LICENSE AMENDMENT REQUEST DATED February 6, 1997

Amendment of Safety Injection Pump Low Temperature Operations

EXHIBIT B

Appendix A, Technical Specification Pages
Marked Up Pages
(shaded material to be added, strikethrough material to be removed)

TS.3.3-1
TS.3.3-3
B 3.3-2
B 3.3-3
B 3.3-4
B 3.3-5 (new)

3.3 ENGINEERED SAFETY FEATURES

Applicability

Applies to the operating status of the engineered safety features.

Objective

To define those limiting conditions that are necessary for operation of engineered safety features: (1) to remove decay heat from the core in an emergency or normal shutdown situations, and (2) to remove heat from containment in normal operating and emergency situations.

Specifications

A. Safety Injection and Residual Heat Removal Systems

1. A reactor shall not be made or maintained critical nor shall reactor coolant system [illegible]e temperature exceed 200°F unless the following conditions are satisfied (except as specified in 3.3.A.2 below):

   a. The refueling water tank contains not less than 200,000 gallons of water with a boron concentration of at least 2500 ppm.

   b. Each reactor coolant system accumulator shall be OPERABLE when reactor coolant system pressure is greater than 1000 psig.

      OPERABILITY requires:
      (1) The isolation valve is open
      (2) Volume is 1270 ±20 cubic feet of borated water
      (3) A minimum boron concentration of 1900 ppm
      (4) A nitrogen cover pressure of 740 ± 30 psig

   c. Two safety injection pumps are OPERABLE except that the pumps ~~control switches in the control room~~ shall meet the requirements of Section 3.3.A.3, 3.3.A.4 and 3.1.A.1.d.(2) whenever the reactor coolant system temperature is less than 310°F*.

   d. Two residual heat removal pumps are OPERABLE.

   e. Two residual heat exchangers are OPERABLE.

*Valid until 20 EFPY

3.3.A.2.g. The valve position monitor lights or alarms for motor-operated valves specified in 3.3.A.1.g above may be inoperable for 72 hours provided the valve position is verified once each shift.

3. At least one safety injection pump control switch in the control room shall be incapable of injecting into the RCSin pullout whenever RCS temperature is less than 310°F* except that one or both SI pumps may be run while conducting the integrated SI test when either of the following conditions is met:

(a) There is a steam or gas bubble in the pressurizer and an isolation valve between the SI pump and the RCS isdischarge valves are shut, or

(b) The reactor vessel head is removed.

4. Both safety injection pumps control switches in the Control Room shall be incapable of injecting into the RCSin pullout whenever RCS temperature is less than 200°F (except as specified in 3.3.A.3 and 3.1.A.1.d.(2))

3.3 ENGINEERED SAFETY FEATURES

Bases continued

(1) Assuring with high reliability that the safety system will function properly if required to do so.

(2) Allowance of sufficient time to complete required repairs and testing using safe and proper procedures.

Assuming the reactor has been operating at full RATED THERMAL POWER for at least 100 days, the magnitude of the decay heat decreases as follows after initiating HOT SHUTDOWN.

Time After Shutdown	Decay Heat, % of RATED POWER
1 min.	4.5
30 min.	2.0
1 hour	1.62
8 hours	0.96
48 hours	0.62

Thus, the requirement for core cooling in case of a postulated loss-of-coolant accident while in the shutdown condition is significantly reduced below the requirements for a postulated loss-of-coolant accident during POWER OPERATION. Putting the reactor in the HOT SHUTDOWN condition significantly reduced the potential consequences of a loss-of-coolant accident, and also allows more free access to some of the engineered safeguards components in order to effect repairs.

The accumulator and refueling water tank conditions specified are consistent with those assumed in the LOCA analysis (Reference 2).

Specification 3.3.A.3 provides RCS overpressure protection by limiting coolant input capability or otherwise assuring the RCS is protected from overpressurization by ensuring at least one SI pump is incapable of injecting into the RCS. Injection is prevented through methods such as the following:

(a) SI pump breaker is not in the CONNECT position;

(b) SI pump control switch is in pullout and a valve in each discharge flow path to the RCS is closed; or

(c) SI pump control switch is not in pullout and a manual valve in each discharge flow path to the RCS is closed (a closed motor operated valve with the breaker OFF is equivalent to a closed manual valve).

