ATTACHMENT 5

Edited Technical Specification Pages

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B. Containment Cooling and Iodine Removal Systems

1. A reactor shall not be made critical, except for low temperature physics tests, unless the following conditions associated with that reactor are met:

   a. The spray additive tank contains not less than 2675 gal. of solution with a sodium hydroxide concentration of not less than 30% by weight.

   b. Two containment spray pumps are operable.

   c. Four accident fan-cooler units are operable.

   d. All valves and piping, associated with the above components and required to function during accident conditions, are operable.

2. During power operation, the requirements of 15.3.3.B-1 may be modified to allow any ONE of the following ~~components to be inoperable~~ limitations (a., b., or c.) to be in effect at any one time. If the system is not restored to meet the requirements of 15.3.3.B-1 within the time period specified, the reactor shall be placed in the hot shutdown condition within six hours and in cold shutdown within 36 hours.

   a. ~~One accident fan cooler may be out of service provided that cooler is returned to operable status within 48 hours. The other accident fan coolers shall be operable before initiating maintenance on the inoperable accident fan cooler.~~
   One or two accident fan coolers may be out of service provided the fan coolers are restored to operable status within 72 hours. The remaining accident fan coolers shall be operable.

   b. One containment spray pump may be out of service provided the pump is restored to operable status within 72 hours. The remaining containment spray pump shall be operable ~~before initiating maintenance on the inoperable pump~~.

a. ~~Four~~ Six service water pumps are operable~~, two from each train~~.

b. All necessary valves, interlocks and piping required for the functioning of the Service Water System during accident conditions are also operable.

2. During power operation, the requirements of 15.3.3.D-1 may be modified to allow ~~one of~~ the following ~~components to be inoperable~~ conditions~~at any one time~~. If the system is not restored to meet the conditions of 15.3.3.D-1 within the time period specified, ~~both~~ the affected reactor(s) will be placed in the hot shutdown condition within six hours and in cold shutdown within 36 hours.

a. ~~One of the four required service water pumps may be out of service provided a pump is restored to operable status within 24 hours.~~

One of the six required service water pumps may be out of service provided a pump is restored to operable status within 7 days. A second service water pump may be out of service provided a pump is restored to operable status within 72 hours. A third service water pump may be out of service provided two pumps are restored to operable status within 72 hours.

b. ~~One of the two loop headers~~ The service water ring header continuous flowpath may be out of service for a period of ~~24 hours~~7 days. If less than four service water pumps are operable, service water system flow shall be evaluated within 24 hours of entry into this LCO.

c. ~~A~~ An automatic isolation valve ~~or other passive component~~ required during accident conditions may be out of service for up to 72 hours provided ~~repairs can be completed within 48 hours~~at least four service water pumps are operable. This LCO can be exited provided the line is isolated with a seismically qualified isolation valve or the valve is restored to operable status.

d. The containment fan cooler outlet motor operated valves may be open for up to 72 hours provided at least four service water pumps are operable. This LCO can be exited provided the valves are returned to the closed position or the flowpath is isolated.

Basis

The normal procedure for starting the reactor is, first, to heat the reactor coolant to near operating temperature, by running the reactor coolant pumps. The reactor is then made critical by withdrawing control rods and/or diluting boron in the coolant.[1] With this mode of start-up, the energy stored in the reactor coolant during the approach to criticality is substantially equal to that during power operation and therefore to be conservative most engineered safety system components and auxiliary cooling systems, shall be fully operable. During low temperature physics tests there is a negligible amount of stored energy in the reactor coolant, therefore an accident comparable in severity to the Design Basis Accident is not possible, and the engineered safety systems are not required.

and (4) long term subcriticality is maintained following a steamline break assuming ARI-1 and fuel failure is precluded.

The containment cooling function is provided by two independent systems: (a) fan coolers and (b) containment spray which, with sodium hydroxide addition, provides the iodine removal function.(4) During normal power operation, only three of the four fan coolers are required to remove heat lost from equipment and piping within the containment.(3) ~~In the event of a Design Basis Accident, any one of the following combinations will provide sufficient cooling to reduce containment pressure: (1) four fan coolers, (2) two containment spray pumps, (3) two fan coolers plus one containment spray pump.~~(4) Sodium hydroxide addition via one spray pump reduces airborne iodine activity sufficiently to limit off-site doses to acceptable values. One ~~of the four~~ or two fan coolers ~~is~~ are permitted to be inoperable for up to ~~48~~ 72 hours during power operation.

