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The combination of the analyses, temperature measurements and physical examination of the cables demonstrates that there are no prematurely degraded cables in the plant as a result of electrical cable sizes not conforming to FSAR ampacity criteria, or as a result of the effect of Thermo-Lag fire barriers. Additionally, the analyses indicate that these cables will have qualified life remaining at the end of March 2000. Thus, there is no potential for these cables to degrade or adversely affect the performance of plant systems or equipment, and accepting the Interim Use-As-Is disposition will not increase the probability of the occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

The evaluations of the deficiency use a combination of analyses, temperature measurements, and physical examination of the cables to demonstrate that there are no prematurely degraded cables in the plant as a result of the exceptions to FSAR ampacity criteria, or the fire barrier material. Additionally, the analyses indicate that these cables will have qualified life remaining at the end of March 2000 and are capable of carrying rated loads under design basis conditions. Thus, the existing cables are fully capable of performing their safety functions, and accepting the Interim Use-As-Is disposition cannot increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The results of the analysis conclude that the cables have not undergone any appreciable degradation at approximately half-way through their design life. This indicates that the existing SAR and engineering design criteria are conservative and sufficient margin exists in the original design to justify continued use of these cables through March 2000 without any clearly discernible increase in risk. Therefore, the interim acceptance of these cables for continued operation cannot increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The combination of temperature measurements, physical examination, and analysis have shown that the existing cables are not degraded and will be suitable for operation beyond the end of March, 2000. Thus there is no effect on the operability of equipment important to safety.

Since the cables installed in the plant have not been prematurely degraded, their condition and operating parameters are consistent with those assumed in the original SAR. Thus, the cause and types of system and equipment failures will not be changed, nor will the capability of mitigating systems be changed. Therefore, the disposition of the deficiency cannot increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The system and equipment failures evaluated in the SAR are generic and thus implicitly include the failures that could be initiated by cable failures. A disposition for the Interim Use-As-Is of the existing cables does not introduce any new mechanism for cable degradation or new type of cable failure. There are no changes in plant systems or operating procedures, nor are there any new interfaces created between systems and equipment. Therefore, the design change for exceptions to cable sizing criteria cannot

create the possibility of an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

A disposition for the Interim Use-As-Is of the existing cables does not introduce any new mechanism for cable degradation or new type of cable failure. Since there is no change in the possible types of cable malfunctions the disposition does not result in any new type of plant system or equipment malfunctions. Further, there are no new interfaces created between systems and equipment. Therefore, the disposition cannot create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The bases for the Improved Technical Specifications do not mention cable ampacity.

The evaluations have shown that the electrical cables will be in better condition at the end of March 2000 than would be assumed for the worst case cable at the end of plant life. Thus the design margin for the cables will be greater than would have been assumed to exist at the end of plant life. In addition, the Bases for the Technical Specification do not mention electrical cables, cable sizing, or ampacity. Therefore, the disposition will not reduce the margin of safety as defined in the bases for any Improved Technical Specification.

SA/USQD Number: 99-0382, Revision 0 **FSAR Change(s):** Section 6.1.3.2 and Table 6-12

SA/USQD Title: Calculation M90-0021, Revision 11; FSAR Change 1999-0132
Building Spray and Decay Heat Net Positive Suction Head $_{a/r}$

