REFERENCE DOCUMENT No. M-049284 Doc. Rev. No. 0
(i.e., indicate the Procedure Number, DCP Number or other reference document for which the Screen is done, including the document revision number or date).

Reference Document Title Pressurization of the Unit 1 CCW Surge Tank

Sponsoring Organization Mechanical Engineering Sponsor Michael W Hicks
(Print)

DESCRIPTION

Summarize the proposed activity, CTE or existing problem and how it differs from the presently approved condition. The reason for the proposed activity or CTE should also be described. Cite applicable drawings and other documents as necessary to describe the current condition. Briefly describe how the issue may interface with the licensing basis (documents).

This LBIE addresses a modification to DCPP Unit 1 to pressurize the Component Cooling Water (CCW) system using a N_2 or air blanket on the CCW surge tank. Presently, the surge tank is vented to atmosphere through RCV-16, which is designed to close and isolate the tank in the event of radioactive in-leakage to the CCW System to prevent any radiological release to the environment.

The purpose for this modification is to provide sufficient static head on the Containment Fan Cooler Units (CFCUs) in order to prevent CCW flashing during a postulated Large Break Loss of Coolant Accident (LBLOCA) coincident with a Loss of Offsite Power (LOOP). Although FSAR Update Sections 6.2.2.3.1(2) and 9.2.2.2.7 state that CCW fluid is not expected to flash in a post-LOCA environment due to sufficient dynamic head provided by the CCW pumps, recent investigations into the potential for CFCU flashing have preliminarily shown that flashing may occur during the first minute following a LBLOCA with LOOP. The analysis which predicts flashing of the CCW fluid is based on the timing and coastdown of the CCW pumps and CFCUs as they are stripped from the 4-kV bus and reloaded to the Emergency Diesel Generators (EDGs), peak containment temperatures for a LBLOCA, initial CCW supply temperature, and static head on the CCW fluid in the CFCUs during the period when CCW System flow stops. As the CCW pumps are restarted on the EDGs and cold water reaches the potential steam space in the CFCU lines, a severe water hammer could occur and cause loss of pressure boundary integrity of the CCW System. By pressurizing the CCW System to at least 17 psig (Ref. Calculation M-998 Rev. 0), the CCW fluid in the CFCUs will stay subcooled during a LBLOCA with LOOP, which will prevent the potential for a CCW water hammer from occurring.

The proposed modification will use nitrogen (N_2) from the plant N_2 system as the primary source of pressure. The N_2 supply line to the CCW surge tank (through drain valve CCW-1-89) will be seismically qualified and will tie into the N_2 header which supplies the Design Class II backup N_2 supply for PCV-21 and PCV-22. The 85 psig N_2 supply from the header will be dropped to nominally 20 psig by a regulator near the surge tank. In the event of loss of the Design Class II N_2 System, a backup system comprised of Design Class I N_2 bottles and a regulator (to drop high bottle pressure to approximately 75 psig) will supply backup N_2 through the same 20 psig (nominal) regulator. An additional backup source from the plant instrument air system will also be provided for the same regulator.

In order to limit pressure in the surge tank given variations in surge tank level, a backpressure regulator is being installed in the existing atmospheric vent line downstream of RCV-16 to maintain tank high pressure at less than approximately 25 psig and to prevent unnecessary challenging of RV-45 which is set at a nominal 30 psig. The backpressure regulator will normally be closed and effectively serve to isolate the CCW surge tank from the atmosphere. The RCV-16 valve and control circuit will remain intact to isolate the tank in the event of radioactive in-leakage to CCW, where RE-17A or 17B will initiate closure of RCV-16. RV-45. as the Code relief valve, will lift to relieve pressure, the flow from which is directed to the auxiliary building sump as is currently stated in the DCM S-14 and FSAR Update Section 9.2.2.2.3.

The proposed modification meets all CCW System design requirements. The safety function of the compressed gas is to maintain CCW pressure at or above 17 psig for only the first minute following a LBLOCA with simultaneous LOOP. Because the proposed modification will maintain CCW surge tank pressure before the LBLOCA occurs, the components added by this modification have no active function to perform once the accident has occurred. Therefore, the only safety-related function of the components added by this modification is to maintain pressure boundary integrity and, thus, failure of these components is not postulated within the first 24 hours following a LOCA per FSAR Update Section 3.1.1. All components used to pressurize the surge tank will be seismically qualified and installed, and will meet piping and instrumentation codes and standards for Design Class I equipment/installation in order to maintain pressure boundary integrity. Additionally, the design includes check valves, isolation valves, instrument alarms, redundant regulators (with one normally valved out), and bottle/instrument locations to maintain reliability, maintainability, and accessibility of the pressurization system as well as assuring control room cognizance of the surge tank pressure condition. Because it is an inert gas, use of N_2 to pressurize the surge tank will not adversely affect CCW chemistry or heat transfer capability. Although N_2 is the preferred gas for surge tank pressurization, the design change allows for compressed air as a pressurization source. Similarly, no adverse effects are postulated with the use of compressed air (including the

initial pressurization of the tank) since: 1) the system is already open to atmosphere, and 2) long term corrosion in the system will not increase with only intermittant use of the backup air (Ref. AR A0396830, E20).

