PSEG Nuclear LLC
P.O. Box 236, Hancocks Bridge, New Jersey 08038-0236

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PSEG Nuclear LLC

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001
Gentlemen:

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS
CONTAINMENT SPRAY SYSTEM
SALEM GENERATING STATION
FACILITY OPERATING LICENSE NOS. DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311

Pursuant to 10 CFR 50.90, PSEG Nuclear LLC (PSEG) hereby requests a revision to the Technical Specifications for the Salem Generating Station. In accordance with 10CFR50.91(b)(1), a copy of this submittal has been sent to the State of New Jersey.

The proposed amendment will modify Surveillance Requirement 4.6.2.1.d to change the frequency for performance of determining that the containment spray nozzles are unobstructed from 'once every ten years' to 'after activities that could result in nozzle blockage, either evaluate the work performed to determine the impact to the containment spray system, or perform an air or smoke flow test.' The requested change is being proposed in order to eliminate challenging worker safety to perform the test (due to the location of the nozzles), reduce radiological exposure for personnel performing the test and reduce refueling outage schedule impact.

PSEG has evaluated the proposed changes in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and has determined this request involves no significant hazards considerations. The proposed amendment also meets the eligibility criteria for categorical exclusion set forth in 10CFR51.22(c)(9). An evaluation of the requested changes is provided in Attachment 1 to this letter. The marked up Technical Specification pages affected by the proposed changes are provided in Attachment 2.

The proposed changes are similar to changes approved for the Perry Nuclear Power Plant Unit 1 (Amendment No. 113) on June 29, 2000, and the Clinton Power Station Unit 1 (Amendment No. 146) on March 28, 2002.

Currently, the ten year surveillance for Salem Unit 1 is scheduled to be performed during the next refueling outage (1R15) in October 2002, therefore PSEG requests

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approval of the proposed License Amendment by September 30, 2002 to be implemented within 30 days.

Should you have any questions regarding this request, please contact Mr. Brian Thomas at 856-339-2022.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 7/18/02

Sincerely,

David F. Garchow
Vice President – Operations

Attachments (2)

C Mr. H. J. Miller, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

U. S. Nuclear Regulatory Commission
ATTN: Mr. R. Fretz, Licensing Project Manager - Salem
Mail Stop 08B1
Washington, DC 20555-0001

USNRC Senior Resident Inspector - Salem (X24)

Mr. K. Tosch, Manager IV
Bureau of Nuclear Engineering
PO Box 415
Trenton, NJ 08625

SALEM GENERATING STATION
UNITS 1 AND 2
FACILITY OPERATING LICENSE DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311

EVALUATION OF REVISIONS TO THE TECHNICAL SPECIFICATIONS FOR CONTAINMENT SPRAY SYSTEM

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS CONTAINMENT SPRAY SYSTEM

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REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS CONTAINMENT SPRAY SYSTEM

1. DESCRIPTION

The proposed amendment would revise the Salem Technical Specifications (TS) contained in Appendix A to the Operating License to modify the surveillance requirements for the Containment Spray (CS) system.

2. PROPOSED CHANGE

The frequency of performance of Surveillance Requirement (SR) 4.6.2.1.d will be revised from, "At least once per 10 years by" to "Following activities that could result in nozzle blockage, either evaluate the work performed to determine the impact to the containment spray system, or perform an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed."

The proposed TS changes are reflected in the marked-up pages contained in Attachment 2.

3. BACKGROUND

SR 4.6.2.1.d requires the verification that each containment spray nozzle is unobstructed through the performance of either an air or smoke flow test once every ten years. The performance of the airflow test presents a safety risk for individual(s) required to access the upper portions of the containment to check the nozzle airflow. Although on Salem Unit 2 the safety risk has been minimized by the installation of a containment dome access system, the performance of this airflow surveillance still poses some safety risks to the individuals performing the tests. In addition to the safety risk, a small reduction in individual radiation exposure will also be recognized by changing the surveillance frequency as well as a reduction in the refueling outage schedule impact.