Description

Results of Calculation M90-0021, Building Spray (BS) and Decay Heat (DH) Net Positive Suction Head (NPSH) $_{a/r}$, Revision 11 changed the calculated $NPSH_r$ for the Building Spray pumps and Low Pressure Injection (LPI) pumps. Changes to FSAR Section 6.1.3.2, Table 6-12 and the enhanced design bases document (EDBD) for the DH system were required to incorporate the results of the calculation. LPI flow was changed from 2200 gpm to 2000 gpm and clarifications were made to the maximum flow through an LPI pump in FSAR Section 6.13.2. The altered BS and LPI $NPSH_r$ (increased by .3 and .1 feet respectively) and BS flow rates (increased by 33 gpm) were incorporated into Table 6-12. These same changes were made to the EDBD.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The Building Spray and LPI pumps do not initiate any SAR accidents. Therefore, a change to the NPSH requirements of these pumps cannot increase the probability of occurrence of an accident in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Changes to the NPSH requirements of the BS and LPI pumps and increasing the BS recirculation mode flow rate did not reduce the capabilities of either system. As long as adequate NPSH exist the pumps will operate as designed. The increase in assumed BS flow still ensures that the design requirement of 1000 gpm is achieved. No changes to an SSC is required and since the BS and DH systems can perform there required functions the post accident analysis evaluated in the SAR remains unchanged. Therefore the consequences of an accident previously evaluated in the SAR will not increase.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The proposed changes will not increase the failure probability of a BS or LPI pump. The probability of occurrence of a malfunction was based on the pumps operating with $NPSH_r$ and $NPSH_a$. Since the calculated $NPSH_r < NPSH_a$, the probability of a malfunction has not increased.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The FSAR and EDBD changes do not change the BS or LPI systems or alter the way they respond to or operate during an accident. The increase in the calculated maximum flow rate (1359 gpm) of BS in recirculation mode is still bound by the minimum analyzed flow rate of 1000 gpm. The increases in $NPSH_r$ do not exceed the $NPSH_a$ calculated level and therefore the pumps are assumed to operate as designed. A failure of a pump is already bounded by the assumed failure of a train and the consequence of such a failure is unchanged. Therefore, the consequences of failure have not increased.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Since the change does not add or change any system interfaces, and operation/function of the BS or LPI pumps and systems are unchanged it cannot create the possibility of an accident of a different type.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The latest revision of M90-0021 determined the required NPSH of the LPI pumps to be slightly higher than previously thought. Even with the slight increase there is still sufficient NPSH available for pump operation. Since proper pump operation is maintained and no system or operating alterations have been made there is no increase in the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

ITS B3.5.4 states the following:

> "...When ECCS pump suction is transferred to the sump, there must be sufficient water in the sump to ensure adequate net positive suction heat (NPSH) for the LPI and RB spray pumps."

The calculated increase of the required NPSH has not changed the amount of water that will accumulate in the sump post-accident. $NPSH_r$ is still less than $NPSH_a$ and therefore adequate NPSH is still available to the LPI and BS pumps. As long as this condition exists, the LPI and BS systems will perform their safety functions as previously analyzed and will maintain the margin of safety (sufficient NPSH) as described in the bases.

SA/USQD Number: 99-0384, Revision 0 **FSAR Change(s):** None

SA/USQD Title: MAR99-09-01-01
Impact on CR-3 to Replace 230kv Switchyard ATB Breakers

Description

This Design Activity replaces all twelve existing 230kv switchyard ATB (air blast arc snuffer) circuit breakers with an updated, more reliable design. Project design is being done by FPC's Relay Design group, and installation is being performed by substation maintenance crews. The only work at CR-3 will involve rewording events recorder points to reflect the configuration of the new breakers, and determination of a circuit being spared from Breaker 1692's breaker failure scheme.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

Loss of Offsite Power (LOOP) alone is not a Chapter 14 accident; however, it can initiate a Loss of Coolant Flow accident as noted in FSAR 14.1.2.6. Since the result of this activity is increased reliability of the 230kv switchyard, the probability of this accident is decreased by this activity.

ITS LCOs (ref. Section 3.8.1) require an action statement entry on loss of either qualified offsite power source (both powered from the 230kv switchyard). Complete LOOP will trip the reactor and start at least one of the EDGs. The activity under consideration will decrease maintenance of switchyard circuit breakers (fewer challenges to ITS LCOs) and increase the reliability of the 230kv switchyard (less chance of LOOP). Increased switchyard reliability will contribute to CR-3's ability to prevent and mitigate accidents, as well as resulting in fewer plant transients caused by LOOP.

Station blackout (LOOP + failure of both EDGs) is an evaluated Chapter 14 accident. Since the switchyard is being made more reliable by this activity, there is no increase in the probability of occurrence of this accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

This activity will change 230kv switchyard breakers to a more reliable design. Otherwise, the breakers will perform the same function in the same manner as before. Their installation will be transparent to Operations (with the exception of "renamed" Events Recorder points). All reliability considerations as described in the FSAR are unchanged by this activity, and overall breaker failure clearing times of the new breakers (with high speed auxiliary relays) is better than the old. Even though LOOP is not an accident

evaluated in the SAR, some accidents are evaluated coincident with LOOP. These accidents are mitigated by the EDGs, and this activity has no affect on the EDGs. Since all characteristics and consequences of LOOP will be the same as before (even though the chance of its occurrence is decreased), there is no increase in the consequences of an accident previously evaluated in the SAR

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

This activity will install more reliable breakers in the 230kv switchyard, decreasing the maintenance required on CR-3's BEST transformer feeder breakers, and generally increasing the reliability of the switchyard. The "reliability considerations" described in section 8.2 of the FSAR are not affected by this activity. A particularly destructive switchyard accident scenario (three-phase fault near/in the switchyard with breaker failure) is being made more unlikely because of the increased tripping reliability and "trip on breaker failure" characteristic of the new breakers. These factors all contribute to a decrease in the probability of occurrence of a malfunction of equipment important to safety (qualified offsite power supplies).