This Design Change Package is a contingency plant modification until the analysis that determines if surge tank pressurization is required for operability of the CCW System is completed. Completion of the analysis is being tracked by A0393068-E06.

SCREENING FOR DETERMINING THE NEED FOR PRIOR REGULATORY AGENCY APPROVAL

	Yes	No
Does this activity, CTE or problem involve a change to the Facility Operating License (OL), including OL Attachments (Technical Specifications, Environmental Protection Plan and Antitrust Conditions)?	( )*	(☑)

* If "Yes", submit an LAR to the NRC and continue this Screen subject to the approval of the contents of the LAR. LAR#_____ . Do not release the Reference Document above for use, construction, etc., until the LA is received. The originator of the Reference Document should provide a reconciliation between the LA and LAR to the PSRC to justify release for use, construction, etc.

Is the Reference Document a procedure? (If "No", skip the next question.)	( )	(☑)
Does the Procedure Commitment Database (PCD) contain any commitment to a Regulatory Agency that must be changed and which would either: a) Require notification to that agency, or b) Require prior approval from that agency?	( )**	( )

** Follow the requirements of IDAP XI4.ID2, Commitment Change Process. Continue this Screen subject to the contents of the request for prior regulatory approval. Requesting document #_____ . If no prior approval is required, continue the Screen.

SCREENING FOR DETERMINING THE NEED FOR A SPECIFIC EVALUATION

For the activity, CTE or problem under consideration answer the following questions. Any "Yes" response (except the answers for items 3.a and 4.a below) requires the appropriate sections of Form 69-10431 (LBIE) to be completed.

SECTION 1. 10 CFR 50.59, 10 CFR 50.54(a)(3) and OL Condition 2.C.(5)b./2.C.(4)b. Screen	Yes	No
a) Does it involve a change to the facility design, function or method of performing the function as described in the SAR, including text, tables and figures and including the Fire Protection Program (FSAR Update, Section 9.5) and Quality Assurance Program (FSAR Update, Chapter 17)?	(☑)	( )
b) Does it involve a change to procedures, system operation or administrative control over plant activities as described in the SAR, including procedures related to the Fire Protection Program (FSAR Update, Section 9.5) and the Quality Assurance Program (FSAR Update, Chapter 17)?	(☑)	( )
c) Does it result in a test, experiment, condition or configuration that might affect safe operation of the plant but was not anticipated, described or evaluated in the SAR?	( )	(☑)
SECTION 2. Environmental Protection Screen		
a) Does it involve changes to or new effluents discharged to air, fresh water, sea water or land?	( )	(☑)
b) Does it involve a change in quantity or use or storage of materials classified as hazardous (including oils) or the generation of hazardous wastes?	( )	(☑)
c) Does it result in disturbance of any previously undisturbed land?	( )	(☑)
d) Does it alter surface water runoff patterns or amounts?	( )	(☑)
e) Does it involve work within the SLO-2 archeological site boundary?	( )	(☑)
SECTION 3. Emergency Plan Screen		
a) Does the Emergency Plan (EP) require review on the basis of Appendix 7.1? If "No," skip the next question and signature.	( )	(☑)
b) If "Yes," does the activity, CTE or problem result in a change to the EP?	( )	( )

_____ / _____

Emergency Plan Reviewer Signature / Date

SECTION 4. Security Plans' Screen

	Yes	No
a) Do any of the security plans (PSP, SCP, STQP) require review on the basis of Appendix 7.2? If "No," skip the next question and signature.	( )	(☑)
b) If "Yes," does the activity, CTE or problem result in a change to a security plan?	( )	( )

If so, which plan(s)?

Security Plan Reviewer Signature / Date

REMARKS: For each Screen Section above having all "No" answers, provide the logic for the "No" answers if clarification is required.

Note: Items in this section correspond to the screening questions:

2. Environmental Protection Screen

a,b,c,d,e) Increasing the normal CCW System pressure by about 20 psi will tend to increase miscellaneous leakage from the system. Any possible increase in liquid leakage will continue to be contained and controlled inside the Power Block. Any nitrogen or air leaking from the tank will have a benign effect in the atmosphere. Therefore, there is no impact on the air, water, or terrestrial quality. This change does not affect the usage of hazardous materials or disposal of hazardous waste. Appendix 7.3 of TS3.ID2 has been reviewed, an Environmental Evaluation is not required as a result of this design change.

