ENCLOSURE 1

Response to Request for Additional Information

9709150068

PVNGS ITS 3.5.1 SAFETY INJECTION TANKS (SITs) - OPERATING

ISSUE #	DOC # or JFD #	CTS/STS LCO.	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.1-1	JD 4	STS 3.5.1 ACTIONS	STS 3.5.1 ACTIONS, allows a 72 hour restoration time for boron concentration not within limits, and 1 hour for reasons other than boron concentration not within limits. ITS ACTION A, allows a 72 hour restoration time for boron concentration not within limits and inability to verify level or pressure, and 24 hours for reasons other than ACTION A. This change to STS requirements is based upon TSTF-59, Technical Specification amendment dated June 13, 1995, Technical Specification updated submittal dated August 16,1995 and CE NPSD-994. Comments: Approval of this change is contingent upon the NRC approval of the listed Technical Specification amendments and TSTF-59.	This is correct. No response needed.
3.5.1-2	None	Bases 3.5.1 LCO	Last paragraph should read "For a SIT" rather than <u>an</u> SIT.	The last paragraph of ITS Bases B 3.5.1, LCO, has been corrected from "an SIT" to "a SIT." In addition, this same correction has been made to ITS Bases B 3.5.1 Action A.1, Bases SR 3.5.1.5, and Bases SR 3.5.2.5.
3.5.1-3	A.8		ITS 3.5.1 ACTIONS adds insert 1 incorporating the changes made by TS change request 102-03392, dated 6/13/95. The CTS does not include the ITS requirements. Comments: Acceptance of this change to CTS requirements is contingent upon the NRC acceptance of AOT TS change request 102-03392.	This is correct. No response needed.

PVNGS ITS 3.5.1 SAFETY INJECTION TANKS (SITs) - OPERATING

ISSUE #	DOC # or JFD #	CTS/STS LCO	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.1 - New	LA.4	CTS SR 4.5.1.e	**PVNGS - identified**	The RCS-SIT differential pressure alarm operability verification at least once per 18 months is being relocated to the Technical Requirements Manual (TRM) instead of the UFSAR, as described in the relocation matrix submitted to the NRC in letter 102-03942-JML/AKK/TNW/BM dated May 30, 1997. DOC 3.5.1, LA.4 has been revised to reflect this change and identify how the relocated requirements are controlled.

PVNGS ITS 3.5.2 SAFETY INJECTION TANKS (SITs) - SHUTDOWN

ISSUE #	DOC# or JFD#	CTS/STS LCO	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.2-1	A.6	CTS Action a,b	CTS 3.5.1,Action a and b are replaced with ITS 3.5.2, Action A,B,and C (Insert 1). This change is pending approval of a CTS change request. Comments: Acceptance of this change is contingent upon NRC approval of AOT TS change 102-03392, dated 6/13/95.	This is correct. No response needed.
3.5.2 - New	LA.4	CTS SR 4.5.1.e	**PVNGS - Identified**	The RCS-SIT differential pressure alarm operability verification at least once per 18 months is being relocated to the Technical Requirements Manual (TRM) instead of the UFSAR, as described in the relocation matrix submitted to the NRC in letter 102-03942-JML/AKK/TNW/BM dated May 30, 1997. DOC 3.5.2, LA.4 has been revised to reflect this change and identify how the relocated requirements are controlled.

PVNGS ITS 3.5.3 ECCS - OPERATING

ISSUE #	DOC # or JFD #	CTS/STS REF	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.3-1	A.5 JFD 5	CTS 3.5.3 Action a	CTS 3.5.2 Action a requires restoration of an inoperable ECCS subsystem within 72 hours or be in MODE 3 within the next 6 hours and in MODE 4 within the following 6 hours. ITS 3.5.3 Action A moves CTS 3.5.2 Action a to ITS Action b and inserts a new ITS 3.5.3 Action A that requires restoration of an Inoperable LPSI subsystem within 7 days. This change is pending approval of a proposed amendment to the CTS submitted 6/13/95. Comments: Acceptance of this change is contingent upon NRC approval of AOT TS change 102-03392, dated 6/13/95.	This is correct. No response needed.

PVNGS ITS 3.5.3 ECCS - OPERATING

ISSUE #	DOC # or JFD #	CTS/STS REF	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.3-2	LA.2, LA.3, LA.5, LA.6, LA.8	CTS 3.5.2 Action b, CTS 4.5.2.c, CTS 4.5.2.g.1, CTS 4.5.2.h, CTS 4.5.2.e.3	The listed CTS requirements are moved to plant procedures. ITS does not retain the information contained in the CTS requirements listed. There is no discussion to which plant procedures the CTS requirements have been moved. Comments: Provide discussion for which specific plant procedures now contain the CTS requirements.	1) The requirement for a special report (LA.2) is being relocated to the Technical Requirements Manual (TRM). DOC 3.5.3, LA.2 has been revised to reflect this relocation. 2) The requirement to perform a visual inspection of containment (LA.3) is being relocated to the TRM. DOC 3.5.3, LA.3 has been revised to reflect this relocation. 3) The requirement to verify correct position of the valve position stop (LA.5) is being relocated to the TRM. DOC 3.5.3, LA.5 has been revised to reflect this relocation. 4) The requirement to perform a flow balance test (LA.6) is being relocated to the TRM. DOC 3.5.3, LA.6 has been revised to reflect this relocation. 5) The list of specific valves required to be actuated (LA.8) is being relocated to the ITS Bases. DOC 3.5.3, LA.8 has been revised to reflect this relocation. These relocations are described in the relocation matrix submitted to the NRC in letter 102-03942-JML/AKK/TNW/BM dated May 30, 1997. The DOCs identify how the relocated requirements are controlled.

PVNGS ITS 3.5.3 ECCS - OPERATING

ISSUE #	DOC # or JFD #	CTS/STS REF	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.3-3	LA.9		The discussion of the relocation of SDC requirements is incomplete. What about the control of SDC per ITS 3.4.7, etc?	DOC 3.5.3, LA.9 has been revised to clarify that ITS does not include a separate specification for the SDC system **during Modes 1, 2, and 3.**

ISSUE #	DOC # or JFD #	CTS/STS REF	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.3-4	L.3	CTS Surveillance Requirements 4.5.2.e.1, 4.5.2.e.2, and 4.5.2.e.3	CTS Surveillance Requirements 4.5.2.e.1, 4.5.2.e.2, and 4,5,2,e,3 require verification of valve actuation and pump start using a test signal. ITS SR 3.5.3.4, 3.5.3.5, and 3.5.3.6 require verification using an actual or simulated signal instead of specifying a test signal. Allowing the use of an actual signal is dependent upon appropriate ECCS components actuating per the safety analysis. There is no discussion on how the data is obtained and analyzed to ensure the ITS SR is satisfied. Comments: Provide discussion and justification for the means of collecting and analyzing data to ensure the ITS SR is satisfied.	CTS 4.5.2.e.1, 4.5.2.e.2, and 4.5.2.e.3 require verification of valve actuation and pump start/stop using a test signal. The proposed change to ITS SRs 3.5.3.4, 3.5.3.5, and 3.5.3.6 require verification using an actual or simulated actuation signal instead of only a test signal. This change allows PVNGS to take credit for ECCS SRs if valve actuation and/or pump start/stop occurs due to an actual actuation signal. In order to take credit for the proper performance of each of these SRs, valve actuation and/or pump start/stop will be verified and documented by PVNGS personnel in accordance with surveillance test procedures whether the actuations and/or start/stop are initiated by actual or test signals. If an actual signal is received and the appropriate ECCS components properly actuate, as observed and documented by PVNGS personnel, there would be no need to re-perform the SRs at the original 18 month interval. PVNGS would have the option to either start the SR Frequency from receipt of the actual actuation or to re-test the ECCS system as originally scheduled. OPERABILITY is adequately demonstrated in either case since the components are not capable of discriminating between an actual or simulated actuation signal. This change to CTS is consistent with NUREG-1432: NUREG-1432 SRs 3.5.2.6, 3.5.2.7, and 3.5.3.8 are the models for ITS SRs 3.5.3.4, 3.5.3.5, and 3.5.3.6, respectively.

PVNGS ITS 3.5.3 ECCS - OPERATING

ISSUE #	DOC # or JFD #	CTS/STS REF	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.4-1	LA.1	CTS 3.5.3 Action b	CTS 3.5.3 Action b requires a Special Report submitted to the NRC if an ECCS actuation occurs. ITS 3.5.4 does not retain the CTS requirement. No discussion of which plant procedure now contains the information. Comments: Provide discussion about where the CTS requirement was moved.	The requirement for a special report (LA.1) is being relocated to the Technical Requirements Manual (TRM), as described in the relocation matrix submitted to the NRC in letter 102-03942-JML/AKK/TNW/BM dated May 30, 1997. DOC 3.5.4, LA.1 has been revised to reflect this relocation. The TRM will be controlled in accordance with the provisions of 10 CFR 50.59.

PVNGS ITS 3.5.5 REFUELING WATER TANK

ISSUE #	DOC # or JFD #	CTS/STS REF	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.5-1	A.2	CTS Figure 3.1-1	CTS Figure 3.1-1 includes the RWT and Spent Fuel Pool water volumes. ITS Figure 3.5.5-1 only retains the RWT water volume. The Spent Fuel Pool water volume has been moved to plant controlled documents. There is no discussion on which plant controlled document the CTS requirement was moved to or how it is controlled. Comments: Provide discussion on where the CTS requirement was moved and how it is controlled.	The graph in CTS Figure 3.1-1 showing the minimum borated water volume in the spent fuel pool is being relocated to the Technical Requirements Manual (TRM), as described in the relocation matrix submitted to the NRC in letter 102-03942-JML/AKK/TNW/BM dated May 30, 1997. This relocation is addressed in the Split Report for CTS 3.1.2.6. The TRM will be controlled in accordance with the provisions of 10 CFR 50.59.
3.5.5-2	None	ITS Figure 3.5.5-1	1) The LCO is only applicable in Modes 1-4 so why does the figure go down to 120 degrees F? Should the applicability include Mode 5? 2) Given that Figure 3.4.1-1 would allow Tc to go up to 570 degrees F, Tave could exceed the 565 degrees F of this Figure for a significant portion of Mode 1. Why does Figure 3.5.5-1 stop at 565 degrees F and what happens to required RWT level above that temperature (CTS Figure 3.1-1 would seem to indicate it continues to increase)?	Potential changes to ITS Figure 3.5.5-1 (CTS Figure 3.1-1) are being evaluated. A response to this issue (3.5.5-2) will be provided in a future submittal.
3.5.5-3	None	ITS 3.5.5 Bases Applicable Safety Analyses	Last sentence - Should reference 50.36 not the Policy Statement.	ITS Bases B 3.5.5 has been revised to reference 10 CFR 50.36 instead of the Policy Statement.

PVNGS ITS 3.5.6 TRISODIUM PHOSPHATE (TSP)

ISSUE #	DOC # or JFD #	CTS/STS REF	DESCRIPTION OF ISSUE	PVNGS RESPONSES
3.5.6-1	A.2	CTS 4.5.2.1.d.2	CTS Surveillance Requirement 4.5.2.1.d.2 requires ≥464 cubic feet of TSP in the TSP baskets. ITS SR 3.5.6.1 changed this amount to 524 cubic feet, pending a CTS change dated June 28,1996. Comments: Acceptance of this change is contingent upon NRC approval of this CTS change.	The referenced CTS change request has been approved by the NRC. DOC 3.5.6, A.2 and ITS Bases B 3.5.6 have been revised to reference the approved Technical Specification amendments.
3.5.6			PVNGS Identified	The ITS Bases 3.5.6 LCO has been revised to state that the minimum required volume of trisodium phosphate (TSP) in ITS LCO 3.5.6 is based on the design basis value density of anhydrous TSP, not the manufactured density of anhydrous TSP. This is a clarification to be consistent with the PVNGS design basis.

ENCLOSURE 2

ITS Section 3.5,
“Emergency Core Cooling Systems (ECCS)”

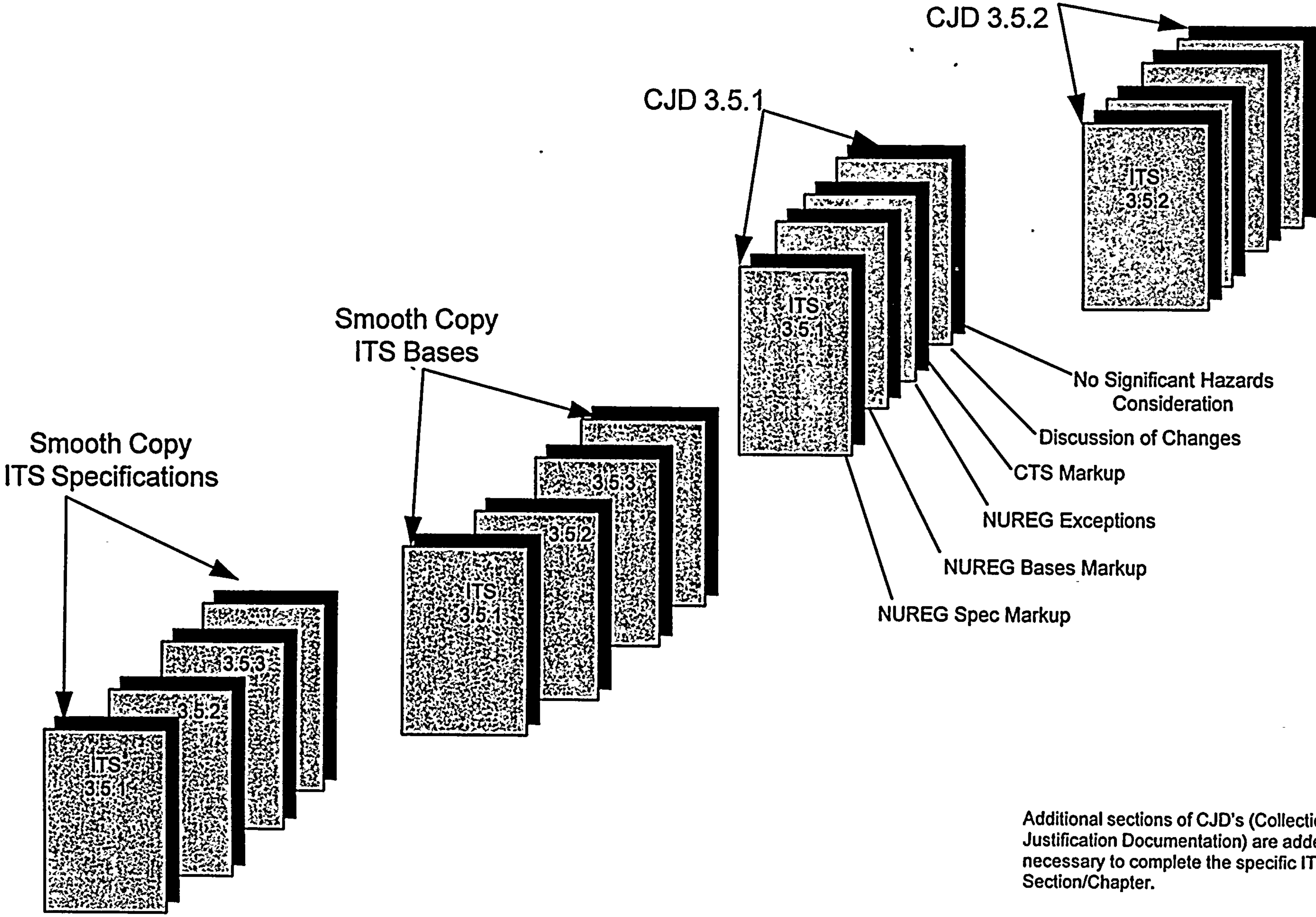
PVNGS

Palo Verde Nuclear Generating Station
Units 1, 2, and 3

Improved Technical Specifications

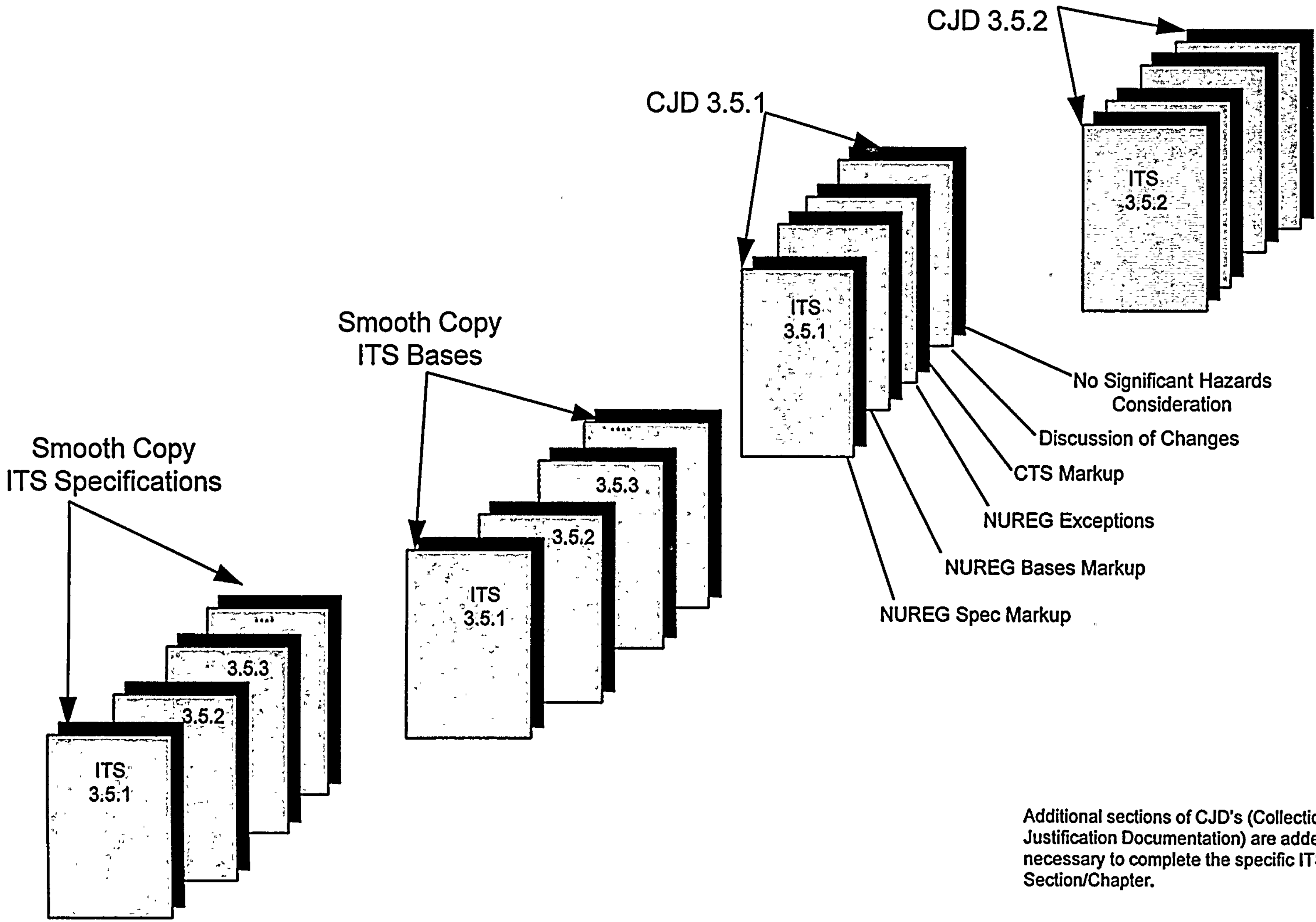
PVNGS ITS
SECTION 3.5 - EMERGENCY CORE COOLING SYSTEMS

ITS REVIEW PACKAGE CONTENTS
(Volume 12)



Additional sections of CJD's (Collection of Justification Documentation) are added as necessary to complete the specific ITS Section/Chapter.

ITS REVIEW PACKAGE CONTENTS
(Volume 12)



Additional sections of CJD's (Collection of Justification Documentation) are added as necessary to complete the specific ITS Section/Chapter.

SMOOTH COPY
ITS SECTION 3.5

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 ≥ 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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each SIT isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify borated water volume in each SIT is ≥ 28% narrow range and ≤ 72% narrow range.	12 hours
SR 3.5.1.3	Verify nitrogen cover pressure in each SIT is ≥ 600 psig and ≤ 625 psig.	12 hours
SR 3.5.1.4	Verify boron concentration in each SIT is ≥ 2300 ppm and ≤ 4400 ppm.	31 days AND -----NOTE------ Only required to be performed for affected SIT -------------- Once within 6 hours, whenever a SIT is drained to maintain the contained borated water level within the limits of SR 3.5.1.2.
SR 3.5.1.5	Verify power is removed from each SIT isolation valve operator.	31 days

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;

<u>OR</u>

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. 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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each required SIT isolation valve is fully open when pressurizer pressure is ≥ 430 psia.	12 hours
SR 3.5.2.2	Verify borated water volume in each required SIT is: a. For four OPERABLE SITs, > 39% wide range indication and < 83% wide range indication. OR b. For three OPERABLE SITs, > 60% wide range indication and < 83% wide range indication.	12 hours
SR 3.5.2.3	Verify nitrogen cover pressure in each required SIT is ≥ 260 psig and ≤ 625 psig.	12 hours
SR 3.5.2.4	Verify boron concentration in each required SIT is ≥ 2300 ppm and ≤ 4400 ppm.	31 days AND -----NOTE------ Only required to be performed for affected SIT -------------- Once within 6 hours, whenever a required SIT is drained to maintain the contained borated water level within the limits of SR 3.5.2.2.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.5	Verify power is removed from each required SIT isolation valve operator when pressurizer pressure is ≥ 1500 psia.	31 days

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS – Operating

LCO 3.5.3 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with pressurizer pressure ≥ 1837 psia or with RCS T_c ≥ 485°F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LPSI subsystem inoperable.	A.1 Restore subsystem to OPERABLE status.	7 days
B. One or more trains inoperable for reasons other than Condition A. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	B.1 Restore train(s) to OPERABLE status.	72 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Reduce pressurizer pressure to < 1837 psia. AND C.3 Reduce RCS T_c to < 485°F.	6 hours 12 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.3.2	Verify ECCS piping is full of water.	31 days
SR 3.5.3.3	Verify each ECCS pump develops the required differential pressure at the flow test point.	In accordance with the Inservice Testing Program
SR 3.5.3.4	Verify each ECCS automatic valve that is not locked, sealed, or otherwise secured in position, in the flow path actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.5.3.5	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.5.3.6	Verify each LPSI pump stops on an actual or simulated actuation signal.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.7	Verify, for each ECCS throttle valve listed below, each position stop is in the correct position. LPSI System <u>Valve Number</u>: SIB-UV 615, SIB-UV 625, SIA-UV 635, SIA-UV 645, SIA-HV 306, SIB-HV 307 Hot Leg Injection <u>Valve Numbers</u>: SIC-HV 321, SID-HV 331	18 months
SR 3.5.3.8	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	18 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 ECCS – Shutdown

LCO 3.5.4 One High Pressure Safety Injection (HPSI) train shall be OPERABLE.

APPLICABILITY: MODE 3 with pressurizer pressure < 1837 psia and with RCS T_c < 485°F.
MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required HPSI train inoperable.	A.1 Restore required HPSI train to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 5.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.4.1 The following SRs are applicable: SR 3.5.3.1 SR 3.5.3.5 SR 3.5.3.2 SR 3.5.3.7 SR 3.5.3.3 SR 3.5.3.8 SR 3.5.3.4	In accordance with applicable SRs

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Refueling Water Tank (RWT)

LCO 3.5.5 The RWT shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RWT boron concentration not within limits. OR RWT borated water temperature not within limits.	A.1 Restore RWT to OPERABLE status.	8 hours
B. RWT inoperable for reasons other than Condition A.	B.1 Restore RWT to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	-------------------NOTE------------------- Only required to be performed when ambient air temperature is < 60°F or > 120°F. -- Verify RWT borated water temperature is ≥ 60°F and ≤ 120°F.	24 hours
SR 3.5.5.2	Verify RWT borated water volume is ≥ minimum required RWT volume in Figure 3.5.5-1.	7 days
SR 3.5.5.3	Verify RWT boron concentration is ≥ 4000 ppm and ≤ 4400 ppm.	7 days

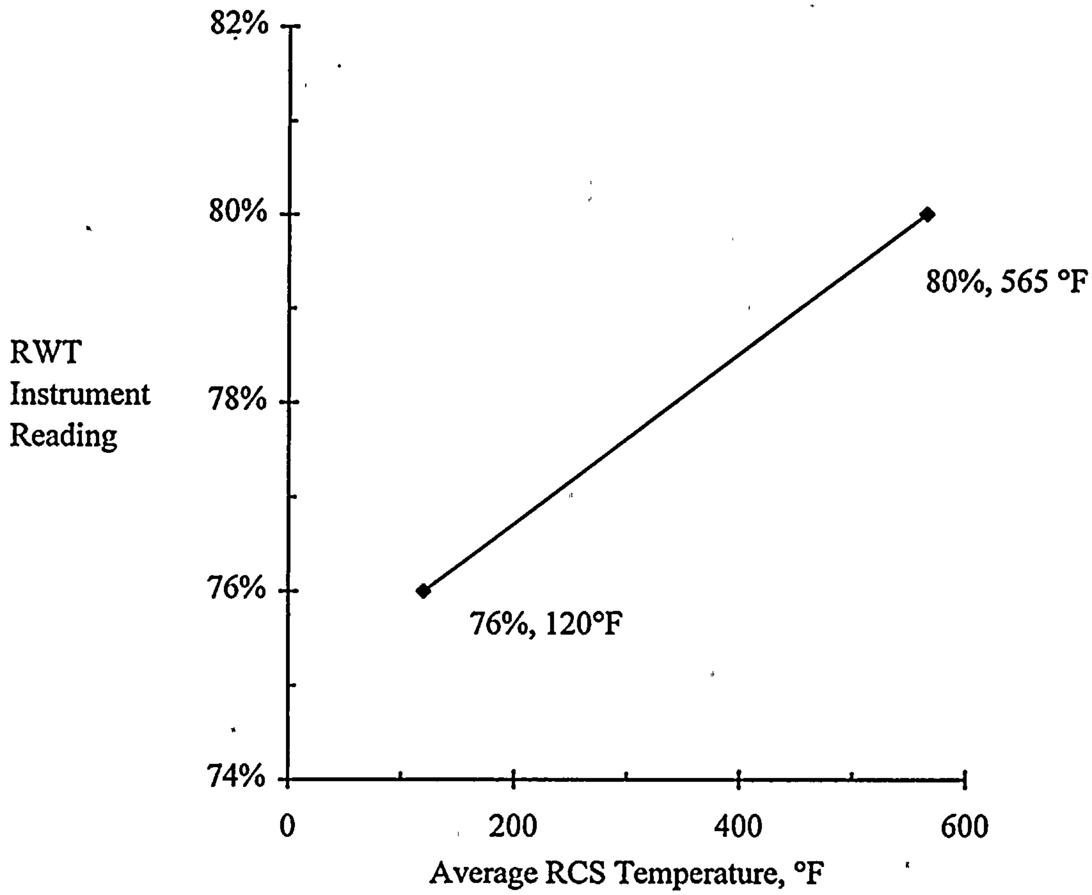


Figure 3.5.5-1
Minimum Required RWT Volume

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.6 Trisodium Phosphate (TSP)

LCO 3.5.6 The TSP baskets shall contain ≥ 524 ft^3 of active TSP.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. TSP not within limits.	A.1 Restore TSP to within limits.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.6.1	Verify the TSP baskets contain ≥ 524 ft^3 of granular anhydrous trisodium phosphate.	18 months
SR 3.5.6.2	Verify that a sample from the TSP baskets provides adequate pH adjustment of borated water.	18 months

SMOOTH COPY
ITS SECTION 3.5 - BASES

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.1 Safety Injection Tanks (SITs) - Operating

BASES

BACKGROUND

The functions of the four SITs are to supply water to the reactor vessel during the blowdown phase of a Loss of Coolant Accident (LOCA), to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System (RCS) makeup for a small break LOCA.

The blowdown phase of a large break LOCA is the initial period of the transient during which the RCS departs from equilibrium conditions, and heat from fission product decay, hot internals, and the vessel continues to be transferred to the reactor coolant. The blowdown phase of the transient ends when the RCS pressure falls to a value approaching that of the containment atmosphere.

The refill phase of a LOCA follows immediately where reactor coolant inventory has vacated the core through steam flashing and ejection out through the break. The core is essentially in adiabatic heatup. The balance of the SITs' inventory is then available to help fill voids in the lower plenum and reactor vessel downcomer to establish a recovery level at the bottom of the core and ongoing reflood of the core with the addition of Safety Injection (SI) water.

The SITs are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The SITs are passive components, since no operator or control action is required for them to perform their function. Internal tank pressure is sufficient to discharge the contents to the RCS, if RCS pressure decreases below the SIT pressure.

Each SIT is piped into one RCS cold leg via the injection lines utilized by the High Pressure Safety Injection and Low Pressure Safety Injection (HPSI and LPSI) Systems. Each SIT is isolated from the RCS by a motor operated isolation valve and two check valves in series. The motor operated isolation valves are normally open, with power removed from the valve motor to prevent inadvertent closure prior to or during an accident.

(continued)

BASES

BACKGROUND (continued)

Additionally, the isolation valves are interlocked with the pressurizer pressure instrumentation channels to ensure that the valves will automatically open as RCS pressure increases above SIT pressure and to prevent inadvertent closure prior to an accident. The valves also receive a Safety Injection Actuation Signal (SIAS) to open. These features ensure that the valves meet the requirements of the Institute of Electrical and Electronic Engineers (IEEE) Standard 279-1971 (Ref. 1) for "operating bypasses" and that the SITs will be available for injection without reliance on operator action.

The SIT gas and water volumes, gas pressure, and outlet pipe size are selected to allow three of the four SITs to partially recover the core before significant clad melting or zirconium water reaction can occur following a LOCA. The need to ensure that three SITs are adequate for this function is consistent with the LOCA assumption that the entire contents of one SIT will be lost via the break during the blowdown phase of a LOCA.

APPLICABLE SAFETY ANALYSES

The SITs are taken credit for in both the large and small break LOCA analyses at full power (Ref. 2). These are the Design Basis Accidents (DBAs) that establish the acceptance limits for the SITs. Reference to the analyses for these DBAs is used to assess changes to the SITs as they relate to the acceptance limits.

In performing the LOCA calculations, conservative assumptions are made concerning the availability of SI flow. These assumptions include signal generation time, equipment starting times, and delivery time due to system piping. In the early stages of a LOCA with a loss of offsite power, the SITs provide the sole source of makeup water to the RCS. (The assumption of a loss of offsite power is required by regulations.) This is because the LPSI pumps and HPSI pumps cannot deliver flow until the Diesel Generators (DGs) start, come to rated speed, and go through their timed loading sequence. In cold leg breaks, the entire contents of one SIT are assumed to be lost through the break during the blowdown and reflood phases.

The limiting large break LOCA is a double ended guillotine cold leg break at the discharge of the reactor coolant pump.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

During this event, the SITs discharge to the RCS as soon as RCS pressure decreases to below SIT pressure. As a conservative estimate, no credit is taken for SI pump flow until the SITs are empty. This results in a minimum effective delay of over 55 seconds, during which the SITs must provide the core cooling function. The actual delay time does not exceed 29 seconds. No operator action is assumed during the blowdown stage of a large break LOCA.

The worst case small break LOCA also assumes a time delay before pumped flow reaches the core. For the larger range of small breaks, the rate of blowdown is such that the increase in fuel clad temperature is terminated solely by the SITs, with pumped flow then providing continued cooling. As break size decreases, the SITs and HPSI pumps both play a part in terminating the rise in clad temperature. As break size continues to decrease, the role of the SITs continues to decrease until they are not required, and the HPSI pumps become solely responsible for terminating the temperature increase.

This LCO helps to ensure that the following acceptance criteria, established by 10 CFR 50.46 (Ref. 3) for the ECCS, will be met following a LOCA:

a. Maximum fuel element cladding temperature is ≤ 2200°F;

b. Maximum cladding oxidation is ≤ 0.17 times the total cladding thickness before oxidation;

c. Maximum hydrogen generation from a zirconium water reaction is ≤ 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react; and

d. The core is maintained in a coolable geometry.

Since the SITs discharge during the blowdown phase of a LOCA, they do not contribute to the long term cooling requirements of 10 CFR 50.46.

Since the SITs are passive components, single active failures are not applicable to their operation. The SIT isolation valves and SIT nitrogen vent valves, however, are not single failure proof;

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

therefore, whenever the SIT motor operated isolation valves are open, power is removed from their operators and the switch is key locked open. Whenever the SIT vent valves are closed, power is removed with a keylock switch.

These precautions ensure that the SITs are available during an accident (Ref. 4). With power supplied to the valves, a single active failure could result in a valve failure, which would render one SIT unavailable for injection. If a second SIT is lost through the break, only two SITs would reach the core. Active failures that could affect the SITs would be the closure of a motor operated outlet valve or opening of a solenoid operated nitrogen vent valve, the requirement to remove power from these eliminates this failure mode.

The minimum volume requirement for the SITs ensures that three SITs can provide adequate inventory to reflood the core and downcomer following a LOCA. The downcomer then remains flooded until the HPSI and LPSI systems start to deliver flow.

The maximum volume limit is based on maintaining an adequate gas volume to ensure proper injection and the ability of the SITs to fully discharge, as well as limiting the maximum amount of boron inventory in the SITs.

A minimum of 1690 cubic feet of borated water, and a maximum of 2000 cubic feet of borated water are used in the safety analyses as the volume in the SITs. To allow for instrument inaccuracy, a 28% narrow range (corresponding to 1802 cubic feet) and a 72% narrow range (corresponding to 1914 cubic feet) are specified. The analyses are based upon the cubic feet requirements; the percentage figures are provided in the LCO for operator use because the level indicator provided in the control room is marked in percentages, not in cubic feet.

The minimum nitrogen cover pressure requirement ensures that the contained gas volume will generate discharge flow rates during injection that are consistent with those assumed in the safety analyses.

The maximum nitrogen cover pressure limit ensures that excessive amounts of gas will not be injected into the RCS after the SITs have emptied.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

A minimum pressure of 588 psig and a maximum pressure of 637 psig are used in the analyses. To allow for instrument accuracy, a 600 psig minimum and 625 psig maximum are specified. The maximum allowable boron concentration of 4400 ppm is based upon boron precipitation limits in the core following a LOCA. Establishing a maximum limit for boron is necessary since the time at which boron precipitation would occur in the core following a LOCA is a function of break location, break size, the amount of boron injected into the core, and the point of ECCS injection. Post LOCA emergency procedures directing the operator to establish simultaneous hot and cold leg injection are based on the worst case minimum boron precipitation time. Maintaining the maximum SIT boron concentration within the upper limit ensures that the SITs do not invalidate this calculation. An excessive boron concentration in any of the borated water sources used for injection during a LOCA could result in boron precipitation earlier than predicted.

The 2300 ppm minimum boron concentration in the SITs assures that the back leakage from the RCS will not dilute the SITs below the minimum boron concentration in the safety analysis. The minimum safety analysis boron requirements of 2000 ppm are based on beginning of life reactivity values and are selected to ensure that the reactor will remain subcritical during the reflood stage of a large break LOCA. During a large break LOCA, all Control Element Assemblies (CEAs) are assumed not to insert into the core, and the initial reactor shutdown is accomplished by void formation during blowdown. Sufficient boron concentration must be maintained in the SITs to prevent a return to criticality during reflood. Although this requirement is similar to the basis for the minimum boron concentration of the Refueling Water Tank (RWT), the minimum SIT concentration is lower than that of the RWT since the SITs need not account for dilution by the RCS during a large break LOCA.

The SITs satisfy Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

The LCO establishes the minimum conditions required to ensure that the SITs are available to accomplish their core cooling safety function following a LOCA. Four SITs are required to be OPERABLE to ensure that 100% of the contents of three of the SITs will reach the core during a LOCA.

(continued)

BASES

LCO (continued)

This is consistent with the assumption that the contents of one tank spill through the break. If the contents of fewer than three tanks are injected during the blowdown phase of a LOCA, the ECCS acceptance criteria of 10 CFR 50.46 (Ref. 3) could be violated.

For a SIT to be considered OPERABLE, the motor operated isolation valve must be fully open, power removed and the limits established in the SR for contained volume, boron concentration, and nitrogen cover pressure must be met.

APPLICABILITY

In MODES 1 and 2, and MODES 3 and 4 with pressurizer pressure ≥ 1837 psia, the SIT OPERABILITY requirements are based on an assumption of full power operation. Although cooling requirements decrease as power decreases, the SITs are still required to provide core cooling as long as elevated RCS pressures and temperatures exist.

The SIT functional requirements in MODES 3 and 4 with pressurizer pressure < 1837 psia are described in LCO 3.5.2, "SIT - Shutdown".

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., a 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.

(continued)

BASES

ACTIONS

A.1

If the boron concentration of one SIT is not within limits, or if the level or pressure in one SIT cannot be verified, 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.

If the level and pressure cannot be verified, pressure and level indication for the affected SIT would not be available to the Operators. However, in this condition the SIT would still be available to fulfill its function because it is unlikely that the level or pressure would deteriorate to outside specified limits within 72 hours. Therefore, based on this, and that the level and pressure instrumentation associated with the SITs do not initiate a safety action, it is reasonable to allow 72 hours to restore the SIT to OPERABLE status. This is consistent with the recommendations of NUREG-1366 (Ref. 5).

If there is a known condition where pressure or level could not be maintained within limits for at least 72 hours, then the affected SIT would be considered inoperable for reasons other than the inability to verify level or pressure.

B.1

If one SIT is inoperable, for reasons other than boron concentration or the inability to verify level or pressure, the SIT must be returned to OPERABLE status within 24 hours. In this condition, the required contents of three SITs cannot be assumed to reach the core during a LOCA as is assumed in Appendix K (Ref. 6).

