

Enclosure 1

Marked-up ITS Pages

9806160236 980609
PDR ADDCK 05000528
P PDR



...

...

...

...

...

...

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Safety Injection Tanks (SITs) - Operating

LCO 3.5.1 Four SITs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.
MODES 3 and 4 with pressurizer pressure \geq 1837 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SIT inoperable due to boron concentration not within limits.	A.1 Restore SIT to OPERABLE status.	72 hours
B. One SIT inoperable for reasons other than Condition A.	B.1 Restore SIT to OPERABLE status.	1 hour 24 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u> C.2 Reduce pressurizer pressure to < 1837 psia.	12 hours
D. Two or more SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

OROne SIT
Inoperable due to
inability to verify
level or pressure.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 Safety Injection Tanks (SITs)-Shutdown

LCO 3.5.2 Four SITs shall be OPERABLE with a borated water volume
> 39% wide range indication and < 83% wide range indication;

OR

Three SITs shall be OPERABLE with a borated water volume
> 60% wide range indication and < 83% wide range indication.

APPLICABILITY: MODES 3 and 4 with pressurizer pressure < 1837 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required SIT inoperable due to boron concentration not within limits.	A.1 Restore required SIT to OPERABLE status.	72 hours
B. One required SIT inoperable for reasons other than Condition A.	B.1 Restore required SIT to OPERABLE status.	1 hour 24 hours
C. Inoperability of the required SIT was discovered but not restored while in ITS 3.5.1. "SITs-Operating"	C.1 Be in MODE 5.	24 hours
<u>OR</u> Required Action and associated Completion Time of Condition A or B not met.		
D. Two or more required SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

OR one required SIT inoperable due to inability to verify level or pressure.

Enclosure 2
Retyped ITS Pages

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Safety Injection Tanks (SITs) - Operating

LCO 3.5.1 Four SITs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODES 3 and 4 with pressurizer pressure \geq 1837 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SIT inoperable due to boron concentration not within limits. <u>OR</u> One SIT inoperable due to inability to verify level or pressure.	A.1 Restore SIT to OPERABLE status.	72 hours
B. One SIT inoperable for reasons other than Condition A.	B.1 Restore SIT to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Reduce pressurizer pressure to < 1837 psia.	6 hours 12 hours
D. Two or more SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 Safety Injection Tanks (SITs)-Shutdown

LCO 3.5.2 Four SITs shall be OPERABLE with a borated water volume
> 39% wide range indication and < 83% wide range indication;

OR

Three SITs shall be OPERABLE with a borated water volume
> 60% wide range indication and < 83% wide range indication.

APPLICABILITY: MODES 3 and 4 with pressurizer pressure < 1837 psia.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required SIT inoperable due to boron concentration not within limits. <u>OR</u> One required SIT inoperable due to inability to verify level or pressure.	A.1 Restore required SIT to OPERABLE status.	72 hours
B. One required SIT inoperable for reasons other than Condition A.	B.1 Restore required SIT to OPERABLE status.	24 hours
C. Inoperability of the required SIT was discovered but not restored while in ITS 3.5.1, "SITs-Operating" <u>OR</u> Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 5.	24 hours
D. Two or more required SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

Enclosure 3

Marked-up ITS Bases Pages

BASES

ACTIONS

A.1

If the boron concentration of one SIT is not within limits, the SIT must be returned to OPERABLE status within 72 hours. If the boron concentration is not within limits, ability to maintain subcriticality or minimum boron precipitation time may be reduced, but the reduced concentration effects on core subcriticality during reflood are minor. Boiling of the ECCS water in the core during reflood concentrates the boron in the saturated liquid that remains in the core. In addition, the volume of the SIT is still available for injection. Since the boron requirements are based on the average boron concentration of the total volume of three SITs, the consequences are less severe than they would be if a SIT were not available for injection. Thus, 72 hours is allowed to return the boron concentration to within limits.

Add Insert A
as new paragraph

B.1

or the inability to verify level or pressure

If one SIT is inoperable for a reason other than boron concentration, the SIT must be returned to OPERABLE status within ~~1 hour~~ 24 hours. In this Condition, the required contents of three SITs cannot be assumed to reach the core during a LOCA. Due to the severity of the consequences should a LOCA occur in these conditions, the 1 hour Completion Time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action will be taken to return the inoperable SIT to OPERABLE status. The Completion Time minimizes the potential for exposure of the plant to a LOCA under these conditions.