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The replacement breakers being installed by this activity will perform the same function in the same manner as the original breakers. They are transparent to the flow of power through the switchyard and to CR-3 operators (except for nomenclature changes on Events Recorder points). Switchyard configuration and characteristics are not being changed. Primary and backup relaying logic and setpoints are the same as before; breaker failure clearing time is slightly improved from the addition of high speed auxiliary relays to the trip schemes. Therefore, malfunction of the new equipment (short circuit, open circuit, breaker failure to any mode) will have the same consequences as before.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The replacement circuit breakers being installed will perform the same function in the same manner as before. No modification is being made to switchyard configuration or characteristics which could affect existing failure modes or create a new one. Breaker failure can only cause LOOP, and the FSAR already evaluates the consequences of LOOP with some accident scenarios. The characteristics of LOOP (power loss) are not being changed by this activity. Therefore, there is no possibility of a new accident type being created by this activity.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The activity replaces some old and relatively unreliable 230kv switchyard breakers with more modern, reliable design. The new switches perform the same function in the same

manner in all modes as the old. Their design requirements are to carry current when closed and to isolate the circuit when asked to open. The new breakers require less maintenance and will perform these functions more reliably than the old. The breaker failure modes and malfunctions (short circuit, failure to close, failure to open, fail open, fail closed) are the same for the new breakers as the old, and have identical consequences (degraded switchyard voltage). The possibility of the breakers failing to open is decreased, since the new breakers trip before failure of arc snuffing equipment (SF6 pressure decreasing below setpoint). The new breakers do not have any new failure modes, and in fact, by design eliminate the high-pressure air system whose unreliability could cause the old breakers to fail to open. Protective relaying is the same, as well as the setpoints for that relaying. Therefore, this activity cannot create the possibility of a different type of malfunction of equipment important to safety than previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS Bases do not define a margin of safety for the breakers being changed by this activity. The required quantity of offsite power circuits is not being changed, and their reliability is being improved. The new breakers perform the same function in the same manner as the old. Protective functions or setpoints are not being changed. The new breakers are more reliable than the old, reduce maintenance requirements which could cause challenges to the ITS LCOs (ITS 3.8.1), and contribute to increased reliability in the switchyard (CR-3's qualified source of offsite power under power operation). Therefore, the margin of safety cannot be decreased by this activity.

SA/USQD Number: 99-0410, Revision 0 **FSAR Change(s):** None

SA/USQD Title: PC99-3321
Condition Resolution Report for Damaged Fuel Assembly Grids

Description

This USQD analyzes the acceptability of dispositions to non-conformances related to fuel assembly grid damage observed during Refueling Outage 11 (11R). The non-conformance dispositions evaluated herein are Interim Use-As-Is and Repair since the assemblies will be reinserted into the core in a degraded condition.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The activity evaluated by this USQD is the use of fuel assemblies with damaged grid corners, which is a degraded condition. No credible failure modes can be attributed to the proposed changes. All accidents analyzed in the FSAR that affect fuel assemblies are initiated by means not relative to the fuel itself, result in loads or impact on the fuel, or require fuel to perform in some manner to limit the consequences of the event. Use of these fuel assemblies cannot initiate an accident nor be a precursor of any accident previously evaluated in the FSAR. Therefore, the proposed changes do not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The Fuel Handling Accident has already been analyzed and determined that the worse case radiological consequences are still well within 10 CFR 100 limitations. Use of the degraded fuel assemblies has no means to increase the analyzed consequences. Therefore, an increase of the consequences of an accident previously evaluated in the SAR is not credible.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   No new failure modes may be attributed to this activity. The fuel assembly spacer grids are passive equipment important to safety. Industry experience has shown that use of these damaged fuel assemblies with minor or moderate damage when appropriately positioned if necessary do not lead to fuel damage. Care is taken in the disposition of fuel assembly grid damage that the fuel assembly will continue to perform its required function. Therefore, a malfunction of equipment important to safety previously evaluated in the SAR is not credible.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

No new failure modes are created by this activity. The disposition of damaged fuel assembly grids will consider aspects that could lead to further damage (e.g., orientation away from the baffle wall, etc.) and therefore will preclude further damage. Existing accident analyses are not impacted. Therefore, an increase in radiological consequences due to a malfunction of equipment important to safety is not feasible.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Though the fuel assemblies will be reinserted into the core in a degraded condition, no new accident scenario is possible as a result of this activity. Therefore, the reuse of fuel assemblies with damaged grids has no means to create an accident of a different type than previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