(continued)

BASES

ACTIONS

B.1 (continued)

CE NPSD-994 (Ref. 7) provides a series of deterministic and probabilistic findings that support the 24 hour Completion Time as having no affect on risk as compared to shorter periods for restoring the SIT to OPERABLE status. The best-estimate analysis confirmed that, during large-break LOCA scenarios, core melt can be prevented by either operation of one LPSI pump or the operation of one HPSI pump and a single SIT.

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.

D.1

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

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Verification every 12 hours that each SIT isolation valve is fully open, as indicated in the control room, ensures that SITs are available for injection and ensures timely discovery if a valve should be partially closed. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve should not change position with power removed, a closed valve could result in not meeting accident analysis assumptions. A 12 hour Frequency is considered reasonable in view of other administrative controls that ensure the unlikelihood of a mispositioned isolation valve.

SR 3.5.1.2 and SR 3.5.1.3

SIT borated water volume and nitrogen cover pressure should be verified to be within specified limits every 12 hours in order to ensure adequate injection during a LOCA. Due to the static design of the SITs, a 12 hour Frequency usually allows the operator sufficient time to identify changes before the limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.

SR 3.5.1.4

Thirty-one days is reasonable for verification to determine that each SIT's boron concentration is within the required limits, because the static design of the SITs limits the ways in which the concentration can be changed. The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Verification of boron concentration by performing a calculation based on level increase, RCS boron concentration, and last sample results; or by sampling the affected SIT within 6 hours, whenever a SIT is drained to maintain contained borated water level will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water is from the RWT, because the water contained in the RWT is within the SIT boron concentration requirements. This is consistent with the recommendations of NUREG-1366 (Ref. 5).

(continued)

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.
6. 10 CFR 50 Appendix K.
7. CE NPSD-994, "CEOG Joint Applications Report for Safety Injection Tank AOT/STI Extension", April 1995.

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.2 SITs – Shutdown

BASES

The functions of the four SITs are to supply water to the reactor vessel during the blowdown phase of a Loss of Coolant Accident (LOCA), to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System (RCS) makeup for a small break LOCA.

The blowdown phase of a large break LOCA is the initial period of the transient during which the RCS departs from equilibrium conditions, and heat from fission product decay, hot internals, and the vessel continues to be transferred to the reactor coolant. The blowdown phase of the transient ends when the RCS pressure falls to a value approaching that of the containment atmosphere.

The refill phase of a LOCA follows immediately where reactor coolant inventory has vacated the core through steam flashing and ejection out through the break. The core is essentially in adiabatic heatup. The balance of the SITs' inventory is then available to help fill voids in the lower plenum and reactor vessel downcomer to establish a recovery level at the bottom of the core and ongoing reflood of the core with the addition of Safety Injection (SI) water.

The SITs are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The SITs are passive components, since no operator or control action is required for them to perform their function. Internal tank pressure is sufficient to discharge the contents to the RCS, if RCS pressure decreases below the SIT pressure.

(continued)

BACKGROUND (continued)

Each SIT is piped into one RCS cold leg via the injection lines utilized by the High Pressure Safety Injection and Low Pressure Safety Injection (HPSI and LPSI) Systems. Each SIT is isolated from the RCS by a motor operated isolation valve and two check valves in series. The motor operated isolation valves are normally open, with power removed from the valve motor to prevent inadvertent closure prior to or during an accident.

Additionally, the SIT motor operated isolation valves are interlocked with the pressurizer pressure instrumentation channels to ensure that the valves will automatically open as RCS pressure increases above SIT pressure and to prevent inadvertent closure prior to an accident. The valves also receive a Safety Injection Actuation Signal (SIAS) to open. These features ensure that the valves meet the requirements of the Institute of Electrical and Electronic Engineers (IEEE) Standard 279-1971 (Ref. 1) for "operating bypasses" and that the SITs will be available for injection without reliance on operator action.

In MODES 3 and 4 with pressurizer pressure < 1837 psia either four SITs with a minimum volume of 962 cubic feet in each SIT or three SITs with a minimum borated water volume of 1415 cubic feet in each SIT are required. The SIT gas and water volumes, gas pressure, and outlet pipe size are selected to allow one less than the required SITs to partially recover the core before significant clad melting or zirconium water reaction can occur following a LOCA. The need to ensure that one less than the required SITs are adequate for this function is consistent with the LOCA assumption that the entire contents of one SIT will be lost via the break during the blowdown phase of a LOCA.

APPLICABLE SAFETY ANALYSES

Due to the reduced decay heat removal requirements in MODES 3 and 4, and the reduced probability of a Design Basis Accident (DBA), the SITS operational requirements are reduced. The operational requirement allows either three or four SITs to be OPERABLE with a reduced borated water volume.

(continued)

APPLICABLE SAFETY ANALYSES (continued)

Since the SITs are passive components, single active failures are not applicable to their operation. The SIT isolation valves and SIT nitrogen vent valves, however, are not single failure proof; therefore, whenever the SIT motor operated isolation valves are open, power is removed from their operators, and the switch is key locked open. Whenever the SIT vent valves are closed, power is removed with a keylock switch.

These precautions ensure that the SITs are available during an accident (Ref. 3). With power supplied to the valves, a single active failure could result in a valve failure, which would render one of the required SITs unavailable for injection. If a second required SIT is lost through the break, only the remaining required SIT(s) would reach the core. Active failures that could affect the SITs would be the closure of a motor operated outlet valve or opening of a solenoid operated nitrogen vent valve, the requirement to remove power from these eliminates this failure mode. Power is removed from the SIT isolation valves and nitrogen vent valves when pressurizer pressure is ≥ 1500 psia. This is consistent with the minimum LOCA analysis pressure of 1600 psia.

The minimum volume requirement for the required SITs, assuming one SIT is not available, ensures that the SITs can provide adequate inventory to reflood the core and downcomer following a LOCA. The downcomer then remains flooded until the HPSI and LPSI systems start to deliver flow.

The maximum volume limit is based on maintaining an adequate gas volume to ensure proper injection and the ability of the SITs to fully discharge, as well as limiting the maximum amount of boron inventory in the SITs.

(continued)

APPLICABLE SAFETY ANALYSES (continued)

For three OPERABLE SITs, the safety analysis uses a minimum of 1361 cubic feet of borated water and a maximum of 2000 cubic feet of borated water. To allow for instrument inaccuracy, a 60% wide range level (corresponding to 1451.5 cubic feet) and a 83% wide range level (corresponding to 1914 cubic feet) are specified. For four OPERABLE SITs, the safety analysis uses a minimum of 908 cubic feet of borated water and a maximum of 2000 cubic feet of borated water. To allow for instrument inaccuracy, a 39% wide range level (corresponding to 1029.2 cubic feet) and a 83% wide range level (corresponding to 1914 cubic feet) are specified. The percentage figures are provided in the LCO for operator use because the level indicator provided in the control room is marked in percentage, not in cubic feet.

The minimum nitrogen cover pressure requirement ensures that the contained gas volume will generate discharge flow rates during injection that are consistent with those assumed in the safety analyses.

The maximum nitrogen cover pressure limit ensures that excessive amounts of gas will not be injected into the RCS after the SITs have emptied.

A minimum pressure of 235 psig and a maximum pressure of 637 psig are used in the analyses. To allow for instrument accuracy, a 260 psig minimum and 625 psig maximum are specified. The maximum allowable boron concentration of 4400 ppm is based upon boron precipitation limits in the core following a LOCA. Establishing a maximum limit for boron is necessary since the time at which boron precipitation would occur in the core following a LOCA is a function of break location, break size, the amount of boron injected into the core, and the point of ECCS injection. Post LOCA emergency procedures directing the operator to establish simultaneous hot and cold leg injection are based on the worst case minimum boron precipitation time. Maintaining the maximum SIT boron concentration within the upper limit ensures that the SITs do not invalidate this calculation. An excessive boron concentration in any of the borated water sources used for injection during a LOCA could result in boron precipitation earlier than predicted.

(continued)

APPLICABLE SAFETY ANALYSES (continued)

The 2300 ppm minimum boron concentration in the SITs assures that the back leakage from the RCS will not dilute the SITs below the minimum boron concentration in the safety analysis. The minimum safety analysis boron requirements of 2000 ppm are based on beginning of life reactivity values and are selected to ensure that the reactor will remain subcritical during the reflood stage of a large break LOCA. Sufficient boron concentration must be maintained in the SITs to prevent a return to criticality during reflood. Although this requirement is similar to the basis for the minimum boron concentration of the Refueling Water Tank (RWT), the minimum SIT concentration is lower than that of the RWT since the SITs need not account for dilution by the RCS.

SIT-Shutdown satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

In MODES 3 and 4 with pressurizer pressure less than 1837 psia, the LCO establishes the minimum conditions required to ensure that the required SITs are available to accomplish their core cooling safety function following a LOCA. The number of SITs required to be OPERABLE is based on the minimum required volume that will reach the core during a LOCA, assuming a single failure.

This is consistent with the assumption that the contents of one tank spill through the break. If the contents of less than the remaining required tanks are injected during the blowdown phase of a LOCA, the ECCS acceptance criteria of 10 CFR 50.46 (Ref. 2) could be violated.

For a required SIT to be considered OPERABLE, the motor operated isolation valve must be fully open when pressurizer pressure is ≥ 430 psia, power removed when pressurizer pressure is ≥ 1500 psia, and the limits established in the SR for contained volume, boron concentration, and nitrogen cover pressure must be met.

(continued)

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.

(continued)

ACTIONS

A.1 (continued)

If the level and pressure cannot be verified, pressure and level indication for the affected SIT would not be available to the Operators. However, in this condition the SIT would still be available to fulfill its function because it is unlikely that the level or pressure would deteriorate to outside specified limits within 72 hours. Therefore, based on this, and that the level and pressure instrumentation associated with the SITs do not initiate a safety action, it is reasonable to allow 72 hours to restore the SIT to OPERABLE status. This is consistent with the recommendations of NUREG-1366 (Ref. 4).

If there is a known condition where pressure or level could not be maintained within limits for at least 72 hours, then the affected SIT would be considered inoperable for reasons other than the inability to verify level or pressure.

B.1

If one required SIT is inoperable, for reasons other than boron concentration or the inability to verify level or pressure, the SIT must be returned to OPERABLE status within 24 hours. In this condition, the required contents of the remaining required SITs cannot be assumed to reach the core during a LOCA as is assumed in Appendix K (Ref. 5).

CE NPSD-994 (Ref. 6) provides a series of deterministic and probabilistic findings that support the 24 hour Completion Time as having no affect on risk as compared to shorter periods for restoring the SIT to OPERABLE status. The best-estimate analysis confirmed that, during large-break LOCA scenarios, core melt can be prevented by either operation of one LPSI pump or the operation of one HPSI pump and a single SIT.

(continued)

ACTIONS (continued)

C.1

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.

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

Verification every 12 hours that each required SIT isolation valve is fully open when pressurizer pressure is ≥ 430 psia as indicated in the control room, ensures that the required SITs are available for injection and ensures timely discovery if a valve should be partially closed. If a required isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve should not change position with power removed, a closed valve could result in not meeting accident analysis assumptions. A 12 hour Frequency is considered reasonable in view of other administrative controls that ensure the unlikelihood of a mispositioned isolation valve.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.2 and SR 3.5.2.3

Borated water volume and nitrogen cover pressure for the required SITs should be verified to be within specified limits every 12 hours in order to ensure adequate injection during a LOCA. Due to the static design of the SITs, a 12 hour Frequency usually allows the operator sufficient time to identify changes before the limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.

SR 3.5.2.4

Thirty-one days is reasonable for verification to determine that each required SIT's boron concentration is within the required limits, because the static design of the SITs limits the ways in which the concentration can be changed. The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Verification of boron concentration by performing a calculation based on level increase, RCS boron concentration, and last sample results; or sampling the affected SIT within 6 hours whenever a SIT is drained to maintain contained borated water level will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water is from the RWT, 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.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.2.5 (continued)

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.
5. 10 CFR 50 Appendix K.
6. CE NPSD-994, "CEOG Joint Applications Report for Safety Injection Tank AOT/STI Extension," April 1995.

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.3 ECCS – Operating

BASES

BACKGROUND

The function of the ECCS is to provide core cooling and negative reactivity to ensure that the reactor core is protected after any of the following accidents:

a. Loss of Coolant Accident (LOCA);

b. Control Element Assembly (CEA) ejection accident;

c. Loss of secondary coolant accident, including uncontrolled steam release or loss of feedwater; and

d. Steam Generator Tube Rupture (SGTR).

The addition of negative reactivity is designed primarily for the loss of secondary coolant accident where primary cooldown could add enough positive reactivity to achieve criticality and return to significant power.

There are two phases of ECCS operation: injection and recirculation. In the injection phase, all injection is initially added to the Reactor Coolant System (RCS) via the cold legs. After the blowdown stage of the LOCA stabilizes, injection flow is split equally between the hot and cold legs. After the Refueling Water Tank (RWT) has been depleted, the ECCS recirculation phase is entered as the ECCS suction is automatically transferred to the containment sump.

Two redundant, 100% capacity trains are provided. In MODES 1, 2, and 3, with pressurizer pressure ≥ 1837 psia or with RCS T_c ≥ 485°F each train consists of High Pressure Safety Injection (HPSI) and Low Pressure Safety Injection (LPSI) subsystems. In MODES 1, 2, and 3, with pressurizer pressure ≥ 1837 psia or with RCS Tc ≥ 485°F both trains must be OPERABLE. This ensures that 100% of the core cooling requirements can be provided in the event of a single active failure.

(continued)

BASES

BACKGROUND (continued)

A suction header supplies water from the RWT or the containment sump to the ECCS pumps. Separate piping supplies each train. The discharge headers from each HPSI pump divide into four supply lines. Both HPSI trains feed into each of the four injection lines. The discharge header from each LPSI pump divides into two supply lines, each feeding the injection line to two RCS cold legs. Control valves or orifices are set to balance the flow to the RCS. This flow balance directs sufficient flow to the core to meet the analysis assumptions following a LOCA in one of the RCS cold legs.

The Safety Injection (SI) systems are actuated upon receipt of an SIAS. The actuation of safeguard loads is accomplished in a programmed time sequence. If offsite power is available, the safeguard loads start immediately in the programmed sequence. If offsite power is not available, the Engineered Safety Feature (ESF) buses shed normal operating loads and are connected to the Diesel Generators (DGs). Safeguard loads are then actuated in the programmed time sequence. The time delay associated with diesel starting, sequenced loading, and pump starting determines the time required before pumped flow is available to the core following a LOCA.

The active ECCS components, along with the passive Safety Injection Tanks (SITs) and the RWT, covered in LCO 3.5.1, "Safety Injection Tanks (SITs)-Operating"; LCO 3.5.2, "SITs-Shutdown"; and LCO 3.5.5, "Refueling Water Tank (RWT)," provide the cooling water necessary to meet GDC 35 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The LCO helps to ensure that the following acceptance criteria, established by 10 CFR 50.46 (Ref. 2) for ECCSs, will be met following a LOCA:

a. Maximum fuel element cladding temperature is ≤ 2200°F;

b. Maximum cladding oxidation is ≤ 0.17 times the total cladding thickness before oxidation;

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

c. Maximum hydrogen generation from a zirconium water reaction is ≤ 0.01 times the hypothetical amount generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react;

d. Core is maintained in a coolable geometry; and

e. Adequate long term core cooling capability is maintained.

The LCO also limits the potential for a post trip return to power following a Steam Line Break (SLB) and ensures that containment temperature limits are met.

Both HPSI and LPSI subsystems are assumed to be OPERABLE in the large break LOCA analysis at full power (Ref. 3). This analysis establishes a minimum required runout flow for the HPSI and LPSI pumps, as well as the maximum required response time for their actuation. The HPSI pumps are credited in the small break LOCA analysis. This analysis establishes the flow and discharge head requirements at the design point for the HPSI pump. The SGTR and SLB analyses also credit the HPSI pumps, but are not limiting in their design.

The large break LOCA event with a loss of offsite power and a single failure (disabling one ECCS train) establishes the OPERABILITY requirements for the ECCS. During the blowdown stage of a LOCA, the RCS depressurizes as primary coolant is ejected through the break into the containment. The nuclear reaction is terminated either by moderator voiding during large breaks or CEA insertion during small breaks. Following depressurization, emergency cooling water is injected into the cold legs, flows into the downcomer, fills the lower plenum, and refloods the core.

On smaller breaks, RCS pressure will stabilize at a value dependent upon break size, heat load, and injection flow. The smaller the break, the higher this equilibrium pressure. In all LOCA analyses, injection flow is not credited until RCS pressure drops below the shutoff head of the HPSI pumps.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The LCO ensures that an ECCS train will deliver sufficient water to match decay heat boiloff rates soon enough to minimize core uncovery for a large LOCA. It also ensures that the HPSI pump will deliver sufficient water during a small break LOCA and provide sufficient boron to maintain the core subcritical following an SLB.

ECCS – Operating satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

In MODES 1, 2, and 3, with pressurizer pressure ≥ 1837 psia or with RCS T_c ≥ 485°F two independent (and redundant) ECCS trains are required to ensure that sufficient ECCS flow is available, assuming there is a single failure affecting either train. Additionally, individual components within the ECCS trains may be called upon to mitigate the consequences of other transients and accidents.

In MODES 1 and 2, and in MODE 3 with pressurizer pressure ≥ 1837 psia or with RCS T_c ≥ 485°F an ECCS train consists of a HPSI subsystem and a LPSI subsystem.

Each train includes the piping, instruments, valves, and controls to ensure the availability of an OPERABLE flow path capable of taking suction from the RWT on a SIAS and automatically transferring suction to the containment sump upon a Recirculation Actuation Signal (RAS).

During an event requiring ECCS actuation, a flow path is provided to ensure an abundant supply of water from the RWT to the RCS, via the HPSI and LPSI pumps and their respective supply headers, to each of the four cold leg injection nozzles. In the long term (post RAS), this flow path is manually switched two to three hours after a LOCA to supply part of its HPSI flow to the RCS hot legs via the HPSI hot leg injection valves which connect to the Shutdown Cooling (SDC) suction nozzles.

(continued)

BASES

LCO (continued)

Simultaneous hot and cold leg injection will maintain core cooling and boric acid flushing following a large break LOCA.

The flow path for each train must maintain its designed independence to ensure that no single failure can disable both ECCS trains.

APPLICABILITY

In MODES 1 and 2, and in MODE 3 with RCS pressure ≥ 1837 psia or with RCS T_c ≥ 485°F the ECCS OPERABILITY requirements for the limiting Design Basis Accident (DBA) large break LOCA are based on full power operation. Although reduced power would not require the same level of performance, the accident analysis does not provide for reduced cooling requirements in the lower MODES. The HPSI pump performance is based on the small break LOCA, which establishes the pump performance curve and has less dependence on plant power. The minimum T_c is based on the ECCS OPERABILITY requirements for a MODE 3 steam line break with a stuck rod and a single HPSI failure to prevent a return to power. The requirements of MODES 2 and 3, with RCS pressure ≥ 1837 psia or with RCS T_c ≥ 485°F, are bounded by the MODE 1 analysis.

The ECCS functional requirements of MODE 3, with RCS pressure < 1837 psia and with RCS T_c < 485°F, and MODE 4 are described in LCO 3.5.4, "ECCS – Shutdown."

In MODES 5 and 6, unit conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops – MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.4, "Shutdown Cooling (SDC) and Coolant Circulation – High Water Level," and LCO 3.9.5, "Shutdown Cooling (SDC) and Coolant Circulation – Low Water Level."

(continued)

BASES

ACTIONS

A-1

With one LPSI subsystem inoperable,action must be taken to restore OPERABLE status within 7 days. In this condition, the remaining OPERABLE ECCS train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure to the remaining LPSI subsystem could result in loss of ECCS function. The 7 day Completion Time is reasonable to perform corrective maintenance on the inoperable LPSI subsystem. The 7 day Completion Time is based on the findings of the deterministic and probabilistic analysis in Reference 5. Reference 5 concluded that the overall risk impact to this Completion Time does not adversely affect risk.

B.1

If one or more trains are inoperable, except for reasons other than Condition A (one LPSI inoperable) and at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train is available, the inoperable components must be returned to OPERABLE status within 72 hours. The 72 hour Completion Time is based on an NRC study (Ref. 4) using a reliability evaluation and is a reasonable amount of time to effect many repairs.

An ECCS train is inoperable if it is not capable of delivering the design flow to the RCS. The individual components are inoperable if they are not capable of performing their design function, or if supporting systems are not available.

The LCO requires the OPERABILITY of a number of independent subsystems. Due to the redundancy of trains and the diversity of subsystems, the inoperability of one component in a train does not render the ECCS incapable of performing its function. Neither does the inoperability of two different components, each in a different train, necessarily result in a loss of function for the ECCS. The intent of this Condition is to maintain a combination of OPERABLE equipment such that 100% of the ECCS flow equivalent to 100% of a single OPERABLE train remains available. This allows increased flexibility in plant operations when components in opposite trains are inoperable.

(continued)

BASES

ACTIONS

B.1 (continued)

An event accompanied by a loss of offsite power and the failure of an emergency DG can disable one ECCS train until power is restored. A reliability analysis (Ref. 4) has shown that the impact with one full ECCS train inoperable is sufficiently small to justify continued operation for 72 hours.

With one or more components inoperable, such that 100% of the equivalent flow to a single OPERABLE ECCS train is not available, the facility is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be immediately entered.

C.1, C.2, and C.2

If the inoperable train 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 and RCS Tc reduced to < 485°F within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging unit systems.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve automatically repositions within the proper stroke time. This Surveillance does not require any testing or valve manipulation. Rather, it involves verification that those valves capable of being mispositioned are in the correct position.

The 31 day Frequency is appropriate because the valves are operated under procedural control and an improper valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.

SR 3.5.3.2

With the exception of systems in operation, the ECCS pumps are normally in a standby, nonoperating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases. One method of ensuring that any voids or pockets of gases are removed from the ECCS piping is to vent the accessible discharge piping high points, which is controlled by PVNGS procedures. Maintaining the piping from the ECCS pumps to the RCS full of water ensures that the system will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent water hammer, pump cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an SIAS or during SDC. The 31 day Frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the adequacy of the procedural controls governing system operation.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.3.3

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by Section XI of the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the unit safety analysis. SRs are specified in the Inservice Testing Program, which encompasses Section XI of the ASME Code. The frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.5.3.4, SR 3.5.3.5, and SR 3.5.3.6

These SRs demonstrate that each automatic ECCS valve actuates to the required position on an actual or simulated SIAS and on an RAS, that each ECCS pump starts on receipt of an actual or simulated SIAS, and that the LPSI pumps stop on receipt of an actual or simulated RAS. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for unplanned transients if the Surveillances were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment. The actuation logic is tested as part of the Engineered Safety Feature Actuation System (ESFAS) testing, and equipment performance is monitored as part of the Inservice Testing Program.

The following valve actuations must be verified at least once per 18 months:

> on an actual or simulated recirculation actuation signal, the containment sump isolation valves open, and the HPSI, LPSI and CS minimum bypass recirculation flow line isolation valves and combined SI mini flow valve close.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.3.7

Realignment of valves in the flow path on an SIAS is necessary for proper ECCS performance. The safety injection valves have stops to position them properly so that flow is restricted to a ruptured cold leg, ensuring that the other cold legs receive at least the required minimum flow. The 18 month Frequency is based on current industry practice. These valves are also monitored in accordance with the requirements of 10 CFR 50.65 (Ref. 6).

SR 3.5.3.8

Periodic inspection of the containment sump ensures that it is unrestricted and stays in proper operating condition. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during an outage, on the need to have access to the location, and on the potential for unplanned transients if the Surveillance were performed with the reactor at power. This Frequency is sufficient to detect abnormal degradation and is confirmed by operating experience.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 35.
2. 10 CFR 50.46.
3. UFSAR, Chapter 6.
4. NRC Memorandum to V. Stello, Jr., from R. L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
5. CE NPSD-995, Low Pressure Safety Injection System AOT Extension, April 1995.
6. 10 CFR 50.65.

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.4 ECCS – Shutdown

BASES

BACKGROUND

The Background section for Bases B 3.5.3, "ECCS – Operating," is applicable to these Bases, with the following modifications.

In MODE 3 with pressurizer pressure < 1837 psia and RCS T_c < 485°F, and in MODE 4, an ECCS train is defined as one High Pressure Safety Injection (HPSI) subsystem. The HPSI flow path consists of piping, valves, and pumps that enable water from the Refueling Water Tank (RWT) on a SIAS signal to be injected into the Reactor Coolant System (RCS) and automatically transferring HPSI suction to the containment sump on a Recirculation Actuation Signal (RAS) following the accidents described in Bases 3.5.3.

APPLICABLE SAFETY ANALYSES

The Applicable Safety Analyses section of Bases 3.5.3 is applicable to these Bases.

Due to the stable conditions associated with operation in MODE 3 with pressurizer pressure <1837 psia and with RCS T_c < 485°F and in MODE 4, and the reduced probability of a Design Basis Accident (DBA), the ECCS operational requirements are reduced. In this MODE, sufficient time exists for manual actuation of the required ECCS to mitigate the consequences of a DBA.

Only one train of ECCS is required for MODE 4. Protection against single failures is not relied on for this MODE of operation.

ECCS – Shutdown satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

(continued)

BASES

LCO

In MODE 3 with pressurizer pressure < 1837 psia and with RCS T_c < 485°F and in MODE 4 an ECCS subsystem is composed of a single HPSI subsystem. Each HPSI subsystem includes the piping, instruments, valves, and controls to ensure an OPERABLE flow path capable of taking suction from the RWT and transferring suction to the containment sump.

During an event requiring ECCS actuation, a flow path is required to supply water from the RWT to the RCS via the HPSI pumps and their respective supply headers to each of the four cold leg injection nozzles. In the long term post (RAS), this flow path is manually switched 2 to 3 hours after a LOCA to supply part of its HPSI flow to the RCS hot legs via the HPSI hot leg injection valves which connect to the Shutdown Cooling (SDC) suction nozzles.

With RCS pressure < 1837 psia and with RCS T_c < 485°F, one HPSI pump is acceptable without single failure consideration, based on the stable reactivity condition of the reactor and the limited core cooling requirements. The Low Pressure Safety Injection (LPSI) pumps may therefore be released from the ECCS train for use in SDC.

APPLICABILITY

In MODES 1, 2, and 3 with RCS pressure ≥ 1837 psia or with RCS T_c ≥ 485°F, the OPERABILITY requirements for ECCS are covered by LCO 3.5.3.

In MODE 3 with RCS pressure < 1837 psia and with RCS T_c < 485°F and in MODE 4, one OPERABLE ECCS train is acceptable without single failure consideration, based on the stable reactivity condition of the reactor and the limited core cooling requirements.

In MODES 5 and 6, unit conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops – MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.4, "Shutdown Cooling (SDC) and Coolant Circulation – High Water Level," and LCO 3.9.5, "Shutdown Cooling (SDC) and Coolant Circulation – Low Water Level."

(continued)

BASES

ACTIONS

A.1

With no HPSI pump OPERABLE, the unit is not prepared to respond to a loss of coolant accident. The 1 hour Completion Time to restore at least one HPSI train to OPERABLE status ensures that prompt action is taken to restore the required cooling capacity or to initiate actions to place the unit in MODE 5, where an ECCS train is not required.

B.1

When the Required Action cannot be completed within the required Completion Time, a controlled shutdown should be initiated. Twenty-four hours is reasonable, based on operating experience, to reach MODE 5 in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.4.1

The applicable Surveillance descriptions from Bases 3.5.3 apply as they pertain to the required HPSI train.

REFERENCES

The applicable references from Bases 3.5.3 apply as they pertain to the required HPSI train.

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.5 Refueling Water Tank (RWT)

BASES

BACKGROUND

The RWT supports the ECCS and the Containment Spray System by providing a source of borated water for Engineered Safety Feature (ESF) pump operation.

The RWT supplies two ECCS trains by separate, redundant supply headers. Each header also supplies one train of the Containment Spray System. A motor operated isolation valve is provided in each header to allow the operator to isolate the usable volume of the RWT from the ECCS after the ESF pump suction has been transferred to the containment sump following depletion of the RWT during a Loss of Coolant Accident (LOCA). A separate header is used to supply the Chemical and Volume Control System (CVCS) from the RWT. Use of a single RWT to supply both trains of the ECCS is acceptable since the RWT is a passive component, and passive failures are not assumed to occur coincidently with the Design Basis Event during the injection phase of an accident. Not all the water stored in the RWT is available for injection following a LOCA; the location of the ECCS suction piping in the RWT will result in some portion of the stored volume being unavailable.

The High Pressure Safety Injection (HPSI), Low Pressure Safety Injection (LPSI), and containment spray pumps are provided with recirculation lines that ensure each pump can maintain minimum flow requirements when operating at shutoff head conditions. These lines discharge back to the RWT, which vents to the Fuel Building Ventilation System. When the suction for the HPSI and containment spray pumps is transferred to the containment sump, this flow path must be isolated to prevent a release of the containment sump contents to the RWT. If not isolated, this flow path could result in a release of contaminants to the atmosphere and the eventual loss of suction head for the ESF pumps.

This LCO ensures that:

a. The RWT contains sufficient borated water to support the ECCS during the injection phase;

(continued)

BASES

BACKGROUND (continued)

b. Sufficient water volume exists in the containment sump to support continued operation of the ESF pumps at the time of transfer to the recirculation mode of cooling; and

c. The reactor remains subcritical following a LOCA.

Insufficient water inventory in the RWT could result in insufficient cooling capacity of the ECCS when the transfer to the recirculation mode occurs. Improper boron concentrations could result in a reduction of SDM or excessive boric acid precipitation in the core following a LOCA, as well as excessive caustic stress corrosion of mechanical components and systems inside containment.

APPLICABLE SAFETY ANALYSES

During accident conditions, the RWT provides a source of borated water to the HPSI, LPSI and containment spray pumps. As such, it provides containment cooling and depressurization, core cooling, and replacement inventory and is a source of negative reactivity for reactor shutdown (Ref. 1). The design basis transients and applicable safety analyses concerning each of these systems are discussed in the Applicable Safety Analyses section of Bases B 3.5.3, "ECCS – Operating," and B 3.6.6, "Containment Spray." These analyses are used to assess changes to the RWT in order to evaluate their effects in relation to the acceptance limits.

The volume limit of Figure 3.5.5-1 is based on two factors:

a. Sufficient deliverable volume must be available to provide at least 20 minutes (plus a 10% margin) of full flow from all ESF pumps prior to reaching a low level switchover to the containment sump for recirculation; and

b. The containment sump water volume must be sufficient to support continued ESF pump operation after the switchover to recirculation occurs. This sump volume water inventory is supplied by the RWT borated water inventory.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Twenty minutes is the point at which 75% of the design flow of one HPSI pump is capable of meeting or exceeding the decay heat boiloff rate.

When ESF pump suction is transferred to the sump, there must be sufficient water in the sump to ensure adequate Net Positive Suction Head (NPSH) for the HPSI and containment spray pumps. The RWT capacity must be sufficient to supply this amount of water without considering the inventory added from the safety injection tanks or Reactor Coolant System (RCS), but accounting for loss of inventory to containment subcompartments and reservoirs due to containment spray operation and to areas outside containment due to leakage from ECCS injection and recirculation equipment.

The 4000 ppm limit for minimum boron concentration was established to ensure that, following a LOCA with a minimum level in the RWT, the reactor will remain subcritical in the cold condition following mixing of the RWT and RCS water volumes. Small break LOCAs assume that all control rods are inserted, except for the Control Element Assembly (CEA) of highest worth, which is withdrawn from the core. Large break LOCAs assume that all CEAs remain withdrawn from the core. The most limiting case occurs at beginning of core life.

The maximum boron limit of 4400 ppm in the RWT is based on boron precipitation in the core following a LOCA. With the reactor vessel at saturated conditions, the core dissipates heat by pool nucleate boiling. Because of this boiling phenomenon in the core, the boric acid concentration will increase in this region. If allowed to proceed in this manner, a point will be reached where boron precipitation will occur in the core. Post LOCA emergency procedures direct the operator to establish simultaneous hot and cold leg injection to prevent this condition by establishing a forced flow path through the core regardless of break location. These procedures are based on the minimum time in which precipitation could occur, assuming that maximum boron concentrations exist in the borated water sources used for injection following a LOCA. Boron concentrations in the RWT in excess of the limit could result in precipitation earlier than assumed in the analysis.

The upper limit of 120°F and the lower limit of 60°F on RWT temperature are the limits assumed in the accident

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

analysis. Although RWT temperature affects the outcome of several analyses, the upper and lower limits established by the LCO are not limited by any of these analyses.

The RWT satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

The RWT ensures that an adequate supply of borated water is available to cool and depressurize the containment in the event of a Design Basis Accident (DBA) and to cool and cover the core in the event of a LOCA, that the reactor remains subcritical following a DBA, and that an adequate level exists in the containment sump to support ESF pump operation in the recirculation mode.

To be considered OPERABLE, the RWT must meet the limits established in the SRs for water volume, boron concentration, and temperature.

APPLICABILITY

In MODES 1, 2, 3, and 4, the RWT OPERABILITY requirements are dictated by the ECCS and Containment Spray System OPERABILITY requirements. Since both the ECCS and the Containment Spray System must be OPERABLE in MODES 1, 2, 3, and 4, the RWT must be OPERABLE to support their operation.

Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops — MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops — MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.4, "Shutdown Cooling (SDC) and Coolant Circulation — High Water Level," and LCO 3.9.5, "Shutdown Cooling (SDC) and Coolant Circulation — Low Water Level."

ACTIONS

A.1

With RWT boron concentration or borated water temperature not within limits, it must be returned to within limits within 8 hours. In this condition neither the ECCS nor the Containment Spray System can perform their design functions; therefore, prompt action must be taken to restore the tank to OPERABLE condition. The allowed Completion Time of

(continued)

BASES

ACTIONS

A.1 (continued)

8 hours to restore the RWT to within limits was developed considering the time required to change boron concentration or temperature and that the contents of the tank are still available for injection and core cooling.

B.1

With RWT borated water volume not within limits, it must be returned to within limits within 1 hour. In this condition, neither the ECCS nor Containment Spray System can perform their design functions; therefore, prompt action must be taken to restore the tank to OPERABLE status or to place the unit in a MODE in which these systems are not required. The allowed Completion Time of 1 hour to restore the RWT to OPERABLE status is based on this condition since the contents of the tank are not available for injection and core cooling.

C.1 and C.2

If the RWT 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 to MODE 5 within 36 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.

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1

RWT borated water temperature shall be verified every 24 hours to be within the limits assumed in the accident analysis. This Frequency has been shown to be sufficient to identify temperature changes that approach either acceptable limit.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1 (continued)

The SR is modified by a Note that eliminates the requirement to perform this Surveillance when ambient air temperatures are within the operating temperature limits of the RWT. With ambient temperatures within this range, the RWT temperature should not exceed the limits.

SR 3.5.5.2

The RWT water volume level shall be verified every 7 days in accordance with Figure 3.5.5-1. This Frequency ensures that a sufficient initial water supply is available for injection and to support continued ESF pump operation on recirculation. Since the RWT volume is normally stable and is provided with a Low Level Alarm in the Control Room, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

SR 3.5.5.3

Boron concentration of the RWT shall be verified every 7 days to be within the required range. This Frequency ensures that the reactor will remain subcritical following a LOCA and the boron precipitation in the core will not occur earlier than predicted. Further, it ensures that the resulting sump pH will be maintained in an acceptable range such that the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. Since the RWT volume is normally stable, a 7 day sampling Frequency is appropriate and has been shown through operating experience to be acceptable.

REFERENCES

1. UFSAR, Chapter 6 and Chapter 15.

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.6 Trisodium Phosphate (TSP)

BASES

BACKGROUND

Anhydrous Trisodium Phosphate (TSP) is placed on the floor of the containment building to ensure that iodine, which may be dissolved in the recirculated reactor cooling water following a Loss of Coolant Accident (LOCA), remains in solution. TSP also helps inhibit Stress Corrosion Cracking (SCC) of austenitic stainless steel components in containment during the recirculation phase following an accident.

Fuel that is damaged during a LOCA will release iodine in several chemical forms to the reactor coolant and to the containment atmosphere. A portion of the iodine in the containment atmosphere is washed to the sump by containment sprays. The emergency core cooling water is borated for reactivity control. This borated water causes the sump solution to be acidic. In a low pH (acidic) solution, dissolved iodine will be converted to a volatile form. The volatile iodine will evolve out of solution into the containment atmosphere, significantly increasing the levels of airborne iodine. The increased levels of airborne iodine in containment contribute to the radiological releases and increase the consequences from the accident due to containment atmosphere leakage.

After a LOCA, the components of the core cooling and Containment Spray Systems will be exposed to high temperature borated water. Prolonged exposure to the core cooling water combined with stresses imposed on the components can cause SCC. The SCC is a function of stress, oxygen and chloride concentrations, pH, temperature, and alloy composition of the components. High temperatures and low pH, which would be present after a LOCA, tend to promote SCC. This can lead to the failure of necessary safety systems or components.

(continued)

BASES

BACKGROUND (continued)

Adjusting the Ph of the recirculation solution to levels at or above 7.0 prevents a significant fraction of the dissolved iodine from converting to a volatile form. The higher pH thus decreases the level of airborne iodine in containment and reduces the radiological consequences from containment atmosphere leakage following a LOCA. Maintaining the solution pH at or above 7.0 also reduces the occurrence of SCC of austenitic stainless steel components in containment. Reducing SCC reduces the probability of failure of components.

Granular anhydrous TSP is employed as a passive form of pH control for post LOCA containment spray and core cooling water. Baskets of TSP are placed on the floor of the containment building to dissolve from released reactor coolant water and containment sprays after a LOCA. Recirculation of the water for core cooling and containment sprays then provides mixing to achieve a uniform solution pH.