Some plant operations require~~allows~~ use of an SI pump ~~to perform operations required~~ at low RCS temperatures; e.g., raising accumulator levels in order to meet the level requirement of Specification 3.3.A.1.b(2) or ASME Section XI tests of the SI system check valves.

Specification 3.3.A.3 also allows use of both SI pumps at low temperatures when either of the required methods for overpressure protection is implemented~~for conduct of the integrated SI test~~. In the first method~~this case~~, pressurizer level is maintained at less than 50% and a

3.3 ENGINEERED SAFETY FEATURES

Bases continued

positive means of isolation is provided between the SI pumps and the RCS~~discharge valves are shut~~ to prevent fluid injection into the RCS. This isolation is accomplished by using either a closed manual valve or a closed motor operated valve with the power removed. This combination of conditions under strict administrative control assures that overpressuri—zation cannot occur. In t~~T~~he second method, ~~option of having~~ the reactor vessel head is removed. This is allowed since in this case RCS overpressurization cannot occur.

Maintaining both safety injection pumps incapable of injection into the RCS~~Control Room control switches in pullout~~, as specified in 3.3.A.4, will ensure that the RCS pressure/temperature limitations specified in Figures TS.3.1-1 and TS.3.1-2 will not be exceeded, at low RCS temperatures, as the result of mass input into the RCS from an inadvertent safety injection pump start.

The containment cooling function is provided by two independent systems: containment fan cooler units and containment sprays. During normal operation, four containment fan cooler units are utilized to remove heat lost from equipment and piping within the containment. In the event of the Design Basis Accident, any one of the following combinations will provide sufficient cooling to reduce containment pressure: four containment fan cooler units, two containment spray pumps or two containment fan cooler units plus one containment spray pump (Reference 4). Two of the four containment fan cooler units are permitted to be inoperable during POWER OPERATION. This is an abnormal operating situation, in that plant operating procedures require that inoperable containment fan cooler units be repaired as soon as practical. However, because of the difficulty of access to make repairs, it is important on occasion to be able to operate temporarily with only two containment fan cooler units. Two containment fan cooler units can provide adequate cooling for normal operation when the containment fan cooler units are cooled by the chilled water system (Reference 3). Compensation for this mode of operation is provided by the high degree of redundancy of containment cooling systems during a Design Basis Accident.

One component cooling water pump together with one component cooling heat exchanger can accommodate the heat removal load on one unit, either following a loss-of-coolant accident or during normal plant shutdown. The four pumps of the two-unit facility can be cross connected as necessary to accommodate temporary outage of the pump. If, during the post-accident phase, the component cooling water supply were lost, core and containment cooling could be maintained until repairs were effected (Reference 5).

Cooling water can be supplied by either of the two horizontal motor-driven pumps, by a safeguards motor-driven pump or by either of two safeguards diesel-driven pumps. (Reference 6). Operation of a single cooling water pump provides sufficient cooling in one unit during the injection and recirculation phases of a postulated loss-of coolant accident plus

3.3 ENGINEERED SAFETY FEATURES

Bases continued

sufficient cooling to maintain the second unit in a hot standby condition.

TS.3.3.D.1.a assures that an automatic Safety Injection signal to the cooling water header isolation valves will not align both OPERABLE safeguards pumps to the same safeguards train.

TS.3.3.D.1.a also assures that 121 cooling water pump is aligned to provide cooling water to the same train as the train from which it is being powered (e.g., if 121 cooling wager pump is aligned to Train B cooling water header, it needs to be powered from Bus 26 and, ultimately, Diesel Generator D6 in the event of a loss of offsite power). Otherwise, the single failure of a diesel generator could leave one train of engineered safety features without power and the other train without cooling water.