No additional failures of the fuel assembly grids are anticipated during the next cycle. No new failure modes are created. Therefore, the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR will not occur.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The Improved Technical Specifications govern refueling operations (Reference 4). Neither the ITS nor the Operating License mandate specific requirements for fuel assemblies. The proposed changes in no way will prevent the refueling activities from satisfying ITS requirements. Margins of safety found in other SERs or other commitment documents such as implied commitments to the Standard Review Plan (SRP), Nuclear Regulations (NuRegs), Offsite Dose Calculation Manual (ODCM), Core Operating Limits Report (COLR), etc., cannot be reduced as a result of this activity. Therefore, the margin of safety as defined in the bases for any Technical Specification will not be reduced by the implementation of the proposed changes.

SA/USQD Number: 99-0424, Revision 0 **FSAR Change(s):** Table 8-1

SA/USQD Title: Calculation E91-0026, Revision 4; EDBD TC 1121; FSAR1999-0133 Revision to FSAR Table 8-1 and EDBD Tab 6/15

Description

FSAR Table 8-1 is being revised to incorporate major Refuel 11 modifications and other load changes that have occurred since this table was last revised during Design outage 11D. This revision is based on recently revised EGDG-1A loading calculations.

Enhanced Design Bases Document (EDBD) Tab 6/15, section 3 is being revised to better describe the limitations on Emergency Diesel Generator ratings. A note is being added to say that the time spent in one rating affects the time available in the other ratings.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The EGDG-1A loading calculations were performed to evaluate EGDG-1A loading under previously evaluated accident scenarios. No new accident scenarios are being created by this evaluation. Loading changes are being incorporated into various previously evaluated accident scenarios. The resulting loading was evaluated to be within the ratings, FSAR, ITS and vendor specified limits of the EGDG-1A. The results of this evaluation for the worst case accident scenario are being summarized in Table 8-1. Therefore, this activity does not increase the probability of occurrence of an accident previously evaluated in the SAR.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The proposed activity did not increase the consequences of an accident previously evaluated in the SAR because the loading remained within the bounding limitations of EGDG-1A and its driven equipment. Therefore, the consequences of an accident previously evaluated in the SAR are not increased.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The recently issued EGDG-1A loading analysis has shown that EGDG-1A can meet the required electrical power needs while staying within its own design basis and keeping the driven equipment within its design basis under worst case accident conditions. Hence, the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR was not increased.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

There are no functional or physical changes being made to EGDG-1A or its driven equipment. In fact, the loading on EGDG-1A is being reduced. The recently issued EGDG-1A loading analysis has demonstrated that EGDG-1A can meet the required electrical power needs while staying within its own design basis and keeping the driven equipment within its design basis. Therefore, the consequences of a malfunction of equipment important to safety previously evaluated in the SAR are not increased.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

There are no functional or physical changes being made to EGDG-1A or its driven equipment. Only loading evaluation of EGDG-1A is being conducted. In fact the loading on EGDG-1A is being reduced. The recently completed EGDG-1A loading analysis demonstrated that EGDG-1A can meet the required electrical power needs while staying within its own design basis and keeping the driven equipment within its design basis. Based on this conclusion of the revised EGDG-1A loading calculation, the possibility of an accident of a different type than any previously evaluated in the SAR is not created.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The EGDG-1A loading calculations consider all modes of plant operation, design basis accidents, design basis events and Licensing basis events. The loading was found acceptable for all these events. Loading evaluation in itself does not create the possibility of a different type of malfunction of equipment important to safety than previously evaluated in the SAR. Therefore, the possibility of a different type of malfunction of equipment important to safety than previously evaluated in the SAR is not created.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The recently issued EGDG-1A loading calculations have shown that the margin of safety as defined in ITS basis 3.8.1 is either maintained or improved. Therefore, the margin of safety as defined in the bases for any improved Technical Specification is not reduced.

SA/USQD Number: 99-0425, Revision 0 **FSAR Change(s):** None

SA/USQD Title: FS-106, Revision 5
Temporary Change to Fuel Assembly Manual Post-Irradiation Examination Procedure, Revision 5

Description

Temporary changes are made to FTI fuel inspection procedures related to hold down spring deflection testing to allow for plastically setting the holddown springs to reduce the preload on select new and once-burned assemblies. The controls ensure minimum preloads will continue to be met, but will reduce the potential for guide tube deformation.