APPLICABLE SAFETY ANALYSES

The LOCA radiological consequences analysis takes credit for iodine retention in the sump solution based on the recirculation water pH being ≥ 7.0. The radionuclide releases from the containment atmosphere and the consequences of a LOCA would be increased if the pH of the recirculation water were not adjusted to 7.0 or above.

LCO

The TSP is required to adjust the pH of the recirculation water to ≥ 7.0 after a LOCA. A pH ≥ 7.0 is necessary to prevent significant amounts of iodine released from fuel failures and dissolved in the recirculation water from converting to a volatile form and evolving into the containment atmosphere. Higher levels of airborne iodine in containment may increase the release of radionuclides and the consequences of the accident. A pH ≥ 7.0 is also necessary to prevent SCC of austenitic stainless steel components in containment. SCC increases the probability of failure of components.

(continued)

BASES

LCO (continued)

The required amount of TSP is based upon the extreme cases of water volume and pH possible in the containment sump after a large break LOCA. The minimum required volume is the volume of TSP that will achieve a sump solution pH of ≥ 7.0 when taking into consideration the maximum possible sump water volume and the minimum possible pH. The amount of TSP needed in the containment building is based on the mass of TSP required to achieve the desired pH. However, a required volume is specified, rather than mass, since it is not feasible to weigh the entire amount of TSP in containment. The minimum required volume is based on the design basis value for density of anhydrous TSP. Since TSP can have a tendency to agglomerate from high humidity in the containment building, the density may increase and the volume decrease during normal plant operation. Due to possible agglomeration and increase in density, estimating the minimum volume of TSP in containment is conservative with respect to achieving a minimum required pH.

APPLICABILITY

In MODES 1, 2, and 3, the RCS is at elevated temperature and pressure, providing an energy potential for a LOCA. The potential for a LOCA results in a need for the ability to control the pH of the recirculated coolant.

In MODES 4, 5, and 6, the potential for a LOCA is reduced and TSP is not required.

ACTIONS

A.1

If it is discovered that the TSP in the containment building is not within limits, action must be taken to restore the TSP to within limits.

The Completion Time of 72 hours is allowed for restoring the TSP within limits, where possible, because 72 hours is the same time allowed for restoration of other ECCS components.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

If the TSP cannot be restored within limits within the Completion Time of Required Action A.1, the plant must be brought to a MODE in which the LCO does not apply. The specified Completion Times for reaching MODES 3 and 4 are those used throughout the Technical Specifications; they were chosen to allow reaching the specified conditions from full power in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.6.1

Periodic determination of the volume of TSP in containment must be performed due to the possibility of leaking valves and components in the containment building that could cause dissolution of the TSP during normal operation. A Frequency of 18 months is required to determine visually that a minimum of 524 cubic feet is contained in the TSP baskets (Ref. 1). This requirement ensures that there is an adequate volume of TSP to adjust the pH of the post LOCA sump solution to a value ≥ 7.0.

The periodic verification is required every 18 months, since access to the TSP baskets is only feasible during outages, and normal fuel cycles are scheduled for 18 months. Operating experience has shown this Surveillance Frequency acceptable due to the margin in the volume of TSP placed in the containment building.

SR 3.5.6.2

Testing must be performed to ensure the solubility and buffering ability of the TSP after exposure to the containment environment. A representative sample of 3.5 grams ± 0.005 grams of TSP from one of the baskets in containment is submerged in 1.0 liters ± 0.005 liters of 2.5 wt% boric acid solution (nominally at 4400 ppm) at 135°F ± 9°F. Without agitation, the solution pH as measured at 77°F ± 9°F should be raised to ≥ 7 within 4 hours. The representative sample weight is based on the minimum required TSP weight of 25,325 pounds which at installed density corresponds to the minimum volume of 524 cubic ft,

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.6.2 (continued)

and maximum possible post LOCA sump volume of 867,124 gallons, normalized to buffer a 1.0 liter sample.

The boron concentration of the test water is representative of the maximum possible boron concentration corresponding to the maximum possible post LOCA sump volume. Agitation of the test solution is prohibited, since an adequate standard for the agitation intensity cannot be specified. The test time of 4 hours is necessary to allow time for the dissolved TSP to naturally diffuse through the sample solution. In the post LOCA containment sump, rapid mixing would occur, significantly decreasing the actual amount of time before the required pH is achieved. This would ensure compliance with the Standard Review Plan requirement of a pH ≥ 7.0 by the onset of recirculation after a LOCA.

The temperature of 135 ± 9°F was chosen for the borated water solution because that is the minimum temperature at the inlet of the shutdown cooling heat exchangers, therefore, this would be the lowest temperature possible during this type of accident.

REFERENCES

1. PVNGS operating license amendment numbers 110, 102 and 82 for Units 1, 2 and 3, respectively, and associated NRC Safety Evaluation dated December 10, 1996.

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.1
MARK UP

<DOC>
<CTS> 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) 1

3.5.1 Safety Injection Tanks (SITs) -OPERATING

<3.5.1> LCO 3.5.1 ~~[Four]~~ SITs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with pressurizer pressure ≥ ~~[700]~~ 1837 psia. 1
5 and 4

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<Action a>	A. One SIT inoperable due to boron concentration not within limits. OR One SIT inoperable due to inability to verify level or pressure <Action b>	A.1 Restore ~~boron concentration to within limits.~~ SIT to OPERABLE status	72 hours 4
<Action c>	B. One SIT inoperable for reasons other than Condition A.	B.1 Restore SIT to OPERABLE status.	~~1~~ 24 hours
<Action a> <Action b> <Action c>	C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Reduce pressurizer pressure to < ~~[700]~~ 1837 psia.	6 hours 12 hours 1
<DOC A.7>	D. Two or more SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately

4

<DOC>
<CTS> SURVEILLANCE REQUIREMENTS

CTS		SURVEILLANCE	FREQUENCY	DOC
<4.5.1.a.2> <3.5.1.a>	SR 3.5.1.1	Verify each SIT isolation valve is fully open.	12 hours	
<4.5.1.a.1> <3.5.1.b>	SR 3.5.1.2	Verify borated water volume in each SIT is ≥ ~~[1802 cubic feet]~~ ~~(~~28% narrow range~~)~~ and ≤ ~~[1914 cubic feet]~~ ~~(~~72% narrow range~~)~~.	12 hours	2
<4.5.1.a.1> <3.5.1.d>	SR 3.5.1.3	Verify nitrogen cover pressure in each SIT is ≥ ~~[615]~~ 600 psig and ≤ ~~[655]~~ 625 psig.	12 hours	6
<4.5.1.b> <3.5.1.c>	SR 3.5.1.4	Verify boron concentration in each SIT is ≥ ~~[1500]~~ 2300 ppm and ≤ ~~[2800]~~ 4400 ppm.	31 days **AND** ------NOTE------ Only required to be performed for affected SIT --------------- Once within 6 hours ~~after each solution volume increase of ≥ [1]% of tank volume that is not the result of addition from the refueling water tank~~ , whenever a SIT is drained to maintain the contained borated water level within the limits of SR 3.5.1.2	6 3

(continued)

<DOC>
<CTS>

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
<4.5.1.c> <3.5.1.a>	SR 3.5.1.5	Verify power is removed from each SIT isolation valve operator when pressurizer pressure is ≥ [2000] psia.	31 days	1

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.1
BASES MARKUP

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.1 Safety Injection Tanks (SITs) {OPERATING}

BASES

BACKGROUND

The functions of the ~~[four]~~ SITs are to supply water to the reactor vessel during the blowdown phase of a loss of coolant accident (LOCA), to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System (RCS) makeup for a small break LOCA. (5)

The blowdown phase of a large break LOCA is the initial period of the transient during which the RCS departs from equilibrium conditions, and heat from fission product decay, hot internals, and the vessel continues to be transferred to the reactor coolant. The blowdown phase of the transient ends when the RCS pressure falls to a value approaching that of the containment atmosphere.

The refill phase of a LOCA follows immediately where reactor coolant inventory has vacated the core through steam flashing and ejection out through the break. The core is essentially in adiabatic heatup. The balance of the SITs' inventory is then available to help fill voids in the lower plenum and reactor vessel downcomer to establish a recovery level at the bottom of the core and ongoing reflood of the core with the addition of safety injection (SI) water. (5)

The SITs are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The SITs are passive components, since no operator or control action is required for them to perform their function. Internal tank pressure is sufficient to discharge the contents to the RCS, if RCS pressure decreases below the SIT pressure.

Each SIT is piped into one RCS cold leg via the injection lines utilized by the High Pressure Safety Injection and Low Pressure Safety Injection (HPSI and LPSI) systems. Each SIT is isolated from the RCS by a motor operated isolation valve and two check valves in series. The motor operated isolation valves are normally open, with power removed from the valve motor to prevent inadvertent closure prior to or during an accident. (5)

(continued)

BASES

BACKGROUND (continued)

Additionally, the isolation valves are interlocked with the pressurizer pressure instrumentation channels to ensure that the valves will automatically open as RCS pressure increases above SIT pressure and to prevent inadvertent closure prior to an accident. The valves also receive a safety injection actuation signal (SIAS) to open. These features ensure that the valves meet the requirements of the Institute of Electrical and Electronic Engineers (IEEE) Standard 279-1971 (Ref. 1) for "operating bypasses" and that the SITs will be available for injection without reliance on operator action. (5)

The SIT gas and water volumes, gas pressure, and outlet pipe size are selected to allow three of the four SITs to partially recover the core before significant clad melting or zirconium water reaction can occur following a LOCA. The need to ensure that three SITs are adequate for this function is consistent with the LOCA assumption that the entire contents of one SIT will be lost via the break during the blowdown phase of a LOCA.

APPLICABLE SAFETY ANALYSES

The SITs are taken credit for in both the large and small break LOCA analyses at full power (Ref. 2). These are the Design Basis Accidents (DBAs) that establish the acceptance limits for the SITs. Reference to the analyses for these DBAs is used to assess changes to the SITs as they relate to the acceptance limits.

In performing the LOCA calculations, conservative assumptions are made concerning the availability of SI flow. These assumptions include signal generation time, equipment starting times, and delivery time due to system piping. In the early stages of a LOCA with a loss of offsite power, the SITs provide the sole source of makeup water to the RCS. (6) (The assumption of a loss of offsite power is required by regulations.) This is because the LPSI pumps, and HPSI pumps, ~~and charging pumps~~ cannot deliver flow until the diesel generators (DGs) start, come to rated speed, and go through their timed loading sequence. In cold leg breaks, the entire contents of one SIT are assumed to be lost through the break during the blowdown and reflood phases.

The limiting large break LOCA is a double ended guillotine cold leg break at the discharge of the reactor coolant pump.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

During this event, the SITs discharge to the RCS as soon as RCS pressure decreases to below SIT pressure. As a conservative estimate, no credit is taken for SI pump flow until the SITs are empty. This results in a minimum effective delay of over ~~60~~ seconds, during which the SITs must provide the core cooling function. The actual delay time does not exceed ~~30~~ seconds. No operator action is assumed during the blowdown stage of a large break LOCA. 55 6 29

The worst case small break LOCA also assumes a time delay before pumped flow reaches the core. For the larger range of small breaks, the rate of blowdown is such that the increase in fuel clad temperature is terminated solely by the SITs, with pumped flow then providing continued cooling. As break size decreases, the SITs and HPSI pumps both play a part in terminating the rise in clad temperature. As break size continues to decrease, the role of the SITs continues to decrease until they are not required, and the HPSI pumps become solely responsible for terminating the temperature increase.

This LCO helps to ensure that the following acceptance criteria, established by 10 CFR 50.46 (Ref. 3) for the ECCS, will be met following a LOCA:

a. Maximum fuel element cladding temperature is ≤ 2200°F;

b. Maximum cladding oxidation is ≤ 0.17 times the total cladding thickness before oxidation;

c. Maximum hydrogen generation from a zirconium water reaction is ≤ 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react; and

d. The core is maintained in a coolable geometry.

Since the SITs discharge during the blowdown phase of a LOCA, they do not contribute to the long term cooling requirements of 10 CFR 50.46.

Since the SITs are passive components, single active failures are not applicable to their operation. The SIT isolation valves and SIT nitrogen vent valves, however, are not single failure proof; 6

(continued)

SIT motor operated isolation (6)

BASES

APPLICABLE SAFETY ANALYSES (continued)

therefore, whenever the valves are open, power is removed from their operators and the switch is key locked open.

Whenever the SIT vent valves are closed, power is removed with a key lock switch.

These precautions ensure that the SITs are available during an accident (Ref. 4). With power supplied to the valves, a single active failure could result in a valve ~~closure~~ failure (6), which would render one SIT unavailable for injection. If a second SIT is lost through the break, only two SITs would reach the core. ~~Since the only~~ (5) active failure that could affect the SITs would be the closure of a motor operated outlet valve, or opening of a solenoid operated nitrogen vent valve, the requirement to remove power from these eliminates this failure mode.

The minimum volume requirement for the SITs ensures that three SITs can provide adequate inventory to reflood the core and downcomer following a LOCA. The downcomer then remains flooded until the HPSI and LPSI systems start to deliver flow.

The maximum volume limit is based on maintaining an adequate gas volume to ensure proper injection and the ability of the SITs to fully discharge, as well as limiting the maximum amount of boron inventory in the SITs.

(6)

A minimum of ~~25% narrow range level, corresponding to [1790]~~ 1690 cubic feet of borated water, and a maximum of ~~75% narrow range level, corresponding to [1927]~~ 2000 cubic feet of borated water, are used in the safety analyses as the volume in the SITs. To allow for instrument inaccuracy, a [28]% narrow range (corresponding to [1802] cubic feet) and a [72]% narrow range (corresponding to [1914] cubic feet) are specified. (2) The analyses are based upon the cubic feet in the LCO requirements; the percentage figures are provided for operator use because the level indicator provided in the control room is marked in percentages, not in cubic feet.

The minimum nitrogen cover pressure requirement ensures that the contained gas volume will generate discharge flow rates during injection that are consistent with those assumed in the safety analyses.

The maximum nitrogen cover pressure limit ensures that excessive amounts of gas will not be injected into the RCS after the SITs have emptied.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

A minimum pressure of ~~[593]~~ 588 600 psig and a maximum pressure of ~~[632]~~ 637 psig are used in the analyses. To allow for instrument accuracy, a ~~[615]~~ psig minimum and ~~[655]~~ 625 psig maximum are specified. (2) The maximum allowable boron concentration of ~~[2800]~~ 4400 ppm is based upon boron precipitation limits in the core following a LOCA. Establishing a maximum limit for boron is necessary since the time at which boron precipitation would occur in the core following a LOCA is a function of break location, break size, the amount of boron injected into the core, and the point of ECCS injection. Post LOCA emergency procedures directing the operator to establish simultaneous hot and cold leg injection are based on the worst case minimum boron precipitation time. Maintaining the maximum SIT boron concentration within the upper limit ensures that the SITs do not invalidate this calculation. An excessive boron concentration in any of the borated water sources used for injection during a LOCA could result in boron precipitation earlier than predicted.

(3) The 2300 ppm minimum boron concentration in the SITs assures that the back leakage from the RCS will not dilute the SITs below the minimum boron concentration in the safety analysis.

The minimum safety analysis ~~boron requirements~~ of ~~[1500]~~ 2000 ppm are based on beginning of life reactivity values and are selected to ensure that the reactor will remain subcritical during the reflood stage of a large break LOCA. (6) During a large break LOCA, all control element assemblies (CEAs) are assumed not to insert into the core, and the initial reactor shutdown is accomplished by void formation during blowdown. (5) Sufficient boron concentration must be maintained in the SITs to prevent a return to criticality during reflood. Although this requirement is similar to the basis for the minimum boron concentration of the refueling water tank (RWT), the minimum SIT concentration is lower than that of the RWT since the SITs need not account for dilution by the RCS during a large break LOCA. (5) (6)

The SITs satisfy Criterion 3 of ~~the NRC Policy Statement~~ 10CFR50.36(c)(2)(ii).

LCO

(5) The LCO establishes the minimum conditions required to ensure that the SITs are available to accomplish their core cooling safety function following a LOCA. Four SITs are required to be OPERABLE to ensure that 100% of the contents of three of the SITs will reach the core during a LOCA.

This is consistent with the assumption that the contents of one tank spill through the break. If the contents of fewer

(continued)

BASES

LCO (continued)

than three tanks are injected during the blowdown phase of a LOCA, the ECCS acceptance criteria of 10 CFR 50.46 (Ref. 3) could be violated.

motor operated

(5) For ~~an~~ a SIT to be considered OPERABLE, the isolation valve must be fully open, power removed ~~above [2000] psig,~~ and the limits established in the SR for contained volume, boron concentration, and nitrogen cover pressure must be met. (1)

APPLICABILITY

(5) and 4 Pressurizer 1837 (1)

In MODES 1 and 2, and MODE 3 with ~~RCS~~ pressure ≥ ~~700~~ psia, the SIT OPERABILITY requirements are based on an assumption of full power operation. Although cooling requirements decrease as power decreases, the SITs are still required to provide core cooling as long as elevated RCS pressures and temperatures exist.

INSERT 1

~~This LCO is only applicable at pressures ≥ 700 psia. Below 700 psia, the rate of RCS blowdown is such that the ECCS pumps can provide adequate injection to ensure that peak clad temperature remains below the 10 CFR 50.46 (Ref. 3) limit of 2200°F.~~ (1)

~~In MODE 3, at pressures < 700 psia, and in MODES 4, 5, and 6, the SIT motor operated isolation valves are closed to isolate the SITs from the RCS. This allows RCS cooldown and depressurization without discharging the SITs into the RCS or requiring depressurization of the SITs.~~ (6)

ACTIONS

A.1

or if the level or pressure in one SIT cannot be verified, the SIT must be returned to OPERABLE status

If the boron concentration

If the boron concentration of one SIT 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 three SITs, the consequences are less severe than they would be if ~~an~~ a SIT were not available for (4) (5)

If the boron concentration is not within limits

(continued)

INSERT FOR BASES 3.5.1
APPLICABILITY SECTION

INSERT 1

The SIT functional requirements in MODES 3 and 4 with pressurizer pressure < 1837 psia are described in LCO 3.5.2, "SIT - Shutdown".

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., a 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.

INSERT PAGE B 3.5-6

BASES

ACTIONS

A.1 (continued)

injection. Thus, 72 hours is allowed to return the boron concentration to within limits.

INSERT 1

4

B.1

~~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 accumulator to OPERABLE status. The Completion Time minimizes the exposure of the plant to a LOCA in these conditions.~~

INSERT 2

4

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 < ~~700~~ 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. 1

D.1

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

(continued)

INSERT FOR BASES 3.5.1
ACTIONS SECTION

INSERT 1

If the level and pressure cannot be verified, pressure and level indication for the affected SIT would not be available to the Operators. However, in this condition the SIT would still be available to fulfill its function because it is unlikely that the level or pressure would deteriorate to outside specified limits within 72 hours. Therefore, based on this, and that the level and pressure instrumentation associated with the SITs do not initiate a safety action, it is reasonable to allow 72 hours to restore the SIT to OPERABLE status. This is consistent with the recommendations of NUREG-1366 (Ref. 5).

If there is a known condition where pressure or level could not be maintained within limits for at least 72 hours, then the affected SIT would be considered inoperable for reasons other than the inability to verify level or pressure.

INSERT 2

If one SIT is inoperable, for reasons other than boron concentration or the inability to verify level or pressure, the SIT must be returned OPERABLE status within 24 hours. In this condition, the required contents of three SITs cannot be assumed to reach the core during a LOCA as is assumed in Appendix K (Ref. 6).

CE NPSD-994 (Ref. 7) provides a series of deterministic and probabilistic findings that support the 24 hour Completion Time as having no affect on risk as compared to shorter periods for restoring the SIT to OPERABLE status. The best-estimate analysis confirmed that, during large-break LOCA scenarios, core melt can be prevented by either operation of one LPSI pump or the operation of one HPSI pump and a single SIT.

INSERT PAGE B 3.5-7

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Verification every 12 hours that each SIT isolation valve is fully open, as indicated in the control room, ensures that SITs are available for injection and ensures timely discovery if a valve should be partially closed. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve should not change position with power removed, a closed valve could result in not meeting accident analysis assumptions. A 12 hour Frequency is considered reasonable in view of other administrative controls that ensure the unlikelihood of a mispositioned isolation valve.

SR 3.5.1.2 and SR 3.5.1.3

SIT borated water volume and nitrogen cover pressure should be verified to be within specified limits every 12 hours in order to ensure adequate injection during a LOCA. Due to the static design of the SITs, a 12 hour Frequency usually allows the operator sufficient time to identify changes before the limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.

SR 3.5.1.4

Verification of boron concentration by performing a calculation based on level increase, RCS boron concentration, and last sample results; or by

whenever a SIT is drained to maintain contained borated water level

Thirty-one days is reasonable for verification to determine that each SIT's boron concentration is within the required limits, because the static design of the SITs limits the ways in which the concentration can be changed. The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Sampling the affected SIT within 6 hours ~~after a 1% volume increase~~ will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water is from the RWT, because the water contained in the RWT is within the SIT boron concentration requirements. This is consistent with the recommendations of NUREG-1366 (Ref. 5). 3

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.5

Verification every 31 days that power is removed from each SIT isolation valve operator ~~when the pressurizer pressure is ≥ 2000 psia~~ ensures that an active failure could not result in the undetected closure of ~~an~~ 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. (1) (5)

~~This~~ SR 3.5.2.5 allows power to be supplied to the motor operated isolation valves when ~~RCS~~ pressurizer pressure is < ~~2000~~ 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. (6)

REFERENCES

1. IEEE Standard 279-1971.
2. U FSAR, Section ~~[~~6.~~3]~~.
3. 10 CFR 50.46.
4. U FSAR, Chapter ~~[~~15~~]~~.
5. ~~Draft~~ NUREG-1366, ~~February 1990~~ December 1992. (5)
6. 10 CFR 50 Appendix K.
7. CE NPSD-994, "CEOG Joint Applications Report for Safety Injection Tank AOT/STI Extension," April 1995.

NUREG-1432 EXCEPTIONS
SPECIFICATION 3.5.1

1. CTS 3.5.1 has two applicability's for SIT operability, 1) greater than or equal to 1837 psia requires four operable SITs, and 2) less than 1837 psia requires either three or four operable SITs depending on the Contained water volume in the SITs. The NUREG specification 3.5.1 is based on having all four SITs operable throughout the applicable pressure range. PVNGS has split the NUREG specification 3.5.1 into ITS 3.5.1 and 3.5.2 based on the CTS and plant specific analysis. The Bases have been revised to be consistent with the LCO/Surveillance.

2. The control room indication for PVNGS is in percent level. Therefore the ITS SR are in percent and the cubic feet volume is relocated to the Bases. The Bases have been revised to be consistent with the LCO/Surveillance.

3. CTS 4.5.1.b requires that the boron concentration be verified whenever a SIT is drained to maintain the contained borated water level within limits. NUREG SR 3.5.1.4 requires that boron concentration be verified after each solution volume increase of ≥ [1%] of tank volume that is not the result of addition from the refueling water tank. The plant specific minimum safety analysis boron concentration is 2000 ppm. CTS 3.5.1.c and 4.5.1.b, and ITS SR 3.5.1.4 list the minimum required boron concentration as 2300 ppm. ITS and CTS Bases 3.5.1 state that the 2300 ppm minimum boron concentration assures that backleakage from the RCS will not dilute the SITs below the minimum boron concentration in the safety analysis. This change was approved by the NRC in amendment 28 to the Unit 1 technical specifications dated October 9,1987 and the initial issue of the Units 2 and 3 technical specifications. Therefore, the current licensing basis has been determined to be appropriate for this surveillance requirement. The Bases have been revised to be consistent with the LCO/Surveillance.

4. NUREG 3.5.1 Actions have a 72 hour restoration time for boron concentration not within limits, and 1 hour for reasons other than boron concentration not within limits. ITS Action A has been changed to allow a 72 hour restoration time for boron concentration not within limits and inability to verify level or pressure, and 24 hours for reasons other than Action A. This is based on the recommendations in NUREG-1366 and discussed in CE NPSD-994, "Joint Application Report for Safety Injection Tank AOT/STI Extension, April 1995." The proposed amendment to PVNGS Technical Specifications, dated June 13, 1995 and updated submittal dated August 16, 1995. This change is also consistent with TSTF-59. The Bases have been revised to be consistent with the LCO/Surveillance.

5. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

6. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values were directly transferred from the CTS to the ITS.

7. Bases Section deleted because the associated Specification/Surveillance was deleted.

PVNGS CTS
SPECIFICATION 3.5.1
MARK UP

SPECIFICATION 3.5.1
(3.5.1/3.5.2)

3.5 ~~3/4.5~~ EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 ~~3/4.5.1~~ SAFETY INJECTION TANKS - OPERATING (A.1)

~~LIMITING CONDITION FOR~~ OPERATION

LCO 3.5.1 ~~3.5.1~~ Each Reactor Coolant System safety injection tank shall be OPERABLE with: (LA.1)

SR 3.5.1.1 ~~a.~~ The isolation valve key-locked open and power to the valve removed,

SR 3.5.1.5 ~~b.~~ A contained borated water level of between 1802 cubic feet (28% narrow range indication) and 1914 cubic feet (72 % narrow range indication), (LA.2)

SR 3.5.1.2

SR 3.5.1.4 ~~c.~~ A boron concentration between 2300 and 4400 ppm of boron, and

SR 3.5.1.3 ~~d.~~ A nitrogen cover-pressure of between 600 and 625 psig.

~~e. Nitrogen vent valves closed and power removed**.~~

~~f. Nitrogen vent valves capable of being operated upon restoration of power.~~ (LA.3)

APPLICABILITY: MODES 1*, 2*, 3,*†, and 4*†. (A.7)

ACTION:

INSERT 1 (A.8)

~~a. With one safety injection tank inoperable, except as a result of a closed isolation valve, restore the inoperable tank to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.~~

~~b. With one safety injection tank inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in at least HOT STANDBY within 1 hour and be in HOT SHUTDOWN within the next 12 hours.~~

Add ITS ACTION D (A.4)

SURVEILLANCE REQUIREMENTS

4.5.1 Each safety injection tank shall be demonstrated OPERABLE:

SR 3.5.1.2
SR 3.5.1.3 ~~a.~~ At least once per 12 hours by:

1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks is within the above limits, and

ITS 3.5.1 †With pressurizer pressure greater than or equal to 1837 psia. When pressur-

ITS 3.5.2 izer pressure is less than 1837 psia, at least three safety injection tanks must be OPERABLE, each with a minimum pressure of 254 psig and a maximum pressure of 625 psig, and a contained borated water volume of between 1415 cubic feet (60% wide range indication) and 1914 cubic feet (83% wide range indication). With all four safety injection tanks OPERABLE, each tank shall have a minimum pressure of 254 psig and a maximum pressure of 625 psig, and a contained borated water volume of between 962 cubic feet (39% wide range indication) and 1914 cubic feet (83% wide range indication). In MODE 4 with

ITS 3.5.2 pressurizer pressure less than 430 psia, the safety injection tanks may be isolated.

ITS 3.5.1 ~~*See Special Test Exceptions 3.10.6 and 3.10.8.~~ (A.2)

~~**Nitrogen vent valves may be cycled as necessary to maintain the required nitrogen cover pressure per Specification 3.5.1d.~~ (LA.3)

SPECIFICATION 3.5.1
(3.5.1/3.5.2)

INSERT FOR CTS 3.5.1
ACTION SECTION

INSERT 1

ACTION A ~~a.~~ With one SIT inoperable due to boron concentration not within limits, restore the boron concentration to within limits within 72 hours

ACTION C or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION A ~~b.~~ With one SIT inoperable due to inability to verify the required water volume or nitrogen cover pressure because of inoperable level or pressure instrumentation, restore the SIT to operable status within 72 hours

ACTION C or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION B ~~c.~~ With one SIT inoperable for reasons other than those stated in ACTION a ~~or ACTION b~~, restore the SIT to operable status within 24 hours

ACTION C or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

reduce pressurizer pressure to <1837 psia

A6

Actions from TS change request 102-03392, dtd. 6/13/95.

Insert Page 3/4 5-1

SPECIFICATION 3.5.1
(3.5.1/3.5.2)

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.5.1.1 ~~2.~~ Verifying that each safety injection tank isolation valve is open ~~and the nitrogen vent valves are closed.~~ LA.3

SR 3.5.1.4 ~~b.~~ At least once per 31 days and whenever the tank is drained to maintain the contained borated water level within the limits of Specification 3.5.1b, by verifying the boron concentration of the safety injection tank solution is between 2300 and 4400 ppm. once within 6 hours M.1

SR 3.5.1.5 ~~c.~~ At least once per 31 days ~~when the pressurizer pressure is above 430 psia~~, by verifying that power to the isolation valve operator is removed. A.5

~~d. At least once per 18 months by verifying that each safety injection tank isolation valve opens automatically under each of the following conditions:~~

~~1. When an actual or simulated RCS pressure signal exceeds 515 psia, and~~

~~2. Upon receipt of a safety injection actuation (SIAS) test signal.~~ LA.5

~~e. At least once per 18 months by verifying OPERABILITY of RCS-SIT differential pressure alarm by simulating RCS pressure > 715 psia with SIT pressure < 600 psig.~~ LA.4

~~f. At least once per 18 months, when SITs are isolated, by verifying the SIT nitrogen vent valves can be opened.~~

~~g. At least once per 31 days, by verifying that power is removed from the nitrogen vent valves.~~ LA.3

DISCUSSION OF CHANGES
SPECIFICATION 3.5.1

ADMINISTRATIVE CHANGES

A.1 All reformatting and renumbering is in accordance with the Combustion Engineering Plant (CE) Standard Technical Specifications NUREG-1432, Rev. 1 (NUREG-1432). As a result, the Palo Verde Nuclear Generating Station (PVNGS) Improved Technical Specifications (ITS) should be more readable, and therefore understandable, by plant operators as well as other users. During the reformatting and renumbering of the ITS, no technical changes (either actual or interpretational) to the PVNGS Current Technical Specifications (CTS) were made unless they were identified and justified.

Editorial rewording (either adding or deleting) is made consistent with NUREG-1432. During NUREG-1432 development, certain wording preferences or English language conventions were adopted which resulted in no technical changes (either actual or interpretational) to the CTS.

Additional information has also been added to more fully describe each subsection. This wording is consistent with NUREG-1432. Since the design is already approved by the NRC, adding more detail does not result in a technical change.

A.2 CTS Applicability "*" Note references "Special Test Exceptions 3.10.6 and 3.10.8". Cross references are not used in the ITS or NUREG-1432. Removing cross references does not alter the requirements of the referenced Specification. Therefore, this is an administrative change with no impact on safety. This change is consistent with NUREG-1432.

A.3 Not used.

A.4 ITS 3.5.1 Action D is added to require entry into LCO 3.0.3 if two or more SITs are inoperable. This Action is consistent with the CTS and PVNGS current operating practices. Even though not specifically stated, when two SITs become inoperable, the plant is in a Condition not specifically stated in the TS and therefore CTS LCO 3.0.3 is entered. This Action is being added for clarification to ensure that if the plant is in Action A for one SIT and in Action B for one SIT inoperable for reasons other than Condition A or two or more SITs inoperable, that it is clear that LCO 3.0.3 entry is required. This is an administrative change with no impact on safety. This change is consistent with NUREG-1432.

A.5 CTS 4.5.1.c requires verification that "power to the isolation valve operator is removed" when the pressurizer pressure is greater than 430 psia. ITS SR 3.5.1.5 does not include the exception, when pressurizer pressure is greater than 430 psia. This exception is not applicable to ITS 3.5.1 since it is only applicable at or above 1837 psia. The SIT operability requirements below 1837 psia are included in ITS 3.5.2. Therefore, this is an administrative change with no impact on safety.

A.6 CTS 3.5.1 Actions a, b, and c require the plant to be in Hot Shutdown if the inoperable SIT is not returned to operable status. ITS 3.5.1 Action C requires the plant to reduce pressurizer pressure to < 1837 psia if the inoperable SIT is not returned to operable status. CTS 3.5.1 was split into ITS 3.5.1 and 3.5.2. ITS 3.5.1 is applicable in Modes 1 and 2, and Modes 3 and 4 with pressurizer pressure ≥ 1837 psia. ITS 3.5.2 is applicable in Modes 3 and 4 with pressurizer pressure < 1837 psia. Therefore this is an administrative change that revises the Actions to take the plant to a condition where the LCO is no longer applicable.

A.7 CTS 3.5.1 is applicable in Modes 1, 2, 3, and 4. The CTS requirements have been divided into two ITS Specifications. ITS 3.5.1, "Safety Injection Tanks - Operating" is applicable in Modes 1 and 2, and in Modes 3 and 4 with pressurizer pressure ≥ 1837 psia. ITS 3.5.2, "SITs - Shutdown" is applicable in Modes 3 and 4 with pressurizer pressure < 1837 psia. Therefore, this is an administrative change with no impact on safety.

A.8 Insert 1 incorporates the changes made by TS change request 102-03392, dated 6/13/95.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS 4.5.1.b requires that whenever a SIT is drained to maintain water level, that the boron concentration be verified. CTS does not include a time for completing the verification. ITS SR 3.5.1.4 requires verification of the boron concentration once within 6 hours, whenever a SIT is drained to maintain water level.

TECHNICAL CHANGES - RELOCATIONS

LA.1 CTS LCO 3.5.1.a requires that "The isolation valve key-locked open and power to the valve removed." ITS SR 3.5.1.1 verifies "each SIT isolation valve is fully opened" and ITS SR 3.5.1.5 verifies "power is removed from each SIT isolation valve operator." The requirement in the CTS to key-lock the valve open is not included in the ITS. The key-lock is a design detail that is discussed in the UFSAR and ITS Bases, Applicable Safety Analysis, and is implemented administratively. The basis for the requirement to open the valve and remove power to the valve is to ensure that a single failure will not cause the valve to close, resulting in loss of a SIT. Opening the valve and removing power to the valve operator meets this requirement. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases Control Program. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

LA.2 CTS LCO 3.5.1.b lists the contained borated water in both "cubic feet" and "% narrow range indication." ITS SR 3.5.1.2 lists the borated water volume in "% narrow range indication." The safety analysis uses cubic feet to determined the minimum and maximum borated water volume for each SIT. Since the level indication provided in the control room is marked in percentages, only this level indication is retained in the Specification. The cubic foot borated water volume is relocated to a Licensee Controlled Document such as the Bases. This is an administrative change that retains the control room indications in the Specification and relocates the cubic foot borated water volume to the Bases. The relationship between the indicated level and safety analysis volume is discussed in the Bases. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases Control Program. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

LA.3 CTS 3.5.1.e, 3.5.1.f, Note **, 4.5.1.a.2, 4.5.1.f and 4.5.1.g provide specific OPERABILITY and SRs for the SIT nitrogen vent valves. This includes the requirement that the nitrogen vent valves be closed with power removed and be capable of being operated upon restoration of power. The SR verifies that the nitrogen vent valves can be opened if required. ITS 3.5.1 requires that nitrogen cover pressure is maintained in the SITs, but does not include specific requirements for the operation of the nitrogen vent valves. The safety analysis for the SITs is based on a minimum and maximum SIT nitrogen cover pressure. The OPERABILITY of the nitrogen vent valves may affect the SIT nitrogen cover pressure. There are two independent nitrogen vent valves on each SIT. Therefore, a single failure would not prevent a SIT from being depressurized if required. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the TRM. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.4 CTS SR 4.5.1.e requires that the RCS-SIT differential pressure alarm OPERABILITY be verified at least once per 18 months. ITS 3.5.1 does not include any requirements for the RCS-SIT differential pressure alarm. The requirement to verify RCS-SIT differential pressure alarm is relocated to the Technical Requirements Manual (TRM) and controlled administratively. ITS 3.5.1 and SR 3.5.1.3 will still require that SIT nitrogen cover pressure be monitored shiftly, therefore, any reduction in pressure will continue to be identified in a timely manner. The RCS-SIT differential pressure alarm is not a Regulatory Guide 1.97 instrument. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the UFSAR. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.5 CTS SR 4.5.1.d requires verification at least once per 18 months that each SIT isolation valve opens automatically when an actual or simulated RCS pressure signal exceeds 515 psia and upon receipt of a SIAS test signal. ITS 3.5.1 does not include this SR. ITS 3.5.1 requires when in Modes 1 through 4 above 430 psia that the SIT isolation valves be open. The SIAS function is required to be Operable in Modes 1 through 3 and manual action is required if an isolation valve is closed. Therefore, there is no reason for the SIT isolation valves to automatically open on a RCS pressure signal or SIAS. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the TRM. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

TECHNICAL CHANGES - LESS RESTRICTIVE

None

NO SIGNIFICANT HAZARDS CONSIDERATION
SPECIFICATION 3.5.1

ADMINISTRATIVE CHANGES
(ITS 3.5.1 Discussion of Changes Labeled A.1, A.2, A.3, A.4, A.5, A.6, A.7 and A.8)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, is converting to the ITS as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants." The proposed changes involve the reformatting, renumbering, rewording of the Technical Specifications (TS) and Bases with no change in intent, and the incorporation of current operating practices consistent with NUREG-1432. These changes, since they do not involve technical changes to the Current TS (CTS), are administrative. Below are the No Significant Hazards Consideration (NSHC) for the conversion of this Section/Chapter to NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes involve reformatting, renumbering, and rewording of the CTS and Bases along with incorporation of PVNGS current operating practices and other changes to the CTS as discussed in the specific Discussion of Changes listed above in order to be consistent with NUREG-1432. The reformatting, renumbering, and rewording along with the other changes listed above, involves no technical changes to the CTS. Specifically, there will be no change in the requirements imposed on PVNGS due to these changes. During development of NUREG-1432, certain wording preferences or English language conventions were adopted. The proposed changes to this Section/Chapter are administrative in nature and do not impact initiators of any analyzed events. They also do not impact the assumed mitigation of accidents or transient events. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

ADMINISTRATIVE CHANGES
(ITS 3.5.1 Discussion of Changes Labeled (A.1, A.2, A.3, A.4, A.5, A.6, A.7 and A.8) (continued)

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or change the methods governing normal plant operation. The proposed changes will not impose any new or different requirements or eliminate any existing requirements. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes are administrative in nature and will not involve any technical changes. The proposed changes will not reduce a margin of safety because they have no impact on any safety analysis assumptions. Also, because these changes are administrative in nature, no question of safety is involved. Therefore, these changes do not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - MORE RESTRICTIVE
(ITS 3.5.1 Discussion of Changes Labeled M.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. This particular NSHC is for the changes labeled "Technical Changes - More Restrictive" described in the specific Discussion of Changes listed above. The proposed changes incorporate more restrictive changes into the CTS by either making current requirements more stringent or adding new requirements which currently do not exist.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes provide more stringent requirements than previously existed in the CTS. The more stringent requirements will not result in operation that will increase the probability of initiating an analyzed event. If anything, the new requirements may decrease the probability or consequences of an analyzed event by incorporating the more restrictive changes discussed in the specific Discussion of Changes listed above. These changes will not alter assumptions relative to mitigation of an accident or transient event. The more restrictive requirements will not alter the operation and will continue to ensure process variables, structures, systems, or components are maintained consistent with safety analyses and licensing basis. These changes have been reviewed to ensure that no previously evaluated accident has been adversely affected. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident evaluated.