Since plant safety can be ensured at the proposed frequency, PSEG Nuclear desires to revise the containment spray system testing provisions to require containment spray nozzle testing only after activities that could block the nozzles (i.e., spray actuation, major configuration change, or loss of foreign material control). Nozzle blockage is considered unlikely since the nozzles are of a passive design and the spray headers and nozzles are constructed of stainless steel and kept in a normally dry state (no corrosion mechanism). The proposed frequency will continue to provide confidence that an unobstructed flow path is available, and will preclude the need for unnecessary testing when no activities have occurred that would introduce debris to the spray headers, or when no other active degradation mechanism is present.

4. TECHNICAL ANALYSIS

The primary purpose of the Containment Spray (CS) System is to spray cool water into the containment atmosphere in the event of a Loss-of-Coolant-Accident (LOCA). The CS system is actuated by the containment hi-hi pressure signal. The secondary purpose of the CS system is to remove radioactive iodine from the containment atmosphere. As discussed in the Salem UFSAR section 15.4.8, the containment pressure response, which assumes CS system initiation, is performed assuming a single failure of the containment heat removal systems. The containment heat removal systems consist of a combination of the CS system and the Containment Fan Cooler Units (CFCUs). There are two trains of CS and five CFCUs. The containment pressure response assumes the failure of one electrical bus that leads to the failure of one CS train and two CFCUs. With the remaining CS train and three CFCUs the containment pressure response remains below the design parameters of the containment.

The two CS trains have the following accident line-ups:

- Injection phase of a design basis accident (DBA): The containment spray pumps take suction from the Refueling Water Storage Tank. An eductor is connected to the recirculation line for the pump where sodium hydroxide is added to perform the iodine scrubbing function of the CS system. The flow from each pump is then delivered to the CS ring headers. There are two ring headers associated with each train.
- Recirculation phase of DBA: The containment spray pumps are stopped upon depletion of the RWST volume. The outlet valves for the CS pumps are then closed. Recirculation spray is then aligned depending upon the number of Residual Heat Removal (RHR) pumps that are running at this point following the LOCA. If recirculation spray is desired then the RHR discharge line to CS header isolation valve is opened to allow discharge flow from RHR pump to feed the CS ring headers. Each train of RHR is only aligned to one train of CS ring headers. The suction for the RHR pumps at this point is from the containment sump. The containment sump has a debris screen with mesh sized to prevent clogging of the spray nozzles.

Each stainless steel containment spray header has an upper and lower ring with 67 nozzles in the Salem Unit 1 upper ring, 68 nozzles in the Salem Unit 2 upper ring and 96 nozzles in the lower ring of both units. The containment spray nozzles are of a hollow-cone pressure nozzle design without any internal parts subject to clogging. The stainless steel nozzles and headers are oriented to maximize coverage of the containment volume. The spray headers are maintained dry. The containment spray pumps are in standby with the discharge valves closed and the RHR system is isolated from the CS headers by a motor operated valve.

Previous testing has verified that the nozzles are not blocked. Since the time most likely to introduce debris into the containment spray headers is during initial construction and installation of the system, confidence exists that debris that would cause blockage is not present. The two most recent airflow tests of the containment spray nozzles were performed on Salem Unit 1 in April 1986 and April 1991 and for Salem Unit 2 in may 1990 and November 1994. During the last Salem Unit 1 refueling outage in April 2001, the lower rings of each spray train were tested satisfactory. Based on the satisfactory test results, it is unlikely that there is any residual debris in the headers or nozzles from original construction. These tests also demonstrated that there is no foreign material in the nozzle. Foreign material could result from corrosion. However if conditions were favorable for corrosion to form, it is expected that some nozzle blockage would have been observed during the above tests since Salem Unit 1 has been operating for approximately 26 years and Salem Unit 2 has been operating for approximately 22 years. It is not expected that corrosion or any other mechanism would cause obstruction of the nozzles in the future based on:

- the temperature of the containment spray header piping being maintained near ambient conditions at all times, and
- the containment spray ring headers are maintained dry and isolated from water by normally closed valves.