3. Emergency Plan Screen

a) The CCW surge tank pressurization system does not impact any of the equipment or issues identified in Appendix 7.1 of TS3.ID2. An Emergency Plan Evaluation is not required.

4. Security Plans' Screen

a) There are no aspects of this change which have the potential for affecting the DCPP Security Plan or equipment described in the Security Plans. Appendix 7.2 of TS3.ID2 has been reviewed.

REFERENCES/ATTACHMENTS:

Instrument Schematic's 102033 Sht. 19, 102034 Sht. 1M; Piping Schematics 102026 Sht. 3, 102014 Sht 5; Installation details provided by 049238, 054174, 049093, 049096 & 049094; FSAR Update Sections 3.3.2.3.2.2, 6.2.2.3.3.4, 6.3.3.2.7, 9.2.2; FSAR Update Tables 3.3-2, 3.3-3, 9.2-7, 9.3-7; Tech Specs 3/4.0, 3/4.3.3, 3/4.7.3.1, 3/4.7.12, 3/4.6.3

Licensing Requirements for the proposed modification are addressed in A0396830-E03, -E05, -E13, and -E14.

Based upon the above criteria, I have determined that an LBIE is ☑ is not ___ required.

Loren E Lemons — Preparer Signature
04/15/96 — Date

Based upon my independent technical review, I concur with the above conclusion.

H. Jeff Hodges — Independent Technical Reviewer Signature
04/15/96 — Date

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As a result of the LBIE Screen (Form 69-10430), indicate which sections of this LBIE have been completed and are attached. Refer to TS3.ID2 to complete each evaluation.

[☑] SECTION 1 10 CFR 50.59 Safety Evaluation (including 10 CFR 50.54(a)(3) and OL Condition 2.C.(5)b./2.C.(4)b. Evaluations)
[ ] SECTION 2 Environmental Protection Evaluation
[ ] SECTION 3 Emergency Plan Evaluation - 10 CFR 50.54(q)
[ ] SECTION 4 Security Plans' Evaluation - 10 CFR 50.54(p)

Explain why this LBIE is being performed (i.e., Why were Screen questions answered "Yes"?)

This design change modifies certain licensing basis features associated with the CCW System as described in the FSAR Update. Pressurization of the surge tank will affect operation of the CCW system and additional administrative controls are placed on the system to ensure CCW system operability.

	Yes	No
PSRC REVIEW: MEETING NO.____ DATE 4/15/96 RECOMMEND APPROVAL	(X)	( )

APPROVED (PLANT MANAGER) [signature] DATE 4/15/96

SECTION 1. 10 CFR 50.59 SAFETY EVALUATION

For the issue under consideration, provide an explanation justifying each of the Yes/No answers. The detail provided shall be commensurate with the nuclear safety significance of the proposed activity or CTE or existing problem.

	Yes	No
1. May the probability of occurrence of an accident previously evaluated in the SAR be increased?	( )	(☑)

Justification:

The CCW System is not associated with the cause of any accidents evaluated in FSAR Update Chapter 15; the CCW System is an accident mitigating system. However, there are several events relating explicitly to the CCW System that are described in FSAR Update Section 9.2.2, including radioactive in-leakage to the CCW System, non-mechanistic out-leakage from the CCW System of 200 gpm for 20 minutes, and prevention of CCW boiling during peak CCW exit temperatures at the CFCUs.

FSAR Update Section 9.2.2.3.2 identifies that radioactive in-leakage into the CCW System can come from leakage in any heat exchanger tube or tube sheet in any component with a single barrier between the CCW System and reactor coolant water. However, the proposed modification will not adversely affect the pressure boundary integrity of any CCW components. The CCW System design pressure of 150 psig is assured by the surge tank relief valve (RV-45) lifting at 30 psig (nominal), and operation of the CCW System with the surge tank pressurized to 17 psig is within previously analyzed conditions. Therefore, the probability of occurrence of an in-leakage event is not increased.

FSAR Update Section 9.2.2.2.3 identifies that the CCW surge tank volume was sized based on a non-mechanistic leak of 200 gpm from the system. The proposed modification will not adversely affect the pressure boundary integrity of any existing CCW components. Additionally, the proposed modification meets the design, material, and construction standards applicable to the CCW System and does not create a new failure mode which could increase the probability for CCW System leakage. All installed tubing, valves, regulators, bottles, and instruments which are part of the surge tank pressure boundary will be Design Class I. All tank pressure boundary components to be added by this modification will be seismically qualified and installed to Seismic Category I requirements. Because the basis for the 200 gpm for 20 minutes out-leakage was a non-mechanistic failure and operator action is credited in FSAR Update Table 9.2-7(5) to establish Class I makeup to the surge tank within 10 minutes, pressurization of the surge tank will not affect the licensing requirement as specified in SSER 16 for minimum surge tank volume based on system out-leakage. Therefore, the probability of occurrence of an out-leakage event is not increased.