TECHNICAL CHANGES - MORE RESTRICTIVE
(ITS 3.5.1 Discussion of Changes Labeled M.1)

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

Making existing requirements more restrictive and adding more restrictive requirements to the CTS will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes do impose different requirements. However, they are consistent with the assumptions made in the safety analyses, licensing basis, and NUREG-1432. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes provide more stringent requirements than previously existed in the CTS. An evaluation of these changes concluded that adding these more restrictive requirements either increases or has no impact on the margin of safety. The changes provide additional restrictions which may enhance plant safety. These changes maintain requirements of the safety analysis, licensing basis, and NUREG-1432. As such, no question of safety is involved. Therefore, these changes will not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.1 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4 and LA.5)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed changes, since detail is being removed from the CTS to a Licensee Controlled Document, are less restrictive. The descriptions of these changes are in the Discussion of Changes listed above.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes do not result in any hardware changes or changes to plant operating practices. The details being relocated are not assumed to be an initiator of any analyzed event. The Licensee Controlled Document containing the relocated requirements will be maintained using the provisions of 10 CFR 50.59 or other specified control processes and is subject to the change control process in the Administrative Controls Section of the ITS. Since any changes to a Licensee Controlled Document will be evaluated, no increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.1 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4 and LA.5) (continued)

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes will not impose different requirements and adequate control of information will still be maintained. These changes will not alter assumptions made in the safety analysis or licensing basis. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not reduce a margin of safety since they have no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the CTS to the Licensee Controlled Document are the same as the CTS. Since any future changes to this Licensee Controlled Document will be evaluated per the requirements of 10 CFR 50.59, or other specified control processes, no reduction (significant or insignificant) in a margin of safety will be allowed. Therefore, these changes will not involve a significant reduction in a margin of safety.

The NRC review provides a certain margin of safety, and although this review will no longer be performed prior to submittal, the NRC still inspects the 10 CFR 50.59 process. The proposed changes are consistent with NUREG-1432, which was approved by the NRC Staff. The change controls for proposed relocated details and requirements provide an acceptable level of regulatory authority. Revising the CTS to reflect the approved level of detail per NUREG-1432 reinforces the conclusion that there is not a significant reduction in the margin of safety. Therefore, revising the CTS to reflect the NRC accepted level of detail and requirements ensures no reduction in a margin of safety.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.1 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4 and LA.5) (continued)

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes will not impose different requirements and adequate control of information will still be maintained. These changes will not alter assumptions made in the safety analysis or licensing basis. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not reduce a margin of safety since they have no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the CTS to the Licensee Controlled Document are the same as the CTS. Since any future changes to this Licensee Controlled Document will be evaluated per the requirements of 10 CFR 50.59, or other specified control processes, no reduction (significant or insignificant) in a margin of safety will be allowed. Therefore, these changes will not involve a significant reduction in a margin of safety.

The NRC review provides a certain margin of safety, and although this review will no longer be performed prior to submittal, the NRC still inspects the 10 CFR 50.59 process. The proposed changes are consistent with NUREG-1432, which was approved by the NRC Staff. The change controls for proposed relocated details and requirements provide an acceptable level of regulatory authority. Revising the CTS to reflect the approved level of detail per NUREG-1432 reinforces the conclusion that there is not a significant reduction in the margin of safety. Therefore, revising the CTS to reflect the NRC accepted level of detail and requirements ensures no reduction in a margin of safety.

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.1
MARK UP

<DOC>
<CTS> 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) (1)

3.5.1 Safety Injection Tanks (SITs) -OPERATING

<3.5.1> LCO 3.5.1 ~~[~~Four~~]~~ SITs shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODES 3 and 4 with pressurizer pressure ≥ ~~[700]~~ 1837 psia. (1)

ACTIONS

	CONDITION	REQUIRED ACTION		COMPLETION TIME
<Action a>	A. One SIT inoperable due to boron concentration not within limits.	A.1	Restore ~~boron concentration to within limits~~ SIT to OPERABLE status	72 hours (4)
<Action b>	OR One SIT inoperable due to inability to verify level or pressure (4)			
<Action c>	B. One SIT inoperable for reasons other than Condition A.	B.1	Restore SIT to OPERABLE status.	24 ~~2~~ hours
<Action a> <Action b> <Action c>	C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Be in MODE 3.	6 hours
		AND		
		C.2	Reduce pressurizer pressure to < ~~[700]~~ 1837 psia.	12 hours (1)
<DOC A.7>	D. Two or more SITs inoperable.	D.1	Enter LCO 3.0.3.	Immediately

SITs - OPERATING
3.5.1

<DOC>
<CTS> SURVEILLANCE REQUIREMENTS

		SURVEILLANCE	FREQUENCY	
<4.5.1.a.2> <3.5.1.a>	SR 3.5.1.1	Verify each SIT isolation valve is fully open.	12 hours	
<4.5.1.a.1> <3.5.1.b>	SR 3.5.1.2	Verify borated water volume in each SIT is ≥ ~~[1802 cubic feet]~~ ~~[~~28% narrow range~~]~~ and ≤ ~~[1914 cubic feet]~~ ~~[~~72% narrow range~~]~~.	12 hours	2
<4.5.1.a.1> <3.5.1.d>	SR 3.5.1.3	Verify nitrogen cover pressure in each SIT is ≥ ~~[615]~~ 600 psig and ≤ ~~[655]~~ 625 psig.	12 hours	6
<4.5.1.b> <3.5.1.c>	SR 3.5.1.4	Verify boron concentration in each SIT is ≥ ~~[1500]~~ 2300 ppm and ≤ ~~[2800]~~ 4400 ppm.	31 days AND ------NOTE------ Only required to be performed for affected SIT -------------- Once within 6 hours ~~after each solution volume increase of ≥ [1]% of tank volume that is not the result of addition from the refueling water tank~~ , whenever a SIT is drained to maintain the contained borated water level within the limits of SR 3.5.1.2	6 3

(continued)

<DOC>
<CTS>

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY	
<4.5.1.c> <3.5.1.a>	SR 3.5.1.5 Verify power is removed from each SIT isolation valve operator when pressurizer pressure is ≥ [2000] psia.	31 days	1

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.1
BASES MARKUP

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.1 Safety Injection Tanks (SITs) - OPERATING

BASES

BACKGROUND

The functions of the [four] SITs are to supply water to the reactor vessel during the blowdown phase of a loss of coolant accident (LOCA), to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System (RCS) makeup for a small break LOCA. 5

The blowdown phase of a large break LOCA is the initial period of the transient during which the RCS departs from equilibrium conditions, and heat from fission product decay, hot internals, and the vessel continues to be transferred to the reactor coolant. The blowdown phase of the transient ends when the RCS pressure falls to a value approaching that of the containment atmosphere.

The refill phase of a LOCA follows immediately where reactor coolant inventory has vacated the core through steam flashing and ejection out through the break. The core is essentially in adiabatic heatup. The balance of the SITs' inventory is then available to help fill voids in the lower plenum and reactor vessel downcomer to establish a recovery level at the bottom of the core and ongoing reflood of the core with the addition of safety injection (SI) water. 5

The SITs are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The SITs are passive components, since no operator or control action is required for them to perform their function. Internal tank pressure is sufficient to discharge the contents to the RCS, if RCS pressure decreases below the SIT pressure.

Each SIT is piped into one RCS cold leg via the injection lines utilized by the High Pressure Safety Injection and Low Pressure Safety Injection (HPSI and LPSI) systems. Each SIT is isolated from the RCS by a motor operated isolation valve and two check valves in series. The motor operated isolation valves are normally open, with power removed from the valve motor to prevent inadvertent closure prior to or during an accident. 5

(continued)

BACKGROUND (continued)

Additionally, the isolation valves are interlocked with the pressurizer pressure instrumentation channels to ensure that the valves will automatically open as RCS pressure increases above SIT pressure and to prevent inadvertent closure prior to an accident. The valves also receive a Safety Injection Actuation Signal (SIAS) to open. These features ensure that the valves meet the requirements of the Institute of Electrical and Electronic Engineers (IEEE) Standard 279-1971 (Ref. 1) for "operating bypasses" and that the SITs will be available for injection without reliance on operator action. 5

The SIT gas and water volumes, gas pressure, and outlet pipe size are selected to allow three of the four SITs to partially recover the core before significant clad melting or zirconium water reaction can occur following a LOCA. The need to ensure that three SITs are adequate for this function is consistent with the LOCA assumption that the entire contents of one SIT will be lost via the break during the blowdown phase of a LOCA.

APPLICABLE SAFETY ANALYSES

The SITs are taken credit for in both the large and small break LOCA analyses at full power (Ref. 2). These are the Design Basis Accidents (DBAs) that establish the acceptance limits for the SITs. Reference to the analyses for these DBAs is used to assess changes to the SITs as they relate to the acceptance limits.

In performing the LOCA calculations, conservative assumptions are made concerning the availability of SI flow. These assumptions include signal generation time, equipment starting times, and delivery time due to system piping. In the early stages of a LOCA with a loss of offsite power, the SITs provide the sole source of makeup water to the RCS. (The assumption of a loss of offsite power is required by regulations.) This is because the LPSI pumps, and HPSI pumps ~~and charging pumps~~ cannot deliver flow until the diesel generators (DGs) start, come to rated speed, and go through their timed loading sequence. In cold leg breaks, the entire contents of one SIT are assumed to be lost through the break during the blowdown and reflood phases. 6

The limiting large break LOCA is a double ended guillotine cold leg break at the discharge of the reactor coolant pump.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

During this event, the SITs discharge to the RCS as soon as RCS pressure decreases to below SIT pressure. As a conservative estimate, no credit is taken for SI pump flow until the SITs are empty. This results in a minimum effective delay of over ~~60~~ 55 seconds, during which the SITs must provide the core cooling function. The actual delay time does not exceed ~~30~~ 29 seconds. No operator action is assumed during the blowdown stage of a large break LOCA. 6

The worst case small break LOCA also assumes a time delay before pumped flow reaches the core. For the larger range of small breaks, the rate of blowdown is such that the increase in fuel clad temperature is terminated solely by the SITs, with pumped flow then providing continued cooling. As break size decreases, the SITs and HPSI pumps both play a part in terminating the rise in clad temperature. As break size continues to decrease, the role of the SITs continues to decrease until they are not required, and the HPSI pumps become solely responsible for terminating the temperature increase.

This LCO helps to ensure that the following acceptance criteria, established by 10 CFR 50.46 (Ref. 3) for the ECCS, will be met following a LOCA:

a. Maximum fuel element cladding temperature is ≤ 2200°F;

b. Maximum cladding oxidation is ≤ 0.17 times the total cladding thickness before oxidation;

c. Maximum hydrogen generation from a zirconium water reaction is ≤ 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react; and

d. The core is maintained in a coolable geometry.

Since the SITs discharge during the blowdown phase of a LOCA, they do not contribute to the long term cooling requirements of 10 CFR 50.46.

Since the SITs are passive components, single active failures are not applicable to their operation. The SIT isolation valves and SIT nitrogen vent valves, however, are not single failure proof; 6

(continued)

SIT motor operated isolation (6)

BASES

APPLICABLE SAFETY ANALYSES (continued)

therefore, whenever the valves are open, power is removed from their operators and the switch is key locked open. whenever the SIT vent valves are closed, power is removed with a key lock switch.

These precautions ensure that the SITs are available during an accident (Ref. 4). With power supplied to the valves, a single active failure could result in a valve closure, failure (6) which would render one SIT unavailable for injection. If a second SIT is lost through the break, only two SITs would reach the core. Since the only (5) active failure that could affect the SITs would be the closure of a motor operated outlet valve, or opening of a solenoid operated nitrogen vent valve the requirement to remove power from these eliminates this failure mode.

The minimum volume requirement for the SITs ensures that three SITs can provide adequate inventory to reflood the core and downcomer following a LOCA. The downcomer then remains flooded until the HPSI and LPSI systems start to deliver flow.

The maximum volume limit is based on maintaining an adequate gas volume to ensure proper injection and the ability of the SITs to fully discharge, as well as limiting the maximum amount of boron inventory in the SITs.

(6)

A minimum of ~~25% narrow range level, corresponding to~~ 1690 ~~[1790]~~ cubic feet of borated water, and a maximum of ~~75% narrow range level, corresponding to [1927]~~ 2000 cubic feet of borated water, are used in the safety analyses as the volume in the SITs. To allow for instrument inaccuracy, a 28% narrow range (corresponding to 1802 cubic feet) and a 72% narrow range (corresponding to 1914 cubic feet) are specified. (2) The analyses are based upon the cubic feet in the LCO requirements; the percentage figures are provided for operator use because the level indicator provided in the control room is marked in percentages, not in cubic feet.

The minimum nitrogen cover pressure requirement ensures that the contained gas volume will generate discharge flow rates during injection that are consistent with those assumed in the safety analyses.

The maximum nitrogen cover pressure limit ensures that excessive amounts of gas will not be injected into the RCS after the SITs have emptied.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

A minimum pressure of ~~[593]~~ 588 600 psig and a maximum pressure of ~~[632]~~ 637 psig are used in the analyses. To allow for instrument accuracy, a ~~[615]~~ psig minimum and ~~[655]~~ 625 psig maximum are specified. The maximum allowable boron concentration of ~~[2800]~~ 4400 ppm is based upon boron precipitation limits in the core following a LOCA. Establishing a maximum limit for boron is necessary since the time at which boron precipitation would occur in the core following a LOCA is a function of break location, break size, the amount of boron injected into the core, and the point of ECCS injection. Post LOCA emergency procedures directing the operator to establish simultaneous hot and cold leg injection are based on the worst case minimum boron precipitation time. Maintaining the maximum SIT boron concentration within the upper limit ensures that the SITs do not invalidate this calculation. An excessive boron concentration in any of the borated water sources used for injection during a LOCA could result in boron precipitation earlier than ~~predicted~~ 2 3

The minimum ~~boron requirements~~ safety analysis of ~~[1500]~~ 2000 ppm are based on beginning of life reactivity values and are selected to ensure that the reactor will remain subcritical during the reflood stage of a large break LOCA. During a large break LOCA, all control element assemblies (CEAs) are assumed not to insert into the core, and the initial reactor shutdown is accomplished by void formation during blowdown. Sufficient boron concentration must be maintained in the SITs to prevent a return to criticality during reflood. Although this requirement is similar to the basis for the minimum boron concentration of the refueling water tank (RWT), the minimum SIT concentration is lower than that of the RWT since the SITs need not account for dilution by the RCS during a large break LOCA. 6 5 5 6

The 2300 ppm minimum boron concentration in the SITs assures that the back leakage from the RCS will not dilute the SITs below the minimum boron concentration in the safety analysis. 3

The SITs satisfy Criterion 3 of ~~the NRC Policy Statement~~ 10CFR50.36(c)(2)(ii).

LCO

The LCO establishes the minimum conditions required to ensure that the SITs are available to accomplish their core cooling safety function following a LOCA. Four SITs are required to be OPERABLE to ensure that 100% of the contents of three of the SITs will reach the core during a LOCA. 5

This is consistent with the assumption that the contents of one tank spill through the break. If the contents of fewer

(continued)

BASES

LCO (continued)

than three tanks are injected during the blowdown phase of a LOCA, the ECCS acceptance criteria of 10 CFR 50.46 (Ref. 3) could be violated.

(5) For ~~an~~ a SIT to be considered OPERABLE, the motor operated isolation valve must be fully open, power removed ~~above [2000] psig,~~ and the limits established in the SR for contained volume, boron concentration, and nitrogen cover pressure must be met. (1)

APPLICABILITY

(S) and 4 Pressurizer 1837 (1)

In MODES 1 and 2, and MODE 3 with ~~RCS~~ pressure ≥ ~~700~~ psia, the SIT OPERABILITY requirements are based on an assumption of full power operation. Although cooling requirements decrease as power decreases, the SITs are still required to provide core cooling as long as elevated RCS pressures and temperatures exist.

INSERT 1

~~This LCO is only applicable at pressures ≥ 700 psia. Below 700 psia, the rate of RCS blowdown is such that the ECCS pumps can provide adequate injection to ensure that peak clad temperature remains below the 10 CFR 50.46 (Ref. 3) limit of 2200°F.~~ (1)

~~In MODE 3, at pressures < 700 psia, and in MODES 4, 5, and 6, the SIT motor operated isolation valves are closed to isolate the SITs from the RCS. This allows RCS cooldown and depressurization without discharging the SITs into the RCS or requiring depressurization of the SITs.~~ (6)

ACTIONS

A.1

or if the level or pressure in one SIT cannot be verified, the SIT must be returned to OPERABLE status

If the boron concentration is not within limits

If the boron concentration of one SIT 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 three SITs, the consequences are less severe than they would be if ~~an~~ a SIT were not available for (4) (5)

(continued)

INSERT FOR BASES 3.5.1
APPLICABILITY SECTION

INSERT 1

The SIT functional requirements in MODES 3 and 4 with pressurizer pressure < 1837 psia are described in LCO 3.5.2, "SIT - Shutdown".

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., a 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.

INSERT PAGE B 3.5-6

BASES

ACTIONS

A.1 (continued)

injection. Thus, 72 hours is allowed to return the boron concentration to within limits.

INSERT 1

4

B.1

INSERT 2

~~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 accumulator to OPERABLE status. The Completion Time minimizes the exposure of the plant to a LOCA in these conditions.~~

4

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 < ~~700~~ 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. 1

D.1

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

(continued)

INSERT FOR BASES 3.5.1
ACTIONS SECTION

INSERT 1

If the level and pressure cannot be verified, pressure and level indication for the affected SIT would not be available to the Operators. However, in this condition the SIT would still be available to fulfill its function because it is unlikely that the level or pressure would deteriorate to outside specified limits within 72 hours. Therefore, based on this, and that the level and pressure instrumentation associated with the SITs do not initiate a safety action, it is reasonable to allow 72 hours to restore the SIT to OPERABLE status. This is consistent with the recommendations of NUREG-1366 (Ref. 5).

If there is a known condition where pressure or level could not be maintained within limits for at least 72 hours, then the affected SIT would be considered inoperable for reasons other than the inability to verify level or pressure.

INSERT 2

If one SIT is inoperable, for reasons other than boron concentration or the inability to verify level or pressure, the SIT must be returned OPERABLE status within 24 hours. In this condition, the required contents of three SITs cannot be assumed to reach the core during a LOCA as is assumed in Appendix K (Ref. 6).

CE NPSD-994 (Ref. 7) provides a series of deterministic and probabilistic findings that support the 24 hour Completion Time as having no affect on risk as compared to shorter periods for restoring the SIT to OPERABLE status. The best-estimate analysis confirmed that, during large-break LOCA scenarios, core melt can be prevented by either operation of one LPSI pump or the operation of one HPSI pump and a single SIT.

INSERT PAGE B 3.5-7

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Verification every 12 hours that each SIT isolation valve is fully open, as indicated in the control room, ensures that SITs are available for injection and ensures timely discovery if a valve should be partially closed. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve should not change position with power removed, a closed valve could result in not meeting accident analysis assumptions. A 12 hour Frequency is considered reasonable in view of other administrative controls that ensure the unlikelihood of a mispositioned isolation valve.

SR 3.5.1.2 and SR 3.5.1.3

SIT borated water volume and nitrogen cover pressure should be verified to be within specified limits every 12 hours in order to ensure adequate injection during a LOCA. Due to the static design of the SITs, a 12 hour Frequency usually allows the operator sufficient time to identify changes before the limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.

SR 3.5.1.4

Thirty-one days is reasonable for verification to determine that each SIT's boron concentration is within the required limits, because the static design of the SITs limits the ways in which the concentration can be changed. The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Sampling the affected SIT within 6 hours ~~after a 1% volume increase~~ will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water is from the RWT, because the water contained in the RWT is within the SIT boron concentration requirements. This is consistent with the recommendations of NUREG-1366 (Ref. 5). 3

Verification of boron concentration by performing a calculation based on level increase, RCS boron concentration, and last sample results; or by

whenever a SIT is drained to maintain contained borated water level

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.5

Verification every 31 days that power is removed from each SIT isolation valve operator ~~when the pressurizer pressure is ≥ 2000 psia~~ ensures that an active failure could not result in the undetected closure of ~~an~~ 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. (1) (5)

~~This~~ SR 3.5.2.5 allows power to be supplied to the motor operated isolation valves when ~~RCS~~ pressurizer pressure is < ~~2000~~ 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. (6)

REFERENCES

1. IEEE Standard 279-1971.

2. UFSAR, Section ~~[~~6.~~3]~~.

3. 10 CFR 50.46.

4. UFSAR, Chapter ~~[~~15~~]~~. (5)

5. ~~Draft~~ NUREG-1366, ~~February 1990~~ December 1992.

6. 10 CFR 50 Appendix K.

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

NUREG-1432 EXCEPTIONS
SPECIFICATION 3.5.1

1. CTS 3.5.1 has two applicability's for SIT operability, 1) greater than or equal to 1837 psia requires four operable SITs, and 2) less than 1837 psia requires either three or four operable SITs depending on the Contained water volume in the SITs. The NUREG specification 3.5.1 is based on having all four SITs operable throughout the applicable pressure range. PVNGS has split the NUREG specification 3.5.1 into ITS 3.5.1 and 3.5.2 based on the CTS and plant specific analysis. The Bases have been revised to be consistent with the LCO/Surveillance.

2. The control room indication for PVNGS is in percent level. Therefore the ITS SR are in percent and the cubic feet volume is relocated to the Bases. The Bases have been revised to be consistent with the LCO/Surveillance.

3. CTS 4.5.1.b requires that the boron concentration be verified whenever a SIT is drained to maintain the contained borated water level within limits. NUREG SR 3.5.1.4 requires that boron concentration be verified after each solution volume increase of ≥ [1%] of tank volume that is not the result of addition from the refueling water tank. The plant specific minimum safety analysis boron concentration is 2000 ppm. CTS 3.5.1.c and 4.5.1.b, and ITS SR 3.5.1.4 list the minimum required boron concentration as 2300 ppm. ITS and CTS Bases 3.5.1 state that the 2300 ppm minimum boron concentration assures that backleakage from the RCS will not dilute the SITs below the minimum boron concentration in the safety analysis. This change was approved by the NRC in amendment 28 to the Unit 1 technical specifications dated October 9,1987 and the initial issue of the Units 2 and 3 technical specifications. Therefore, the current licensing basis has been determined to be appropriate for this surveillance requirement. The Bases have been revised to be consistent with the LCO/Surveillance.

4. NUREG 3.5.1 Actions have a 72 hour restoration time for boron concentration not within limits, and 1 hour for reasons other than boron concentration not within limits. ITS Action A has been changed to allow a 72 hour restoration time for boron concentration not within limits and inability to verify level or pressure, and 24 hours for reasons other than Action A. This is based on the recommendations in NUREG-1366 and discussed in CE NPSD-994, "Joint Application Report for Safety Injection Tank AOT/STI Extension, April 1995." The proposed amendment to PVNGS Technical Specifications, dated June 13, 1995 and updated submittal dated August 16, 1995. This change is also consistent with TSTF-59. The Bases have been revised to be consistent with the LCO/Surveillance.

5. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

6. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values were directly transferred from the CTS to the ITS.

7. Bases Section deleted because the associated Specification/Surveillance was deleted.

PVNGS CTS
SPECIFICATION 3.5.1
MARK UP

SPECIFICATION 3.5.1
(3.5.1/3.5.2)

3.5 ~~3/4.5~~ EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 ~~3/4.5.1~~ SAFETY INJECTION TANKS - OPERATING (A.1)

~~LIMITING CONDITION FOR~~ OPERATION

LCO 3.5.1 ~~3.5.1~~ Each Reactor Coolant System safety injection tank shall be OPERABLE with: (LA.1)

SR 3.5.1.1 ~~a.~~ The isolation valve key-locked open and power to the valve removed,

SR 3.5.1.5 SR 3.5.1.2 ~~b.~~ A contained borated water level of between 1802 cubic feet (28% narrow range indication) and 1914 cubic feet (72 % narrow range indication), (LA.2)

SR 3.5.1.4 ~~c.~~ A boron concentration between 2300 and 4400 ppm of boron, and

SR 3.5.1.3 ~~d.~~ A nitrogen cover-pressure of between 600 and 625 psig.

~~e. Nitrogen vent valves closed and power removed**.~~

~~f. Nitrogen vent valves capable of being operated upon restoration of power.~~ (LA.3)

APPLICABILITY: MODES 1*, 2*, 3,*†, and 4*†. (A.7)

ACTION:

INSERT 1 (A.8)

~~a. With one safety injection tank inoperable, except as a result of a closed isolation valve, restore the inoperable tank to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.~~

~~b. With one safety injection tank inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in at least HOT STANDBY within 1 hour and be in HOT SHUTDOWN within the next 12 hours.~~

Add ITS ACTION D (A.4)

SURVEILLANCE REQUIREMENTS

4.5.1 Each safety injection tank shall be demonstrated OPERABLE:

SR 3.5.1.2 SR 3.5.1.3 ~~a.~~ At least once per 12 hours by:

1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks is within the above limits, and

ITS 3.5.1 †With pressurizer pressure greater than or equal to 1837 psia. When pressur-

ITS 3.5.2 izer pressure is less than 1837 psia, at least three safety injection tanks must be OPERABLE, each with a minimum pressure of 254 psig and a maximum pressure of 625 psig, and a contained borated water volume of between 1415 cubic feet (60% wide range indication) and 1914 cubic feet (83% wide range indication). With all four safety injection tanks OPERABLE, each tank shall have a minimum pressure of 254 psig and a maximum pressure of 625 psig, and a contained borated water volume of between 962 cubic feet (39% wide range indication) and 1914 cubic feet (83% wide range indication). In MODE 4 with

ITS 3.5.2 pressurizer pressure less than 430 psia, the safety injection tanks may be isolated.

ITS 3.5.1 ~~*See Special Test Exceptions 3.10.6 and 3.10.8.~~ (A.2)

~~**Nitrogen vent valves may be cycled as necessary to maintain the required nitrogen cover pressure per Specification 3.5.1d.~~ (LA.3)

SPECIFICATION 3.5.1
(3.5.1/3.5.2)

INSERT FOR CTS 3.5.1
ACTION SECTION

INSERT 1

ACTION A ~~a.~~ With one SIT inoperable due to boron concentration not within limits, restore the boron concentration to within limits within 72 hours

ACTION C or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION A ~~b.~~ With one SIT inoperable due to inability to verify the required water volume or nitrogen cover pressure because of inoperable level or pressure instrumentation, restore the SIT to operable status within 72 hours

ACTION C or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION B ~~c.~~ With one SIT inoperable for reasons other than those stated in ACTION a ~~or ACTION b~~, restore the SIT to operable status within 24 hours

ACTION C or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

reduce pressurizer pressure to < 1837 psia

A.6

Actions from TS change request 102-03392, dtd. 6/13/95.

Insert Page 3/4 5-1

SPECIFICATION 3.5.1
(3.5.1/3.5.2)

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.5.1.1 ~~2.~~ Verifying that each safety injection tank isolation valve is open and the nitrogen vent valves are closed. LA.3

SR 3.5.1.4 ~~b.~~ At least once per 31 days and whenever the tank is drained to maintain the contained borated water level within the limits of Specification 3.5.1b, by verifying the boron concentration of the safety injection tank solution is between 2300 and 4400 ppm.

once within 6 hours

M.1

SR 3.5.1.5 ~~c.~~ At least once per 31 days when the pressurizer pressure is above 430 psia, by verifying that power to the isolation valve operator is removed. A.5

d. At least once per 18 months by verifying that each safety injection tank isolation valve opens automatically under each of the following conditions:

1. When an actual or simulated RCS pressure signal exceeds 515 psia, and

2. Upon receipt of a safety injection actuation (SIAS) test signal.

LA.5

e. At least once per 18 months by verifying OPERABILITY of RCS-SIT differential pressure alarm by simulating RCS pressure > 715 psia with SIT pressure < 600 psig.

LA.4

f. At least once per 18 months, when SITs are isolated, by verifying the SIT nitrogen vent valves can be opened.

g. At least once per 31 days, by verifying that power is removed from the nitrogen vent valves.

LA.3

DISCUSSION OF CHANGES
SPECIFICATION 3.5.1

ADMINISTRATIVE CHANGES

A.1 All reformatting and renumbering is in accordance with the Combustion Engineering Plant (CE) Standard Technical Specifications NUREG-1432, Rev. 1 (NUREG-1432). As a result, the Palo Verde Nuclear Generating Station (PVNGS) Improved Technical Specifications (ITS) should be more readable, and therefore understandable, by plant operators as well as other users. During the reformatting and renumbering of the ITS, no technical changes (either actual or interpretational) to the PVNGS Current Technical Specifications (CTS) were made unless they were identified and justified.

Editorial rewording (either adding or deleting) is made consistent with NUREG-1432. During NUREG-1432 development, certain wording preferences or English language conventions were adopted which resulted in no technical changes (either actual or interpretational) to the CTS.

Additional information has also been added to more fully describe each subsection. This wording is consistent with NUREG-1432. Since the design is already approved by the NRC, adding more detail does not result in a technical change.

A.2 CTS Applicability "*" Note references "Special Test Exceptions 3.10.6 and 3.10.8". Cross references are not used in the ITS or NUREG-1432. Removing cross references does not alter the requirements of the referenced Specification. Therefore, this is an administrative change with no impact on safety. This change is consistent with NUREG-1432.

A.3 Not used.

A.4 ITS 3.5.1 Action D is added to require entry into LCO 3.0.3 if two or more SITs are inoperable. This Action is consistent with the CTS and PVNGS current operating practices. Even though not specifically stated, when two SITs become inoperable, the plant is in a Condition not specifically stated in the TS and therefore CTS LCO 3.0.3 is entered. This Action is being added for clarification to ensure that if the plant is in Action A for one SIT and in Action B for one SIT inoperable for reasons other than Condition A or two or more SITs inoperable, that it is clear that LCO 3.0.3 entry is required. This is an administrative change with no impact on safety. This change is consistent with NUREG-1432.

A.5 CTS 4.5.1.c requires verification that "power to the isolation valve operator is removed" when the pressurizer pressure is greater than 430 psia. ITS SR 3.5.1.5 does not include the exception, when pressurizer pressure is greater than 430 psia. This exception is not applicable to ITS 3.5.1 since it is only applicable at or above 1837 psia. The SIT operability requirements below 1837 psia are included in ITS 3.5.2. Therefore, this is an administrative change with no impact on safety.

A.6 CTS 3.5.1 Actions a, b, and c require the plant to be in Hot Shutdown if the inoperable SIT is not returned to operable status. ITS 3.5.1 Action C requires the plant to reduce pressurizer pressure to < 1837 psia if the inoperable SIT is not returned to operable status. CTS 3.5.1 was split into ITS 3.5.1 and 3.5.2. ITS 3.5.1 is applicable in Modes 1 and 2, and Modes 3 and 4 with pressurizer pressure ≥ 1837 psia. ITS 3.5.2 is applicable in Modes 3 and 4 with pressurizer pressure < 1837 psia. Therefore this is an administrative change that revises the Actions to take the plant to a condition where the LCO is no longer applicable.

A.7 CTS 3.5.1 is applicable in Modes 1, 2, 3, and 4. The CTS requirements have been divided into two ITS Specifications. ITS 3.5.1, "Safety Injection Tanks - Operating" is applicable in Modes 1 and 2, and in Modes 3 and 4 with pressurizer pressure ≥ 1837 psia. ITS 3.5.2, "SITs - Shutdown" is applicable in Modes 3 and 4 with pressurizer pressure < 1837 psia. Therefore, this is an administrative change with no impact on safety.

A.8 Insert 1 incorporates the changes made by TS change request 102-03392, dated 6/13/95.

<u>TECHNICAL CHANGES - MORE RESTRICTIVE</u>

M.1 CTS 4.5.1.b requires that whenever a SIT is drained to maintain water level, that the boron concentration be verified. CTS does not include a time for completing the verification. ITS SR 3.5.1.4 requires verification of the boron concentration once within 6 hours, whenever a SIT is drained to maintain water level.

TECHNICAL CHANGES - RELOCATIONS

LA.1 CTS LCO 3.5.1.a requires that "The isolation valve key-locked open and power to the valve removed." ITS SR 3.5.1.1 verifies "each SIT isolation valve is fully opened" and ITS SR 3.5.1.5 verifies "power is removed from each SIT isolation valve operator." The requirement in the CTS to key-lock the valve open is not included in the ITS. The key-lock is a design detail that is discussed in the UFSAR and ITS Bases, Applicable Safety Analysis, and is implemented administratively. The basis for the requirement to open the valve and remove power to the valve is to ensure that a single failure will not cause the valve to close, resulting in loss of a SIT. Opening the valve and removing power to the valve operator meets this requirement. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases Control Program. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

LA.2 CTS LCO 3.5.1.b lists the contained borated water in both "cubic feet" and "% narrow range indication." ITS SR 3.5.1.2 lists the borated water volume in "% narrow range indication." The safety analysis uses cubic feet to determined the minimum and maximum borated water volume for each SIT. Since the level indication provided in the control room is marked in percentages, only this level indication is retained in the Specification. The cubic foot borated water volume is relocated to a Licensee Controlled Document such as the Bases. This is an administrative change that retains the control room indications in the Specification and relocates the cubic foot borated water volume to the Bases. The relationship between the indicated level and safety analysis volume is discussed in the Bases. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases Control Program. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

LA.3 CTS 3.5.1.e, 3.5.1.f, Note **, 4.5.1.a.2, 4.5.1.f and 4.5.1.g provide specific OPERABILITY and SRs for the SIT nitrogen vent valves. This includes the requirement that the nitrogen vent valves be closed with power removed and be capable of being operated upon restoration of power. The SR verifies that the nitrogen vent valves can be opened if required. ITS 3.5.1 requires that nitrogen cover pressure is maintained in the SITs, but does not include specific requirements for the operation of the nitrogen vent valves. The safety analysis for the SITs is based on a minimum and maximum SIT nitrogen cover pressure. The OPERABILITY of the nitrogen vent valves may affect the SIT nitrogen cover pressure. There are two independent nitrogen vent valves on each SIT. Therefore, a single failure would not prevent a SIT from being depressurized if required. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the TRM. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.4 CTS SR 4.5.1.e requires that the RCS-SIT differential pressure alarm OPERABILITY be verified at least once per 18 months. ITS 3.5.1 does not include any requirements for the RCS-SIT differential pressure alarm. The requirement to verify RCS-SIT differential pressure alarm is relocated to the Technical Requirements Manual (TRM) and controlled administratively. ITS 3.5.1 and SR 3.5.1.3 will still require that SIT nitrogen cover pressure be monitored shiftly, therefore, any reduction in pressure will continue to be identified in a timely manner. The RCS-SIT differential pressure alarm is not a Regulatory Guide 1.97 instrument. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the UFSAR. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.5 CTS SR 4.5.1.d requires verification at least once per 18 months that each SIT isolation valve opens automatically when an actual or simulated RCS pressure signal exceeds 515 psia and upon receipt of a SIAS test signal. ITS 3.5.1 does not include this SR. ITS 3.5.1 requires when in Modes 1 through 4 above 430 psia that the SIT isolation valves be open. The SIAS function is required to be Operable in Modes 1 through 3 and manual action is required if an isolation valve is closed. Therefore, there is no reason for the SIT isolation valves to automatically open on a RCS pressure signal or SIAS. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the TRM. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

TECHNICAL CHANGES - LESS RESTRICTIVE

None

NO SIGNIFICANT HAZARDS CONSIDERATION
SPECIFICATION 3.5.1

ADMINISTRATIVE CHANGES
(ITS 3.5.1 Discussion of Changes Labeled A.1, A.2, A.3, A.4, A.5, A.6, A.7 and A.8)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, is converting to the ITS as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants." The proposed changes involve the reformatting, renumbering, rewording of the Technical Specifications (TS) and Bases with no change in intent, and the incorporation of current operating practices consistent with NUREG-1432. These changes, since they do not involve technical changes to the Current TS (CTS), are administrative. Below are the No Significant Hazards Consideration (NSHC) for the conversion of this Section/Chapter to NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes involve reformatting, renumbering, and rewording of the CTS and Bases along with incorporation of PVNGS current operating practices and other changes to the CTS as discussed in the specific Discussion of Changes listed above in order to be consistent with NUREG-1432. The reformatting, renumbering, and rewording along with the other changes listed above, involves no technical changes to the CTS. Specifically, there will be no change in the requirements imposed on PVNGS due to these changes. During development of NUREG-1432, certain wording preferences or English language conventions were adopted. The proposed changes to this Section/Chapter are administrative in nature and do not impact initiators of any analyzed events. They also do not impact the assumed mitigation of accidents or transient events. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

ADMINISTRATIVE CHANGES
(ITS 3.5.1 Discussion of Changes Labeled (A.1, A.2, A.3, A.4, A.5, A.6, A.7 and A.8) (continued)

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or change the methods governing normal plant operation. The proposed changes will not impose any new or different requirements or eliminate any existing requirements. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes are administrative in nature and will not involve any technical changes. The proposed changes will not reduce a margin of safety because they have no impact on any safety analysis assumptions. Also, because these changes are administrative in nature, no question of safety is involved. Therefore, these changes do not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - MORE RESTRICTIVE
(ITS 3.5.1 Discussion of Changes Labeled M.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. This particular NSHC is for the changes labeled "Technical Changes - More Restrictive" described in the specific Discussion of Changes listed above. The proposed changes incorporate more restrictive changes into the CTS by either making current requirements more stringent or adding new requirements which currently do not exist.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes provide more stringent requirements than previously existed in the CTS. The more stringent requirements will not result in operation that will increase the probability of initiating an analyzed event. If anything, the new requirements may decrease the probability or consequences of an analyzed event by incorporating the more restrictive changes discussed in the specific Discussion of Changes listed above. These changes will not alter assumptions relative to mitigation of an accident or transient event. The more restrictive requirements will not alter the operation and will continue to ensure process variables, structures, systems, or components are maintained consistent with safety analyses and licensing basis. These changes have been reviewed to ensure that no previously evaluated accident has been adversely affected. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident evaluated.