The current foreign material exclusion (FME) program requires that any breaches of system boundaries during maintenance activities be appropriately protected from intrusion of foreign material. These controls normally include covers for system breaches, inspection of tools to avoid introduction of foreign parts, accounting for tools and materials during the work activity and other controls as appropriate. The FME program provides guidelines that establish cleanliness requirements and accounting of material, tools and parts to preclude the introduction of foreign materials into systems or components during maintenance, modification, test or inspection activities. The program requires supervisory involvement if FME integrity is lost or could not be assured and that a condition report be written. These controls are sufficient to ensure that material is not inadvertently introduced.

Normal plant operation and maintenance practices are not expected to trigger the surveillance requirement as proposed. Only an unanticipated circumstance would initiate this surveillance, such as inadvertent spray actuation, a major configuration change, or a loss of foreign material control when working within the affected boundary of the system.

The passive nature of the system, coupled with the fact that the spray headers and nozzles are maintained in a dry condition, is not conducive to the presence of a corrosion mechanism. Likewise, the design, configuration and maintenance of the systems are sufficient to provide confidence that other degradation

mechanisms are not present. The containment nozzles are located near the top of containment and are not easily accessed. The introduction of foreign materials from the exterior of the headers and nozzles is considered remote for this reason. Use of chemical cleaners or compounds during maintenance would be limited and controlled in accordance with plant programs.

The surveillance requirement is also being revised to allow an option of either performing the air or smoke flow test through each header when an activity has introduced the potential of nozzle blockage or performing an evaluation to determine the impact to the containment spray system. If an activity occurred that presents the potential of creating nozzle blockage, an evaluation would be performed by the engineering organization to determine if the amount of nozzle blockage would impact the required design capabilities of the containment spray system. If the evaluation determines that the containment spray system would continue to perform its design basis function, then performance of the air or smoke flow test would not be required. If the evaluation cannot conclusively determine the impact to the containment spray system, then the air or smoke flow test would be performed to determine if any nozzle blockage has occurred.

The changes being proposed in this request are similar to changes requested by Perry Nuclear Power Plant Unit 1 (approved on June 29, 2000 as Amendment No. 113) and Clinton Power Station Unit 1 (approved on March 28, 2002 as Amendment No. 146).

5. REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

PSEG Nuclear LLC (PSEG) has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment" as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed change revises the testing requirements for the containment spray nozzles to only require verification that each spray nozzle is unobstructed following activities that could result in nozzle blockage. The proposed change does not have a detrimental impact on the integrity of any plant structure, system, or component that initiates an analyzed event. No active or passive failure mechanisms that could lead to an accident are affected. The proposed change will not alter the operation of, or otherwise increase the failure probability of any plant

equipment that initiates an analyzed accident. The containment spray system is not an accident initiator but is used for mitigation of design basis accidents. As a result, the probability of any accident previously evaluated, is not significantly increased.

The consequences of a previously evaluated accident are not significantly increased. The proposed change revises the current Surveillance Frequency from 10 years to following activities that could result in spray nozzle blockage. Since activities that could introduce foreign material into the system (such as inadvertent actuation of the containment spray system or loss of foreign material control) are the most likely cause for obstruction, testing or inspection following such activities would verify that the nozzle(s) are unobstructed, and the system is capable of performing its safety function. No other evolutions require the system boundary to be breached, so introduction of debris during times when maintenance activities are not in progress are precluded. Introduction of foreign materials into the system from the exterior is highly unlikely due to the location of the spray headers, the passive nature of the nozzles, and the fact that the stainless steel containment spray headers are maintained dry which does not lend itself to active degradation mechanisms such as corrosion. The proposed testing requirements are considered sufficient to provide a high degree of confidence that containment spray will function when required.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change to the test frequency for the containment spray system nozzles does not involve the use or installation of new equipment. Installed equipment is not operated in a new or different manner. No new or different system interactions are created, and no new processes are introduced. The current foreign material exclusion practices have been reviewed and judged sufficient to provide high confidence that debris will not be introduced during times when the system boundary is breached.