The cold set evaluation reviews the effects of the cold setting operation of Mark-B 10 cruciform holddown springs. The results of the evaluation show that holddown spring assemblies cold set in first burn and fresh fuel assemblies during the outage will continue to meet their structural, holddown, and interface requirements. The material evaluation concludes that there remains adequate ductility to withstand the additional strain of cold setting without cracking and the additional coldworking will not change the irradiation relaxation characteristics nor reduce the resistance of the material to intergranular stress corrosion cracking.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   There is no increase in the probability of occurrence of any accident previously evaluated in the SAR. The fuel handling accident is discussed above. There is no increase in the probability of occurrence of the fuel handling accident because the assembly remains in the rack during the evolution, grapple attachments to the UEF and UEF loads remain allowable during/following the cold set. Once the spring is reset, the fuel assembly restraint requirements will continue to be met. The component associated with this change (cruciform leaf holddown spring) is not an accident initiators. There are no accidents, transients or upset conditions initiated upon failure of the component.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   There is no increase in the consequences of any accident previously evaluated in the SAR. Based on the results of the Framatome Cogema Fuel analyses in references 2.5, 2.6, 2.7 and 2.8 the fuel assembly remains within design limits and plant operation (4th pump start) is unaffected by a reduction in spring holddown force. There is no change in the fuel assembly activity or curie content as a result of this activity.

3. Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR? No

There is no increase in the probability of occurrence of any malfunction of equipment important to safety previously evaluated in the SAR. The fuel handling accident is discussed above. There is no increase in the probability of occurrence of equipment important to safety because the assembly remains in the rack during the evolution, grapple attachments are to the UEF and UEF loads remain allowable during/following the cold set. The component associated with this change (cruciform leaf holddown spring) is not an accident or malfunction initiator. There are no accidents, transients, malfunctions or upset conditions initiated upon failure of the component.

4. Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR? No

There is no increase in the consequences of any malfunction of equipment important to safety previously evaluated in the SAR. Based on the results of the Framatome Cogema Fuel analyses in references 2.5, 2.6, 2.7 and 2.8 The fuel assembly remains within design limits and plant operation (4^{th} pump start) is unaffected by a reduction in spring holddown force. There is no change in the fuel assembly activity or curie content as a result of this activity. Since all fuel design requirements are met following implementation of the cold set, there is no impact on the core coolable geometry.

5. Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR? No

There is no increase in the possibility of occurrence of an accident of a different type because the assembly remains in the rack during the evolution, grapple attachments are to the UEF and UEF loads remain allowable during/following the cold set. The component associated with this change (cruciform leaf holddown spring) is not an accident initiators. There are no accidents, transients or upset conditions initiated upon failure of the component. All fuel design requirements are of the fuel are met after the implementation of the change.

6. Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR? No

There is no increase in the possibility of any different type malfunction of equipment important to safety than previously evaluated in the SAR. There is no increase of possibility of any different type malfunction of equipment important to safety than previously evaluated in the SAR because the assembly remains in the rack during the evolution, grapple attachments are to the UEF and UEF loads remain allowable during/following the cold set. The component associated with this change (cruciform leaf holddown spring) is not an accident or malfunction initiator. Following the activity the fuel assembly meets all design requirements. There are no accidents, transients, malfunctions or upset conditions initiated upon failure of the component.

7. Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification? No

Following the completion of the cold set of the cruciform leaf holddown spring, the fuel assembly will continue to meet all design requirements. There are no changes in the: reactivity, flow, hydraulic, cooling, accident response, DNB/CHF or coolable geometry characteristics of the fuel assembly due to this activity. Therefore, there is no reduction in the margin of safety as defined in the ITS.

SA/USQD Number: 99-0433, Revision 0 **FSAR Change(s):** None

SA/USQD Title: MP-499, Revision 19; ITS Bases Change B99-28
EDG Overspeed Trip Point Acceptance Criteria Change for MP-499