TECHNICAL CHANGES - MORE RESTRICTIVE
(ITS 3.5.1 Discussion of Changes Labeled M.1)

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

Making existing requirements more restrictive and adding more restrictive requirements to the CTS will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes do impose different requirements. However, they are consistent with the assumptions made in the safety analyses, licensing basis, and NUREG-1432. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes provide more stringent requirements than previously existed in the CTS. An evaluation of these changes concluded that adding these more restrictive requirements either increases or has no impact on the margin of safety. The changes provide additional restrictions which may enhance plant safety. These changes maintain requirements of the safety analysis, licensing basis, and NUREG-1432. As such, no question of safety is involved. Therefore, these changes will not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.1 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4 and LA.5)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed changes, since detail is being removed from the CTS to a Licensee Controlled Document, are less restrictive. The descriptions of these changes are in the Discussion of Changes listed above.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes do not result in any hardware changes or changes to plant operating practices. The details being relocated are not assumed to be an initiator of any analyzed event. The Licensee Controlled Document containing the relocated requirements will be maintained using the provisions of 10 CFR 50.59 or other specified control processes and is subject to the change control process in the Administrative Controls Section of the ITS. Since any changes to a Licensee Controlled Document will be evaluated, no increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.1 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4 and LA.5) (continued)

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes will not impose different requirements and adequate control of information will still be maintained. These changes will not alter assumptions made in the safety analysis or licensing basis. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not reduce a margin of safety since they have no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the CTS to the Licensee Controlled Document are the same as the CTS. Since any future changes to this Licensee Controlled Document will be evaluated per the requirements of 10 CFR 50.59, or other specified control processes, no reduction (significant or insignificant) in a margin of safety will be allowed. Therefore, these changes will not involve a significant reduction in a margin of safety.

The NRC review provides a certain margin of safety, and although this review will no longer be performed prior to submittal, the NRC still inspects the 10 CFR 50.59 process. The proposed changes are consistent with NUREG-1432, which was approved by the NRC Staff. The change controls for proposed relocated details and requirements provide an acceptable level of regulatory authority. Revising the CTS to reflect the approved level of detail per NUREG-1432 reinforces the conclusion that there is not a significant reduction in the margin of safety. Therefore, revising the CTS to reflect the NRC accepted level of detail and requirements ensures no reduction in a margin of safety.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.1 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4 and LA.5) (continued)

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes will not impose different requirements and adequate control of information will still be maintained. These changes will not alter assumptions made in the safety analysis or licensing basis. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not reduce a margin of safety since they have no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the CTS to the Licensee Controlled Document are the same as the CTS. Since any future changes to this Licensee Controlled Document will be evaluated per the requirements of 10 CFR 50.59, or other specified control processes, no reduction (significant or insignificant) in a margin of safety will be allowed. Therefore, these changes will not involve a significant reduction in a margin of safety.

The NRC review provides a certain margin of safety, and although this review will no longer be performed prior to submittal, the NRC still inspects the 10 CFR 50.59 process. The proposed changes are consistent with NUREG-1432, which was approved by the NRC Staff. The change controls for proposed relocated details and requirements provide an acceptable level of regulatory authority. Revising the CTS to reflect the approved level of detail per NUREG-1432 reinforces the conclusion that there is not a significant reduction in the margin of safety. Therefore, revising the CTS to reflect the NRC accepted level of detail and requirements ensures no reduction in a margin of safety.

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.2
MARK UP

<DOC>
<CTS> 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.~~1~~ 2 Safety Injection Tanks (SITs) - SHUTDOWN (1)

LCO 3.5.~~1~~ 2 ~~[Four] SITs shall be OPERABLE.~~ INSERT 1

<3.5.1 Note t> APPLICABILITY: ~~MODES 1 and 2,~~
~~MODE~~ MODES 3 and 4 with pressurizer pressure ~~≥ [700] psia~~ < 1837 psia (1)

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<DOC A.6>	A. One required SIT inoperable due to boron concentration not within limits. OR One required SIT inoperable due to inability to verify level or pressure <DOC A.7> (4)	A.1 Restore ~~boron concentration to within limits.~~ required SIT to OPERABLE status (4)	72 hours
<Action a> <Action b>	B. One required SIT inoperable for reasons other than Condition A.	B.1 Restore required SIT to OPERABLE status. (1)	~~1~~ 24 hours
<Action a> <Action b> <DOC M.1> <Action c>	C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE ~~3~~ 5. ~~AND~~ ~~C.2 Reduce pressurizer pressure to < [700] psia.~~	~~6~~ 24 hours ~~12 hours~~ (1)
<DOC A.4>	D. Two or more required SITs inoperable.	D.1 Enter LCO 3.0.3.	Immediately (1)

INSERT FOR 3.5.2
LCO SECTION

INSERT 1

Four SITs shall be OPERABLE with a borated water volume > 39% wide range indication and < 83% wide range indication;
OR 2

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

INSERT PAGE 3.5-1

<DOC>

<CTS>

SURVEILLANCE REQUIREMENTS

		SURVEILLANCE	FREQUENCY	
<3.5.1.a> <4.5.1.a.2>	SR 3.5.1.1 {2}	Verify each {required} SIT isolation valve is fully open.	12 hours	(1) when pressurizer pressure is ≥430 psia.
<4.5.1.a.1> <3.5.1 Note †>	SR 3.5.1.2 {2} INSERT 1	Verify borated water volume in each SIT is ≥ [1802 cubic feet (28% narrow range) and ≤ 1914 cubic feet (72% narrow range)].	12 hours	(1)
<4.5.1.a.1> <3.5.1 Note †>	SR 3.5.1.3 {2}	Verify nitrogen cover pressure in each {required} SIT is ≥ [625] {260} psig and ≤ [625] {625} psig.	12 hours	(6)
<4.5.1.b>	SR 3.5.1.4 {2}	Verify boron concentration in each {required} SIT is ≥ [1500] {2300} ppm and ≤ [2800] {4400} ppm.	31 days AND ------NOTE------ Only required to be performed for affected SIT --------------- Once within 6 hours ~~after each solution volume increase of ≥ [1]% of tank volume that is not the result of addition from the refueling water tank~~ whenever a required SIT is drained to maintain the contained borated water level within the limits of SR 3.5.2.2	(6) (3)

(continued)

INSERT FOR 3.5.2
SURVEILLANCE REQUIREMENTS SECTION

INSERT 1

Verify borated water volume in each required SIT is:

a. For four OPERABLE SITs, > 39% wide range indication and < 83% wide range indication.

OR 2

b. For three OPERABLE SITs, > 60% wide range indication and < 83% wide range indication.

INSERT PAGE 3.5-2

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
<3.5.1.a> <4.5.1.c> SR 3.5.~~1~~{2}.5	Verify power is removed from each {required} SIT isolation valve operator when pressurizer pressure is ≥ ~~[2000]~~ {1500} psia.	31 days ① ⑥

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.2
BASES MARKUP

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.2 SITs – Shutdown

BASES

The functions of the four SITs are to supply water to the reactor vessel during the blowdown phase of a Loss of Coolant Accident (LOCA), to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System (RCS) makeup for a small break LOCA.

The blowdown phase of a large break LOCA is the initial period of the transient during which the RCS departs from equilibrium conditions, and heat from fission product decay, hot internals, and the vessel continues to be transferred to the reactor coolant. The blowdown phase of the transient ends when the RCS pressure falls to a value approaching that of the containment atmosphere.

The refill phase of a LOCA follows immediately where reactor coolant inventory has vacated the core through steam flashing and ejection out through the break. The core is essentially in adiabatic heatup. The balance of the SITs' inventory is then available to help fill voids in the lower plenum and reactor vessel downcomer to establish a recovery level at the bottom of the core and ongoing reflood of the core with the addition of Safety Injection (SI) water.

The SITs are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The SITs are passive components, since no operator or control action is required for them to perform their function. Internal tank pressure is sufficient to discharge the contents to the RCS, if RCS pressure decreases below the SIT pressure.

(continued)

BACKGROUND (continued)

Each SIT is piped into one RCS cold leg via the injection lines utilized by the High Pressure Safety Injection and Low Pressure Safety Injection (HPSI and LPSI) Systems. Each SIT is isolated from the RCS by a motor operated isolation valve and two check valves in series. The motor operated isolation valves are normally open, with power removed from the valve motor to prevent inadvertent closure prior to or during an accident.

Additionally, the SIT motor operated isolation valves are interlocked with the pressurizer pressure instrumentation channels to ensure that the valves will automatically open as RCS pressure increases above SIT pressure and to prevent inadvertent closure prior to an accident. The valves also receive a Safety Injection Actuation Signal (SIAS) to open. These features ensure that the valves meet the requirements of the Institute of Electrical and Electronic Engineers (IEEE) Standard 279-1971 (Ref. 1) for "operating bypasses" and that the SITs will be available for injection without reliance on operator action.

In MODES 3 and 4 with pressurizer pressure < 1837 psia either four SITs with a minimum volume of 962 cubic feet in each SIT or three SITs with a minimum borated water volume of 1415 cubic feet in each SIT are required. The SIT gas and water volumes, gas pressure, and outlet pipe size are selected to allow one less than the required SITs to partially recover the core before significant clad melting or zirconium water reaction can occur following a LOCA. The need to ensure that one less than the required SITs are adequate for this function is consistent with the LOCA assumption that the entire contents of one SIT will be lost via the break during the blowdown phase of a LOCA.

APPLICABLE SAFETY ANALYSES

Due to the reduced decay heat removal requirements in MODES 3 and 4, and the reduced probability of a Design Basis Accident (DBA), the SITS operational requirements are reduced. The operational requirement allows either three or four SITs to be OPERABLE with a reduced borated water volume.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Since the SITs are passive components, single active failures are not applicable to their operation. The SIT isolation valves and SIT nitrogen vent valves, however, are not single failure proof; therefore, whenever the SIT motor operated isolation valves are open, power is removed from their operators, and the switch is key locked open. Whenever the SIT vent valves are closed, power is removed with a keylock switch.

These precautions ensure that the SITs are available during an accident (Ref. 3). With power supplied to the valves, a single active failure could result in a valve failure, which would render one of the required SITs unavailable for injection. If a second required SIT is lost through the break, only the remaining required SIT(s) would reach the core. Active failures that could affect the SITs would be the closure of a motor operated outlet valve or opening of a solenoid operated nitrogen vent valve, the requirement to remove power from these eliminates this failure mode. Power is removed from the SIT isolation valves and nitrogen vent valves when pressurizer pressure is ≥ 1500 psia. This is consistent with the minimum LOCA analysis pressure of 1600 psia.

The minimum volume requirement for the required SITs, assuming one SIT is not available, ensures that the SITs can provide adequate inventory to reflood the core and downcomer following a LOCA. The downcomer then remains flooded until the HPSI and LPSI systems start to deliver flow.

The maximum volume limit is based on maintaining an adequate gas volume to ensure proper injection and the ability of the SITs to fully discharge, as well as limiting the maximum amount of boron inventory in the SITs.

(continued)

APPLICABLE SAFETY ANALYSES (continued)

For three OPERABLE SITs, the safety analysis uses a minimum of 1361 cubic feet of borated water and a maximum of 2000 cubic feet of borated water. To allow for instrument inaccuracy, a 60% wide range level (corresponding to 1451.5 cubic feet) and a 83% wide range level (corresponding to 1914 cubic feet) are specified. For four OPERABLE SITs, the safety analysis uses a minimum of 908 cubic feet of borated water and a maximum of 2000 cubic feet of borated water. To allow for instrument inaccuracy, a 39% wide range level (corresponding to 1029.2 cubic feet) and a 83% wide range level (corresponding to 1914 cubic feet) are specified. The percentage figures are provided in the LCO for operator use because the level indicator provided in the control room is marked in percentage, not in cubic feet.

The minimum nitrogen cover pressure requirement ensures that the contained gas volume will generate discharge flow rates during injection that are consistent with those assumed in the safety analyses.

The maximum nitrogen cover pressure limit ensures that excessive amounts of gas will not be injected into the RCS after the SITs have emptied.

A minimum pressure of 235 psig and a maximum pressure of 637 psig are used in the analyses. To allow for instrument accuracy, a 260 psig minimum and 625 psig maximum are specified. The maximum allowable boron concentration of 4400 ppm is based upon boron precipitation limits in the core following a LOCA. Establishing a maximum limit for boron is necessary since the time at which boron precipitation would occur in the core following a LOCA is a function of break location, break size, the amount of boron injected into the core, and the point of ECCS injection. Post LOCA emergency procedures directing the operator to establish simultaneous hot and cold leg injection are based on the worst case minimum boron precipitation time. Maintaining the maximum SIT boron concentration within the upper limit ensures that the SITs do not invalidate this calculation. An excessive boron concentration in any of the borated water sources used for injection during a LOCA could result in boron precipitation earlier than predicted.

(continued)

APPLICABLE SAFETY ANALYSES (continued)

The 2300 ppm minimum boron concentration in the SITs assures that the back leakage from the RCS will not dilute the SITs below the minimum boron concentration in the safety analysis. The minimum safety analysis boron requirements of 2000 ppm are based on beginning of life reactivity values and are selected to ensure that the reactor will remain subcritical during the reflood stage of a large break LOCA. Sufficient boron concentration must be maintained in the SITs to prevent a return to criticality during reflood. Although this requirement is similar to the basis for the minimum boron concentration of the Refueling Water Tank (RWT), the minimum SIT concentration is lower than that of the RWT since the SITs need not account for dilution by the RCS.

SIT-Shutdown satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii).

LCO

In MODES 3 and 4 with pressurizer pressure less than 1837 psia, the LCO establishes the minimum conditions required to ensure that the required SITs are available to accomplish their core cooling safety function following a LOCA. The number of SITs required to be OPERABLE is based on the minimum required volume that will reach the core during a LOCA, assuming a single failure.

This is consistent with the assumption that the contents of one tank spill through the break. If the contents of less than the remaining required tanks are injected during the blowdown phase of a LOCA, the ECCS acceptance criteria of 10 CFR 50.46 (Ref. 2) could be violated.

For a required SIT to be considered OPERABLE, the motor operated isolation valve must be fully open when pressurizer pressure is ≥ 430 psia, power removed when pressurizer pressure is ≥ 1500 psia, and the limits established in the SR for contained volume, boron concentration, and nitrogen cover pressure must be met.

(continued)

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.

(continued)

ACTIONS

A.1 (continued)

If the level and pressure cannot be verified, pressure and level indication for the affected SIT would not be available to the Operators. However, in this condition the SIT would still be available to fulfill its function because it is unlikely that the level or pressure would deteriorate to outside specified limits within 72 hours. Therefore, based on this, and that the level and pressure instrumentation associated with the SITs do not initiate a safety action, it is reasonable to allow 72 hours to restore the SIT to OPERABLE status. This is consistent with the recommendations of NUREG-1366 (Ref. 4).

If there is a known condition where pressure or level could not be maintained within limits for at least 72 hours, then the affected SIT would be considered inoperable for reasons other than the inability to verify level or pressure.

B.1

If one required SIT is inoperable, for reasons other than boron concentration or the inability to verify level or pressure, the SIT must be returned to OPERABLE status within 24 hours. In this condition, the required contents of the remaining required SITs cannot be assumed to reach the core during a LOCA as is assumed in Appendix K (Ref. 5).

CE NPSD-994 (Ref. 6) provides a series of deterministic and probabilistic findings that support the 24 hour Completion Time as having no affect on risk as compared to shorter periods for restoring the SIT to OPERABLE status. The best-estimate analysis confirmed that, during large-break LOCA scenarios, core melt can be prevented by either operation of one LPSI pump or the operation of one HPSI pump and a single SIT.

(continued)

BASES

ACTIONS (continued)

C.1

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.

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

Verification every 12 hours that each required SIT isolation valve is fully open when pressurizer pressure is ≥ 430 psia as indicated in the control room, ensures that the required SITs are available for injection and ensures timely discovery if a valve should be partially closed. If a required isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve should not change position with power removed, a closed valve could result in not meeting accident analysis assumptions. A 12 hour Frequency is considered reasonable in view of other administrative controls that ensure the unlikelihood of a mispositioned isolation valve.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.2 and SR 3.5.2.3

Borated water volume and nitrogen cover pressure for the required SITs should be verified to be within specified limits every 12 hours in order to ensure adequate injection during a LOCA. Due to the static design of the SITs, a 12 hour Frequency usually allows the operator sufficient time to identify changes before the limits are reached. Operating experience has shown this Frequency to be appropriate for early detection and correction of off normal trends.

SR 3.5.2.4

Thirty-one days is reasonable for verification to determine that each required SIT's boron concentration is within the required limits, because the static design of the SITs limits the ways in which the concentration can be changed. The 31 day Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Verification of boron concentration by performing a calculation based on level increase, RCS boron concentration, and last sample results; or sampling the affected SIT within 6 hours whenever a SIT is drained to maintain contained borated water level will identify whether inleakage has caused a reduction in boron concentration to below the required limit. It is not necessary to verify boron concentration if the added water is from the RWT, 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.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.5.2.5 (continued)

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.
5. 10 CFR 50 Appendix K.
6. CE NPSD-994, "CEOG Joint Applications Report for Safety Injection Tank AOT/STI Extension," April 1995.

NUREG-1432 EXCEPTIONS
SPECIFICATION 3.5.2

1. CTS 3.5.1 has two applicability's for SIT operability, 1) greater than or equal to 1837 psia requires four operable SITs, and 2) less than 1837 psia requires either three or four operable SITs depending on the Contained water volume in the SITs. The NUREG specification 3.5.1 is based on having all four SITs operable throughout the applicable pressure range. PVNGS has split the NUREG specification 3.5.1 into ITS 3.5.1 and 3.5.2 based on the CTS and PVNGS plant specific analysis. The Bases have been revised to be consistent with the LCO/Surveillance.

2. The control room indication for PVNGS is in percent level. Therefore the NUREG LCO 3.5.1 and SR 3.5.2.2 will be in percent and the cubic feet volume relocated to the Bases. The Bases have been revised to be consistent with the LCO/Surveillance.

3. CTS 4.5.1.b requires that the boron concentration be verified whenever a SIT is drained to maintain the borated water level within limits. NUREG SR 3.5.2.4 requires that boron concentration be verified after each solution volume increase of ≥ [1%] of tank volume that is not the result of addition from the refueling water tank. The PVNGS plant specific minimum safety analysis boron concentration is 2000 ppm. CTS 3.5.2.c and 4.5.1.b, and ITS SR 3.5.2.4 list the minimum required boron concentration as 2300 ppm. ITS and CTS Bases 3.5.2 state that the 2300 ppm minimum boron concentration assures that back leakage from the RCS will not dilute the SITs below the minimum boron concentration in the safety analysis. This change was approved by the NRC in amendment 28 to the Unit 1 technical specifications dated October 9,1987 and the initial issue of the Units 2 and 3 technical specifications. Therefore, the current licensing basis has been determined to be appropriate for this surveillance requirement. The Bases have been revised to be consistent with the LCO/Surveillance.

4. NUREG 3.5.1 Actions have a 72 hour restoration time for boron concentration not within limits, and 1 hour for reasons other than boron concentration not within limits. ITS Action A has been changed to allow a 72 hour restoration time for boron concentration not within limits or inability to verify level or pressure, and 24 hours for reasons other than Action A. This is based on the recommendations in NUREG-1366 and discussed in CE NPSD-994, "Joint Application Report for Safety Injection Tank AOT/STI Extension, April 1995." The proposed amendment to PVNGS Technical Specifications was submitted June 13, 1995 and updated by a submittal dated August 16, 1995. This change is also consistent with TSTF-59. The Bases have been revised to be consistent with the LCO/Surveillance.

5. Not used.

6. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values were directly transferred from the CTS to the ITS.

PVNGS CTS
SPECIFICATION 3.5.2
MARK UP

SPECIFICATION 3.5.2
(3.5.1/3.5.2)

3.5 ~~3/4.5~~ EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ~~3/4.5.1~~ SAFETY INJECTION TANKS - SHUTDOWN (A.1)

LIMITING CONDITION FOR OPERATION

LCD 3.5.2 ~~3.5.1~~ Each Reactor Coolant System safety injection tank shall be OPERABLE with: (LA.1)

SR 3.5.2.1 and SR 3.5.2.5 ~~a.~~ The isolation valve ~~key locked~~ open and power to the valve removed,

ITS 3.5.1 b. A contained borated water level of between 1802 cubic feet (28% narrow range indication) and 1914 cubic feet (72 % narrow range indication),

SR 3.5.2.4 ~~c.~~ A boron concentration between 2300 and 4400 ppm of boron, and

SR 3.5.2.3 ~~d.~~ A nitrogen cover-pressure of between 600 and 625 psig.

~~e. Nitrogen vent valves closed and power removed**.~~ (LA.3)

~~f. Nitrogen vent valves capable of being operated upon restoration of power.~~ (A.5)

3.5.2 APPLICABILITY: MODES 1*, 2*, 3,*†, and 4*†. with pressurizer pressure <1837 psia

ACTION:

INSERT 1 (A.6)

~~a. With one safety injection tank inoperable, except as a result of a closed isolation valve, restore the inoperable tank to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.~~

~~b. With one safety injection tank inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in at least HOT STANDBY within 1 hour and be in HOT SHUTDOWN within the next 12 hours.~~

SURVEILLANCE REQUIREMENTS

Add Action D (A4)

4.5.1 Each safety injection tank shall be demonstrated OPERABLE:

SR 3.5.2.2, SR 3.5.2.3 ~~a.~~ At least once per 12 hours by:

1. Verifying the contained borated water volume and nitrogen cover-pressure in the tanks is within the above limits, and

ITS 3.5.1 †With pressurizer pressure greater than or equal to 1837 psia. When pressurizer pressure is less than 1837 psia, at least three safety injection tanks must be OPERABLE, each with a minimum pressure of 254 (260) (LB1) psig and a maximum pressure of 625 psig, and a contained borated water volume of between ~~1415 cubic feet~~ 60% wide range indication and ~~1914 cubic feet~~ 83% wide range indication. With all four safety injection tanks OPERABLE, each tank shall have a minimum pressure of 254 psig and a maximum pressure of 625 psig, and a contained borated water volume of between ~~962 cubic feet~~ 39% wide range indication and ~~1914 cubic feet~~ 83% wide range indication. In MODE 4 with pressurizer pressure less than 430 psia, the safety injection tanks may be isolated. (LA.2)

SR 3.5.2.3, SR 3.5.2.2, SR 3.5.2.3, SR 3.5.2.2, SR 3.5.2.1

*See Special Test Exceptions 3.10.6 and 3.10.8. (A.2)

~~**Nitrogen vent valves may be cycled as necessary to maintain the required nitrogen cover pressure per Specification 3.5.1d.~~

260 (LB.1) (LA.3)

SPECIFICATION 3.5.2
(3.5.1/3.5.2)

INSERT FOR CTS 3.5.2
ACTION SECTION

INSERT 1

ACTION A a. With one SIT inoperable due to boron concentration not within limits, restore the boron concentration to within limits within 72 hours ~~or be in~~

ACTION C ~~at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.~~

ACTION A b. With one SIT inoperable due to inability to verify the required water volume or nitrogen cover pressure because of inoperable level or pressure instrumentation, restore the SIT to operable status within 72 hours ~~or be in~~

ACTION C ~~at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.~~

ACTION B c. With one SIT inoperable for reasons other than those stated in ACTION a or ACTION b, restore the SIT to operable status within 24 hours ~~or be in~~

ACTION C ~~at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours~~

MODES within 24 hours

M.1

Actions from TS change request 102-03792, dtd. 6/13/95

Insert Page 3/4 5-1

SPECIFICATION 3.5.2
(3.5.1/3.5.2)

3.5 EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.5.2.1 ~~2.~~ Verifying that each safety injection tank isolation valve is open and the nitrogen vent valves are closed. LA.3

SR 3.5.2.4 b. At least once per 31 days and whenever the tank is drained to maintain the contained borated water level within the limits of Specification 3.5.1b, by verifying the boron concentration of the safety injection tank solution is between 2300 and 4400 ppm.

SR 3.5.2.5 c. At least once per 31 days when the pressurizer pressure is above ~~430~~ 1500 psia, by verifying that power to the isolation valve operator is removed. L.1

~~d. At least once per 18 months by verifying that each safety injection tank isolation valve opens automatically under each of the following conditions:~~

~~1. When an actual or simulated RCS pressure signal exceeds 515 psia, and~~

~~2. Upon receipt of a safety injection actuation (SIAS) test signal.~~ LA5

~~e. At least once per 18 months by verifying OPERABILITY of RCS-SIT differential pressure alarm by simulating RCS pressure > 715 psia with SIT pressure < 600 psig.~~ LA4

~~f. At least once per 18 months, when SITs are isolated, by verifying the SIT nitrogen vent valves can be opened.~~

~~g. At least once per 31 days, by verifying that power is removed from the nitrogen vent valves.~~ LA.3

DISCUSSION OF CHANGES
SPECIFICATION 3.5.2

'ADMINISTRATIVE CHANGES

A.1 All reformatting and renumbering is in accordance with the Combustion Engineering Plant (CE) Standard Technical Specifications NUREG-1432, Rev. 1 (NUREG-1432). As a result, the Palo Verde Nuclear Generating Station (PVNGS) Improved Technical Specifications (ITS) should be more readable, and therefore understandable, by plant operators as well as other users. During the reformatting and renumbering of the ITS, no technical changes (either actual or interpretational) to the PVNGS Current Technical Specifications (CTS) were made unless they were identified and justified.

Editorial rewording (either adding or deleting) is made consistent with NUREG-1432. During NUREG-1432 development, certain wording preferences or English language conventions were adopted which resulted in no technical changes (either actual or interpretational) to the CTS.

Additional information has also been added to more fully describe each subsection. This wording is consistent with NUREG-1432. Since the design is already approved by the NRC, adding more detail does not result in a technical change.

A.2 CTS Applicability "*" Note references "Special Test Exceptions 3.10.6 and 3.10.8". Cross references are not used in the ITS or NUREG-1432. Removing cross references does not alter the requirements of the referenced Specification. Therefore, this is an administrative change with no impact on safety. This change is consistent with NUREG-1432.

A.3 Not used.

A.4 ITS 3.5.2 Action D is added to require entry into LCO 3.0.3 if two or more SITs are inoperable. This Action is consistent with the CTS. Even though not specifically stated, when two SITs became inoperable the plant is in a Condition not specifically stated in the TS and therefore LCO 3.0.3 is entered. This Action is being added for clarification to ensure that if the plant is in Action A for one SIT and in Action B for one SIT inoperable for reasons other than Condition A, that it is clear that LCO 3.0.3 entry is required. This is an administrative change with no impact on safety. This change is consistent with NUREG-1432.

A.5 CTS 3.5.1 is applicable in Modes 1, 2, 3, and 4. The CTS requirements have been divided into two ITS Specifications. ITS 3.5.1, "Safety Injection Tanks - Operating" is applicable in Modes 1 and 2, and in Modes 3 and 4 with pressurizer pressure ≥ 1837 psia. ITS 3.5.2, "SITs - Shutdown" is applicable in Modes 3 and 4 with pressurizer pressure < 1837 psia. Therefore, this is an administrative change with no impact on safety.

A.6 Insert 1 incorporates the changes made by TS change request 102-03392, dated 6/13/95.

TECHNICAL CHANGES - MORE RESTRICTIVE

M.1 CTS 3.5.1, Actions a and b require that the plant be in HOT SHUTDOWN if the SIT cannot be returned to Operable status. ITS 3.5.2, ACTION C.1 requires that the plant be in Mode 5 if the SIT cannot be returned to Operable status. The CTS Action does not take the plant to a Condition where the LCO is no longer applicable. The ITS Action takes the plant to a Condition, Mode 5, where the LCO is no longer applicable. This is a more restrictive change.

TECHNICAL CHANGES - RELOCATIONS

LA.1 CTS LCO 3.5.1 a requires that "The isolation valve key-locked open and power to the valve removed." ITS SR 3.5.2.1 verifies "each required SIT isolation valve is fully opened" and ITS SR 3.5.2.5 verifies "power is removed from each required SIT isolation valve operator." The requirement in the CTS to key-lock the valve open is not included in the ITS. The key-lock is a design detail that is discussed in the UFSAR and is implemented administratively. The basis for the requirement to open the valve and remove power to the valve is to ensure that a single failure will not cause the valve to close, resulting in loss of a SIT. Opening the valve and removing power to the valve operator meets this requirement. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases Control Program. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

LA.2 CTS LCO 3.5.1 Note † lists the contained borated water in both "cubic feet" and "% wide range indication." ITS SR 3.5.2.2 lists the borated water volume in "% wide range indication." The safety analysis uses cubic feet to determined the minimum and maximum borated water volume for each SIT. Since the level indication provided in the control room is marked in percentages, only this level indication is retained in the Specification. The cubic foot borated water volume is relocated to the Bases. This is an administrative change that retains the control room indications in the Specification and relocates the cubic foot borated water volume to the Bases. The relationship between the indicated level and safety analysis volume is discussed in the Bases. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases Control Program. This provides an equivalent level of control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

LA.3 CTS 3.5.1.e, 3.5.1.f, Note **, 4.5.1.a.2, 4.5.1.f and 4.5.1.g provide specific OPERABILITY and SRs for the SIT nitrogen vent valves. This includes the requirement that the nitrogen vent valves be closed with power removed and be capable of being operated upon restoration of power. The SR verifies that the nitrogen vent valves can be opened if required. ITS 3.5.2 requires that nitrogen cover pressure is maintained in the SITs, but does not include specific requirements for the operation of the nitrogen vent valves. The safety analysis for the SITs is based on a minimum and maximum SIT nitrogen cover pressure. The OPERABILITY of the nitrogen vent valves may affect the SIT nitrogen cover pressure. There are two independent nitrogen vent valves on each SIT. Therefore, a single failure would not prevent a SIT from being depressurized if required. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the TRM. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.4 CTS SR 4.5.1.e requires that the RCS-SIT differential pressure alarm OPERABILITY be verified at least once per 18 months. ITS 3.5.2 does not include any requirements for the RCS-SIT differential pressure alarm. The requirement to verify RCS-SIT differential pressure alarm is relocated to the Technical Requirements Manual (TRM) and controlled administratively. ITS 3.5.2 will still require that SIT nitrogen cover pressure be monitored shiftly, therefore, any reduction in pressure will continue to be identified in a timely manner. The RCS-SIT differential pressure alarm is not a Regulatory Guide 1.97 instrument. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the UFSAR. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.5 CTS SR 4.5.1.d requires verification at least once per 18 months that each SIT isolation valve opens automatically when an actual or simulated RCS pressure signal exceeds 515 psia, and upon receipt of a SIAS test signal. ITS 3.5.2 does not include this surveillance requirement. ITS 3.5.2 requires that the SIT isolation valves be open when pressurizer pressure is ≥ 430 psia. Therefore, there is no reason for the SIT isolation valves to automatically open on a RCS pressure signal. The valves are also requied to be locked open, eliminating the need for the SIAS verification. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the TRM. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 CTS 4.5.1.c requires verification that power to each SIT isolation valve operator is removed when pressurizer pressure is above 430 psia. ITS SR 3.5.2.5 requires verification that power to each SIT isolation valve operator is removed when pressurizer pressure is above 1500 psia. This allows operational flexibility by avoiding unnecessary delays to manipulate the breakers during plant startups and 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.

TECHNICAL CHANGES - CTS CHANGES

LB.1 PVNGS CTS 3/4.5.1, "Safety Injection Tanks" (Note †) requires that a minimum nitrogen cover pressure of 254 psig (indicated) be maintained in the Safety Injection Tanks when the plant is in Modes 3 and 4 with pressurizer pressure less than 1837 psia. The Bases for this CTS identifies the corresponding analytical limit for minimum pressure under this condition as 235 psig, and 254 psig is chosen for the LCO to account for instrument inaccuracy. Thus, up to 19 psig is credited for the total uncertainty associated with the instrument loop(s) to verify compliance with the LCO.

PVNGS surveillance procedures specify the use of pressure indicators J-SIA-PI-331 and J-SIB-PI-311 to verify minimum pressure in Modes 3 and 4. These indicators are termed "wide range," and have a span of 0-750 psig. The total uncertainties associated with the instrument loops that include these indicators are derived in PVNGS setpoint and uncertainty calculation 13-JC-SI-211, Rev. 2. The calculation summarizes the indicator loop uncertainties under various environmental conditions. For normal conditions the uncertainties are +3.01/-3.36% of span, or +22.6/-25.2 psig. For a decreasing process variable (i.e., approaching the minimum), the positive (+) uncertainty is applied to the minimum analytical limit to derive the minimum indicated value. Adding 22.6 psig to 235 psig results in a minimum indicated value of 257.6 psig. The scale of the indicators is 10 psig per division. Thus, PVNGS is changing the limiting indicated value from 254 psig to 260 psig, for both readability and conservatism. The analytical limit of 235 psig remains unchanged.

TECHNICAL CHANGES - CTS CHANGES (continued)

PVNGS CTS 3/4.5.1 requires the nitrogen cover pressure (indicated) in the Safety Injection Tanks shall be maintained between 600 and 625 psig when the plant is in Modes 1 and 2, and Modes 3 and 4 with pressurizer pressure greater than or equal to 1837 psia. These requirements are not changing. The minimum and maximum analysis pressures for this requirement have changed from a minimum of 593 psig and a maximum of 632 (as specified in the CTS Bases) to a minimum of 588 psig and a maximum of 637 psig (as specified in the ITS Bases). These changes are not within the scope of change LB.1. The minimum and maximum analytical values for pressure are part of the ITS Bases and controlled in accordance with 10 CFR50.59 and the ITS TS Bases Control Program.

NO SIGNIFICANT HAZARDS CONSIDERATION
SPECIFICATION 3.5.2

ADMINISTRATIVE CHANGES
(ITS 3.5.2 Discussion of Changes Labeled A.1, A.2, A.4, A.5 and A.6)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, is converting to the ITS as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants." The proposed changes involve the reformatting, renumbering, rewording of the Technical Specifications (TS) and Bases with no change in intent, and the incorporation of current operating practices consistent with NUREG-1432. These changes, since they do not involve technical changes to the Current TS (CTS), are administrative. Below are the No Significant Hazards Consideration (NSHC) for the conversion of this Section/Chapter to NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes involve reformatting, renumbering, and rewording of the CTS and Bases along with incorporation of PVNGS current operating practices and other changes to the CTS as discussed in the specific Discussion of Changes listed above in order to be consistent with NUREG-1432. The reformatting, renumbering, and rewording along with the other changes listed above, involves no technical changes to the CTS. Specifically, there will be no change in the requirements imposed on PVNGS due to these changes. During development of NUREG-1432, certain wording preferences or English language conventions were adopted. The proposed changes to this Section/Chapter are administrative in nature and do not impact initiators of any analyzed events. They also do not impact the assumed mitigation of accidents or transient events. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

ADMINISTRATIVE CHANGES
(ITS 3.5.2 Discussion of Changes Labeled (A.1, A.2, A.4, A.5 and A.6)

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or change the methods governing normal plant operation. The proposed changes will not impose any new or different requirements or eliminate any existing requirements. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes are administrative in nature and will not involve any technical changes. The proposed changes will not reduce a margin of safety because they have no impact on any safety analysis assumptions. Also, because these changes are administrative in nature, no question of safety is involved. Therefore, these changes do not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - MORE RESTRICTIVE
(ITS 3.5.2 Discussion of Changes Labeled M.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. This particular NSHC is for the changes labeled "Technical Changes - More Restrictive" described in the specific Discussion of Changes listed above. The proposed changes incorporate more restrictive changes into the CTS by either making current requirements more stringent or adding new requirements which currently do not exist.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes provide more stringent requirements than previously existed in the CTS. The more stringent requirements will not result in operation that will increase the probability of initiating an analyzed event. If anything, the new requirements may decrease the probability or consequences of an analyzed event by incorporating the more restrictive changes discussed in the specific Discussion of Changes listed above. These changes will not alter assumptions relative to mitigation of an accident or transient event. The more restrictive requirements will not alter the operation and will continue to ensure process variables, structures, systems, or components are maintained consistent with safety analyses and licensing basis. These changes have been reviewed to ensure that no previously evaluated accident has been adversely affected. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident evaluated.