24 hours

Add Insert B
as new
paragraph

ACTIONS

C.1 and C.2

If the SIT cannot be restored to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and pressurizer pressure reduced to < 1837 psia within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

INSERT A (ITS BASES B 3.5.1, ACTION A.1)

If one SIT is inoperable due to the inability to verify level or pressure, the SIT must be returned to operable status within 72 hours. Section 7.4 of NUREG-1366 (Ref. 5) discusses surveillance requirements in technical specifications for the instrument channels used in the measurement of water level and pressure in SITs. The following statement is made in Section 7.4 of NUREG-1366 (Ref. 5):

"The combination of redundant level and pressure instrumentation [for any single SIT] may provide sufficient information so that it may not be worthwhile to always attempt to correct drift associated with one instrument [with resulting radiation exposures during entry into containment] if there were sufficient time to repair one in the event that a second one became inoperable. Because these instruments do not initiate a safety action, it is reasonable to extend the allowable outage for them. The [NRC] staff, therefore, recommends that an additional condition be established for the specific case, where 'One accumulator [SIT] is inoperable due to the inoperability of water level and pressure channels,' in which the completion time to restore the accumulator to operable status will be 72 hours. While technically inoperable, the accumulator would be available to fulfill its safety function during this time and, thus, this change would have a negligible increase in risk."

INSERT B (ITS BASES B 3.5.1, ACTION B.1)

CE NPSD-994 (Ref. 6) provides a series of deterministic and probabilistic findings that support 24 hours as being either "risk beneficial" or "risk neutral" in comparison to shorter periods for restoring the SIT to OPERABLE status. CE NPSD-994 (Ref. 6) discusses best-estimate analysis for a typical PWR that confirmed that, during large-break LOCA scenarios, core melt can be prevented by either operation of one low pressure safety injection (LPSI) pump or the operation of one high pressure safety injection (HPSI) pump and a single SIT. CE NPSD-994 (Ref. 6) also discusses plant-specific probabilistic analysis that evaluated the risk-impact of the 24 hour recovery period in comparison to shorter recovery periods.

BASES (continued)

SURVEILLANCE
REQUIREMENTS
(continued)SR 3.5.1.5

Verification every 31 days that power is removed from each SIT isolation valve operator ensures that an active failure could not result in the undetected closure of a SIT motor operated isolation valve. If this were to occur, only two SITs would be available for injection, given a single failure coincident with a LOCA. Since installation and removal of power to the SIT isolation valve operators is conducted under administrative control, the 31 day Frequency was chosen to provide additional assurance that power is removed.

SR 3.5.2.5 allows power to be supplied to the motor operated isolation valves when RCS pressure is < 1500 psia, thus allowing operational flexibility by avoiding unnecessary delays to manipulate the breakers during unit startups or shutdowns. Even with power supplied to the valves, inadvertent closure is prevented by the RCS pressure interlock associated with the valves. Should closure of a valve occur in spite of the interlock, the SI signal provided to the valves would open a closed valve in the event of a LOCA.

REFERENCES

1. IEEE Standard 279-1971.
2. UFSAR, Section 6.
3. 10 CFR 50.46.
4. UFSAR, Chapter 15.
5. NUREG-1366, December 1992. "Improvements to Technical Specifications Surveillance Requirements,"

6. CE NPSD-994, "CEOG Joint Applications Report for Safety Injection Tank AOT/STI Extension," May 1995.

BASES

APPLICABILITY

In MODES 1 and 2, and MODES 3 and 4 with pressurizer pressure ≥ 1837 psia, the OPERABILITY requirements for SITs are covered by LCO 3.5.1.

In MODES 3 and 4 with pressurizer pressure < 1837 psia, the reduced borated water volume requirement is acceptable, based on the stable reactivity condition of the reactor and the limited core cooling requirements.

In MODE 4 with pressurizer pressure < 430 psia, the SIT motor operated isolation valves may be closed to isolate the SITs from the RCS but must remain energized. This allows RCS cooldown and depressurization without discharging the SITs into the RCS or requiring depressurization of the SITs. In this situation manual actions would be required to open the SIT motor operated isolation valves (i.e., manually initiated SIAS).

In MODES 5 and 6 the SITs are not required and the SIT motor operated isolation valves are closed as required to isolate the SITs from the RCS.

ACTIONS

A.1

If the boron concentration of one of the required SITs is not within limits, it must be returned to within the limits within 72 hours. In this condition, ability to maintain subcriticality or minimum boron precipitation time may be reduced, but the reduced concentration effects on core subcriticality during reflood are minor. Boiling of the ECCS water in the core during reflood concentrates the boron in the saturated liquid that remains in the core. In addition, the volume of the SIT is still available for injection. Since the boron requirements are based on the average boron concentration of the total volume of the required SITs assuming a single failure, the consequences are less severe than they would be if a SIT were not available for injection. Thus, 72 hours is allowed to return the boron concentration to within limits.

