Attachment B
PG&E Letter DCL-98-045

MARKED-UP TECHNICAL SPECIFICATION BASES PAGE

Remove Page	Insert Page
B 3/4 6-3	B 3/4 6-3

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 safety analyses. Insert A

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.

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 a pH value of between 8.0 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. 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 safety analyses.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM

BACKGROUND

The OPERABILITY of the Containment Fan Cooler Units (CFCUs) ensures that: (1) The containment air temperature will be maintained within limits during normal operation, and (2) adequate heat removal capacity is available when operated in conjunction with the Containment Spray System during ~~post loss of coolant accident (LOCA) conditions.~~ during the injection phase of a LOCA.

The five CFCUs are provided with power from the three vital busses as follows:

CFCU 1 - Bus F
CFCU 2 - Bus F
CFCU 3 - Bus G
CFCU 4 - Bus H
CFCU 5 - Bus G

Any two CFCUs, in conjunction with one train of containment spray are capable of providing adequate containment heat removal to assure that the

Insert A for TS Bases 3/4.6.2.1.

Containment Spray is not required to be actuated during the recirculation phase of a LOCA, but may be actuated at the discretion of the Technical Support Center. During the recirculation phase of a LOCA, the Containment Spray System must be capable of transferring the spray function to an RHR System taking suction from the containment sump. OPERABILITY of valves 9003A and B, and the capability to close valves 8809A and B to divert water from the RCS to the spray headers, will ensure that this capability exists.

PROPOSED TECHNICAL SPECIFICATION BASES PAGE

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3/4.6.2.3 CONTAINMENT COOLING SYSTEM

BACKGROUND

The OPERABILITY of the Containment Fan Cooler Units (CFCUs) ensures that: (1) The containment air temperature will be maintained within limits during normal operation, and (2) adequate heat removal capacity is available when operated in conjunction with the Containment Spray System during the injection phase of a LOCA.

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MARKED-UP IMPROVED TECHNICAL SPECIFICATION PAGES

Remove Page	Insert Page
B 3.6-33	B 3.6-33
B 3.6-35	B 3.6-35
B 3.6-42	B 3.6-42

BASES (continued)

BACKGROUND (continued)

fission products from the containment atmosphere during a DBA. The RWST solution temperature is an important factor in determining the heat removal capability of the Containment Spray System during the injection phase. In the recirculation mode of operation, heat is removed from the containment sump water by the RHR heat exchangers. Each train of the Containment Spray System provides adequate spray coverage to meet the system design requirements for containment atmospheric heat removal.

The Spray Additive System injects an NaOH solution into the spray. The resulting alkaline pH of the spray enhances the ability of the spray to scavenge fission products from the containment atmosphere. The NaOH added in the spray also ensures an alkaline pH for the solution recirculated in the containment sump. The alkaline pH of the containment sump water maximizes the retention of iodine and minimizes the occurrence of chloride and caustic stress corrosion on mechanical systems and components exposed to the fluid.

The Containment Spray System is actuated either automatically by a containment High- High pressure signal or manually. If an "S" signal is present, the high-high pressure signal automatically starts the two containment spray pumps, opens the containment spray pump discharge valves, opens the spray additive tank outlet valves, initiates a phase "B" isolation signal, and begins the injection phase. A manual actuation of the Containment Spray System will begin the same sequence and can be initiated by operator action from the main control board. The injection phase of containment spray continues until an RWST Low-Low level alarm is received. The Low-Low level alarm for the RWST signals the operator to manually secure the system. After re-alignment of the RHR system to the containment recirculation sump, the associated RHR spray header isolation valve may be opened to allow continued spray operation of one train of spray utilizing the RHR pump to supply flow.

Insert A

Containment Cooling System

Two trains of containment fan cooling, each consisting of two CFCUs with one shared CFCU for a total of five, are provided. The five CFCUs are powered from three separate vital buses, with two CFCUs on each of two vital buses and the remaining CFCU from the third vital bus. Each CFCU is supplied with cooling water from one of two separate loops of component

BASES (continued)

APPLICABLE ANALYSIS (continued)

at 70% power) and is compared to the environmental SAFETY qualifications of plant equipment. Both results meet the intent of the design basis. The analyses and evaluations assume a unit specific power level of 102% for the LOCA with one containment spray train and two CFCU operating. The analyses and evaluations limiting cases are based upon a unit specific power level of 30% or 70% for the MSLB with two containment spray train and three CFCUs operating for the MSLB, failure of one MSIV to close for the MSLB, and initial (pre-accident) containment conditions of 120°F and 1.3 psig. The analyses also assume a response time delayed initiation to provide conservative peak calculated containment pressure and temperature responses.

For certain aspects of transient accident analyses, maximizing the calculated containment pressure is not conservative. In particular, the effectiveness of the Emergency Core Cooling System during the core reflood phase of a LOCA analysis increases with increasing containment backpressure. For these calculations, the containment backpressure is calculated in a manner designed to conservatively minimize, rather than maximize, the calculated transient containment pressures in accordance with 10 CFR 50, Appendix K (Ref. 2).

Insert B

The effect of an inadvertent containment spray actuation has been analyzed. An inadvertent spray actuation results in a -1.80 psid containment pressure decrease and is based on a sudden cooling effect of 70°F in the interior of the leak tight containment. Additional discussion is provided in the Bases for LCO 3.6.4.

The modeled Containment Spray System actuation from the containment analysis is based on a response time associated with exceeding the containment High-High pressure setpoint to achieving full flow through the containment spray nozzles. The Containment Spray System total response time includes diesel generator (DG) startup (for loss of offsite power), sequenced loading of equipment, containment spray pump startup, and spray line filling (Ref. 4).

The CFCUs performance for post accident conditions is given in Reference 4. The result of the analysis is that each train (two CFCUs) combined with one train of containment spray can provide 100% of the required peak cooling capacity during the post accident condition.

(continued)

BASES (continued)

REFERENCES (continued)

4. FSAR, Section 6.2.2.

5. ASME, Operations and Maintenance Code, 1987 with OMa-1988 addenda, Part 6.

6. License Amendment 89 to DPR-80 and License Amendment 88 to DPR-82, 3/2/94.

Insert C

Insert A for Improved TS Bases B 3.6.6 under "Background"

Containment Spray is not required to be actuated during recirculation phase of a LOCA, but may be actuated at the discretion of the Technical Support Center. During the recirculation phase of a LOCA, the Containment Spray System must be capable of transferring the spray function to an RHR System taking suction from the containment sump. OPERABILITY of valves 9003A and B, and the capability to close valves 8809A and B to divert water from the RCS to the spray headers, will ensure that this capability exists.

Insert B for Improved TS Bases B 3.6.6 under "Applicable Safety Analyses"

Analyses and evaluation show that containment spray is not required during the recirculation phase of a LOCA (Ref. 7). If only one RHR pump is available during the recirculation phase of a LOCA, it may not be possible to obtain significant containment spray without closing valves 8809A or B. If recirculation spray is used with only one train of RHR in operation, ECCS flow to the reactor will be reduced, but analysis has shown that the flow to the reactor in this situation is still in excess of that needed to supply the required core cooling.

Insert C for Improved TS Bases B 3.6.6 under "References"

7. Calculation STA-075, "Minimum ECCS Flow and Minimum Recirculation Spray Flow During The Sump Recirculation Phases."