   Therefore, this proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The revision to the containment spray nozzle testing frequency does not introduce any new setpoints at which protective or mitigative actions are initiated. No current setpoints are altered by this change. The design and functioning of the containment spray system is unchanged. Since the system is not susceptible to corrosion induced obstruction nor is the introduction of foreign material from the exterior likely, the proposed testing frequency is sufficient to provide high confidence that the containment spray system will be available to provide the flow necessary to mitigate the consequences of a design basis accident. Therefore, the capability of the system will remain unchanged. As a result, this change does not involve a significant reduction in a margin of safety.

Based on the above, PSEG concludes that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

The applicable criterion from 10CFR50 Appendix A, General Design Criteria for Nuclear Plants, associated with the containment spray system are criterion 38 (Containment Heat Removal), 39 (Inspection of Containment Heat Removal System), 40 (Testing of Containment Heat Removal System), and 50 (Containment Design Basis). As stated in section 3.1.3 of the Salem UFSAR, the Salem plant design conforms with the intent of the "General Design Criteria for Nuclear Power Plants," dated July 7, 1971. The proposed change to the frequency of the surveillance requirement to perform air/smoke flow testing to demonstrate that the containment spray nozzles are unobstructed does not impact the above requirements.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6. ENVIRONMENTAL CONSIDERATION

PSEG has determined the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or a surveillance requirement. The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or

significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

7. REFERENCES

1. Salem Updated Final Safety Analysis Report

2. Perry Nuclear Power Plant Unit 1 Amendment No. 113, dated June 29, 2000.

3. Clinton Power Station Unit 1 Amendment No. 146, dated March 28, 2002.

SALEM GENERATING STATION
FACILITY OPERATING LICENSE DPR-70 & DPR-75
DOCKET NO. 50-272 & 50-311
REVISIONS TO THE TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATION PAGES WITH PROPOSED CHANGES

The following Technical Specifications for Facility Operating License No. DPR-70 are affected by this change request:

Technical Specification	Page
3/4.6.2	3/4 6-9
B3/4.6.2	B 3/4 6-3

The following Technical Specifications for Facility Operating License No. DPR-75 are affected by this change request:

Technical Specification	Page
3/4.6.2	3/4 6-10
B3/4.6.2	B 3/4 6-3

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent containment spray systems shall be OPERABLE with each spray system capable of taking suction from the RWST and transferring suction to the RHR pump discharge.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one containment spray system inoperable, restore the inoperable spray system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable spray system to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each containment spray system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. By verifying, that on recirculation flow, each pump develops a differential pressure of greater than or equal to 204 psid when tested pursuant to Specification 4.0.5.

c. At least once per 18 months during shutdown, by:

1. Verifying that each automatic valve in the flow path actuates to its correct position on a Containment High-High pressure test signal.

2. Verifying that each spray pump starts automatically on a Containment High-High pressure test signal.

d. ~~At least once per 10 years by:~~ **Following activities that could result in nozzle blockage, either evaluate the work performed to determine the impact to the containment spray system, or perform** ~~**by:**~~

~~1.~~ ~~Performing~~ an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM

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~~1. Performing~~ an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the accident analyses.

Normal plant operation and maintenance practices are not expected to trigger surveillance requirement 4.6.2.1.d. Only an unanticipated circumstance would initiate this surveillance, such as inadvertent spray actuation, a major configuration change, or a loss of foreign material control when working within the affected boundary of the system. If an activity occurred that presents the potential of creating nozzle blockage, an evaluation would be performed by the engineering organization to determine if the amount of nozzle blockage would impact the required design capabilities of the containment spray system. If the evaluation determines that the containment spray system would continue to perform its design basis function, then performance of the air or smoke flow test would not be required. If the evaluation cannot conclusively determine the impact to the containment spray system, then the air or smoke flow test would be performed to determine if any nozzle blockage has occurred.