Description

CR-3 Emergency Diesel Generator (EDG) trip setpoints were recently revised upward in response to a re-evaluation of a vendor Service Information Letter. EDG overspeed trip point acceptance criteria are being set back down (still well within the historical range for CR-3's EDGs) to reduce the potential for equipment problems and failures as a consequence of overspeed trip testing.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   Reducing the overspeed trip point acceptance criteria for the EDGs does not affect their safety function or normal mode of operation. The only impact is to reduce the stresses the engines experience during periodic overspeed trip testing. Since the EDGs are an accident mitigation system (they do not initiate any accident before or after this change in the trip point acceptance criteria), this activity cannot increase the probability of an accident previously evaluated.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   Reducing the overspeed trip point acceptance criteria for the EDGs does not affect their safety function or normal mode of operation. The only impact is to reduce the stresses the engines experience during periodic overspeed trip testing. Their capability to mitigate accidents is unchanged; testing has shown that overspeed caused by load shedding and fast start for accident mitigation is still will below the lower bound of the new trip point acceptance criteria [note that the "new" trip setpoints (1005-1025 RPM) are still within CR-3's historical acceptance range until R11 refueling outage (990-1053 RPM)]. Any postulated common mode increase in spurious tripping caused by the lower trip point is offset by equipment reliability gains (reduction in possibility of unpredictable catastrophic failure) from the reduced stresses during periodic overspeed trip testing. Therefore, this activity will not increase the consequences of an accident previously evaluated.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   Each EDG is provided with an engine overspeed trip device to prevent damage to the engine in the event of a failure in the engine governor and/or the fuel injection system.

Periodic testing has demonstrated the EDG engine and governor response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency values while maintaining a suitable margin from the overspeed trip point. CR-3 has operated since initial service with EDG overspeed trip setpoint range from 990-1053 RPM; a revision just prior to R11 refueling outage changed it to 1035-1053 RPM. The re-establishing of the overspeed trip points acceptance criteria for both EDGs to 1005-1025 RPM will reduce the possibility that overspeed testing can be a contributing factor to future EDG equipment problems or failures, and still be well within historical criteria, with no history of nuisance trips from overspeed during fast start or operational transients with tested overspeed trips as low as 1015 RPM.

Past operation and testing have shown that the EDGs at CR-3 do not approach the proposed overspeed trip points for anticipated transients during fast starts, accident conditions, or design basis events; therefore this activity does not increase the probability of occurrence of a malfunction of equipment important to safety as evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The failure modes applicable to the overspeed trip are failure to trip the diesel at the specified setpoint and tripping prior to reaching the specified setpoint. These failures could occur during or after governor control system failure, "fast starts" or upon loss of load during operation. For the case of failure to trip at the specified setpoint, the diesel engine could experience a catastrophic failure in which mechanical parts of the engine could break or overheat to the point of failure. This would result in the subject diesel being inoperable, and the redundant diesel would be required to safely shut down the plant. For the second case of tripping prior to reaching the specified setpoint, the diesel would remain intact, but could not be relied upon to perform its safety function in a timely manner. The redundant diesel would remain unaffected.

The consequences of failure of one EDG have been evaluated previously in the SAR, and this trip point acceptance criteria change does not increase those consequences.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

Since the EDGs are an accident mitigation system (they do not initiate an accident of any type before or after this change in the trip point acceptance criteria), changing the overspeed trip point acceptance criteria cannot increase the possibility of an accident of a different type than any previously evaluated.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

The proposed change in the overspeed trip point acceptance criteria does not change the function of the overspeed trip device nor does it change the function or functionality of the emergency diesel generators. The change only results in accepting operation of the

overspeed trip device at speeds somewhat lower than the previous (recently revised) acceptance range. The change will be well within historical limits for EDG overspeed trip setpoint range at CR-3, and will not impact the ability of the emergency diesel generators to perform their safety function since there is sufficient margin between the worst case design transients and the new lower trip point. Thus, the change will not create the possibility of any different type of malfunction of the emergency diesel generators or any other equipment important to safety.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The ITS Bases SR 3.8.1.8 specifies that the EDGs are acceptable if the increase in engine speed following rejection of the largest single load does not exceed 75 % of the difference between synchronous speed and the overspeed trip setpoint. The maximum speed following rejection of the largest single load for the CR-3 emergency diesel generators is 924 RPM (61.6 Hz) and the proposed trip point acceptance range is 1005 to 1025 RPM (67 to 68.3 Hz). The maximum transient speed (22.9%) does not exceed 75% of the difference between synchronous speed and the minimum acceptable overspeed trip point. Thus, the margin is greater than that defined in the bases for the Improved Technical Specifications.