TECHNICAL CHANGES - MORE RESTRICTIVE
(ITS 3.5.2 Discussion of Changes Labeled M.1)

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

Making existing requirements more restrictive and adding more restrictive requirements to the CTS will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes do impose different requirements. However, they are consistent with the assumptions made in the safety analyses, licensing basis, and NUREG-1432. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes provide more stringent requirements than previously existed in the CTS. An evaluation of these changes concluded that adding these more restrictive requirements either increases or has no impact on the margin of safety. The changes provide additional restrictions which may enhance plant safety. These changes maintain requirements of the safety analysis, licensing basis, and NUREG-1432. As such, no question of safety is involved. Therefore, these changes will not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.2 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4 and LA.5)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed changes, since detail is being removed from the CTS to a Licensee Controlled Document, are less restrictive. The descriptions of these changes are in the Discussion of Changes listed above.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes do not result in any hardware changes or changes to plant operating practices. The details being relocated are not assumed to be an initiator of any analyzed event. The Licensee Controlled Document containing the relocated requirements will be maintained using the provisions of 10 CFR 50.59 or other specified control processes and is subject to the change control process in the Administrative Controls Section of the ITS. Since any changes to a Licensee Controlled Document will be evaluated, no increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.2 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4 and LA.5) (continued)

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes will not impose different requirements and adequate control of information will still be maintained. These changes will not alter assumptions made in the safety analysis or licensing basis. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not reduce a margin of safety since they have no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the CTS to the Licensee Controlled Document are the same as the CTS. Since any future changes to this Licensee Controlled Document will be evaluated per the requirements of 10 CFR 50.59, or other specified control processes, no reduction (significant or insignificant) in a margin of safety will be allowed. Therefore, these changes will not involve a significant reduction in a margin of safety.

The NRC review provides a certain margin of safety, and although this review will no longer be performed prior to submittal, the NRC still inspects the 10 CFR 50.59 process. The proposed changes are consistent with NUREG-1432, which was approved by the NRC Staff. The change controls for proposed relocated details and requirements provide an acceptable level of regulatory authority. Revising the CTS to reflect the approved level of detail per NUREG-1432 reinforces the conclusion that there is not a significant reduction in the margin of safety. Therefore, revising the CTS to reflect the NRC accepted level of detail and requirements ensures no reduction in a margin of safety.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.2 Discussion of Changes Labeled L.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for the conversion to NUREG 1432.

L.1 CTS 4.5.1.c requires verification that power to each SIT isolation valve operator is removed when pressurizer pressure is above 430 psia. ITS SR 3.5.2.5 requires verification that power to each SIT isolation valve operator is removed when pressurizer pressure is above 1500 psia. This allows operational flexibility by avoiding unnecessary delays to manipulate the breakers during plant startups and 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.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.2 Discussion of Changes Labeled L.1) (continued)

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

The proposed change involves a change from the CTS requirement that power to each SIT isolation valve be removed when pressurizer pressure is above 430 psia to the ITS requirement that power to each SIT isolation valve be removed when pressurizer pressure is above 1500 psia. 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. The safety analysis assumes a reactor trip and ESFAS actuation at a minimum pressurizer pressure of 1600 psia. The 1500 psia pressure ensures that the SITs will be available at or above 1600 psia. This change is consistent with NUREG-1432. This change does not result in any hardware changes or changes to plant operating practices nor does it affect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

The proposed change involves a change from the CTS requirement that power to each SIT isolation valve be removed when pressurizer pressure is above 430 psia to the ITS requirement that power to each SIT isolation valve be removed when pressurizer pressure is above 1500 psia. 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. The safety analysis assumes a reactor trip and ESFAS actuation at a minimum pressurizer pressure of 1600 psia. The 1500 psia pressure ensures that the SITs will be available at or above 1600 psia. This change is consistent with NUREG-1432. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed change involves a change from the CTS requirement that power to each SIT isolation valve be removed when pressurizer pressure is above 430 psia to the ITS requirement that power to each SIT isolation valve be removed when pressurizer pressure is above 1500 psia. 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. The safety analysis assumes a reactor trip and ESFAS actuation at a minimum pressurizer pressure of 1600 psia. The 1500 psia pressure ensures that the SITs will be available at or above 1600 psia. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. This change is consistent with NUREG-1432, which was approved by the NRC Staff. Therefore, this change does not result in a reduction in a margin of safety.

TECHNICAL CHANGES - CTS CHANGES
(ITS 3.5.2 Discussion of Changes Labeled LB.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for the conversion to NUREG 1432.

LB.1 CTS 3.5.1 Note † lists the minimum SIT nitrogen cover pressure as 254 psig. As part of the ECCS performance reanalysis, PVNGS engineering found that due to a new instrument uncertainty values, that the minimum SIT nitrogen cover pressure should be increased from 254 psig to 260 psig. The new or changed instrument uncertainty is associated with the pressure transmitters in the SIT pressure indication loops. The minimum and maximum analysis pressures in the Bases for ITS 3.5.1 have changed from a minimum of 587 psig and maximum of 636 psig to 588 psig and 637 psig respectfully. The maximum analysis pressure in the Bases for ITS 3.5.2 has also changed from 632 psig to 637 psig. Both these changes also effect the Bases for CTS 3.5.1. These Bases changes do not effect the ITS or CTS surveillance requirements.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - CTS CHANGES
(ITS 3.5.2 Discussion of Changes Labeled LB.1) (continued)

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

The proposed change involves a change from the CTS minimum SIT nitrogen pressure of 254 psig to 260 psig. The reanalysis of ECCS performance using the revised analysis (based on the change in instrument uncertainty) shows that the SITs will provide adequate core cooling for the required accident scenarios. The revised analytical range envelopes the values assumed for initial SIT pressure in Chapter 6 of the UFSAR. This change does not result in any hardware changes or changes to plant operating practices nor does it affect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

The proposed change in the CTS minimum SIT nitrogen pressure incorporates the changes to the instrument uncertainty, ensuring that equipment performance will not be changed. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed change in the CTS minimum SIT nitrogen pressure reflects the results of the ECCS analysis, which define the margin of safety for the applicable plant conditions. The change also increases the minimum pressure which is conservative. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. Therefore, this change does not result in a reduction in a margin of safety.

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.3
MARK UP

<DOC>
<CTS>

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

<3.5.2> 3.5.~~2~~ {3} ECCS—Operating

<LCO 3.5.2> LCO 3.5.~~2~~ {3} Two ECCS trains shall be OPERABLE. 1

<3.5.2 Footnote> APPLICABILITY: MODES 1 and 2,
MODE 3 with pressurizer pressure ≥ ~~[1700]~~ {1837} psia {or with RCS T_c ≥ 485°F}

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
<Action a> <DOC L.1>	{B} ~~A~~. One or more trains inoperable {for reasons other than Condition A}. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	{B} ~~A~~.1 Restore train(s) to OPERABLE status.	72 hours	5
<Action a> <DOC L.2>	{C} ~~B~~. Required Action and associated Completion Time not met.	{C} ~~B~~.1 Be in MODE 3. AND {C} ~~B~~.2 Reduce pressurizer pressure to < ~~[1700]~~ {1837} psia. AND C.3 Reduce RCS T_c to < 485°F	6 hours 12 hours 12 hours	1 1
	A. One LPSI subsystem inoperable	A.1 Restore subsystem to OPERABLE status	7 days	5

<DOC>
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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
<DOC L.4> ~~SR 3.5.2.1~~	~~Verify the following valves are in the listed position with power to the valve operator removed [and key locked in position].~~ ~~Valve Number / Position / Function~~ ~~[ ] [ ] [ ]~~ ~~[ ] [ ] [ ]~~ ~~[ ] [ ] [ ]~~	~~12 hours~~ ← 3
<4.5.2.b.1> SR 3.5.~~2.2~~ 3.1	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
<4.5.2.b.2> [SR 3.5.~~2.3~~ 3.2	Verify ECCS piping is full of water.	31 days] *
<4.5.2.f> SR 3.5.~~2.4~~ 3.3	Verify ~~the following~~ ECCS pumps develop the required differential pressure on recirculation flow. ~~Pump / Differential Pressure, psid~~ <4.5.2.f.1> ~~HPSI[(a)] ≥ [1600]~~ <4.5.2.f.2> ~~LPSI[(b)] ≥ [300]~~ Verify each ECCS pump develops the required differential pressure at the flow test point.	In accordance with the Inservice Testing Program

(continued)

~~(a) high pressure safety injection~~
~~(b) low pressure safety injection~~

← 2

<DOC>
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SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
~~SR 3.5.2.5~~	~~Verify each charging pump develops a flow of ≥ [36] gpm at a discharge pressure of ≥ [2200] psig.~~	~~In accordance with the Inservice Testing Program~~ ← 4
<4.5.2.e.1> <4.6.2.1> <4.6.3.2> SR 3.5.2.6 {3.4}	Verify each ECCS automatic valve that is not locked, sealed, or otherwise secured in position, in the flow path actuates to the correct position on an actual or simulated actuation signal.	[18] months
<4.5.2.e.2> SR 3.5.2.7 {3.5}	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	[18] months
<4.5.2.e.3> SR 3.5.2.8 {3.6}	Verify each LPSI pump stops on an actual or simulated actuation signal.	[18] months
<4.5.2.g> <4.5.2.g.2> [SR 3.5.2.9 {3.7}	Verify, for each ECCS throttle valve listed below, each position stop is in the correct position. {LPSI System} Valve Number SIB-UV 615 SIB-UV 625 SIA-UV 635 SIA-UV 645 SIA-HV 306 SIB-HV 307 {Hot Leg Injection Valve Number} SIC-HV 321 SID-HV 331	[18] months] ← 7

(continued)

<DOC>
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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
<4.5.2.d.1> SR 3.5.~~2.10~~ {3.8}	Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	[18] months

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.3
BASES MARKUP

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.~~2~~ 3 ECCS—Operating

BASES

BACKGROUND

The function of the ECCS is to provide core cooling and negative reactivity to ensure that the reactor core is protected after any of the following accidents:

a. Loss of Coolant Accident (LOCA); 6

b. Control Element Assembly (CEA) ejection accident;

c. Loss of secondary coolant accident, including uncontrolled steam release or loss of feedwater; and

d. Steam Generator Tube Rupture (SGTR). 6

The addition of negative reactivity is designed primarily for the loss of secondary coolant accident where primary cooldown could add enough positive reactivity to achieve criticality and return to significant power.

There are two phases of ECCS operation: injection and recirculation. In the injection phase, all injection is initially added to the Reactor Coolant System (RCS) via the cold legs. After the blowdown stage of the LOCA stabilizes, injection flow is split equally between the hot and cold legs. After the Refueling Water Tank (RWT) has been depleted, the ECCS recirculation phase is entered as the ECCS suction is automatically transferred to the containment sump. 1

Two redundant, 100% capacity trains are provided. In MODES 1, 2, and 3, with pressurizer pressure ≥ ~~1700~~ 1837 psia or with RCS Tc ≥ 485°F, each train consists of High Pressure Safety Injection (HPSI) and Low Pressure Safety Injection (LPSI) ~~and charging~~ subsystems. 6 4 In MODES 1, 2, and 3, with pressurizer pressure ≥ ~~1700~~ 1837 psia, both trains must be OPERABLE. This ensures that 100% of the core cooling requirements can be provided in the event of a single active failure.

A suction header supplies water from the RWT or the containment sump to the ECCS pumps. Separate piping supplies each train. The discharge headers from each HPSI pump divide into four supply lines. Both HPSI trains feed

(continued)

BASES

BACKGROUND (continued)

into each of the four injection lines. The discharge header from each LPSI pump divides into two supply lines, each feeding the injection line to two RCS cold legs. Control valves or orifices are set to balance the flow to the RCS. This flow balance directs sufficient flow to the core to meet the analysis assumptions following a LOCA in one of the RCS cold legs.

~~For LOCAs that are too small to initially depressurize the RCS below the shutoff head of the HPSI pumps, the charging pumps supply water to maintain inventory until the RCS pressure decreases below the HPSI pump shutoff head. During this period, the steam generators (SGs) must provide the core cooling function. The charging pumps take suction from the RWT on a safety injection actuation signal (SIAS) and discharge directly to the RCS through a common header. The normal supply source for the charging pumps is isolated on an SIAS to prevent noncondensible gas (e.g., air, nitrogen, or hydrogen) from being entrained in the charging pumps.~~ 7

~~During low temperature conditions in the RCS, limitations are placed on the maximum number of HPSI pumps that may be OPERABLE. Refer to the Bases for LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," for the basis of these requirements.~~ 7

~~During a large break LOCA, RCS pressure will decrease to < 200 psia in < 20 seconds.~~ The safety injection (SI) systems are actuated upon receipt of an SIAS. The actuation of safeguard loads is accomplished in a programmed time sequence. If offsite power is available, the safeguard loads start immediately in the programmed sequence. If offsite power is not available, the Engineered Safety Feature (ESF) buses shed normal operating loads and are connected to the diesel generators (DGs). Safeguard loads are then actuated in the programmed time sequence. The time delay associated with diesel starting, sequenced loading, and pump starting determines the time required before pumped flow is available to the core following a LOCA. 7 6 6

The active ECCS components, ~~along with the~~ passive safety injection tanks (SITs) and the RWT, covered in LCO 3.5.1, "Safety Injection Tanks (SITs)-Operating," LCO 3.5.2, "SITs-Shutdown," and LCO 3.5.~~4~~ 5, "Refueling Water Tank (RWT)," provide the cooling water necessary to meet GDC 35 (Ref. 1). 6

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The LCO helps to ensure that the following acceptance criteria, established by 10 CFR 50.46 (Ref. 2) for ECCSs, will be met following a LOCA:

a. Maximum fuel element cladding temperature is ≤ 2200°F;

b. Maximum cladding oxidation is ≤ 0.17 times the total cladding thickness before oxidation;

c. Maximum hydrogen generation from a zirconium water reaction is ≤ 0.01 times the hypothetical amount generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react;

d. Core is maintained in a coolable geometry; and

e. Adequate long term core cooling capability is maintained.

The LCO also limits the potential for a post trip return to power following a steam line break (SLB) and ensures that containment temperature limits are met. 6

Both HPSI and LPSI subsystems are assumed to be OPERABLE in the large break LOCA analysis at full power (Ref. 3). This analysis establishes a minimum required runout flow for the HPSI and LPSI pumps, as well as the maximum required response time for their actuation. The HPSI pumps and charging pumps are credited in the small break LOCA analysis. This analysis establishes the flow and discharge head requirements at the design point for the HPSI pump. The SGTR and SLB analyses also credit the HPSI pumps, but are not limiting in their design. 4

The large break LOCA event with a loss of offsite power and a single failure (disabling one ECCS train) establishes the OPERABILITY requirements for the ECCS. During the blowdown stage of a LOCA, the RCS depressurizes as primary coolant is ejected through the break into the containment. The nuclear reaction is terminated either by moderator voiding during large breaks or control element assembly ~~(~~CEA~~)~~ insertion during small breaks. Following depressurization, emergency cooling water is injected into the cold legs, flows into the downcomer, fills the lower plenum, and refloods the core. 6

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

On smaller breaks, RCS pressure will stabilize at a value dependent upon break size, heat load, and injection flow. The smaller the break, the higher this equilibrium pressure. In all LOCA analyses, injection flow is not credited until RCS pressure drops below the shutoff head of the HPSI pumps.

The LCO ensures that an ECCS train will deliver sufficient water to match decay heat boiloff rates soon enough to minimize core uncovery for a large LOCA. It also ensures that the HPSI pump will deliver sufficient water during a small break LOCA and provide sufficient boron to maintain the core subcritical following an SLB. ~~For smaller LOCAs, the charging pumps deliver sufficient fluid to maintain RCS inventory until the RCS can be depressurized below the HPSI pumps' shutoff head. During this period of a small break LOCA, the SGs continue to serve as the heat sink providing core cooling.~~ 7

ECCS—Operating satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10CFR 50.36 (c)(2)(ii) 6

LCO

In MODES 1, 2, and 3, with pressurizer pressure ≥ ~~1700~~ 1837 psia, or with RCS Tc ≥ 485°F two independent (and redundant) ECCS trains are required to ensure that sufficient ECCS flow is available, assuming there is a single failure affecting either train. Additionally, individual components within the ECCS trains may be called upon to mitigate the consequences of other transients and accidents. 1

In MODES 1 and 2, and in MODE 3 with pressurizer pressure ≥ ~~1700~~ 1837 psia, an ECCS train consists of a~~n~~ HPSI subsystem, ~~an~~ and LPSI subsystem, ~~and a charging pump~~. 4

Each train includes the piping, instruments, valves, and controls to ensure the availability of an OPERABLE flow path capable of taking suction from the RWT on a~~n~~ SIAS and automatically transferring suction to the containment sump upon a recirculation actuation signal (RAS). 7

During an event requiring ECCS actuation, a flow path is provided to ensure an abundant supply of water from the RWT to the RCS, via the HPSI and LPSI pumps and their respective supply headers, to each of the four cold leg injection nozzles. In the long term (post RAS), this flow path ~~may be switched~~ 7

(continued)

BASES

is manually switched 2 to 3 hours after a LOCA

LCO (continued)

HPSI ~~to take its supply from the containment sump and~~ to supply part of its flow to the RCS hot legs via ~~the shutdown cooling (SDC) suction nozzles~~. ~~The charging pump flow path takes suction from the RWT and supplies the RCS via the normal charging lines.~~

the HPSI hot leg injection valves which connect to

(7)

Simultaneous hot and cold leg injection will maintain core cooling and boric acid flushing following a large break LOCA.

The flow path for each train must maintain its designed independence to ensure that no single failure can disable both ECCS trains.

(1)

APPLICABILITY

In MODES 1 and 2, and in MODE 3 with RCS pressure ≥ ~~1700~~ 1837 psia, or with RCS T_c ≥ 485°F, the ECCS OPERABILITY requirements for the limiting Design Basis Accident (DBA) large break LOCA are based on full power operation. Although reduced power would not require the same level of performance, the accident analysis does not provide for reduced cooling requirements in the lower MODES. The HPSI pump performance is based on the small break LOCA, which establishes the pump performance curve and has less dependence on power. ~~The charging pump performance requirements are based on a small break LOCA.~~ The requirements of MODES 2 and 3, with RCS pressure ≥ ~~1700~~ 1837 psia, are bounded by the MODE 1 analysis.

The minimum T_c is based on the ECCS OPERABILITY requirements for a MODE 3 steam line break with a stuck rod and a single HPSI failure to prevent a return to power

The ECCS functional requirements of MODE 3, with RCS pressure < ~~1700~~ 1837 psia and with RCS T_c < 485°F, and MODE 4 are described in LCO 3.5.~~3~~ 4, "ECCS—Shutdown."

(4)

In MODES 5 and 6, unit conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops—MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops—MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.4, "Shutdown Cooling (SDC) and Coolant Circulation—High Water Level," and LCO 3.9.5, "Shutdown Cooling (SDC) and Coolant Circulation—Low Water Level."

ACTIONS

INSERT 1

B ~~A~~.1

(5)

If one or more trains are inoperable except for reasons other than Condition A (one LPSI inoperable) and at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train is available, the inoperable components must be returned to

(continued)

INSERT FOR BASES 3.5.3
ACTIONS SECTION

INSERT 1

With one LPSI subsystem inoperable, action must be taken to restore OPERABLE status within 7 days. In this condition, the remaining OPERABLE ECCS train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure to the remaining LPSI subsystem could result in loss of ECCS function. The 7 day Completion Time is reasonable to perform corrective maintenance on the inoperable LPSI subsystem. The 7 day Completion Time is based on the findings of the deterministic and probabilistic analysis in Reference 5. Reference 5 concluded that the overall risk impact to this Completion Time does not adversely affect risk.

BASES

ACTIONS

B ~~A~~.1 (continued)

OPERABLE status within 72 hours. The 72 hour Completion Time is based on an NRC study (Ref. 4) using a reliability evaluation and is a reasonable amount of time to effect many repairs.

An ECCS train is inoperable if it is not capable of delivering the design flow to the RCS. The individual components are inoperable if they are not capable of performing their design function, or if supporting systems are not available.

The LCO requires the OPERABILITY of a number of independent subsystems. Due to the redundancy of trains and the diversity of subsystems, the inoperability of one component in a train does not render the ECCS incapable of performing its function. Neither does the inoperability of two different components, each in a different train, necessarily result in a loss of function for the ECCS. The intent of this Condition is to maintain a combination of OPERABLE equipment such that 100% of the ECCS flow equivalent to 100% of a single OPERABLE train remains available. This allows increased flexibility in plant operations when components in opposite trains are inoperable.

An event accompanied by a loss of offsite power and the failure of an emergency DG can disable one ECCS train until power is restored. A reliability analysis (Ref. 4) has shown that the impact with one full ECCS train inoperable is sufficiently small to justify continued operation for 72 hours.

~~Reference 5 describes situations in which one component, such as a shutdown cooling total flow control valve, can disable both ECCS trains.~~ With one or more components inoperable, such that 100% of the equivalent flow to a single OPERABLE ECCS train is not available, the facility is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be immediately entered. 7

~~B.1 and B.2~~ C.1, C.2, and C.3

If the inoperable train cannot be restored to OPERABLE status within the associated Completion Time, the plant must

(continued)

BASES

ACTIONS

C.1, C.2, and C.3 ~~B.1 and B.2~~ (continued)

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 < ~~1700~~ 1837 psia and RCS Tc reduced to <485°F within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging unit systems. 1

SURVEILLANCE REQUIREMENTS

~~SR 3.5.2.1~~

~~Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable. Securing these valves in position by removing power or by key locking the control in the correct position ensures that the valves cannot be inadvertently misaligned or change position as the result of an active failure. These valves are of the type described in Reference 5, which can disable the function of both ECCS trains and invalidate the accident analysis. A 12 hour Frequency is considered reasonable in view of other administrative controls ensuring that a mispositioned valve is an unlikely possibility.~~ 3

SR 3.5.~~2.2~~ 3.1

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve automatically repositions within the proper stroke time. This Surveillance does not require any testing or valve manipulation. Rather, it involves verification that those valves capable of being mispositioned are in the correct position.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.~~2.2~~ 3.1 (continued)

The 31 day Frequency is appropriate because the valves are operated under procedural control and an improper valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.

SR 3.5.~~2.3~~ 3.2

With the exception of systems in operation, the ECCS pumps are normally in a standby, nonoperating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases. One method of ensuring that any voids or pockets of gases are removed from the ECCS piping is to vent the accessible discharge piping high points, which is controlled by PVNGS procedures. Maintaining the piping from the ECCS pumps to the RCS full of water ensures that the system will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent water hammer, pump cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an SIAS or during SDC. The 31 day Frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the adequacy of the procedural controls governing system operation. 7

SR 3.5.~~2.4~~ 3.3

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by Section XI of the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the unit safety analysis. SRs are specified in the Inservice Testing Program, which encompasses Section XI of the ASME Code. ~~Section XI of the ASME Code provides the activities and Frequencies necessary to satisfy the requirements.~~ The Frequency of this SR is in accordance with the Inservice Testing Program. 2

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.5.2.5~~

~~Discharge head at design flow is a normal test of charging pump performance required by Section XI of the ASME Code. A quarterly Frequency for such tests is a Code requirement. Such inservice inspections detect component degradation and incipient failures.~~ 4

SR 3.5.~~2.6~~ 3.4, SR 3.5.~~2.7~~ 3.5, and SR 3.5.~~2.8~~ 3.6

These SRs demonstrate that each automatic ECCS valve actuates to the required position on an actual or simulated SIAS and on an RAS, that each ECCS pump starts on receipt of an actual or simulated SIAS, and that the LPSI pumps stop on receipt of an actual or simulated RAS. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for unplanned transients if the Surveillances were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment. The actuation logic is tested as part of the Engineered Safety Feature Actuation System (ESFAS) testing, and equipment performance is monitored as part of the Inservice Testing Program.

The following valve actuations must be verified at least once per 18 months: on an actual or simulated recirculation signal, the containment sump isolation valves open, and the HPSI, LPSI and CS minimum bypass recirculation valves and combined SI mini flow valve close

SR 3.5.~~2.9~~ 3.7

Realignment of valves in the flow path on an SIAS is necessary for proper ECCS performance. The safety injection valves have stops to position them properly so that flow is restricted to a ruptured cold leg, ensuring that the other cold legs receive at least the required minimum flow. ~~This SR is not required for units with flow limiting orifices.~~ ~~The 18 month Frequency is based on the same factors as those stated above for SR 3.5.2.6, SR 3.5.2.7, and SR 3.5.2.8.~~ 7

current industry practice. These valves are also monitored in accordance with the requirements of 10 CFR 50.65 (Ref. 6).

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.~~X.10~~ 3.8

Periodic inspection of the containment sump ensures that it is unrestricted and stays in proper operating condition. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during an outage, on the need to have access to the location, and on the potential for unplanned transients if the Surveillance were performed with the reactor at power. This Frequency is sufficient to detect abnormal degradation and is confirmed by operating experience.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 35.
2. 10 CFR 50.46.
3. U FSAR, Chapter ~~X~~6~~X~~.
4. NRC Memorandum to V. Stello, Jr., from R. L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.

6

~~5. IE Information Notice No. 87-01, January 6, 1987.~~

5. CE NPSD-995, Low Pressure Safety Injection System AOT Extension, April 1995.
6. 10 CFR 50.65

NUREG-1432 EXCEPTIONS
SPECIFICATION 3.5.3

1. CTS 3.5.2 is applicable in Mode 3 with pressurizer pressure ≥ 1837 psia or RCS T_c ≥ 485°F. NUREG 3.5.3 is applicable in Mode 3 with only pressurizer pressure ≥ 1837 psia. The current licensing basis for PVNGS requires that this specification also be applicable when RCS T_c ≥ 485°F. This technical specification change was approved by the NRC by Unit 1 amendment 106, Unit 2 amendment 98, and Unit 3 amendment 78 dated April 30, 1996. Therefore, the current licensing basis has been determined to be appropriate. The Bases have been revised to be consistent with the LCO/Surveillance.

2. NUREG SR 3.5.2.3 requires functional testing of the ECCS pumps only at recirculation flow rate. ITS SR 3.5.3.3 is changed to allow functional testing at various flowrates. PVNGS has determined that pump performance testing at reduced flow rate may be adequate to assess operational readiness as required by ASME Section XI, but should be augmented by tests performed at flowrates in the vicinity of the design flowrate when allowed by operating conditions. This change will allow testing at full flow or recirculation flow as specified by the Inservice Testing Program. Acceptance criteria will be developed and specified in accordance with the Inservice Test Program. This change provides a greater level of safety than is provided by NUREG 1432 or the CTS. The Bases have been revised to be consistent with the LCO/Surveillance.

3. NUREG SR 3.5.2.1 requires that every 12 hours the listed valves be verified in the their correct position with power to the valve operator removed. The Bases for this SR states that "Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable." The Bases also references IE Information Notice No. 87-01, which described a situation where the malfunction or mispositioning of a single valve could disable both ECCS trains. The PVNGS plant specific design does not include any ECCS valves that could alone render both ECCS trains inoperable. Therefore, the plant specific design does not require this SR. The Bases have been revised to be consistent with the LCO/Surveillance.

4. NUREG SR 3.5.2.5 requires flow testing of the charging pumps. The plant specific safety analysis does not take credit for the charging pumps. Therefore, this SR is not retained in the ITS. The Bases have been revised to be consistent with the LCO/Surveillance.

5. NUREG 3.5.2 Action A has a 72 hour completion time to restore inoperable ECCS trains to Operable status. ITS Action A has been changed to Action B and a new Action A has been added that allows one LPSI subsystem to be inoperable for up to 7 days. This is based on the recommendations in NUREG-1366 and discussed in CE NPSD-994, "Joint Application Report for Safety Injection Tank AOT/STI Extension, April 1995." The proposed amendment to PVNGS Technical Specifications was submitted June 13, 1995 and submittal updated August 16, 1995. This change is also consistent with TSTF-58. The Bases have been revised to be consistent with the LCO/Surveillance.

6. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

7. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values were directly transferred from the CTS to the ITS.

8. CTS 4.5.2.e.3 lists the specific valves that are required to be actuated. ITS SR 3.5.3.4 requires verification that ECCS and Containment Spray (CS) valves actuate to the correct position. This is an administrative change since the specific valves listed are the actuated ECCS and CS valves. These valves are specifically listed in the ITS Bases. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the ITS 3.5.3 Bases. Any changes to the requirements in the ITS Bases will be governed by the provisions of the PVNGS Bases control process. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the ITS Bases is acceptable and is consistent with NUREG-1432.

PVNGS CTS
SPECIFICATION 3.5.3
MARK UP

SPECIFICATION 3.5.3
(3.5.3/3.4.15)

PLANT SYSTEMS

3/4.7.11 SHUTDOWN COOLING SYSTEM

A.1

LIMITING CONDITION FOR OPERATION

ITS 3.4.15

ITS 3.5.3

3.7.11 Two independent shutdown cooling subsystems shall be OPERABLE, with each subsystem comprised of:

a. One OPERABLE low pressure safety injection pump, and

b. An independent OPERABLE flow path capable of taking suction from the RCS hot leg and discharging coolant through the shutdown cooling heat exchanger and back to the RCS through the cold leg injection lines.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

a. With one shutdown cooling subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within 1 hour, be in at least HOT SHUTDOWN within the next 6 hours and be in COLD SHUTDOWN within the next 30 hours and continue action to restore the required subsystem to OPERABLE status. LA.9

b. With both shutdown cooling subsystems inoperable, restore one subsystem to OPERABLE status within 1 hour or be in at least HOT STANDBY within 1 hour and be in HOT SHUTDOWN within the next 6 hours and continue action to restore the required subsystems to OPERABLE status.

c. With both shutdown cooling subsystems inoperable and both reactor coolant loops inoperable, initiate action to restore the required subsystems to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.7.11 Each shutdown cooling subsystem shall be demonstrated OPERABLE:

a. At least once per 18 months, during shutdown, by establishing shutdown cooling flow from the RCS hot legs, through the shutdown cooling heat exchangers, and returning to the RCS cold legs.

ITS 3.5.3

ITS 3.4.15

b. At least once per 18 months, during shutdown, by testing the open permissive interlock action of the shutdown cooling system connections from the RCS. The shutdown cooling system suction valves shall not open when RCS pressure is greater than 410 psia.

SPECIFICATION 3.5.3

A.1

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ~~3/4.5.2~~ ECCS SUBSYSTEMS - OPERATING

LIMITING CONDITION FOR OPERATION

A.1

LCO 3.5.3 ~~3.5.2~~ Two independent Emergency Core Cooling System (ECCS) subsystems trains shall be OPERABLE with ~~each subsystem comprised of:~~

LA.1

~~a. One OPERABLE high-pressure safety injection pump,~~

~~b. One OPERABLE low-pressure safety injection pump, and~~

~~c. An independent OPERABLE flow path capable of taking suction from the refueling water tank on a safety injection actuation signal and automatically transferring suction to the containment sump on a recirculation actuation signal.~~

A.5

APPLICABILITY: MODES 1, 2, and 3*. L.1

ACTION:

INSERT ACTION A a. With one or more ECCS subsystem trains A.1 inoperable, INSERT 1 restore the inoperable subsystem trains A.1 to OPERABLE status within 72 hours

ACTION B or be in at least HOT STANDBY within the next 6 hours

ACTION C and ~~in HOT SHUTDOWN within the following 6 hours~~ INSERT 2 L.2.

~~b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.~~ LA.2

3.5.3 Applicability *With pressurizer pressure greater than or equal to 1837 psia, or RCS cold leg temperature greater than or equal to 485 degrees F.

INSERT FOR 3.5.3

INSERT 1

L.1

and at least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.

INSERT 2

L.2

Reduce pressurizer pressure to $<$ 1837 psia and reduce RCS Tc to $<$ 485 °F within 12 hours.

INSERT PAGE 3/4 5-3

SPECIFICATION 3.5.3

3.5 EMERGENCY CORE COOLING SYSTEMS

A.1

SURVEILLANCE REQUIREMENTS

~~4.5.2~~ Each ECCS subsystem shall be demonstrated OPERABLE:

a. At least once per 12 hours by verifying that the following valves are in the indicated positions with the valves key-locked shut:

Valve Number	Valve Function	Valve Position
1. SIA HV-604	1. HOT LEG INJECTION	1. SHUT
2. SIC HV-321	2. HOT LEG INJECTION	2. SHUT
3. SIB HV-609	3. HOT LEG INJECTION	3. SHUT
4. SID HV-331	4. HOT LEG INJECTION	4. SHUT

L4

~~b.~~ At least once per 31 days by:

SR 3.5.3.1 ~~1.~~ 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, and

SR 3.5.3.2 ~~2.~~ Verifying that the ECCS piping is full of water by ~~venting the accessible discharge piping high points.~~ LA.4

c. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. This visual inspection shall be performed:

1. For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and

2. At least once daily of the affected areas within containment by containment entry and during the final entry when CONTAINMENT INTEGRITY is established.

LA.3

SR 3.5.3.8 ~~d.~~ At least once per 18 months by:

SPECIFICATION 3.5.3
(3.5.3/3.5.6/5.5.2)

3.5 EMERGENCY CORE COOLING SYSTEMS A.1

SURVEILLANCE REQUIREMENTS (Continued)

SR 3.5.3.8 ~~1.~~ A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

ITS 3.5.3

ITS 3.5.6

2. Verifying that a minimum total of 464 cubic feet of solid granular anhydrous trisodium phosphate (TSP) is contained within the TSP storage baskets.

3. Verifying that when a representative sample of 0.055 ± 0.001 lb of TSP from a TSP storage basket is submerged, without agitation, in 1.0 ± 0.05 gallons of 77 ± 9 °F borated water from the RWT, the pH of the mixed solution is raised to greater than or equal to 7 within 4 hours.

ITS 3.5.6

ITS 3.5.3

e. At least once per 18 months, ~~during shutdown~~, by: A.2

SR 3.5.3.4 ~~1.~~ Verifying that each automatic valve in the flow path actuates to its correct position on (SIAS and RAS) test or actual signal(s).

SR 3.5.3.5 ~~2.~~ Verifying that each of the following pumps start automatically upon receipt of a safety injection actuation test or actual signal: L.3

~~a. High pressure safety injection pump.~~ A.3

~~b. Low pressure safety injection pump.~~

SR 3.5.3.6 ~~3.~~ Verifying that on a recirculation actuation test ~~signal, the containment sump isolation valves open, the HPSI/ LPSI and CS pump minimum bypass recirculation flow line isolation valves and combined SI mini-flow valve close, and the LPSI pumps stop.~~ LA.8

ITS 3.5.5

ITS 5.5.2

4. Conducting an inspection of all ECCS piping outside of containment, which is in contact with recirculation sump inventory during LOCA conditions, and verifying that the total measured leakage from piping and components is less than 1 gpm when pressurized to at least 40 psig.

ITS 5.5.2

ITS 3.5.3

SR 3.5.3.3

~~f.~~ By verifying that each ~~of the following pumps develops the indicated differential pressure at or greater than their respective minimum allowable recirculation flow~~ when tested ~~pursuant to Specification 4.0.5:~~ in accordance with the Inservice Testing Program A4

~~1. High pressure safety injection pump greater than or equal to 1761 psid.~~

~~2. Low pressure safety injection pump greater than or equal to 165 psid.~~

ECCS pump develops the required differential pressure at the test flowrate LA.7

each ECCS automatic valve actuates to correct position LA.8

SPECIFICATION 3.5.3

A.1

SR 3.5.3.7

g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:

1. ~~Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE.~~ LA.5

2. At least once per 18 months.

LPSI System Valve Number		Hot Leg Injection Valve Number	
1.	SIB-UV 615, SIA-HV 306	1.	SIC-HV 321
2.	SIB-UV 625, SIB-HV 307	2.	SID-HV 331
3.	SIA-UV 635		
4.	SIA-UV 645		

~~h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying the following flow rates:~~

~~HPSI System - Single Pump~~

~~The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 816 gpm.~~

~~LPSI System - Single Pump~~

1. ~~Injection Loop 1, total flow equal to 4800 ± 200 gpm~~
2. ~~Injection Legs 1A and 1B when tested individually, with the other leg isolated, shall be within 200 gpm of each other.~~
3. ~~Injection Loop 2, total flow equal to 4800 ± 200 gpm~~
4. ~~Injection Legs 2A and 2B when tested individually, with the other leg isolated, shall be within 200 gpm of each other.~~

~~Simultaneous Hot Leg and Cold Leg Injection - Single Pump~~

1. ~~The hot leg flowrate is greater than or equal to 525 gpm;~~
2. ~~The sum of the cold leg flowrates is greater than or equal to 525 gpm; and~~
3. ~~The total pump flowrate does not exceed 1200 gpm.~~

LA.6

DISCUSSION OF CHANGES
SPECIFICATION 3.5.3

ADMINISTRATIVE CHANGES

A.1 All reformatting and renumbering is in accordance with the Combustion Engineering Plant (CE) Standard Technical Specifications NUREG-1432, Rev. 1 (NUREG-1432). As a result, the Palo Verde Nuclear Generating Station (PVNGS) Improved Technical Specifications (ITS) should be more readable, and therefore understandable, by plant operators as well as other users. During the reformatting and renumbering of the ITS, no technical changes (either actual or interpretational) to the PVNGS Current Technical Specifications (CTS) were made unless they were identified and justified.

Editorial rewording (either adding or deleting) is made consistent with NUREG-1432. During NUREG-1432 development, certain wording preferences or English language conventions were adopted which resulted in no technical changes (either actual or interpretational) to the CTS.

Additional information has also been added to more fully describe each subsection. This wording is consistent with NUREG-1432. Since the design is already approved by the NRC, adding more detail does not result in a technical change.

A.2 CTS 4.5.2.e requires verification every 18 months, during shutdown that each automatic valve in the flow path actuates and each ECCS pump starts upon receipt of an initiation signal. ITS SRs 3.5.3.4, 3.5.3.5, 3.5.3.6, 3.5.3.7, and 3.5.3.8 require verification of valve actuation and pump start every 18 months, but does not include the "during shutdown" requirement. The 18 month interval specified in the ITS indicates that this testing should be limited to periods when the plant is shutdown. The intent of both the CTS and ITS frequencies are the same. This change is consistent with NUREG-1432.