3/4.6.2.2 SPRAY ADDITIVE SYSTEM

The OPERABILITY of the spray additive system ensures that sufficient NaOH is added to the containment spray in the event of a LOCA. The limits on NaOH minimum volume and concentration, ensure that 1) the iodine removal efficiency of the spray water is maintained because of the increase in pH value, and 2) corrosion effects on components within containment are minimized. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics. These assumptions are consistent with the iodine removal efficiency assumed in the accident analyses.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM

The OPERABILITY of the containment cooling system ensures that adequate heat removal capacity is available when operated in conjunction with the containment spray systems during post-LOCA conditions.

The surveillance requirements for the service water accumulator vessels ensure each tank contains sufficient water and nitrogen to maintain water filled, subcooled fluid conditions in three containment fan coil unit (CFCU) cooling loops in response to a loss of offsite power, without injecting nitrogen covergas into the containment fan coil unit loops assuming the most limiting single failure. The surveillance requirement for the discharge valve response time test ensures that on a loss of offsite power, each discharge valve actuates to the open position in accordance with the design

to allow sufficient tank discharge into CFCU piping to maintain water filled, subcooled fluid conditions in three CFCU cooling loops, assuming the most limiting single failure.

3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment. Containment isolation within the time limits specified ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

The opening of locked or sealed closed containment isolation valves (penetration flow paths)on an intermittent basis under administrative control includes the following considerations: (1) stationing a dedicated individual, who is in constant communication with the control room, at the valve controls, (2) instructing this individual to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the accident analyses.

The containment spray system and the containment cooling system are redundant to each other in providing post accident cooling of the containment atmosphere. However, the containment spray system also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable spray system to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

Normal plant operation and maintenance practices are not expected to trigger surveillance requirement 4.6.2.1.d. Only an unanticipated circumstance would initiate this surveillance, such as inadvertent spray actuation, a major configuration change, or a loss of foreign material control when working within the affected boundary of the system. If an activity occurred that presents the potential of creating nozzle blockage, an evaluation would be performed by the engineering organization to determine if the amount of nozzle blockage would impact the required design capabilities of the containment spray system. If the evaluation determines that the containment spray system would continue to perform its design basis function, then performance of the air or smoke flow test would not be required. If the evaluation cannot conclusively determine the impact to the containment spray system, then the air or smoke flow test would be performed to determine if any nozzle blockage has occurred.

3/4.6.2.2 SPRAY ADDITIVE SYSTEM

The OPERABILITY of the spray additive system ensures that sufficient NaOH is added to the containment spray in the event of a LOCA. The limits on NaOH volume and concentration, ensure that 1) the iodine removal efficiency of the spray water is maintained because of the increase in pH value, and 2) corrosion effects on components within containment are minimized. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics. These assumptions are consistent with the iodine removal efficiency assumed in the accident analyses.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM

The OPERABILITY of the containment cooling system ensures that adequate heat removal capacity is available when operated in conjunction with the containment spray systems during post-LOCA conditions.

The containment cooling system and the containment spray system are redundant to each other in providing post accident cooling of the containment

atmosphere. As a result of this redundancy in cooling capability, the allowable out of service time requirements for the containment cooling system have been appropriately adjusted. However, the allowable out of service time requirements for the containment spray system have been maintained consistent with that assigned other inoperable ESF equipment since the containment spray system also provides a mechanism for removing iodine from the containment atmosphere.

The surveillance requirements for the service water accumulator vessels ensure each tank contains sufficient water and nitrogen to maintain water filled, subcooled fluid conditions in three containment fan coil unit (CFCU) cooling loops in response to a loss of offsite power, without injecting nitrogen covergas into the containment fan coil unit loops assuming the most limiting single failure. The surveillance requirement for the discharge valve response time test ensures that on a loss of offsite power, each discharge valve actuates to the open position in accordance with the design to allow sufficient tank discharge into CFCU piping to maintain water filled, subcooled fluid conditions in three CFCU cooling loops, assuming the most limiting single failure.