SA/USQD Number: 99-0446, Revision 2 **FSAR Change(s):** None

SA/USQD Title: PC97-8358
Condition Resolution for Interim Use-As-Is of Circuit Breaker 3341

Description

This USQD has been prepared to evaluate a Condition Resolution Report disposition for Interim-Use-As-Is of the setting of circuit breaker MTSW-3F-3D (breaker 3341). This circuit breaker provides power to safety related motor control center MTMC-3 (ES MCC 3A1). This disposition temporarily changes the circuit breaker setting criteria to accept a circuit breaker setting that has less than the normal design margin between the maximum steady state load current and the long-time amperage trip point setting of the circuit breaker.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   There are no accidents evaluated in the FSAR that are initiated by the action, or failure of, a 480 Volt Auxiliary System circuit breaker. Thus, the design change to accept the existing setting of the circuit breakers cannot increase the probability of the occurrence of an accident previously evaluated in the SAR

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The safety function of the circuit breakers is to maintain power to the motor control centers during a design basis event to power other accident migration equipment. The evaluation of the change to the circuit breaker setting criteria has demonstrated that the MCC feeder circuit breaker will not trip open for the worst case design basis event loading. Since the MCC feeder circuit breaker has been demonstrated to be capable of performing its safety function, there will be no change in the inputs or results of any existing accident analyses as the result of this change in criteria. Thus, the change will not increase the consequences of an accident previously evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

   The safety function of the circuit breakers is to maintain power to the motor control centers during a design basis event to power other accident migration equipment. The change in criteria to accept the existing setting of the long-time amperage trip point setting will require the long-time delay setting to prevent a trip during the operation of the motor operated valves in addition to preventing a trip during motor starting. Since this is not a change in the function of the delay element, but rather only a change in the amount of time

before the long-time ampacity trip is de-activated, there is no change in the possible failure modes.

Similarly, the change in criteria to accept the existing long-time amperage trip point setting does not increase the probability of any of the previously existing failure modes. Changing the criteria for long-time amperage trip point setting only changes the margin between the time-current profile for which the circuit breaker will trip and the worst case profile. Even with this change a substantial margin remains between the amperage and time required to trip the circuit breaker and the maximum transient amperage and time for the worst case design basis event loading.

Thus, the change to accept the existing setting of the circuit breaker overcurrent trip setting does not change the probability of de-energizing the motor control centers during a design basis event. The evaluation of the change to the circuit breaker setting criteria has demonstrated that the MCC feeder circuit breaker will not trip open for the worst case design basis event loading. There is no increase in the probability of a malfunction in the circuit breaker due to the existing long-time amperage point setting.

Therefore, the change to accept the existing circuit breaker trip settings will not increase the overall probability of the occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The change to accept the existing circuit breaker trip setting does not change the failure modes of the circuit breaker. If the circuit breaker overcurrent trip device malfunctions by spuriously tripping, the consequences are the same regardless of the setting. Similarly, if the overcurrent trip device malfunctions by failing to trip when exposed to excessive current the consequences are the same regardless of the setting. Thus, a change in the setting criteria for the circuit breaker overcurrent device does not increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The spurious tripping of a circuit breaker feeding a motor control center during normal plant operation will not result in an accident of a different type than previously evaluated because the loss of power to a complete train of equipment has already been evaluated. The failure of a circuit breaker to trip in the event of a fault can, in the extreme, result in a fire and fires are an event previously evaluated. Therefore, the change to increase the circuit breaker trip setting cannot create the possibility of an accident of a different type than any previously evaluated in the SAR.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

There is no change in failure modes. No new or different equipment is being added to the plant and the various credible malfunctions of circuit breaker trip devices are implicitly evaluated in the SAR by the consideration of electrical system failures. Therefore the change to accept the existing trip setting of the circuit breaker will not create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The Bases for the Improved Technical Specifications do not mention 480 volt circuit breaker settings nor do they imply any specific margin of safety or operating margin regarding these circuit breaker settings. The normal industrial practice is to set the overcurrent trip devices to about 115% of the maximum continuous expected load current. The maximum continuous expected load current is 412.9 amperes and the existing setting is 480 amperes. Thus, the existing setting is 116% of the maximum continuous expected load and therefore meets this criteria.

ES MCC 3A1 is somewhat unique, due to the rather large short term load that can be experienced during a design basis event. The load during a design basis event includes 412.9 amperes of continuous load plus 119.4 amperes of short term load. During a design basis event, circuit breaker 3341 will have to allow 532.3 amperes to pass through to ES MCC 3A1 for a short period of time without tripping open. The 532.3 amperes will be above the long-time amperage trip point setting of 480 amperes. The long-time delay portion (and setting) of circuit breaker 3341 will have to accommodate the time necessary for the short term amperage to be passed through to the MCC after which the amperage will return to the continuous 413 amperes.

To avoid relying on the long-time delay to prevent tripping during this short term loading by MOVs, normal engineering practice is to select a long-time amperage trip point setting that is at least 111% of the expected worst case load due to block loading of motor operated valves. A setting of greater than 111% will ensure that the current does not reach 90% of the circuit breaker long-time amperage trip point setting. This would then ensure that circuit breaker long-time delay only needs to prevent circuit breaker tripping during motor starting.