FSAR Update Section 9.2.2.2.7 identifies that CCW System pressure on the cooling water exiting the CFCUs is sufficient to prevent local CCW boiling even during accident conditions. Maintaining pressurization of the CCW surge tank to above 17 psig will prevent the possibility of CCW fluid flashing and subsequent water hammer in the CFCUs during a LBLOCA with LOOP by maintaining sufficient subcooled margin for the CFCUs water for the first minute following a LBLOCA. Therefore, the probability of occurrence of CCW boiling at the CFCU is not increased.

The analyses determining the need for 17 psig overpressure on the surge tank also evaluated the MSLB inside containment. The MSLB effects on CCW water in the CFCUs are bounded by the LBLOCA effects.

Based on the above, the probability of occurrence of an accident previously evaluated in the SAR is not increased.

2. May the consequences of an accident previously evaluated in the SAR be increased? ( ) (☑)

Justification:

The only specific CCW event with radiological consequences evaluated in the SAR is described in FSAR Update Section 9.2.2.2.3 and SER 16 Section 9.3.2.1 and is described as a Reactor Coolant Pump (RCP) thermal barrier rupture which causes radioactive in-leakage to the CCW System. These references state that the CCW System has redundant radiation monitors (RE-17A & 17B) for detecting radioactive in-leakage to the CCW System. The purpose of these radiation monitors is to isolate the CCW System from the atmosphere by closing RCV-16. Design Code overpressure protection is provided by relying on RV-45 to lift and relieve to the auxiliary building sump.

This design maintains the controls necessary to reduce the potential for a radiological release to the environment. The proposed modification maintains RCV-16 and its current function to close on a radiation signal from RE-17A or 17B. Because RCV-16 is in series with the backpressure regulator which maintains surge tank pressure less than approximately 25 psig, it will override the relieving capacity of the regulator if tank pressure is increasing due to radioactive in-leakage to CCW.

Overall, the CCW System is designed to provide cooling water to vital and nonvital components during both normal and accident conditions, including LBLOCA as discussed in FSAR Update Section 9.2.2.2. Because the proposed modification will not impact CCW System heat transfer capability, the ability of the CCW System to provide cooling to safety-related components and mitigate a LBLOCA is not adversely impacted.

Therefore, because this modification does not change the radiological consequences of any event evaluated in the SAR, it does not increase the consequences of an accident previously evaluated in the SAR.

3. May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased? ( ) (☑)

Justification:

The important to safety equipment which is impacted by this proposed modification is all of the CCW pressure boundary components as well as PCV-21 and PCV-22, the 10% steam dump valves.

For the CCW System, FSAR Update Table 9.2-7 evaluates various CCW System malfunctions and their consequences, including: 1) CCW pump casing rupture, 2) failure of a CCW pump to start, 3) closed manual valves at pump suction or discharge or stuck closed check valve, 4) CCW heat exchanger tube or shell rupture, and 5) CCW System leakage. Pressurization of the CCW surge tank will not have an impact on the probability of failure of a CCW pump to start or closure of manual pump suction or discharge valves or a stuck closed check valve.

The direct impact of this modification on the CCW components is that their normal operating pressure will be increased to between about 20 and 25 psi above current working pressures. Operation of the CCW System with the surge tank pressurized to 25 psig (nominal) will not adversely affect the integrity or operation of the CCW surge tank, pumps, piping, or components because the system is qualified to the RV-45 setpoint of 30 psig (nominal) at the surge tank. Therefore, this modification will not increase the probability of CCW pump casing rupture or CCW heat exchanger tube or shell rupture as discussed above.

The only safety-related function of the components added by this modification is to maintain pressure boundary integrity. All components used to pressurize the surge tank will be seismically qualified and installed, and will meet piping and instrumentation codes and standards for Class I equipment/installation in order to maintain pressure boundary integrity. Additionally, the design includes check valves, isolation valves, instrument alarms, redundant regulators (with one normally valved out), and bottle/instrument locations to maintain reliability, maintainability, and accessibility of the system. Based on the above discussion, installation of additional equipment to maintain CCW surge tank pressure between 20 and 25 psig (nominal) will not increase the probability of CCW System leakage or the consequences of the malfunction as described in FSAR Update Table 9.2-7. Any failure of new components which may result in a tank pressure of less

than 17 psig will be detected in the control room through the instrumentation provided by the design and Tech Spec 3.0.3 will govern.

FSAR Update Table 3.3-3 evaluates tornado failure analysis for the CCW surge tank and related instrumentation. The proposed modification installs compressed gas lines in the vicinity of the surge tank which are, therefore, susceptible to tornado failure. Although not previously analyzed in Table 3.3-3, failure of the passive pressurization system would cause loss of pressure on the surge tank. However, the safety function of the compressed gas is to maintain CCW pressure at or above 17 psig for only the first minute of a LBLOCA with simultaneous LOOP. Per DCM T-9 Section 4.3.4.5, a simultaneous accident such as a LBLOCA does not need to be considered with a tornado. Pressurization of the surge tank does not increase the probability of any other component failure by tornado as described in FSAR Update Table 3.3-3. Therefore, the probability of occurrence of a malfunction of CCW due to failure by a tornado is not increased.