The minimum fuel supply of 19,000 gallons wil supply one diesel-driven cooling water pump for 14 days. Note that the 19,000 gallon requirement is included in the 70,000 gallon total diesel fuel oil requirement of Specification 3.7.A.5 for Unit 1.

The Safeguards Traveling Screens and Emergency Cooling Water Supply line are designed to provide a supply of screened cooling water in the event that an earthquake 1) destroys Dam No. 3 (dropping the water level in the normal canal to the screenhouse) and 2) causes the banks bordering the normal canal to the screenhouse to collapse eliminating the river as a source of cooling water. The Safeguards Traveling Screens and Emergency Cooling Water Supply line provide an alternate supply of water to the Safeguards Bay, which contains the two diesel driven and the one vertical motor driven cooling water pumps. Their normal supply is from the Circ Water Bay thru one of two sluice gates. Either one of the two sluice gates or one of the two Safeguards Traveling Screens will adequately supply any of the three cooling water pumps. The Safeguards Traveling Screens are not considered part of the "engineered safety features associated with the operable diesel-driven cooling water pump" for determination of operability of diesel-driven cooling water pumps.

The component cooling water system and the cooling water system provide water for cooling components used in normal operation, such as turbine generator components, and reactor auxiliary components in addition to supplying water for accident functions. These systems are designed to automatically provide two separate redundant paths in each system following an accident. Each redundant path is capable of cooling required components in the unit having the accident and in the operating unit.

There are several manual valves and manually-controlled motor-operated valves in the engineered safety feature systems that could, if one valve is improperly positioned, prevent the required injection of emergency coolant (Reference 7). These valves are used only when the reactor is

3.3 ENGINEERED SAFETY FEATURES

Bases continued

subcritical and there is adequate time for actuation by the reactor operator. To ensure that the manual valve alignment is appropriate for safety injection during power operation, these valves are tagged and the valve position will be changed only under direct administrative control. For the motor-operated valves, the motor control center supply breaker is physically locked in the open position to ensure that a single failure in the actuation circuit or power supply would not move the valve.

References

1. USAR, Section 3.3.2
2. USAR, Section 14.6.1
3. USAR, Section 6.3.2
4. USAR, Section 6.3
5. USAR, Section 10.4.2
6. USAR, Section 10.4.1
7. USAR, Figure 6.2-1

USAR, Figure 6.2-2
USAR, Figure 6.2-5
USAR, Figure 10.2-11

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Amendment of Safety Injection Pump Low Temperature Operations

EXHIBIT C

Appendix A, Technical Specification Pages
Revised Pages

TS.3.3-1
TS.3.3-3
B 3.3-2
B 3.3-3
B 3.3-4
B 3.3-5

3.3 ENGINEERED SAFETY FEATURES

Applicability

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Objective

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Specifications

A. Safety Injection and Residual Heat Removal Systems

1. A reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F unless the following conditions are satisfied (except as specified in 3.3.A.2 below):

   a. The refueling water tank contains not less than 200,000 gallons of water with a boron concentration of at least 2500 ppm.

   b. Each reactor coolant system accumulator shall be OPERABLE when reactor coolant system pressure is greater than 1000 psig.

      OPERABILITY requires:
      (1) The isolation valve is open
      (2) Volume is 1270 ±20 cubic feet of borated water
      (3) A minimum boron concentration of 1900 ppm
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   c. Two safety injection pumps are OPERABLE except that the pumps shall meet the requirements of Section 3.3.A.3, 3.3.A.4 and 3.1.A.1.d.(2) whenever the reactor coolant system temperature is less than 310°F*.

   d. Two residual heat removal pumps are OPERABLE.

   e. Two residual heat exchangers are OPERABLE.

*Valid until 20 EFPY

3.3.A.2.g. The valve position monitor lights or alarms for motor-operated valves specified in 3.3.A.1.g above may be inoperable for 72 hours provided the valve position is verified once each shift.

3. At least one safety injection pump shall be incapable of injecting into the RCS whenever RCS temperature is less than 310°F* except that one or both SI pumps may be run when either of the following conditions is met:

   (a) There is a steam or gas bubble in the pressurizer and an isolation valve between the SI pump and the RCS is shut, or

   (b) The reactor vessel head is removed.