A.3 CTS 4.5.2.e.2 requires that the low pressure safety injection pumps and high pressure safety injection pumps start upon receipt of a SI actuation signal. ITS SR 3.5.3.5 requires verification that ECCS pumps start and does not identify specific pumps. This is an administrative change since the low pressure safety injection and high pressure safety injection pumps are the ECCS pumps. This change is consistent with NUREG-1432.

A.4 CTS 4.5.2.f references Specification 4.0.5 which contains IST requirements. Cross references are not used in the ITS or NUREG-1432. Therefore, the wording, "In Accordance with Inservice Testing Program" has been added. Removing cross references does not alter the requirements of the referenced Specification. Therefore, this is an administrative change with no impact on safety. This change is consistent with NUREG-1432.

A.5 ITS Action A incorporates the changes made by TS change request 102-03392, dated 6/13/95.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - RELOCATIONS

LA.1 CTS LCO 3.5.2 requires that two ECCS "subsystems shall be OPERABLE" and lists the specific ECCS components that comprise an ECCS subsystem/train. ITS LCO 3.5.3 requires that "two ECCS trains be operable" and relocates the description of the specific components that comprise an ECCS to the Bases LCO Section. Relocating the description of the specific ECCS components to a Licensee Controlled Document such as the Bases is administrative with no impact on nuclear safety. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases Control Program. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

LA.2 CTS 3.5.2 Action b. requires that "in the event the ECCS is actuated and injects water into the RCS, that a Special Report" be submitted to the NRC. ITS 3.5.3 does not include this requirement. This requirement is being relocated to the Technical Requirements Manual (TRM). Therefore, relocating the Special Report requirement to a Licensee Controlled Document is administrative and has no impact on nuclear safety. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to plant procedures. Any changes to the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.3 CTS 4.5.2.c requires a visual inspection of the containment prior to establishing containment integrity and when containment entries are made after containment integrity has been established. ITS 3.5.3 does not include this requirement. This is an administrative requirement for containment closeout, prior to or after establishing containment integrity. One of the purposes of the visual inspection is to verify that there is no debris in the sumps which would restrict or eliminate pump suction, therefore, reducing or stopping recirculation flow. ITS SR 3.5.3.8 verifies that the ECCS sumps are not restricted by debris. This information does not meet the 10 CFR 50.36 (c) (2) (ii) criteria for inclusion in ITS and is, therefore, being relocated. This requirement is being relocated to the Technical Requirements Manual (TRM). Any changes to the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to TRM is acceptable and is consistent with NUREG-1432.

LA.4 CTS 4.5.2.b.2 requires verification "that the ECCS piping is full of water by venting the accessible discharge piping high points". ITS SR 3.5.3.2 requires verification "that the ECCS piping is full of water." The specific method, venting the accessible discharge piping high points, for verifying the ECCS piping is full of water is relocated to the Bases and the Technical Requirements Manual (TRM). Since the piping will still be required to be water filled, relocating this requirement to a Licensee Controlled Document such as the BASES or the TRM, has no impact on nuclear safety. The venting requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases control program. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

LA.5 CTS 4.5.2.g.1 requires that the correct position of each ECCS throttle valve position stop be verified "following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE." ITS does not include this requirement. This is a post maintenance requirement that is being relocated to the Technical Requirements Manual (TRM). Since the requirement is administratively controlled, there is no impact on nuclear safety. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the TRM. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.6 CTS 4.5.2.h requires that a flow balance test verifying flow rates be performed following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics. This is a post modification requirement that is being relocated to the Technical Requirements Manual (TRM). Since the requirement is administratively controlled, there is no impact on nuclear safety. Any changes to the requirements in the TRM will be governed by 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.7 CTS 4.5.2.f provides details of functional testing for the ECCS (HPSI and LPSI) pumps. The details of flowrate and developed head are relocated to the Inservice Testing Program. Relocation of these details will allow performance of ASME Section XI testing at flowrates closer to those required by the design bases. Changes in test parameters will be made in accordance with the Inservice Testing Program. Performance of functional testing at flowrates in the vicinity of design provides a better indication of equipment condition than testing at recirculation flowrates. The details of test performance are not required to determine the OPERABILITY of systems or equipment; therefore, they can be removed from the ITS. There is no reduction in the level of safety resulting from these changes since the requirements for OPERABILITY still exist in the SRs. These changes provide an appropriate measure of regulatory control and reduce the NRC and PVNGS resources required to process future changes. This change provides a greater level of safety than is currently provided by the CTS, discussed in NUREG Exception 2. Any changes to the requirements in the Inservice Testing Program will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to Inservice Testing Program is acceptable and is consistent with NUREG-1432.

LA.8 CTS 4.5.2.e.3 lists the specific valves that are required to be actuated. ITS SR 3.5.3.4 requires verification that ECCS and Containment Spray (CS) valves actuate to the correct position. This is an administrative change since the specific valves listed are the actuated ECCS and CS valves. These valves are specifically listed in the ITS Bases. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the ITS 3.5.3 Bases. Any changes to the requirements in the ITS Bases will be governed by the provisions of the PVNGS Bases control process. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the ITS Bases is acceptable and is consistent with NUREG-1432.

LA.9 CTS 3.7.11 provides the LCO, Applicability, Action, and Surveillance Requirements for the shutdown cooling system in Modes 1, 2 and 3. ITS does not include separate specification for the shutdown cooling system in Modes 1, 2, and 3. The shutdown cooling system components are part of other systems that are included in ITS 3.5.3, ECCS - Operating and ITS 3.6.6, Containment Spray System. Therefore, since these components are covered by other specifications, this requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the TRM. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59. This provides an equivalent level of regulatory control and is an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 CTS 3.5.2 Action a allows 72 hours to restore one inoperable ECCS subsystem to Operable status. ITS 3.5.3 Action B allows 72 hours to restore one or more ECCS trains to Operable status if at least 100% of the ECCS flow equivalent to a single Operable ECCS train is available. The LCO requires the Operability of a number of independent subsystems. Due to the redundancy of trains and the diversity of subsystems, the inoperability of one component in a train does not render the ECCS incapable of performing its function. The inoperability of two different components, each in a different train, necessarily result in a loss of function for the ECCS. The intent of this Condition is to maintain a combination of Operable equipment such that 100% of the ECCS flow equivalent to 100% of a single Operable train remains available. This allows increased flexibility in plant operations when components in opposite trains are inoperable. This change is consistent with NUREG-1432.

L.2 CTS 3.5.2 Action a requires that the plant be in HOT SHUTDOWN if the ECCS subsystem cannot be returned to Operable status. ITS Action C requires that pressurizer pressure be reduced to less than 1837 psia and Tc be reduced to < 485°F if the ECCS train cannot be returned to Operable status. Even though the ITS Action is not as restrictive as the CTS Action, the ITS Action takes the plant to a condition, less than 1837 psia and 485°F, where the LCO is no longer applicable. Therefore, there is no impact on nuclear safety. This change is consistent with NUREG-1432 and with PVNGS specific amendments.

L.3 CTS 4.5.2.e.1, 4.5.2.e.2, and 4.5.2.e.3 require verification of valve actuation and pump start using a test signal. ITS SRs 3.5.3.4, 3.5.3.5, and 3.5.3.6 require verification using an actual or simulated actuation signal instead of just a test signal. This change allows PVNGS to take credit for ECCS SRs if valve actuation and/or pump start occurs in the event an actual actuation signal is received. In this case, if an actual signal is received and the appropriate ECCS components properly actuate per the safety analysis, there would be no need to perform the SRs at the original 18 month interval. PVNGS would have the option to either start the SR Frequency from receipt of the actual actuation or to retest the ECCS system as originally scheduled. OPERABILITY is adequately demonstrated in either case since the components are not capable of discriminating between an actual or simulated actuation signal. This change is consistent with NUREG-1432.

L.4 CTS 4.5.2.a requires that at least once per 12 hours verify that the listed valves are in their indicated positions with the valve key locked shut. NUREG SR 3.5.2.1 requires that every 12 hours the listed valves (plant specific valve number, position, and function) be verified in the their correct position with power to the valve operator removed. The Bases for this NUREG SR states that "Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable." The Bases also references IE Information Notice No. 87-01, which described a situation where the malfunction or mispositioning of a single valve could disable both ECCS trains. The PVNGS plant specific design does not include any ECCS valves that could alone render both ECCS trains inoperable. Therefore, since the plant specific design does not include any valves that meet the Bases for this SR, the requirements of CTS 4.5.2.a are not retained in the ITS. This change is consistent with NUREG-1432.

NO SIGNIFICANT HAZARDS CONSIDERATION
SPECIFICATION 3.5.3

ADMINISTRATIVE CHANGES
(ITS 3.5.3 Discussion of Changes Labeled A.1, A.2, A.3, A.4, and A.5)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, is converting to the ITS as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants." The proposed changes involve the reformatting, renumbering, rewording of the Technical Specifications (TS) and Bases with no change in intent, and the incorporation of current operating practices consistent with NUREG-1432. These changes, since they do not involve technical changes to the Current TS (CTS), are administrative. Below are the No Significant Hazards Consideration (NSHC) for the conversion of this Section/Chapter to NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes involve reformatting, renumbering, and rewording of the CTS and Bases along with incorporation of PVNGS current operating practices and other changes to the CTS as discussed in the specific Discussion of Changes listed above in order to be consistent with NUREG-1432. The reformatting, renumbering, and rewording along with the other changes listed above, involves no technical changes to the CTS. Specifically, there will be no change in the requirements imposed on PVNGS due to these changes. During development of NUREG-1432, certain wording preferences or English language conventions were adopted. The proposed changes to this Section/Chapter are administrative in nature and do not impact initiators of any analyzed events. They also do not impact the assumed mitigation of accidents or transient events. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

ADMINISTRATIVE CHANGES
(ITS 3.5.3 Discussion of Changes Labeled (A.1, A.2, A.3, A.4, and A.5)

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or change the methods governing normal plant operation. The proposed changes will not impose any new or different requirements or eliminate any existing requirements. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes are administrative in nature and will not involve any technical changes. The proposed changes will not reduce a margin of safety because they have no impact on any safety analysis assumptions. Also, because these changes are administrative in nature, no question of safety is involved. Therefore, these changes do not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.3 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4, LA.5, LA.6, LA.7, LA.8 and LA.9)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed changes, since detail is being removed from the CTS to a Licensee Controlled Document, are less restrictive. The descriptions of these changes are in the Discussion of Changes listed above.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes do not result in any hardware changes or changes to plant operating practices. The details being relocated are not assumed to be an initiator of any analyzed event. The Licensee Controlled Document containing the relocated requirements will be maintained using the provisions of 10 CFR 50.59 or other specified control processes and is subject to the change control process in the Administrative Controls Section of the ITS. Since any changes to a Licensee Controlled Document will be evaluated, no increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.3 Discussion of Changes Labeled LA.1, LA.2, LA.3, LA.4, LA.5, LA.6, LA.7, LA.8 and LA.9 (continued)

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes will not impose different requirements and adequate control of information will still be maintained. These changes will not alter assumptions made in the safety analysis or licensing basis. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not reduce a margin of safety since they have no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the CTS to the Licensee Controlled Document are the same as the CTS. Since any future changes to this Licensee Controlled Document will be evaluated per the requirements of 10 CFR 50.59, or other specified control processes, no reduction (significant or insignificant) in a margin of safety will be allowed. Therefore, these changes will not involve a significant reduction in a margin of safety.

The NRC review provides a certain margin of safety, and although this review will no longer be performed prior to submittal, the NRC still inspects the 10 CFR 50.59 process. The proposed changes are consistent with NUREG-1432, which was approved by the NRC Staff. The change controls for proposed relocated details and requirements provide an acceptable level of regulatory authority. Revising the CTS to reflect the approved level of detail per NUREG-1432 reinforces the conclusion that there is not a significant reduction in the margin of safety. Therefore, revising the CTS to reflect the NRC accepted level of detail and requirements ensures no reduction in a margin of safety.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for the conversion to NUREG 1432.

L.1 CTS 3.5.2 Action a allows 72 hours to restore one inoperable ECCS subsystem to Operable status. ITS 3.5.3 Action B allows 72 hours to restore one or more ECCS trains to Operable status if at least 100% of the ECCS flow equivalent to a single Operable ECCS train is available. The LCO requires the Operability of a number of independent subsystems. Due to the redundancy of trains and the diversity of subsystems, the inoperability of one component in a train does not render the ECCS incapable of performing its function. The inoperability of two different components, each in a different train, necessarily result in a loss of function for the ECCS. The intent of this Condition is to maintain a combination of Operable equipment such that 100% of the ECCS flow equivalent to 100% of a single Operable train remains available. This allows increased flexibility in plant operations when components in opposite trains are inoperable. This change is consistent with NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.1) (continued)

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

The proposed change involves a change from the CTS requirement that allows only one inoperable ECCS subsystem. The ITS allows one or more ECCS trains to be inoperable if at least 100% of the ECCS flow equivalent to a single operable ECCS train is available. The LCO takes credit for a number of operable independent subsystems. Due to the redundancy of trains and the diversity of subsystems, the inoperability of different components, each in a different train, does not necessarily result in a loss of function for the ECCS. The ITS takes credit for a combination of operable equipment such that 100% of the ECCS flow equivalent to 100% of a single operable train remains available. This allows increased flexibility in plant operations when components in opposite trains are inoperable, while still maintaining the same level of safety. This change is consistent with NUREG-1432. This change does not result in any hardware changes or changes to plant operating practices nor does it affect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.1) (continued)

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

The proposed change involves a change from the CTS requirement that allows only one inoperable ECCS subsystem. The ITS allows one or more ECCS trains to be inoperable if at least 100% of the ECCS flow equivalent to a single operable ECCS train is available. The LCO takes credit for a number of operable independent subsystems. Due to the redundancy of trains and the diversity of subsystems, the inoperability of different components, each in a different train, does not necessarily result in a loss of function for the ECCS. The ITS takes credit for a combination of operable equipment such that 100% of the ECCS flow equivalent to 100% of a single operable train remains available. This allows increased flexibility in plant operations when components in opposite trains are inoperable. This change is consistent with NUREG-1432. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed change involves a change from the CTS requirement that allows only one inoperable ECCS subsystem. The ITS allows one or more ECCS trains to be inoperable if at least 100% of the ECCS flow equivalent to a single operable ECCS train is available. The LCO takes credit for a number of operable independent subsystems. Due to the redundancy of trains and the diversity of subsystems, the inoperability of different components, each in a different train, does not necessarily result in a loss of function for the ECCS. The ITS takes credit for a combination of operable equipment such that 100% of the ECCS flow equivalent to 100% of a single operable train remains available. This allows increased flexibility in plant operations when components in opposite trains are inoperable. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. This change is consistent with NUREG-1432, which was approved by the NRC Staff. Therefore, this change does not result in a reduction in a margin of safety.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.2)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for conversion to NUREG-1432.

L.2 CTS 3.5.2 Action a requires that the plant be in HOT SHUTDOWN if the ECCS subsystem cannot be returned to Operable status. ITS Action C requires that pressurizer pressure be reduced to less than 1837 psia and Tc be reduced to < 485°F if the ECCS train cannot be returned to Operable status. Even though the ITS Action is not as restrictive as the CTS Action, the ITS Action takes the plant to a condition, less than 1837 psia and 485°F, where the LCO is no longer applicable. Therefore, there is no impact on nuclear safety. This change is consistent with NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.2) (continued)

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

The proposed change involves a change from the CTS requirement that requires that the plant be in HOT SHUTDOWN if the ECCS subsystem cannot be returned to operable status. ITS requires that pressurizer pressure be reduced to less than 1837 psia and Tc be reduced to < 485°F if the ECCS train cannot be returned to operable status. Even though the ITS Action is not as restrictive as the CTS Action, the ITS Action takes the plant to a condition, less than 1837 psia and 485°F, where the LCO is no longer applicable. Therefore, there is no impact on nuclear safety. This change is consistent with NUREG-1432 and with PVNGS specific amendments. This change does not result in any hardware changes or changes to plant operating practices nor does it effect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

The proposed change involves a change from the CTS requirement that requires that the plant be in HOT SHUTDOWN if the ECCS subsystem cannot be returned to operable status. ITS requires that pressurizer pressure be reduced to less than 1837 psia and Tc be reduced to < 485°F if the ECCS train cannot be returned to operable status. Even though the ITS Action is not as restrictive as the CTS Action, the ITS Action takes the plant to a condition, less than 1837 psia and 485°F, where the LCO is no longer applicable. Therefore, there is no impact on nuclear safety. This change is consistent with NUREG-1432 and with PVNGS specific amendments. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.2) (continued)

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

The proposed change involves a change from the CTS requirement that requires that the plant be in HOT SHUTDOWN if the ECCS subsystem cannot be returned to operable status. ITS Action C requires that pressurizer pressure be reduced to less than 1837 psia and Tc be reduced to < 485°F if the ECCS train cannot be returned to operable status. Even though the ITS Action is not as restrictive as the CTS Action, the ITS Action takes the plant to a condition, less than 1837 psia and 485°F, where the LCO is no longer applicable. Therefore, there is no impact on nuclear safety. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. This change is consistent with NUREG-1432 and with PVNGS specific amendments, which were approved by the NRC Staff. Therefore, this change does not result in a reduction in a margin of safety.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.3)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for conversion to NUREG-1432.

L.3 CTS 4.5.2.e.1, 4.5.2.e.2, and 4.5.2.e.3 require verification of valve actuation and pump start using a test signal. ITS SRs 3.5.3.4, 3.5.3.5, and 3.5.3.6 require verification using an actual or simulated actuation signal instead of just a test signal. This change allows PVNGS to take credit for ECCS SRs if valve actuation and/or pump start occurs in the event an actual actuation signal is received. In this case, if an actual signal is received and the appropriate ECCS components properly actuate per the safety analysis, there would be no need to perform the SRs at the original 18 month interval. PVNGS would have the option to either start the SR Frequency from receipt of the actual actuation or to retest the ECCS system as originally scheduled. OPERABILITY is adequately demonstrated in either case since the components are not capable of discriminating between an actual or simulated actuation signal. This change is consistent with NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.3) (continued)

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

The proposed change involves a change from the CTS requirement for verification of valve actuation and pump start using a test signal. ITS allows verification using an actual or simulated actuation signal instead of just a test signal. This change allows PVNGS to take credit for ECCS SRs if valve actuation and/or pump start occur in the event an actual actuation signal is received. In this case, if an actual signal is received and the appropriate ECCS components properly actuate per the safety analysis, there would be no need to perform the SRs at the original 18 month interval. PVNGS would have the option to either start the SR frequency from receipt of the actual actuation or to retest the ECCS system as originally scheduled. Operability is adequately demonstrated in either case since the components are not capable of discriminating between an actual or simulated actuation signal. This change is consistent with NUREG-1432. This change does not result in any hardware changes or changes to plant operating practices nor does it effect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.3) (continued)

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

The proposed change involves a change from the CTS requirement that for verification of valve actuation and pump start using a test signal. ITS allows verification using an actual or simulated actuation signal instead of just a test signal. This change allows PVNGS to take credit for ECCS SRs if valve actuation and/or pump starts occur in the event an actual actuation signal is received. In this case, if an actual signal is received and the appropriate ECCS components properly actuate per the safety analysis, there would be no need to perform the SRs at the original 18 month interval. PVNGS would have the option to either start the SR frequency from receipt of the actual actuation or to retest the ECCS system as originally scheduled. Operability is adequately demonstrated in either case since the components are not capable of discriminating between an actual or simulated actuation signal. This change is consistent with NUREG-1432. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.3) (continued)

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

The proposed change involves a change from the CTS requirement for verification of valve actuation and pump start using a test signal. ITS allows verification using an actual or simulated actuation signal instead of just a test signal. This change allows PVNGS to take credit for ECCS SRs if valve actuation occurs in the event an actual actuation signal is received. In this case, if an actual signal is received and the appropriate ECCS components properly actuate per the safety analysis, there would be no need to perform the SRs at the original 18 month interval. PVNGS would have the option to either start the SR frequency from receipt of the actual actuation or to retest the ECCS system as originally scheduled. Operability is adequately demonstrated in either case since the components are not capable of discriminating between an actual or simulated actuation signal. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. This change is consistent with NUREG-1432, which was approved by the NRC Staff. Therefore, this change does not result in a reduction in a margin of safety.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.4)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for conversion to NUREG-1432.

L.4 CTS 4.5.2.a requires that at least once per 12 hours verify that the listed valves are in their indicated positions with the valve key locked shut. NUREG SR 3.5.2.1 requires that every 12 hours the listed valves (plant specific valve number, position, and function) be verified in the their correct position with power to the valve operator removed. The Bases for this NUREG SR states that "Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable." The Bases also references IE Information Notice No. 87-01, which described a situation where the malfunction or mispositioning of a single valve could disable both ECCS trains. The PVNGS plant specific design does not include any ECCS valves that could alone render both ECCS trains inoperable. Therefore, since the plant specific design does not include any valves that meet the Bases for this SR, the requirements of CTS 4.5.2.a are not retained in the ITS. This change is consistent with NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.4) (continued)

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

The proposed change involves a change from the CTS requirement to verify at least once per 12 hours that the listed valves are in their indicated positions with the valve key locked shut. NUREG SR requires that every 12 hours the listed valves (plant specific valve number, position, and function) be verified in the their correct position with power to the valve operator removed. The Bases for this NUREG SR states that "Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable." The Bases also references IE Information Notice No. 87-01, which described a situation where the malfunction or mispositioning of a single valve could disable both ECCS trains. The PVNGS plant specific design does not include any ECCS valves that could alone render both ECCS trains inoperable. Therefore, since he plant specific design does not include any valves that meet the Bases for this SR, the requirements are not retained in the ITS. This change is consistent with NUREG-1432. This change does not result in any hardware changes or changes to plant operating practices nor does it effect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.4) (continued)

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

The proposed change involves a change from the CTS requirement to verify at least once per 12 hours that the listed valves are in their indicated positions with the valve key locked shut. NUREG SR requires that every 12 hours the listed valves (plant specific valve number, position, and function) be verified in the their correct position with power to the valve operator removed. The Bases for this NUREG SR states that "Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable." The Bases also references IE Information Notice No. 87-01, which described a situation where the malfunction or mispositioning of a single valve could disable both ECCS trains. The PVNGS plant specific design does not include any ECCS valves that could alone render both ECCS trains inoperable. Therefore, since he plant specific design does not include any valves that meet the Bases for this SR, the requirements are not retained in the ITS. This change is consistent with NUREG-1432. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.3 Discussion of Changes Labeled L.4) (continued)

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

The proposed change involves a change from the CTS requirement to verify at least once per 12 hours that the listed valves are in their indicated positions with the valve key locked shut. NUREG SR requires that every 12 hours the listed valves (plant specific valve number, position, and function) be verified in the their correct position with power to the valve operator removed. The Bases for this NUREG SR states that "Verification of proper valve position ensures that the flow path from the ECCS pumps to the RCS is maintained. Misalignment of these valves could render both ECCS trains inoperable." The Bases also references IE Information Notice No. 87-01, which described a situation where the malfunction or mispositioning of a single valve could disable both ECCS trains. The PVNGS plant specific design does not include any ECCS valves that could alone render both ECCS trains inoperable. Therefore, since he plant specific design does not include any valves that meet the Bases for this SR, the requirements are not retained in the ITS. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. This change is consistent with NUREG-1432, which was approved by the NRC Staff. Therefore, this change does not result in a reduction in a margin of safety.

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.4
MARK UP

<CTS>

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

<3.5.3>

3.5.~~3~~ {4} ECCS—Shutdown

LCO 3.5.~~3~~ {4} One ~~h~~igh ~~p~~ressure ~~s~~afety ~~i~~njection (HPSI) train shall be OPERABLE.

(1)

<3.5.3 Footnote> APPLICABILITY: MODE 3 with pressurizer pressure < ~~[1700]~~ {1837} psia, {and with RCS T_c < 485°F}
MODE 4.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<Action a>	A. Required HPSI train inoperable.	A.1 Restore required HPSI train to OPERABLE status.	1 hour
<Action a>	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 5.	24 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
<4.5.3>	SR 3.5.~~8~~ {4}.1 The following SRs are applicable: *SR 3.5.~~2.1~~ 3.1 SR 3.5.~~2.6~~ 3.5 SR 3.5.~~2.2~~ 3.2 SR 3.5.~~2.7~~ 3.7 *SR 3.5.~~2.3~~ 3.3 ~~*SR 3.5.2.9~~ SR 3.5.~~2.4~~ 3.4 SR 3.5.~~2.10~~ 3.8	In accordance with applicable SRs (2)

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.4
BASES MARKUP

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.~~X~~ 4 ECCS—Shutdown

BASES

BACKGROUND

The Background section for Bases B 3.5.~~X~~ 3, "ECCS—Operating," is applicable to these Bases, with the following modifications. 2

In MODE 3 with pressurizer pressure < ~~1700~~ 1837 psia and RCS T_c < 485 °F, and in MODE 4, an ECCS train is defined as one ~~h~~igh ~~p~~ressure ~~s~~afety ~~i~~njection (HPSI) subsystem. The HPSI flow path consists of piping, valves, and pumps that enable water from the ~~r~~efueling ~~w~~ater ~~t~~ank (RWT) on a SIAS signal to be injected into the Reactor Coolant System (RCS), and automatically transferring HPSI suction to the containment sump on a Recirculation Actuation Signal (RAS), following the accidents described in Bases 3.5.~~X~~ 3. 2 1 2 3

APPLICABLE SAFETY ANALYSES

The Applicable Safety Analyses section of Bases 3.5.~~X~~ 3 is applicable to these Bases. 2

Due to the stable conditions associated with operation in MODE 3 with pressurizer pressure < 1837 psia and with RCS T_c < 485 °F and in MODE 4, and the reduced probability of a Design Basis Accident (DBA), the ECCS operational requirements are reduced. ~~Included in these reductions is that certain automatic safety injection (SI) actuation signals are not available.~~ In this MODE, sufficient time exists for manual actuation of the required ECCS to mitigate the consequences of a DBA. 1 3

Only one train of ECCS is required for MODE 4. Protection against single failures is not relied on for this MODE of operation.

ECCS—Shutdown satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). 2

LCO

In MODE 3 with pressurizer pressure < ~~1700~~ 1837 psia and with RCS Tc < 485 °F and in MODE 4, an ECCS subsystem is composed of a single HPSI subsystem. Each HPSI subsystem includes the piping, instruments, valves, and controls to ensure an OPERABLE flow path capable of taking suction from the RWT and transferring suction to the containment sump. 1 3

(continued)

BASES

LCO (continued)

During an event requiring ECCS actuation, a flow path is required to supply water from the RWT to the RCS via the HPSI pumps and their respective supply headers to each of the four cold leg injection nozzles. In the long term, (post RAS) (3) this flow path ~~may be~~ is manually switched, 2 to 3 hours after a LOCA, to ~~take its~~ part of supply ~~from the containment sump and to deliver~~ its HPSI flow to the RCS hot ~~and cold~~ legs via the HPSI hot leg injection valves which connect to the Shutdown Cooling (SDC) suction nozzles.

With RCS pressure < ~~1700~~ 1837 psia and with RCS Tc < 485°F (1), one HPSI pump is acceptable without single failure consideration, based on the stable reactivity condition of the reactor and the limited core cooling requirements. The Low Pressure Safety Injection (2) (LPSI) pumps may therefore be released from the ECCS train for use in ~~shutdown cooling (SDC)~~ SDC. ~~In MODE 4 with RCS cold leg temperature ≤ 285°F, a maximum of one HPSI pump is allowed to be OPERABLE in accordance with LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System."~~ (3)

APPLICABILITY

In MODES 1, 2, and 3 with RCS pressure ≥ ~~1700~~ 1837 psia or with RCS Tc ≥ 485°F (1), the (8) OPERABILITY requirements for ECCS are covered by LCO 3.5.~~2~~.

In MODE 3 with RCS pressure < ~~1700~~ 1837 psia and with RCS Tc < 485°F, and in MODE 4, one OPERABLE ECCS train is acceptable without single failure consideration, based on the stable reactivity condition of the reactor and the limited core cooling requirements.

In MODES 5 and 6, unit conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops—MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops—MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.4, "Shutdown Cooling (SDC) and Coolant Circulation—High Water Level," and LCO 3.9.5, "Shutdown Cooling (SDC) and Coolant Circulation—Low Water Level."

ACTIONS

A.1

With no HPSI pump OPERABLE, the unit is not prepared to respond to a loss of coolant accident. The 1 hour Completion Time to restore at least one HPSI train to OPERABLE status ensures that prompt action is taken to

(continued)

BASES

ACTIONS

A.1 (continued)

restore the required cooling capacity or to initiate actions to place the unit in MODE 5, where an ECCS train is not required.

B.1

When the Required Action cannot be completed within the required Completion Time, a controlled shutdown should be initiated. Twenty-four hours is reasonable, based on operating experience, to reach MODE 5 in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.~~7~~4.1

The applicable Surveillance descriptions from Bases 3.5.~~X~~3 apply.

REFERENCES

The applicable references from Bases 3.5.~~X~~3 apply~~.~~ as they pertain to the required HPSI train. 3

NUREG-1432 EXCEPTIONS
SPECIFICATION 3.5.4

1. CTS 3.5.3 is applicable in Mode 3 with pressurizer pressure < 1837 psia and RCS T_c < 485°F. NUREG 3.5.3 is applicable in Mode 3 with only pressurizer pressure < 1837 psia. The current licensing basis for PVNGS requires that this specification also be applicable when RCS T_c < 485°F. This technical specification change was approved by the NRC by Unit 1 amendment 106, Unit 2 amendment 98, and Unit 3 amendment 78 dated April 30, 1996. Therefore, this plant specific requirement is retained. The Bases have been revised to be consistent with the LCO/Surveillance.

2. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

3. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values were directly transferred from the CTS to the ITS.

PVNGS CTS
SPECIFICATION 3.5.4
MARK UP

SPECIFICATION 3.5.4

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 ~~3/4.5.3~~ ECCS SUBSYSTEMS - SHUTDOWN

One High Pressure Safety Injection (HPSI) train A.1

LIMITING CONDITION FOR OPERATION

~~3.5.3~~ ~~As a minimum, one ECCS subsystem comprised of the following~~ shall be OPERABLE:

A.1

~~a. An OPERABLE high pressure safety injection pump, and~~

~~b. An OPERABLE flow path capable of taking suction from the refueling water tank on a safety injection actuation signal and automatically transferring suction to the containment sump on a recirculation actuation signal.~~ LA.2

APPLICABILITY: MODES 3* AND 4.

ACTION:

HPSI train

ACTION A a. With no ~~ECCS subsystem~~ OPERABLE, restore at least one ~~ECCS subsystem~~ to OPERABLE status within 1 hour or be in COLD SHUTDOWN within the

ACTION B next ~~20~~ 24 hours. L.1

~~b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected safety injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.~~ LA.1

SURVEILLANCE REQUIREMENTS

SR 3.5.4.1 ~~4.5.3~~ The ECCS subsystem shall be demonstrated OPERABLE per the applicable surveillance requirements of Specification 4.5.2.

3.5.4 Applicability *With pressurizer pressure less than 1837 psia and RCS cold leg temperature less than 485 degrees F.

DISCUSSION OF CHANGES
SPECIFICATION 3.5.4

1ADMINISTRATIVE CHANGES

A.1 All reformatting and renumbering is in accordance with the Combustion Engineering Plant (CE) Standard Technical Specifications NUREG-1432, Rev. 1 (NUREG-1432). As a result, the Palo Verde Nuclear Generating Station (PVNGS) Improved Technical Specifications (ITS) should be more readable, and therefore understandable, by plant operators as well as other users. During the reformatting and renumbering of the ITS, no technical changes (either actual or interpretational) to the PVNGS Current Technical Specifications (CTS) were made unless they were identified and justified.

Editorial rewording (either adding or deleting) is made consistent with NUREG-1432. During NUREG-1432 development, certain wording preferences or English language conventions were adopted which resulted in no technical changes (either actual or interpretational) to the CTS.

Additional information has also been added to more fully describe each subsection. This wording is consistent with NUREG-1432. Since the design is already approved by the NRC, adding more detail does not result in a technical change.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - RELOCATIONS

LA.1 CTS 3.5.3 Action b requires that in the event the ECCS is actuated and injects water into the RCS, that a Special Report be submitted to the NRC. ITS 3.5.4 does not include this requirement. This requirement is being relocated to the Technical Requirements Manual (TRM). Therefore, relocating the Special Report requirement to the TRM is administrative and has no impact on nuclear safety. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to plant procedures. Any changes to the requirements in the TRM will be governed by the provisions of 10 CFR 50.59 procedure review and approval process. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the TRM is acceptable and is consistent with NUREG-1432.

LA.2 CTS LCO 3.5.3.b requires that an ECCS subsystems contain an operable HPSI pump and an Operable flow path. ITS LCO 3.5.4 requires that one HPSI train be Operable and does not contain the detailed information in the LCO. This type of information is relocated to the Bases. Relocating the detailed information to a Licensee Controlled Document such as the Bases is administrative with no impact on nuclear safety. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Any changes to the requirements in the Bases will be governed by the provisions of the Bases control program. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 CTS 3.5.3 Action a requires the plant to "be in COLD SHUTDOWN within the next 20 hours" with no ECCS subsystem Operable. ITS 3.5.4 Action A requires the plant to be in COLD SHUTDOWN within 24 hours if the required HPSI train cannot be returned to Operable status. Twenty-four hours is reasonable, based on operating experience, to reach Mode 5 in an orderly manner and without challenging plant systems. This change is consistent with NUREG-1432.

NO SIGNIFICANT HAZARDS CONSIDERATION
SPECIFICATION 3.5.4

ADMINISTRATIVE CHANGES
(ITS 3.5.4 Discussion of Changes Labeled A.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, is converting to the ITS as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants." The proposed changes involve the reformatting, renumbering, rewording of the Technical Specifications (TS) and Bases with no change in intent, and the incorporation of current operating practices consistent with NUREG-1432. These changes, since they do not involve technical changes to the Current TS (CTS), are administrative. Below are the No Significant Hazards Consideration (NSHC) for the conversion of this Section/Chapter to NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes involve reformatting, renumbering, and rewording of the CTS and Bases along with incorporation of PVNGS current operating practices and other changes to the CTS as discussed in the specific Discussion of Changes listed above in order to be consistent with NUREG-1432. The reformatting, renumbering, and rewording along with the other changes listed above, involves no technical changes to the CTS. Specifically, there will be no change in the requirements imposed on PVNGS due to these changes. During development of NUREG-1432, certain wording preferences or English language conventions were adopted. The proposed changes to this Section/Chapter are administrative in nature and do not impact initiators of any analyzed events. They also do not impact the assumed mitigation of accidents or transient events. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

ADMINISTRATIVE CHANGES
(ITS 3.5.4 Discussion of Changes Labeled (A.1)

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or change the methods governing normal plant operation. The proposed changes will not impose any new or different requirements or eliminate any existing requirements. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes are administrative in nature and will not involve any technical changes. The proposed changes will not reduce a margin of safety because they have no impact on any safety analysis assumptions. Also, because these changes are administrative in nature, no question of safety is involved. Therefore, these changes do not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.4 Discussion of Changes Labeled LA.1 and LA.2)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed changes, since detail is being removed from the CTS to a Licensee Controlled Document, are less restrictive. The descriptions of these changes are in the Discussion of Changes listed above.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes do not result in any hardware changes or changes to plant operating practices. The details being relocated are not assumed to be an initiator of any analyzed event. The Licensee Controlled Document containing the relocated requirements will be maintained using the provisions of 10 CFR 50.59 or other specified control processes and is subject to the change control process in the Administrative Controls Section of the ITS. Since any changes to a Licensee Controlled Document will be evaluated, no increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.4 Discussion of Changes Labeled LA.1 and LA.2) (continued)

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes will not impose different requirements and adequate control of information will still be maintained. These changes will not alter assumptions made in the safety analysis or licensing basis. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not reduce a margin of safety since they have no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the CTS to the Licensee Controlled Document are the same as the CTS. Since any future changes to this Licensee Controlled Document will be evaluated per the requirements of 10 CFR 50.59, or other specified control processes, no reduction (significant or insignificant) in a margin of safety will be allowed. Therefore, these changes will not involve a significant reduction in a margin of safety.

The NRC review provides a certain margin of safety, and although this review will no longer be performed prior to submittal, the NRC still inspects the 10 CFR 50.59 process. The proposed changes are consistent with NUREG-1432, which was approved by the NRC Staff. The change controls for proposed relocated details and requirements provide an acceptable level of regulatory authority. Revising the CTS to reflect the approved level of detail per NUREG-1432 reinforces the conclusion that there is not a significant reduction in the margin of safety. Therefore, revising the CTS to reflect the NRC accepted level of detail and requirements ensures no reduction in a margin of safety.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.4 Discussion of Changes Labeled L.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for the conversion to NUREG 1432.

L.1 CTS 3.5.3 Action a requires the plant to "be in COLD SHUTDOWN within the next 20 hours" with no ECCS subsystem Operable. ITS 3.5.4 Action A requires the plant to be in COLD SHUTDOWN within 24 hours if the required HPSI train cannot be returned to Operable status. Twenty-four hours is reasonable, based on operating experience, to reach Mode 5 in an orderly manner and without challenging plant systems. This change is consistent with NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.4 Discussion of Changes Labeled L.1) (continued)

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

The proposed change involves a change from the CTS requirement that requires the plant to "be in COLD SHUTDOWN within the next 20 hours" with no ECCS subsystem operable. ITS requires the plant to be in COLD SHUTDOWN within 24 hours if the required HPSI train cannot be returned to operable status. Twenty-four hours is reasonable, based on operating experience, to reach Mode 5 in an orderly manner and without challenging plant systems. This change is consistent with NUREG-1432. This change does not result in any hardware changes or changes to plant operating practices nor does it affect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

The proposed change involves a change from the CTS requirement that requires the plant to "be in COLD SHUTDOWN within the next 20 hours" with no ECCS subsystem operable. ITS requires the plant to be in COLD SHUTDOWN within 24 hours if the required HPSI train cannot be returned to operable status. Twenty-four hours is reasonable, based on operating experience, to reach Mode 5 in an orderly manner and without challenging plant systems. This change is consistent with NUREG-1432. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.4 Discussion of Changes Labeled L.1) (continued)

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

The proposed change involves a change from the CTS requirement that requires the plant to "be in COLD SHUTDOWN within the next 20 hours" with no ECCS subsystem operable. ITS requires the plant to be in COLD SHUTDOWN within 24 hours if the required HPSI train cannot be returned to operable status. Twenty-four hours is reasonable, based on operating experience, to reach Mode 5 in an orderly manner and without challenging plant systems. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. This change is consistent with NUREG-1432, which was approved by the NRC Staff. Therefore, this change does not result in a reduction in a margin of safety.