The criteria for sizing the capacity of the compressed gas supply regulator was based on normal level changes in the CCW surge tank as well as assumed maximum compressed gas leakage through fittings and valve packing. Historically, the level in the surge tank remains relatively constant and rapid drops in level do not occur. Because the safety function of the regulator is to maintain pressure on the surge tank for the first minute of a LBLOCA with LOOP, there is no requirement to design the regulator for a simultaneous accident of system out-leakage at 200 gpm for 20 minutes concurrent with a LBLOCA with LOOP. (Ref. A0396830 - E03) In order to optimize the design and accurately control tank pressure during normal operation, a maximum capacity of 25 scfm was chosen, which equates to approximately 80 gpm out-leakage from the surge tank (assuming no gas leaks). Therefore, in the event of a design basis out-leakage event of 200 gpm for 20 minutes, the compressed gas regulator may not be able to maintain tank pressure greater than 17 psig, but will be adequate to restore pressure to greater than 17 psig within a reasonable time after the event.

The criteria for sizing the capacity of the backpressure regulator was based on normal increases in surge tank level as well as optimizing the design given the narrow pressure control band between the supply regulator setpoint and the RV-45 setpoint. Makeup to the surge tank through LCV-69 and LCV-70 is normally supplied at approximately 250 gpm. However, makeup to the surge tank is rarely required and surge tank level variations usually only occur during unit outages when tank pressurization is not required for CCW System operability. Additionally, there is no requirement to design the backpressure regulator for in-leakage to CCW simultaneous with a LBLOCA with LOOP. (Ref. A0396830 - E03) Therefore, a backpressure regulator was chosen that will relieve approximately 8 scfm (23 gpm) at 25 psig, 97 scfm (255 gpm) at 27 psig, and 133 scfm (335 gpm) at 29 psig. Although the primary function of the backpressure regulator is to prevent challenges to RV-45, it may not be able to relieve tank pressure fast enough

during rapid surge tank level increases to prevent RV-45 from opening. The reliability of RV-45 to lift and reseat to maintain surge tank pressure at approximately 30 psig is addressed in Question 6.

The criteria for sizing the bottle volume and minimum bottle pressure was based on: 1) assumed maximum gas leakage through fittings and valve packing, and 2) allowance for operator action within 20 minutes to restore a plant compressed gas source or replace N_2 bottles to maintain surge tank pressure. Because the pressurization system has a passive safety function to maintain pressure boundary integrity, failure of the system is not assumed during the first minute of a LBLOCA with LOOP. However, from a plant availability perspective, loss of the common Class II N_2 System and surge tank gas leaks could reduce the pressure of the surge tank to less than 17 psig and challenge system operability on both units simultaneously. For this reason, the proposed modification will add a low pressure alarm to alert operators of a degraded plant nitrogen system. Assuming a normal gas leakage through fittings and valve packing of 8 scfm, two bottles of N_2 at a minimum of 800 psig each will provide approximately 20 minutes for operators to restore a plant compressed gas source or replace bottles in the event that the plant nitrogen low pressure alarm annunciates in the control room.

The direct impact of this modification on PCV-21 and PCV-22 is that the N_2 supply to these valves will also supply N_2 to maintain surge tank pressure during normal operation. N_2 at nominally 85 psig is the backup supply to normal instrument air, which is delivered to the supply regulator for PCV-21 and PCV-22 at 100 psig(nominal). Since both instrument air and N_2 are Class II systems, PCV-21 and PCV-22 have Class I bottled backup air to provide sufficient capacity to meet their safety-related function. Therefore, the proposed modification will not affect the ability of PCV-21 and PCV-22 to perform their safety function.

Since CCW System components and PCV-21 and PCV-22 are not adversely affected by the proposed modification, the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR is not increased.

The loss of the plant instrument air system can result in a plant trip. The loss of this air system is no more likely than previously since: 1) the instrument air supply is normally valved out (except for initial fill and backup pressure maintenance on the tank) and 2) no credible failure in the surge tank can result in backflow of CCW water into the air system. Therefore, loss of air and a plant trip are no more likely. It is acceptable to pressurize the tank with instrument air if the normal N2 supply is unavailable.