Specification 15.3.3.B.2 allows one of the following limitations (a., b., or c.) to be in effect at any one time. This is intended to preclude simultaneous inoperability of the containment accident fan cooling system and the containment spray system. It is also intended to preclude inoperability of both trains of either of these systems. It is not intended to preclude inoperability of components in the same train for either of these systems. For example, simultaneous inoperability of the Train A containment spray pump and the Train A containment spray system valves is allowed.

Specification 15.3.3.B.2.c requires valves that provide the duplicate function be operable prior to initiating repairs on an inoperable valve. For the specific case of the containment spray pump discharge (SI-860) valves, SI-860A and SI-860D provide duplicate functions. Valves SI-860B and SI-860C are not required for system operability. Hence, prior to removing valve SI-860A from service, valve SI-860D must be operable and vice versa.

The component cooling system is different from the other systems discussed above in that the components are so located in the Auxiliary Building as to be accessible for repair after a loss-of-coolant accident. The 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. If during the post-accident phase the component cooling water supply is lost, core and containment cooling could be maintained until repairs were effected.[5]

A total of six service water pumps are installed, only ~~two~~ three of which are required to operate during the injection and recirculation phases of a postulated loss-of-coolant accident,[6] in one unit together with a hot shutdown or normal operation condition in the other unit. For either reactor to be critical, ~~four~~ six service water pumps must be operable. ~~Two of the pumps must be powered from the 'A' train, and the other two must be powered from the 'B' train.~~ Specifications 15.3.3.D.2.c and d require four service water pumps to be operable to provide sufficient flow for accident mitigation when these specifications are in effect.

The service water ring header continuous flowpath LCO requirement (TS 15.3.3.D.2.b) applies anytime continuity of the flowpath in the service water ring header is interrupted. This includes isolation of any header or headers in the system. This LCO recognizes that one aspect of redundancy in the service water system is the ability to isolate a break in the system and still maintain ability to provide required flow to supported equipment. This capability is impaired anytime the continuous flowpath of the ring header is blocked. The 7 day allowed outage time is based on the fact that a piping failure must occur to cause a subsequent problem with system operability. Piping failures are not considered as the single failure for system functionality during an accident.

TS 15.3.3.D.2.b requires that service water system flow is evaluated within 24 hours of entry into this LCO if less than four service water pumps are operable. This is necessary to ensure that all required equipment will receive sufficient flow in this condition. If it is determined that any equipment will not receive sufficient flow, the applicable LCOs for the affected equipment shall be entered. These LCOs can be exited if system realignment is completed to achieve the required flow rates for the affected equipment.

Entry into the applicable LCOs for the affected equipment is also required when any part of the service water ring header is removed from service. For example, if the north header is removed from service, all Technical Specification required equipment required for operation should be or have already been switched to the south header. The containment accident fan cooler inoperability requires entry into the applicable LCO for Unit 2 (TS 15.3.3.B.2.a which is 72 hours) when the header is removed from service. If Unit 2 is already in a shutdown condition where containment accident fan cooler operability is not required, no LCO would apply. Unit 1 would be subject to the 7 day allowed outage time for the loss of the service water ring header continuous flowpath. The 7 day allowed outage time is based on approximate repair time for system piping and the possibility that a mechanical failure in another part of the system could result in a loss of service water system function.

The containment fan cooler service water outlet motor operated valves consist of two fully redundant valves that are automatically opened in response to a safety injection signal. Either valve is capable of passing the full flow required for all four fan cooler units in accident mode. At various times, these valves are opened to allow testing of the containment fan coolers or adjustment of the system flow rates. If one or both of these motor operated valves are open in a unit, there may be insufficient service water flow if an accident occurs in the other unit and single failure occurs. Therefore, in this case, the other unit is in a limiting condition for operation because relaxation of single failure is necessary. That unit would be considered the "affected unit" and hence the valves must be closed within 72 hours or the affected unit must be shut down. If the valves are open in both units, they would both be considered "affected" until such time that the motor operated valves were closed for a unit, at which time the affected unit would be the unit with the closed valves. The 72 hour allowed time is consistent with the relaxation of single failure and allowed outage time associated with a loss of redundancy for the service water system. For the case of single unit operation, the valves for the operating unit may be open without limitation if the valves for the shutdown unit are in the shut position or the flowpath is isolated. The flowpath is considered isolated if total flow would not exceed the expected flowrate in the non-accident unit during accident conditions.