Add Insert C
as new
pargraph →

(continued)

INSERT C (ITS BASES B 3.5.2, ACTION A.1)

If one of the required SITs is inoperable due to the inability to verify level or pressure, the SIT must be returned to operable status within 72 hours. Section 7.4 of NUREG-1366 (Ref. 4) discusses surveillance requirements in technical specifications for the instrument channels used in the measurement of water level and pressure in SITs. The following statement is made in Section 7.4 of NUREG-1366 (Ref. 4):

"The combination of redundant level and pressure instrumentation [for any single SIT] may provide sufficient information so that it may not be worthwhile to always attempt to correct drift associated with one instrument [with resulting radiation exposures during entry into containment] if there were sufficient time to repair one in the event that a second one became inoperable. Because these instruments do not initiate a safety action, it is reasonable to extend the allowable outage for them. The [NRC] staff, therefore, recommends that an additional condition be established for the specific case, where 'One accumulator [SIT] is inoperable due to the inoperability of water level and pressure channels,' in which the completion time to restore the accumulator to operable status will be 72 hours. While technically inoperable, the accumulator would be available to fulfill its safety function during this time and, thus, this change would have a negligible increase in risk."

B 3.5.2-7, Insert C

BASES

ACTIONS

B.1

or the inability to verify level or pressure

24 hours

If one SIT is inoperable for a reason other than boron concentration, the SIT must be returned to OPERABLE status within 1 hour. In this Condition, the required contents of three SITs cannot be assumed to reach the core during a LOCA. Due to the severity of the consequences should a LOCA occur in these conditions, the 1 hour Completion Time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action will be taken to return the inoperable SIT to OPERABLE status. The Completion Time minimizes the potential for exposure of the plant to a LOCA under these conditions.

Add Insert D
as new
paragraph

C.1

If the inoperability of the required SIT was discovered but not restored while the plant was within the applicability of specification 3.5.1, "SITs - Operating", the plant must be brought to a MODE in which the LCO does not apply. The time allowed for restoration in specification 3.5.2 is adequate and may not be duplicated, for the same condition, when in specification 3.5.2, "SITs - Shutdown".

If the required SIT cannot be restored to OPERABLE status within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply.

To achieve this status, the plant must be brought to at least MODE 5 within 24 hours. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions in an orderly manner and without challenging plant systems.

D.1

If more than one of the required SITs is inoperable, the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

(continued)

INSERT D (ITS BASES B 3.5.2, ACTION B.1)

CE NPSD-994 (Ref. 5) provides a series of deterministic and probabilistic findings that support 24 hours as being either "risk beneficial" or "risk neutral" in comparison to shorter periods for restoring the SIT to OPERABLE status. CE NPSD-994 (Ref. 5) discusses best-estimate analysis for a typical PWR that confirmed that, during large-break LOCA scenarios, core melt can be prevented by either operation of one low pressure safety injection (LPSI) pump or the operation of one high pressure safety injection (HPSI) pump and a single SIT. CE NPSD-994 (Ref. 5) also discusses plant-specific probabilistic analysis that evaluated the risk-impact of the 24 hour recovery period in comparison to shorter recovery periods.

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.5.2.4 (continued)

because the water contained in the RWT is within the SIT boron concentration requirements. This is consistent with the recommendations of NUREG-1366 (Ref. 4).

SR 3.5.2.5

Verification every 31 days that power is removed from each required SIT isolation valve operator when the pressurizer pressure is ≥ 1500 psia ensures that an active failure could not result in the undetected closure of a SIT motor operated isolation valve. If this were to occur, two less than the required SITs would be available for injection, given a single failure coincident with a LOCA.

Since installation and removal of power to the SIT isolation valve operators is conducted under administrative control, the 31 day Frequency was chosen to provide additional assurance that power is removed.

This SR allows power to be supplied to the motor operated isolation valves when pressurizer pressure is < 1500 psia, thus allowing operational flexibility by avoiding unnecessary delays to manipulate the breakers during unit startups or shutdowns. Even with power supplied to the valves, inadvertent closure is prevented by the RCS pressure interlock associated with the valves. Should closure of a valve occur in spite of the interlock, the SI signal provided to the valves would open a closed valve in the event of a LOCA.

REFERENCES

1. IEEE Standard 279-1971.
2. 10 CFR 50.46.
3. UFSAR, Chapter 15.
4. NUREG-1366, December 1992.

"Improvements to Technical Specifications Surveillance Requirements,"

5. CE NPSD-994, "CEOG Joint Applications Report for Safety Injection Tank AOT/STI Extension," May 1995.