4. May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased? ( ) (☑)

Justification:

The only specific radiological event postulated in the FSAR Update for CCW is radioactive in-leakage to the system. The tank isolation function of RCV-16 and RE-17A and 17B has not changed as a result of this modification. FSAR Update Chapters 9, 11, 12, and 15 were reviewed to determine the licensing basis for this radiological event. The inleakage discussions in Section 9.2.2.2 and 9.2.2.3 are to assure CCW System design provides for adequate leak detection and overpressure protection for worst case inleakage into the system. This possible inleakage for system design basis does not, however, form the licensing basis for dose calculations. Chapters 11 and 15 do not contain dose consequence evaluations for inleakage except for the normal, minor quantities described in Table 11.2-5. The DCP changes do not affect these small quantities. There is, otherwise, no dose consequence to evaluate for the types of inleakage sources described above in Chapter 9.

There may be a period of time associated with the implementation of this design that requires temporarily breaching the pressure boundary integrity (PBI) of the surge tank vent line upstream of or including RCV-16. To assure that the isolation normally provided by RE-17A/B and RCV-16 can be accomplished (Ref. FSAR Update Section 11.4.2.2.1), compensatory measures. as follows, will be used:

Immediately prior to and during the time PBI of the vent line is breached in Modes 1 to 4:

-close valve RCV-16
-assure that there is NO alarm condition with RE-17A or B
-monitor the surge tank level to assure there is no level increase
-maintain direct contact between the maintenance/construction location and the control room for system and PBI status updating
-at the breach location, maintain the ability to reclose the open vent line immediately after notification from the control room with a temporary closure having a pressure capability of 40 psig
-minimize the time the breach exists.

These measures assure that the surge tank's PBI can be restored within a few minutes of the initiation of in-leakage. The seismic integrity of the vent line is maintained if RCV-16 is temporarily removed and replaced with an upstream blind flange.

Overall, the CCW System is designed to provide cooling water to vital and nonvital components during both normal and accident conditions, including LBLOCA as discussed in FSAR Update Section 9.2.2.2. By pressurizing the CCW System to at least 17 psig, the CCW fluid in the CFCUs will stay subcooled during a LBLOCA with LOOP and will not flash, thus preventing the possibility of a CCW water hammer occurring in the CFCUs. The proposed modification ensures CCW System pressure boundary integrity and will not

impact system heat transfer capability. The ability of the CCW System to provide cooling to safety-related components and to mitigate a LBLOCA is not adversely impacted.

Therefore, because this modification does not change the radiological consequences of any event previously evaluated in the SAR, it does not increase the consequences of a malfunction previously evaluated in the SAR.

5. May the possibility of an accident of a different type than any previously evaluated in the SAR be created? ( ) (☑)

Justification:
The only accident related to the proposed modification as evaluated in the FSAR Update Chapter 15 is a Condition IV Major Reactor Coolant System Pipe Rupture, which assumes Loss of Offsite Power at the beginning of the LOCA per Section 15.4.1.1.1.2. The purpose of pressurizing the CCW surge tank is to prevent loss of accident mitigation capability that would increase the consequences of a LBLOCA with LOOP or any other accident previously evaluated in FSAR Update Chapter 15. Pressurization of the CCW System will eliminate the potential for CCW flashing and water hammer at the CFCUs and, thus, eliminate the potential for loss of CCW pressure boundary during the LBLOCA with LOOP accident.

As described previously, the possibility of an accident of a different type than any previously evaluated in the SAR is not created by the proposed modification.

6. May the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR be created? ( ) (☑)

Justification:

The important to safety equipment which is impacted by this proposed modification is all of the CCW pressure boundary components as well as PCV-21 and PCV-22, the 10% steam dump valves.

The impact of the proposed modification on the design and operation of various CCW System components has been reviewed as follows:

a) Instrumentation
Instrumentation in the CCW System which operates based on differential pressure, such as level or flow instrumentation, will not be affected by pressurization of the surge tank. However, pressure transmitters and indicators that measure direct pressure will be affected by this modification in that their outputs will include the surge tank compressed gas

pressure. The only automatic control function based on sensing direct system pressure is the CCW pump autostart function on low discharge header pressure, but this is a Design Class II function that is not required to mitigate any design basis accidents. These autostart setpoints will be reset to account for increased system static head (Ref A0398224). All CCW instruments are qualified to maintain pressure boundary integrity up to 150 psig and are ranged to include up to an additional 30 psig static head on the system. Additionally, surge tank instrumentation will not be adversely affected by a vacuum pressure of 2 psig in the surge tank which results from a 200 gpm out-leakage for 20 minutes as described below under "CCW Surge Tank".

b) Relief Valves

Most of the thermal relief valves in the CCW System are designed to relieve back to the CCW System. Because these relief valves are set based on differential pressure across the valve, the proposed modification will have no affect on their setpoints. Additionally, calculation M-353 Rev. 2 verified that the psid setpoints of these thermal relief valves are acceptable to maintain pressure below the design pressure for each isolated component during concurrent lifting of RV-45 at 30 psig (nominal). The RV-45 setpoint envelopes the proposed normal operating pressures on the CCW System as a result of pressurization of the surge tank and, therefore, the thermal relief valve setpoints are not impacted by this modification.