This design change accepts a long-time amperage trip point setting that provides less than the normal design margin while the motor operated valves are operating. However, the evaluation has shown that with the existing setting, the long-time amperage trip point setting will be de-activated when only 52% of the I^2t needed to trip the circuit breaker has been accumulated. Thus, the circuit breaker will not trip during this short time load due to the existing long-time delay setting. Therefore, this change does not reduce the margin of safety as defined in the bases for any improved Technical Specification.

SA/USQD Number: 99-0474, Revision 0

FSAR Change(s): Sections 1.4.11, 2.2.3, 7.4.5, 7.6, 9.7.3, 9.7.4, Table 9-15, 14.2.2.5.10, Table 14-52, Table 14-54 and Figure 14-67

SA/USQD Title: License Amendment Request 222 (3F1297-19); License Amendment 185 (3N0899-13); PC97-4355; PC99-0164; FSAR Change 1999-0147 CREVS and Ventilation Filter Testing Program (Control Room Habitability)

Description

The only aspect of the FSAR changes that requires a USQD is the correction to the quoted face velocity in Table 9-15 for the control room ventilation system charcoal filters. These filters are taken credit for in calculating the control room operator dose for the MHA (LBLOCA), the Fuel Handling Accident, a Letdown Line Rupture and a Steam Generator Tube Rupture. The face velocity for these filters is only related to the assumed and verified iodine removal efficiency for the filters. There are no failure modes associated with this parameter, as it is well below flows at which structural damage would be a consideration.

The importance of face velocity for charcoal filters is to ensure sufficient residency time of the process flow in the charcoal media. This is to ensure adequate time for adsorption of iodine by the filter media to meet the required efficiency. Regulatory Guide 1.52, Rev. 2, provides a design guideline of an average residence time of 0.25 seconds for a 2 inch thick bed. This corresponds to a face velocity of 40 ft/min. The CREVS charcoal filters were designed to meet this guidance, and have a nominal face velocity of 40 ft/min.

The assurance that installed charcoal meets the efficiency assumptions of the design basis dose calculations is demonstrated by the periodic laboratory tests of the charcoal. These tests have been performed at the specified test face velocity of 40 ft/min. Therefore, meeting the test acceptance criteria for removal efficiency will ensure that the filters meet the assumed efficiency in the dose calculations at a face velocity of 40 ft/min.

Unreviewed Safety Question Determination (10 CFR 50.59)

1. **Could the proposed activity increase the probability of occurrence of an accident previously evaluated in the SAR?** No

   The proposed change is simply a correction. The new value is consistent with the design of the CREVS filters. There are no physical changes to the plant, or to any plant procedures. Therefore, the change cannot increase the probability of an accident.

2. **Could the proposed activity increase the consequences of an accident previously evaluated in the SAR?** No

   The change to 40 ft/min is consistent with the actual design and with the efficiency testing that has been performed to date. Therefore, the change does not affect the assumed

efficiency of the charcoal filters in the dose calculations. Therefore, the change cannot increase the consequences of an accident as evaluated in the SAR.

3. **Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR?** No

No actual changes to equipment or procedures are made as a result of the proposed changes. The changes simply make the FSAR consistent with actual design. The noted face velocity is well below the flow at which structural damage might be expected. Therefore, these changes cannot affect the probability of a malfunction of equipment important to safety.

4. **Could the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the SAR?** No

The proposed change is related to the actions and consequences following an accident, not a direct malfunction. Therefore, the discussion on increased consequences of an accident above would bound any consequence effect from a specific malfunction and hence, there would be no increase in consequence of a malfunction of equipment important to safety.

5. **Could the proposed activity create the possibility of an accident of a different type than any previously evaluated in the SAR?** No

The CREVS filters are not components that can initiate an accident. The changes do not affect any equipment that would be a precursor to an event. Hence, the changes cannot create the possibility of a different type accident.

6. **Could the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the SAR?** No

No actual changes to equipment or procedures are made as a result of the proposed changes. The changes simply make the FSAR consistent with actual design. The noted face velocity is well below the flow at which structural damage might be expected. Therefore, these changes cannot create the possibility of a new malfunction.

7. **Could the proposed activity reduce the margin of safety as defined in the bases for any Improved Technical Specification?** No

The Bases to Section 3.7.12 discuss the ability of CREVS to maintain the control room habitable. As discussed above, the revised value for face velocity is consistent with the design and analyzed capability of the filters. Hence, there can be no decrease in the margin of safety.