References

(1) FSAR Section 3.2.1
(2) FSAR Section 6.2
(3) FSAR Section 6.3.2
(4) FSAR Section 6.3
(5) FSAR Section 9.3.2
(6) FSAR Section 9.6.2

i. For one or both units to be made critical, the normal power supply and a standby emergency power supply to all the 4160/480 Volt safeguards buses shall be operable and the buses are energized from their normal supply.

~~j. For Unit 1 to be made critical, the normal power supply and a standby emergency power supply to the 4160/480 Volt safeguards buses Unit 1 A05/B03, Unit 1 A06/B04, and Unit 2 A06/B04 shall be operable and the buses are energized from their normal supply.~~

~~k. For Unit 2 to be made critical, the normal power supply and a standby emergency power supply to the 4160/480 Volt safeguards buses Unit 2 A05/B03, Unit 2 A06/B04, and Unit 1 A05/B03 shall be operable and the buses are energized from their normal supply.~~

B.1 During power operation of one or both reactors, the requirements of 15.3.7.A.1 may be modified to allow the following arrangements of systems and components:

a. If the 345 KV lines are reduced to only one, any operating reactor(s) must be promptly reduced to, and limited to, 50% power. If all 345 KV lines are lost, any operating reactor(s) will be reduced to supplying its auxiliary load, until one or more 345 KV transmission lines are again available.

b. If both 345/13.8 KV auxiliary transformers are out of service and only the gas turbine is operating, only one reactor will remain operating and it will be limited to 50% power. The second reactor will be placed in the hot shutdown condition.

c. If the 13.8/4.16 KV auxiliary transformers are reduced to only one, the reactor associated with the out of service transformer must be placed in the hot shutdown condition.

d. With a unit in cold or refueling shutdown or defueled, B03 and B04, for that shutdown unit, may be tied together through their common tie breaker for up to 8 hours provided the required redundant decay heat removal in the shutdown unit and the required redundant shared engineered safety features for the other unit are operable. If the tie breaker cannot be opened or the conditions of 15.3.7.B.1.e met within 8 hours, the operating unit shall be placed in the hot shutdown condition within 6 hours and in cold shutdown within the following 30 hours.

e. With a unit defueled, B03 and B04, for that shutdown unit, may be tied together through their common tie-breaker in excess of 8 hours provided:

1) An evaluation is performed to show that the loads that remain or can be energized by the buses will not cause a potential overload of the associated diesel generator. The applicable Limiting Conditions for Operation of the equipment removed from service shall be entered for the operating unit.

2) A single train of spent fuel cooling is adequate to cool the spent fuel pool.

3) The required redundant shared engineered safety features for the other unit are operable.

f. The normal power supply or standby emergency power supply to Unit 1 A05/B03 or Unit 2 A06/B04 may be out of service for a period not exceeding 7 days provided the required redundant engineered safety features are operable and the required redundant standby emergency power supplies are started within 24 hours before or after entry into this LCO and every 72 hours thereafter. If the normal power supply is out of service, an operable emergency diesel generator is supplying the affected 4160/480 Volt buses. After 7 days, both units will be placed in hot shutdown within the following 6 hours and cold shutdown within 36 hours.

g. The normal power supply or standby emergency power supply to Unit 1 A06/B04 or Unit 2 A05/B03 or both may be out of service for a period not exceeding 7 days provided the required redundant engineered safety features are operable and the required redundant standby emergency power supplies are started within 24 hours before or after entry into this LCO and every 72 hours thereafter. If the normal power supply is out of service, an operable emergency diesel generator is supplying the affected 4160/480 Volt buses. After 7 days, ~~the affected unit or~~ both units will be placed in hot shutdown within the following 6 hours and cold shutdown within 36 hours.

2. The automatically actuated containment isolation valves are designed to close upon high pressure in the containment (set-point no higher than 6 psig) and on a safety injection signal. The actuation system is designed such that no single component failure will prevent containment isolation if required.

C. Containment Systems

1. The containment vessel has an internal spray system which is capable of providing a distributed borated water spray of at least 1200 gpm. During the initial period of spray operation, sodium hydroxide would be added to the spray water to increase the removal of iodine from the containment atmosphere.(3)

2. The containment vessel has an internal air recirculation system which consists of four ventilation fans and air coolers capable of a total heat removal capability of ~~55,600~~ 41,700 Btu/sec under conditions following a loss-of-coolant accident.(4)

References:

(1) FSAR Section 5.1.2.2
(2) FSAR Section 5.1.2.6
(3) FSAR Section 6.4
(4) FSAR Section 6.3