There are several relief valves in the CCW System that are designed to relieve directly to containment, including those for the reactor vessel support coolers, RCP thermal barriers, and excess letdown heat exchanger. The setpoints for these relief valves have been evaluated and an increase in CCW System pressure of up to 30 psig will not cause these relief valves to lift during normal system operation. Additionally, the ability of these relief valves to maintain pressure below the design pressure for each isolated component is not affected by the proposed modification.

The CCW surge tank relief valve, RV-45, is set at 30 +/-2 psig. RV-45 is an ASME Section VIII certified relief valve for steam, air, gas, and liquid service. RV-45 is not expected to be challenged during normal operation because the backpressure regulator limits high tank pressure prior to the surge tank reaching the RV-45 setpoint. However, in the event that RV-45 is challenged, a high probability of reliable service and minimal blowdown will be expected based on recent bench testing, discussion with the vendor. and ASME Section VIII certification.

Per FSAR Update Section 3.3.2.3.2.2, discharges from RV-45 are routed under the surge tank where they enter a drain line to the auxiliary building sump. The area under the surge tank has a skirting to prevent rain water from entering the auxiliary building sump, but the skirting is not air tight. Therefore, any compressed gas that would be relieved through

RV-45 would not be forced into the auxiliary building or pressurize the area under the surge tank.

c) Air and Motor Operated Valves
The proposed modification will not adversely affect any CCW System Air or Motor Operated Valve (AOV or MOV) design differential pressures. Only AOVs and MOVs that function as containment isolation valves or surge tank makeup water valves are potentially affected by surge tank pressurization because all other valves are exposed to the CCW System static head both upstream and downstream in all system modes. Calculation M-320 Rev. 4 evaluated maximum differential pressures across CCW System containment isolation valves and surge tank makeup valves using conservative system assumptions. For containment isolation valves, the CCW pressure inside containment is assumed to be at the specific component thermal relief valve lift pressure minus the static head due to the surge tank low level. This is conservative considering that system static head will be increased by the proposed modification and therefore maximum differential pressure across the MOVs will be reduced. Similarly, the maximum differential pressure across the make-up valves LCV-69 and LCV-70 was determined based on the surge tank being at atmospheric pressure. This is conservative considering that the proposed modification increases surge tank pressure and thus decreases the expected differential pressure across these valves. Therefore, pressurizing the CCW surge tank does not adversely affect any CCW System valve design differential pressures.

d) CCW Pumps
The proposed modification will not adversely affect the ability of the CCW pumps to deliver the required cooling water flow to mitigate design basis accidents. CCW pump recirculation valves are controlled by motor amps and will not be affected by the proposed modification. Pressurizing the surge tank will not adversely affect pump NPSH. Presently, Unit 1 CCW pump lube oil coolers are rated for a design pressure of 125 psig, but are being replaced by AT-MM AR A0362500 with new coolers rated for 150 psig. Because pressurization of the surge tank will exceed the existing design pressure of the Unit 1 CCW pump lube oil coolers, replacement of the coolers will be completed prior to or concurrent with implementation of this modification.

e) CCW Surge Tank
Existing surge tank level control setpoints, which actuate makeup valves LCV-69 or LCV-70 to maintain sufficient volume in the surge tank to mitigate a non-mechanistic system leak of 200 gpm for 20 minutes, will be maintained by this modification. In the event of an out-leakage event as postulated in FSAR Update Section 9.2.2.2.3 with surge tank volume at the high alarm setpoint, pressurization of the surge tank will create a vacuum (-2 psig) in the tank at the end of the twenty minute event (Calculation M-175 Rev. 2). As specified in DCM S-14 Section 4.3.3.4(c), the surge tank is capable of withstanding a total vacuum of 0 psia. In the event of a failure of the 20 psig regulator,

the compressed gas relief capability through RV-45 is sufficient to prevent surge tank overpressurization. Potential failure of the high pressure regulator will have no affect on the surge tank because a relief valve immediately downstream of the high pressure regulator will protect the remainder of the pressurization system.

f) CCW System Chemistry

Use of N_2 to pressurize the surge tank will not adversely affect CCW chemistry because it is an inert gas. In fact, N_2 may improve CCW System resistance to biological growth and reduce system corrosion. Although N_2 is the preferred gas for surge tank pressurization, the design change allows for compressed air as a pressurization source. No adverse affects are postulated with the use of compressed air since: 1) the system is already open to atmosphere, and 2) long term corrosion in the system will not increase with only intermittant use of the backup air (Ref. AR A0396830 E20 and A0396844 E8). Pressurization of the CCW surge tank will not adversely affect the heat transfer capability of the CCW System and components. The impact of increased dissolved gas within the cooling water at increased system pressure has been reviewed and determined to not significantly impact CCW thermal conductivity. Although degassification within the CCW System in the event of rapid surge tank depressurization could occur and affect heat transfer capability and CCW pump NPSH, failure of the proposed modification is not postulated concurrent with a LBLOCA due to the passive safety function of the modification. Venting of the tank during Modes 5 or 6 to perform system maintenance may cause degassification, but CCW pumps have significant NPSH margin in these modes to preclude the possibility of cavitation.