4. Both safety injection pumps shall be incapable of injecting into the RCS whenever RCS temperature is less than 200°F (except as specified in 3.3.A.3 and 3.1.A.1.d.(2)).

3.3 ENGINEERED SAFETY FEATURES

Bases continued

(1) Assuring with high reliability that the safety system will function properly if required to do so.

(2) Allowance of sufficient time to complete required repairs and testing using safe and proper procedures.

Assuming the reactor has been operating at full RATED THERMAL POWER for at least 100 days, the magnitude of the decay heat decreases as follows after initiating HOT SHUTDOWN.

Time After Shutdown	Decay Heat, % of RATED POWER
1 min.	4.5
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Thus, the requirement for core cooling in case of a postulated loss-of-coolant accident while in the shutdown condition is significantly reduced below the requirements for a postulated loss-of-coolant accident during POWER OPERATION. Putting the reactor in the HOT SHUTDOWN condition significantly reduced the potential consequences of a loss-of-coolant accident, and also allows more free access to some of the engineered safeguards components in order to effect repairs.

The accumulator and refueling water tank conditions specified are consistent with those assumed in the LOCA analysis (Reference 2).

Specification 3.3.A.3 provides RCS overpressure protection by limiting coolant input capability or otherwise assuring the RCS is protected from overpressurization by ensuring at least one SI pump is incapable of injecting into the RCS. Injection is prevented through methods such as the following:

(a) SI pump breaker is not in the CONNECT position;

(b) SI pump control switch is in pullout and a valve in each discharge flow path to the RCS is closed; or

(c) SI pump control switch is not in pullout and a manual valve in each discharge flow path to the RCS is closed (a closed motor operated valve with the breaker OFF is equivalent to a closed manual valve).

Some plant operations require use of an SI pump at low RCS temperatures; e.g., raising accumulator levels in order to meet the level requirement of Specification 3.3.A.1.b(2) or ASME Section XI tests of the SI system check valves.

Specification 3.3.A.3 also allows use of both SI pumps at low temperatures when either of the required methods for overpressure protection is implemented. In the first method, pressurizer level is maintained at

3.3 ENGINEERED SAFETY FEATURES

Bases continued

less than 50% and a positive means of isolation is provided between the SI pumps and the RCS to prevent fluid injection into the RCS. This isolation is accomplished by using either a closed manual valve or a closed motor operated valve with the power removed. This combination of conditions under strict administrative control assures that overpressurization cannot occur. In the second method, the reactor vessel head is removed. This is allowed since in this case RCS overpressurization cannot occur.

Maintaining both safety injection pumps incapable of injection into the RCS, as specified in 3.3.A.4, will ensure that the RCS pressure/temperature limitations specified in Figures TS.3.1-1 and TS.3.1-2 will not be exceeded, at low RCS temperatures, as the result of mass input into the RCS from an inadvertent safety injection pump start.

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3.3 ENGINEERED SAFETY FEATURES

Bases continued

sufficient cooling to maintain the second unit in a hot standby condition.

TS.3.3.D.1.a assures that an automatic Safety Injection signal to the cooling water header isolation valves will not align both OPERABLE safeguards pumps to the same safeguards train.

TS.3.3.D.1.a also assures that 121 cooling water pump is aligned to provide cooling water to the same train as the train from which it is being powered (e.g., if 121 cooling wager pump is aligned to Train B cooling water
header, it needs to be powered from Bus 26 and, ultimately, Diesel Generator D6 in the event of a loss of offsite power). Otherwise, the single failure of a diesel generator could leave one train of engineered safety features without power and the other train without cooling water.

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3.3 ENGINEERED SAFETY FEATURES

Bases continued

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2. USAR, Section 14.6.1
3. USAR, Section 6.3.2
4. USAR, Section 6.3
5. USAR, Section 10.4.2
6. USAR, Section 10.4.1
7. USAR, Figure 6.2-1
USAR, Figure 6.2-2
USAR, Figure 6.2-5
USAR, Figure 10.2-11