7) Common CCW Headers

The areas where CCW header C components are common between Unit 1 and Unit 2 are at the Waste Gas Concentrator, the Waste Gas Compressors, and the Auxiliary Steam drain receiver. In the event that only one of the units is pressurized and common valves leak, inventory in the pressurized CCW System could be lost to the non-pressurized unit. Because there are unit supply and return valves for each component, leakage past any one of these valves could be isolated by closing the opposite unit's supply/return valves. In the case of the waste gas compressor, RV-303 relieves back to Unit 1. If there is leakage through the relief valve, the compressor can be isolated.

The direct impact of this modification on PCV-21 and PCV-22 is that the N_2 supply to these valves will also supply N_2 to maintain surge tank pressure during normal operation. N_2 at nominally 85 psig is the backup supply to normal instrument air, which is delivered to the supply regulator for PCV-21 and PCV-22 at 100 psig (nominal). Since both instrument air and N_2 are Class II systems, PCV-21 and PCV-22 have independent Class I bottled backup air to provide sufficient capacity to meet their safety-related function. Therefore, the proposed modification will not affect the ability of PCV-21 and PCV-22 to perform their safety function.

Since CCW System components and PCV-21 and PCV-22 are not adversely affected by the proposed modification, the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the SAR is not created.

7. Is there a reduction in the margin of safety as defined in the basis for any Technical Specification? ( ) (☑)

Justification:

The Technical Specifications that apply to this modification are 3.6.2.3 "Containment Cooling System", 3.7.3.1 "Component Cooling Water System", and 3.7.12 "Ultimate Heat Sink".

Technical Specification Bases 3/4.6.2, "Depressurization and Cooling Systems", does not specifically address a margin of safety for the CFCUs. However, pressurizing the surge tank has no adverse affect on the ability of the CFCUs to maintain containment cooling during normal and post-LOCA conditions. The proposed modification prevents potential CCW flashing in the CFCUs during a LBLOCA with LOOP and, therefore, maintains the margin of safety. Additionally, the CFCUs are qualified for the maximum 30 psi increase in static pressure over current operating conditions.

Technical Specification Bases 3/4.7.3, "Vital Component Cooling Water System", does not specifically address a margin of safety for the CCW System. The Bases do state that "the redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analysis." Because the proposed modification is a completely passive, seismically qualified system (i.e., single failure assumption is not required for design) whose only safety function is to maintain CCW surge tank pressure for the first minute of a LBLOCA with LOOP, the design is consistent with assumptions used in the safety analysis.

Technical Specification Bases 3/4.7.12, "Ultimate Heat Sink", only defines a margin of safety with respect to CCW and Auxiliary Salt Water (ASW) system peak temperatures. The proposed modification has no impact on either CCW or ASW system performance and, therefore, will not impact resulting temperatures.

FSAR Update Section 9.2.2.2.7 is revised to more clearly present the design assumptions/conditions for CCW in the CFCUs. These revisions were compared to the acceptance criteria described in NRC SSER 16, pages 9-5 and -6 (i.e., compliance with GDC 44). It is concluded that pressurizing the CCW surge tank assures that no boiling occurs, that the system performs as previously evaluated, and that margins of safety are not reduced.

Based on the above, there is no reduction in the margin of safety as defined in the basis for any Technical Specifications as a result of the proposed modification.

8. Is there a change to the Fire Protection Program (FPP) (FSAR Update, Section 9.5, including tables, figures and appendices)? ( )† (☑)

9. Is there a change to the Quality Assurance (QA) Program (FSAR Update, Chapter 17)? ( )† (☑)

†Complete and attach the next form sheet to this 10 CFR 50.59 Safety Evaluation.

Based upon the above criteria and justification, I have determined that an unreviewed safety question is*___ is not ☑ involved. A change to the DCPP Technical Specifications is*___ is not ☑ involved. Further, any resulting changes to the FPP or QA Program are documented as being within the licensing basis.

Loren E Lemons — Preparer Signature
04/15/96 — Date

REVIEWED: Based upon my independent technical review, I concur with the above conclusion.

H. Jeff Hodges — Independent Technical Reviewer Signature
04/15/96 — Date

*If an unreviewed safety question, change to DCPP Technical Specifications or other license amendment is involved. NRC approval is required prior to implementing the activity or CTE.

Any LAR which forms part of the basis for this evaluation must be approved by the NRC before implementing the activity or CTE.