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.5
MARK UP

<DOC>

<CTS>

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

<3.5.4> 3.5.~~X~~ 5 Refueling Water Tank (RWT) 2

<LCO 3.5.4> LCO 3.5.~~X~~ 5 The RWT shall be OPERABLE.

<App. 3.5.4> APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
<DOC L.1>	A. RWT boron concentration not within limits. OR RWT borated water temperature not within limits.	A.1 Restore RWT to OPERABLE status.	8 hours
<ACTION>	B. RWT inoperable for reasons other than Condition A.	B.1 Restore RWT to OPERABLE status.	1 hour
<ACTION>	C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

<CTS>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
<3.5.4.c> <4.5.4.b> SR 3.5.~~4~~{5}.1	-------------------NOTE------------------- Only required to be performed when ambient air temperature is < ~~40~~ {66}°F or > ~~100~~ {120}°F. -- Verify RWT borated water temperature is ≥ ~~[40]~~ {60}°F and ≤ ~~[100]~~ {120}°F.	24 hours (3)
<3.5.4.a> <4.5.4.a.1> SR 3.5.~~4~~{5}.2	Verify RWT borated water volume is ~~≥ [362,800 gallons, (88)%] [above the ECCS suction connection]~~. {≥ minimum required RWT volume in Figure 3.5.5-1} (1)	7 days (1)
<3.5.4.b> <4.5.4.a.2> SR 3.5.~~4~~{5}.3	Verify RWT boron concentration is ≥ ~~[1720]~~ {4000} ppm and ≤ ~~[2500]~~ {4400} ppm.	7 days (3)

(1)

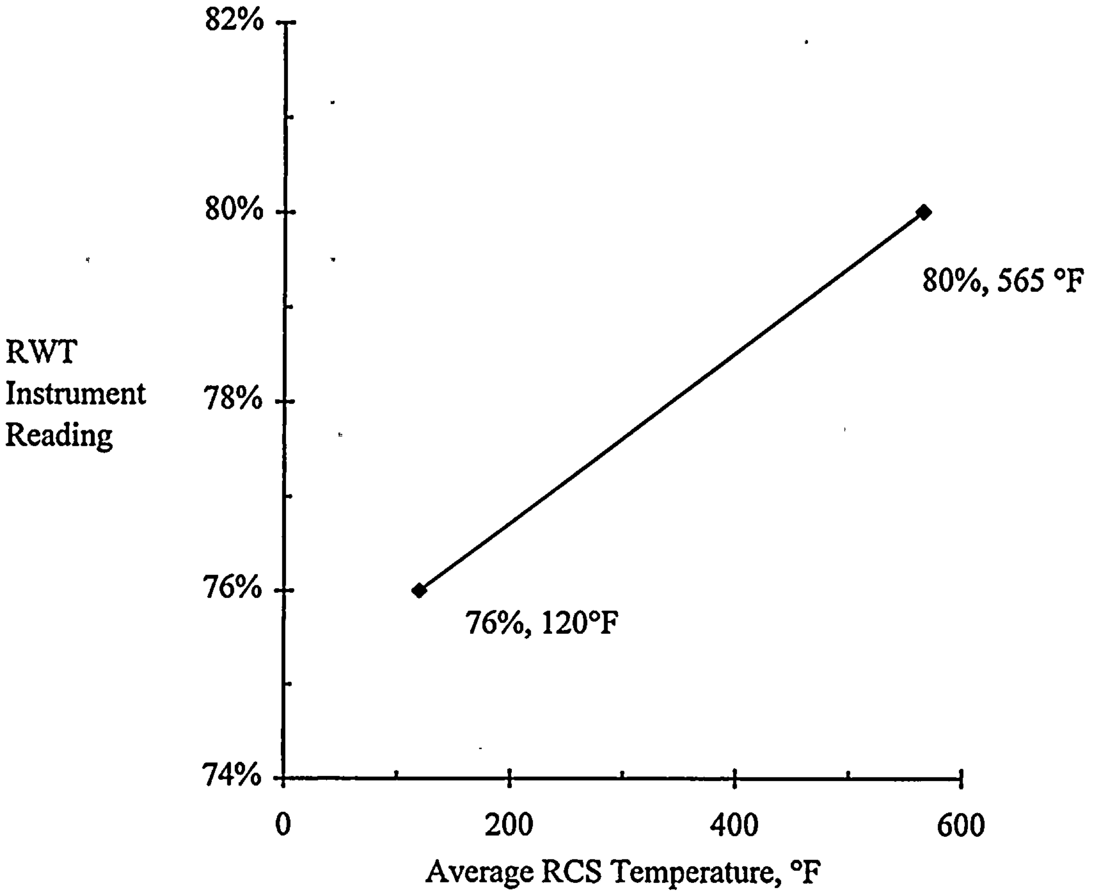


Figure 3.5.5-1

Minimum Required RWT Volume

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.5
BASES MARKUP

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.~~X~~ 5 Refueling Water Tank (RWT)

BASES

BACKGROUND

The RWT supports the ECCS and the Containment Spray System by providing a source of borated water for Engineered Safety Feature (ESF) pump operation.

The RWT supplies two ECCS trains by separate, redundant supply headers. Each header also supplies one train of the Containment Spray System. A motor operated isolation valve is provided in each header to allow the operator to isolate the usable volume of the RWT from the ECCS after the ESF pump suction has been transferred to the containment sump following depletion of the RWT during a loss of coolant accident (LOCA). A separate header is used to supply the Chemical and Volume Control System (CVCS) from the RWT. Use of a single RWT to supply both trains of the ECCS is acceptable since the RWT is a passive component, and passive failures are not assumed to occur coincidently with the Design Basis Event during the injection phase of an accident. Not all the water stored in the RWT is available for injection following a LOCA; the location of the ECCS suction piping in the RWT will result in some portion of the stored volume being unavailable. 2

The high pressure safety injection (HPSI), low pressure safety injection (LPSI), and containment spray pumps are provided with recirculation lines that ensure each pump can maintain minimum flow requirements when operating at shutoff head conditions. These lines discharge back to the RWT, which vents to the atmosphere. When the suction for the HPSI and containment spray pumps is transferred to the containment sump, this flow path must be isolated to prevent a release of the containment sump contents to the RWT. If not isolated, this flow path could result in a release of contaminants to the atmosphere and the eventual loss of suction head for the ESF pumps. 2 3

Fuel Building ventilation system

This LCO ensures that:

a. The RWT contains sufficient borated water to support the ECCS during the injection phase;

(continued)

BASES

BACKGROUND (continued)

b. Sufficient water volume exists in the containment sump to support continued operation of the ESF pumps at the time of transfer to the recirculation mode of cooling; and

c. The reactor remains subcritical following a LOCA.

Insufficient water inventory in the RWT could result in insufficient cooling capacity of the ECCS when the transfer to the recirculation mode occurs. Improper boron concentrations could result in a reduction of SDM or excessive boric acid precipitation in the core following a LOCA, as well as excessive caustic stress corrosion of mechanical components and systems inside containment.

APPLICABLE SAFETY ANALYSES

During accident conditions, the RWT provides a source of borated water to the HPSI, LPSI, containment spray, ~~and~~ ~~charging~~ pumps. As such, it provides containment cooling and depressurization, core cooling, and replacement inventory and is a source of negative reactivity for reactor shutdown (Ref. 1). The design basis transients and applicable safety analyses concerning each of these systems are discussed in the Applicable Safety Analyses section of Bases B 3.5.~~2~~ 3, "ECCS—Operating," and B 3.6.6, "Containment Spray ~~and Cooling~~ System~~s~~." These analyses are used to assess changes to the RWT in order to evaluate their effects in relation to the acceptance limits. (3) (2)

The volume limit of ~~[362,800] gallons~~ Figure 3.5.5-1 is based on two factors: (1)

a. Sufficient deliverable volume must be available to provide at least 20 minutes (plus a 10% margin) of full flow from all ESF pumps prior to reaching a low level switchover to the containment sump for recirculation; and

b. The containment sump water volume must be sufficient to support continued ESF pump operation after the switchover to recirculation occurs. This sump volume water inventory is supplied by the RWT borated water inventory.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Twenty minutes is the point at which 75% of the design flow of one HPSI pump is capable of meeting or exceeding the decay heat boiloff rate.

When ESF pump suction is transferred to the sump, there must be sufficient water in the sump to ensure adequate net positive suction head (NPSH) for the HPSI and containment spray pumps. The RWT capacity must be sufficient to supply this amount of water without considering the inventory added from the safety injection tanks or Reactor Coolant System (RCS), but accounting for loss of inventory to containment subcompartments and reservoirs due to containment spray operation and to areas outside containment due to leakage from ECCS injection and recirculation equipment. 2

The ~~[1720]~~ 4000 ppm limit for minimum boron concentration was established to ensure that, following a LOCA with a minimum level in the RWT, the reactor will remain subcritical in the cold condition following mixing of the RWT and RCS water volumes. Small break LOCAs assume that all control rods are inserted, except for the control element assembly (CEA) of highest worth, which is withdrawn from the core. Large break LOCAs assume that all CEAs remain withdrawn from the core. The most limiting case occurs at beginning of core life. 3 2

The maximum boron limit of ~~[2500]~~ 4400 ppm in the RWT is based on boron precipitation in the core following a LOCA. With the reactor vessel at saturated conditions, the core dissipates heat by pool nucleate boiling. Because of this boiling phenomenon in the core, the boric acid concentration will increase in this region. If allowed to proceed in this manner, a point will be reached where boron precipitation will occur in the core. Post LOCA emergency procedures direct the operator to establish simultaneous hot and cold leg injection to prevent this condition by establishing a forced flow path through the core regardless of break location. These procedures are based on the minimum time in which precipitation could occur, assuming that maximum boron concentrations exist in the borated water sources used for injection following a LOCA. Boron concentrations in the RWT in excess of the limit could result in precipitation earlier than assumed in the analysis. 3

The upper limit of ~~[100]~~ 120 °F and the lower limit of ~~[40]~~ 60 °F on RWT temperature are the limits assumed in the accident 2

(continued)

APPLICABLE SAFETY ANALYSES (continued)

analysis. Although RWT temperature affects the outcome of several analyses, the upper and lower limits established by the LCO are not limited by any of these analyses.

The RWT satisfies Criterion 3 of the NRC Policy Statement.

LCO

The RWT ensures that an adequate supply of borated water is available to cool and depressurize the containment in the event of a Design Basis Accident (DBA) and to cool and cover the core in the event of a LOCA, that the reactor remains subcritical following a DBA, and that an adequate level exists in the containment sump to support ESF pump operation in the recirculation mode.

To be considered OPERABLE, the RWT must meet the limits established in the SRs for water volume, boron concentration, and temperature.

APPLICABILITY

In MODES 1, 2, 3, and 4, the RWT OPERABILITY requirements are dictated by the ECCS and Containment Spray System OPERABILITY requirements. Since both the ECCS and the Containment Spray System must be OPERABLE in MODES 1, 2, 3, and 4, the RWT must be OPERABLE to support their operation.

Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "RCS Loops—MODE 5, Loops Filled," and LCO 3.4.8, "RCS Loops—MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.4, "Shutdown Cooling (SDC) and Coolant Circulation—High Water Level," and LCO 3.9.5, "Shutdown Cooling (SDC) and Coolant Circulation—Low Water Level."

ACTIONS

A.1

With RWT boron concentration or borated water temperature not within limits, it must be returned to within limits within 8 hours. In this condition neither the ECCS nor the Containment Spray System can perform their design functions; therefore, prompt action must be taken to restore the tank to OPERABLE condition. The allowed Completion Time of

(continued)

BASES

ACTIONS

A.1 (continued)

8 hours to restore the RWT to within limits was developed considering the time required to change boron concentration or temperature and that the contents of the tank are still available for injection.

B.1

With RWT borated water volume not within limits, it must be returned to within limits within 1 hour. In this condition, neither the ECCS nor Containment Spray System can perform their design functions; therefore, prompt action must be taken to restore the tank to OPERABLE status or to place the unit in a MODE in which these systems are not required. The allowed Completion Time of 1 hour to restore the RWT to OPERABLE status is based on this condition ~~simultaneously affecting multiple redundant trains~~.

3 since the contents of the tank are not available for injection and core cooling

C.1 and C.2

If the RWT 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 to MODE 5 within 36 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.

SURVEILLANCE REQUIREMENTS

SR 3.5.~~X~~ 5.1

RWT borated water temperature shall be verified every 24 hours to be within the limits assumed in the accident analysis. This Frequency has been shown to be sufficient to identify temperature changes that approach either acceptable limit.

The SR is modified by a Note that eliminates the requirement to perform this Surveillance when ambient air temperatures are within the operating temperature limits of the RWT. With

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.~~4~~ 5.1 (continued)

ambient temperatures within this range, the RWT temperature should not exceed the limits.

SR 3.5.~~4~~ 5.2

in accordance with Figure 3.5.5-1

Above minimum The RWT water volume level shall be verified every 7 days. This Frequency ensures that a sufficient initial water supply is available for injection and to support continued ESF pump operation on recirculation. Since the RWT volume is normally stable and is provided with a Low Level Alarm, in the Control Room a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience. (1) (3)

SR 3.5.~~4~~ 5.3

Boron concentration of the RWT shall be verified every 7 days to be within the required range. This Frequency ensures that the reactor will remain subcritical following a LOCA. and the Further, it ensures that the resulting sump pH will be maintained in an acceptable range such that boron precipitation in the core will not occur earlier than predicted and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. Since the RWT volume is normally stable, a 7 day sampling Frequency is appropriate and has been shown through operating experience to be acceptable. (3)

REFERENCES

1. {U}FSAR, Chapter {6} and Chapter {15}. (2)

NUREG-1432 EXCEPTIONS
SPECIFICATION 3.5.5

1. CTS uses a figure to identify minimum RWT borated water volume. PVNGS will continue to apply the current licensing basis and use the figure in ITS for minimum RWT borated water volume. The Bases have been revised to be consistent with the LCO/Surveillance.

2. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

3. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values were directly transferred from the CTS to the ITS.

PVNGS CTS
SPECIFICATION 3.5.5
MARK UP

SPECIFICATION 3.5.5

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 3/4.5.4 REFUELING WATER TANK (RWT)

A.1

LIMITING CONDITION FOR OPERATION

LCO 3.5.5 ~~3.5.4~~ The refueling water tank (RWT) shall be OPERABLE with: 3.5.5-1

SR 3.5.5.2 ~~a.~~ A minimum borated water volume as specified in Figure ~~3.1-1 of Specification 3.1.2.5~~, and A.1

SR 3.5.5.3 ~~b.~~ A boron concentration between 4000 and 4400 ppm of boron, and

SR 3.5.5.1 ~~c.~~ A solution temperature between 60°F and 120°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION: Add ACTION A L.1

ACTION B With the refueling water tank inoperable, restore the tank to OPERABLE status within 1 hour/or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN

ACTION C within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.5.4 The RWT shall be demonstrated OPERABLE:

a. At least once per 7 days by:

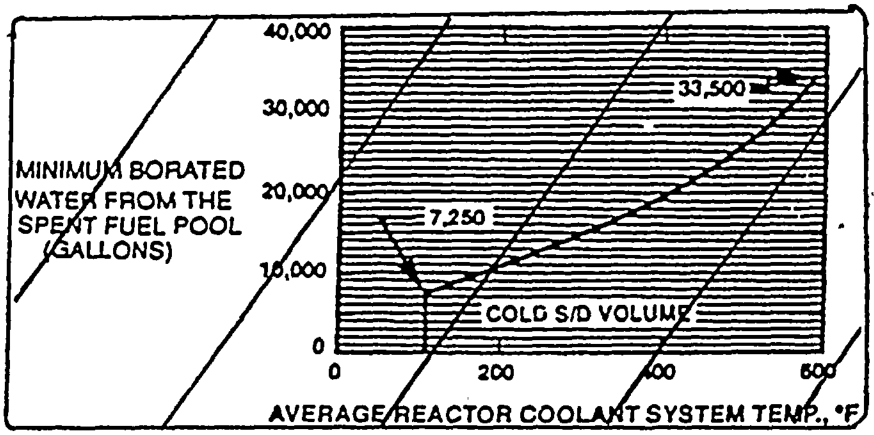
SR 3.5.5.2 ~~1.~~ Verifying the contained borated water volume in the tank, and

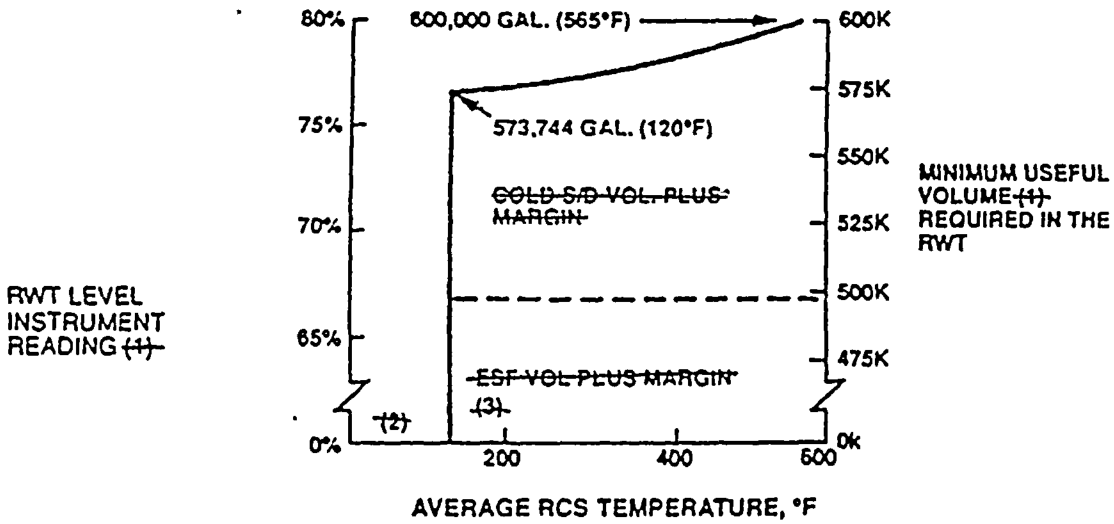
SR 3.5.5.3 ~~2.~~ Verifying the boron concentration of the water.

SR 3.5.5.1 ~~b.~~ At least once per 24 hours by verifying the RWT temperature when the (outside) air temperature is outside the 60°F to 120°F range.

SPECIFICATION 3.5.5

A2





(1) The tank level and volume shown are the useful level and volume above that in the tank which is required for vortex considerations.

(2) During Mode 5 and 6 one of these borated sources shall contain a minimum of 33,500 gallons.

(3) This volume is not required during Mode 6.

FIGURE ~~3.1-1~~ 3.5.5-1
MINIMUM ~~BORATED WATER~~ VOLUME~~S~~
REQUIRED RWT

DISCUSSION OF CHANGES
SPECIFICATION 3.5.5

ADMINISTRATIVE CHANGES

A.1 All reformatting and renumbering is in accordance with the Combustion Engineering Plant (CE) Standard Technical Specifications NUREG-1432, Rev. 1 (NUREG-1432). As a result, the Palo Verde Nuclear Generating Station (PVNGS) Improved Technical Specifications (ITS) should be more readable, and therefore understandable, by plant operators as well as other users. During the reformatting and renumbering of the ITS, no technical changes (either actual or interpretational) to the PVNGS Current Technical Specifications (CTS) were made unless they were identified and justified.

Editorial rewording (either adding or deleting) is made consistent with NUREG-1432. During NUREG-1432 development, certain wording preferences or English language conventions were adopted which resulted in no technical changes (either actual or interpretational) to the CTS.

Additional information has also been added to more fully describe each subsection. This wording is consistent with NUREG-1432. Since the design is already approved by the NRC, adding more detail does not result in a technical change.

A.2 CTS Figure 3.1-1, Minimum Borated Water Volume, includes both the RWT and spent fuel pool water volumes. CTS Figure 3.1-1 is moved to ITS 3.5.5, Figure 3.5.5-1. Since ITS 3.5.5 only addresses RWT volume, only the RWT volume figure is retained. Since SR 3.5.5.2 only addresses the minimum borated water volume, the design and analysis details in the figure are deleted. CTS 3.1.2.6 uses the spent fuel pool volume figure in CTS Figure 3.1-1. CTS 3.1.2.6 is relocated to the Technical Requirements Manual, as described in the Split Report.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - RELOCATIONS

None

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 CTS 3.5.4 Action requires that the RWT be restored "to operable status within 1 hour" if either minimum borated water volume, boron concentration, or solution temperature do not meet the requirements in CTS LCO 3.5.4. ITS 3.5.5 Action A allows 8 hours to restore boron concentration or RWT borated water temperature to within limits and 1 hour for any other reason (ITS 3.5.5, Action B). The allowed completion time of 8 hours to restore the RWT to within limits was developed considering the time required to change boron concentration or temperature and that the contents of the tank are still available for injection. This change is consistent with NUREG-1432.

NO SIGNIFICANT HAZARDS CONSIDERATION
SPECIFICATION 3.5.5

ADMINISTRATIVE CHANGES
(ITS 3.5.5 Discussion of Changes Labeled A.1 and A.2)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, is converting to the ITS as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants." The proposed changes involve the reformatting, renumbering, rewording of the Technical Specifications (TS) and Bases with no change in intent, and the incorporation of current operating practices consistent with NUREG-1432. These changes, since they do not involve technical changes to the Current TS (CTS), are administrative. Below are the No Significant Hazards Consideration (NSHC) for the conversion of this Section/Chapter to NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes involve reformatting, renumbering, and rewording of the CTS and Bases along with incorporation of PVNGS current operating practices and other changes to the CTS as discussed in the specific Discussion of Changes listed above in order to be consistent with NUREG-1432. The reformatting, renumbering, and rewording along with the other changes listed above, involves no technical changes to the CTS. Specifically, there will be no change in the requirements imposed on PVNGS due to these changes. During development of NUREG-1432, certain wording preferences or English language conventions were adopted. The proposed changes to this Section/Chapter are administrative in nature and do not impact initiators of any analyzed events. They also do not impact the assumed mitigation of accidents or transient events. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

ADMINISTRATIVE CHANGES
(ITS 3.5.5 Discussion of Changes Labeled (A.1 and A.2)

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or change the methods governing normal plant operation. The proposed changes will not impose any new or different requirements or eliminate any existing requirements. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes are administrative in nature and will not involve any technical changes. The proposed changes will not reduce a margin of safety because they have no impact on any safety analysis assumptions. Also, because these changes are administrative in nature, no question of safety is involved. Therefore, these changes do not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.5 Discussion of Changes Labeled L.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for the conversion to NUREG 1432.

L.1 CTS 3.5.4 Action requires that the RWT be restored "to operable status within 1 hour" if either minimum borated water volume, boron concentration, or solution temperature do not meet the requirements in CTS LCO 3.5.4. ITS 3.5.5 Action A allows 8 hours to restore boron concentration or RWT borated water temperature to within limits and 1 hour for any other reason (ITS 3.5.5, Action B). The allowed completion time of 8 hours to restore the RWT to within limits was developed considering the time required to change boron concentration or temperature and that the contents of the tank are still available for injection. This change is consistent with NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.5 Discussion of Changes Labeled L.1) (continued)

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

The proposed change involves a change to the requirement in CTS 3.5.4 Action that requires the RWT to be restored "to operable status within 1 hour" if either minimum borated water volume, boron concentration, or solution temperature do not meet the requirements in CTS LCO 3.5.4. ITS 3.5.5 Action A allows 8 hours to restore boron concentration or RWT borated water temperature to within limits and 1 hour for any other reason (ITS Action B). The allowed completion time of 8 hours to restore the RWT to within limits was developed considering the time required to change boron concentration or temperature and that the contents of the tank are still available for injection. This change is consistent with NUREG-1432. This change does not result in any hardware changes or changes to plant operating practices nor does it affect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

The proposed change involves a change to the requirement in CTS 3.5.4 Action that the RWT be restored "to operable status within 1 hour" if either minimum borated water volume, boron concentration, or solution temperature do not meet the requirements in CTS LCO 3.5.4. ITS 3.5.5 Action A allows 8 hours to restore boron concentration or RWT borated water temperature to within limits and 1 hour for any other reason (ITS Action B). The allowed completion time of 8 hours to restore the RWT to within limits was developed considering the time required to change boron concentration or temperature and that the contents of the tank are still available for injection. This change is consistent with NUREG-1432. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.5 Discussion of Changes Labeled L.1) (continued)

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

The proposed change involves a change to the requirement in CTS 3.5.4 Action that requires the RWT be restored "to operable status within 1 hour" if either minimum borated water volume, boron concentration, or solution temperature do not meet the requirements in CTS LCO 3.5.4. ITS 3.5.5 Action A allows 8 hours to restore boron concentration or RWT borated water temperature to within limits and 1 hour for any other reason (ITS Action B). The allowed completion time of 8 hours to restore the RWT to within limits was developed considering the time required to change boron concentration or temperature and that the contents of the tank are still available for injection. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. This change is consistent with NUREG-1432, which was approved by the NRC Staff. Therefore, this change does not result in a reduction in a margin of safety.

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SPECIFICATION 3.5.6
MARK UP

<DOC>
<CTS>

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.8 {6} Trisodium Phosphate (TSP)

<4.5.2.1.d.2> LCO 3.5.8 {6} The TSP baskets shall contain ≥ [281] {524} ft^3 of active TSP. (2)

<DOC L.1> APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<DOC L.1> A. TSP not within limits.	A.1 Restore TSP to within limits.	72 hours
<DOC L.1> B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours [12] hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
<4.5.2.1.d.2> SR 3.5.8.1 {6}	Verify the TSP baskets contain ≥ [281] {524} ft^3 of granular ~~trisodium phosphate dodecahydrate.~~ {anhydrous TSP.}	[18] months (2) (1)
<4.5.2.1.d.3> SR 3.5.8.2 {6}	Verify that a sample from the TSP baskets provides adequate pH adjustment of [RWT] {borated} water.	[18] months (3)

CE STS
NUREG-1432 REV. 1
SPECIFICATION 3.5.6
BASES MARKUP

B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.~~X~~ 6 Trisodium Phosphate (TSP)

BASES

BACKGROUND

Anhydrous

Trisodium phosphate (TSP) ~~dodecahydrate~~ is placed on the floor ~~or in the sump~~ of the containment building to ensure that iodine, which may be dissolved in the recirculated reactor cooling water following a loss of coolant accident (LOCA), remains in solution. TSP also helps inhibit stress corrosion cracking (SCC) of austenitic stainless steel components in containment during the recirculation phase following an accident. 1 5 4

Fuel that is damaged during a LOCA will release iodine in several chemical forms to the reactor coolant and to the containment atmosphere. A portion of the iodine in the containment atmosphere is washed to the sump by containment sprays. The emergency core cooling water is borated for reactivity control. This borated water causes the sump solution to be acidic. In a low pH (acidic) solution, dissolved iodine will be converted to a volatile form. The volatile iodine will evolve out of solution into the containment atmosphere, significantly increasing the levels of airborne iodine. The increased levels of airborne iodine in containment contribute to the radiological releases and increase the consequences from the accident due to containment atmosphere leakage.

After a LOCA, the components of the core cooling and containment spray systems will be exposed to high temperature borated water. Prolonged exposure to the core cooling water combined with stresses imposed on the components can cause SCC. The SCC is a function of stress, oxygen and chloride concentrations, pH, temperature, and alloy composition of the components. High temperatures and low pH, which would be present after a LOCA, tend to promote SCC. This can lead to the failure of necessary safety systems or components. 4

Adjusting the pH of the recirculation solution to levels at or above 7.0 prevents a significant fraction of the dissolved iodine from converting to a volatile form. The higher pH thus decreases the level of airborne iodine in containment and reduces the radiological consequences from containment atmosphere leakage following a LOCA. Maintaining the 5

(continued)

BASES

BACKGROUND (continued)

solution pH at or above 7.0 also reduces the occurrence of SCC of austenitic stainless steel components in containment. Reducing SCC reduces the probability of failure of components. 5

Granular anhydrous TSP ~~dodecahydrate~~ is employed as a passive form of pH control for post LOCA containment spray and core cooling water. Baskets of TSP are placed on the floor ~~or in the sump~~ of the containment building to dissolve from released reactor coolant water and containment sprays after a LOCA. Recirculation of the water for core cooling and containment sprays then provides mixing to achieve a uniform solution pH. ~~The dodecahydrate form of TSP is used because of the high humidity in the containment building during normal operation. Since the TSP is hydrated, it is less likely to absorb large amounts of water from the humid atmosphere and will undergo less physical and chemical change than the anhydrous form of TSP.~~ 1 5 1

APPLICABLE SAFETY ANALYSES

The LOCA radiological consequences analysis takes credit for iodine retention in the sump solution based on the recirculation water pH being ≥ 7.0. The radionuclide releases from the containment atmosphere and the consequences of a LOCA would be increased if the pH of the recirculation water were not adjusted to 7.0 or above.

LCO

The TSP is required to adjust the pH of the recirculation water to ≥ 7.0 after a LOCA. A pH ≥ 7.0 is necessary to prevent significant amounts of iodine released from fuel failures and dissolved in the recirculation water from converting to a volatile form and evolving into the containment atmosphere. Higher levels of airborne iodine in containment may increase the release of radionuclides and the consequences of the accident. A pH ≥ 7.0 is also necessary to prevent SCC of austenitic stainless steel components in containment. SCC increases the probability of failure of components. ≥ 5

The required amount of TSP is based upon the extreme cases of water volume and pH possible in the containment sump after a large break LOCA. The minimum required volume is the volume of TSP that will achieve a sump solution pH of

(continued)

BASES

LCO (continued)

≥ 7.0 when taking into consideration the maximum possible sump water volume and the minimum possible pH. The amount of TSP needed in the containment building is based on the mass of TSP required to achieve the desired pH. However, a required volume is specified, rather than mass, since it is not feasible to weigh the entire amount of TSP in containment. The minimum required volume is based on the ~~manufactured~~ anhydrous density of TSP ~~dodecahydrate~~. Since TSP can have a tendency to agglomerate from high humidity in the containment building, the density may increase and the volume decrease during normal plant operation. Due to possible agglomeration and increase in density, estimating the minimum volume of TSP in containment is conservative with respect to achieving a minimum required pH. design basis value 1

APPLICABILITY

In MODES 1, 2, and 3, the RCS is at elevated temperature and pressure, providing an energy potential for a LOCA. The potential for a LOCA results in a need for the ability to control the pH of the recirculated coolant.

In MODES 4, 5, and 6, the potential for a LOCA is reduced ~~or nonexistent~~ and TSP is not required. 5

ACTIONS

A.1

If it is discovered that the TSP in the containment building ~~sump~~ is not within limits, action must be taken to restore the TSP to within limits. ~~During plant operation the containment sump is not accessible and corrections may not be possible.~~ 5

The Completion Time of 72 hours is allowed for restoring the TSP within limits, where possible, because 72 hours is the same time allowed for restoration of other ECCS components.

B.1 and B.2

If the TSP cannot be restored within limits within the Completion Time of Required Action A.1, the plant must be brought to a MODE in which the LCO does not apply. The specified Completion Times for reaching MODES 3 and 4 are

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

those used throughout the Technical Specifications; they were chosen to allow reaching the specified conditions from full power in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.~~8~~{6}.1

Periodic determination of the volume of TSP in containment must be performed due to the possibility of leaking valves and components in the containment building that could cause dissolution of the TSP during normal operation. A Frequency of 18 months is required to determine visually that a minimum of ~~[291]~~ {524} cubic feet is contained in the TSP baskets (Ref. 1). (2) This requirement ensures that there is an adequate volume of TSP to adjust the pH of the post LOCA sump solution to a value ≥ 7.0.

The periodic verification is required every 18 months, since access to the TSP baskets is only feasible during outages, and normal fuel cycles are scheduled for 18 months. Operating experience has shown this Surveillance Frequency acceptable due to the margin in the volume of TSP placed in the containment building.

SR 3.5.~~8~~{6}.2

Testing must be performed to ensure the solubility and buffering ability of the TSP after exposure to the containment environment. A representative sample of ~~[ ]~~ {3.5±0.005} grams of TSP from one of the baskets in containment is ~~submerged in 1.0 gal ± 0.05 gal of water at a boron concentration of [ ] ppm and at the standard temperature of 25°C ± 5°C.~~ {1.0 liters ± 0.005 liters of 2.5 wt% boric acid solution (nominally 4400 ppm) at 135°F ± 9°F.} (5) Without agitation, the solution pH {as measured at 77°F ± 9°F} should be raised to ≥ 7 within 4 hours. The representative sample weight is based on the minimum required TSP weight of ~~[ ]~~ {25,325 pounds} kilograms, which at ~~manufactured~~ {installed} density corresponds to the minimum volume of ~~[ ]~~ {524} cubic ft, and maximum possible post LOCA sump volume of ~~[ ]~~ {867,124} gallons, normalized to buffer a 1.0 ~~gal~~ {liter} sample. The boron concentration of the test water is representative of the maximum possible boron concentration corresponding to the maximum possible post (2)(5)

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.~~5~~6.2 (continued)

LOCA sump volume. Agitation of the test solution is prohibited, since an adequate standard for the agitation intensity cannot be specified. The test time of 4 hours is necessary to allow time for the dissolved TSP to naturally diffuse through the sample solution. In the post LOCA containment sump, rapid mixing would occur, significantly decreasing the actual amount of time before the required pH is achieved. This would ensure compliance with the Standard Review Plan requirement of a pH ≥ 7.0 by the onset of recirculation after a LOCA.

The temperature of 135 ± 9°F was chosen for the borated water solution because that is the minimum temperature of the inlet of the shutdown cooling heat exchangers, therefore, this would be the lowest temperature possible during this type of accident. 5

REFERENCES

~~None.~~

1. Operating license amendment numbers 110, 102 and 82 to PVNGS units 1, 2 and 3 respectively, and associated NRC Safety Evaluation dated December 10, 1996. 2

NUREG-1432 EXCEPTIONS
SPECIFICATION 3.5.6

1. CTS 4.5.2.d.2 identifies the required TSP as anhydrous TSP. NUREG SR 3.5.6.1 identifies the required TSP as trisodium phosphate dodecahydrate. Since anhydrous TSP is used at PVNGS, the current licensing basis has been determined to be appropriate for this surveillance requirement. This technical specification change was approved by the NRC by Unit 1 amendment 107, Unit 2 amendment 99, and Unit 3 amendment 79 dated May 15, 1996. The Bases have been revised to be consistent with the LCO/Surveillance.

2. The TSP volume change from 464 ft^3 to 524 ft^3 of TSP incorporates the changes made by the PVNGS TS change request dated June 28, 1996. This is a bracketed number and is plant specific. The Bases have been revised to be consistent with the LCO/Surveillance.

3. NUREG SR 3.5.6.2 and CTS 4.5.2.d.3 require that RWT water be used. PVNGS TS change request dated June 28, 1996 changes this requirement from RWT water to borated water. Therefore, the current licensing basis has been determined to be appropriate for this surveillance requirement. The Bases has been revised to be consistent with the LCO/Surveillance.

4. Grammar and/or editorial changes have been made to enhance clarity. No technical or intent changes to the Specification are made by this change.

5. The plant specific titles, nomenclature, number, parameter/value, reference, system description, system design, operating practices or analysis description was used (additions, deletions, and/or changes are included). Plant specific parameters/values were directly transferred from the CTS to the ITS.

PVNGS CTS
SPECIFICATION 3.5.6
MARK UP

SPECIFICATION 3.5.6
(3.5.3/3.5.6/5.5.2)

3.5 EMERGENCY CORE COOLING SYSTEMS 3.5.6 TRISODIUM PHOSPHATE (TSP)

SURVEILLANCE REQUIREMENTS (Continued)

L.1 A.1 Add ITS 3.5.6 Applicability, Action A, and Action B

1. A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

ITS 3.5.3

ITS 3.5.6

LCO 3.5.6
SR 3.5.6.1

2. Verifying that a minimum total of 464 524 cubic feet of solid granular anhydrous trisodium phosphate (TSP) is contained within the TSP storage baskets. A.2

SR 3.5.6.2

3. Verifying that ~~when a representative~~ sample of 0.055 ± 0.001 lb of TSP from a TSP storage basket is submerged, without agitation, in 1.0 ± 0.05 gallons of 77 ± 9 °F borated water from the RWT, the pH of the mixed solution is raised to greater than or equal to 7 within 4 hours. LA.1

provides adequate pH adjustment of borated water

ITS 3.5.6

ITS 3.5.3

e. 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 (SIAS and RAS) test signal(s).

2. Verifying that each of the following pumps start automatically upon receipt of a safety injection actuation test signal:

   a. High pressure safety injection pump.

   b. Low pressure safety injection pump.

3. Verifying that on a recirculation actuation test signal, the containment sump isolation valves open, the HPSI, LPSI and CS pump minimum bypass recirculation flow line isolation valves and combined SI mini-flow valve close, and the LPSI pumps stop.

ITS 3.5.3

ITS 5.5.2

4. Conducting an inspection of all ECCS piping outside of containment, which is in contact with recirculation sump inventory during LOCA conditions, and verifying that the total measured leakage from piping and components is less than 1 gpm when pressurized to at least 40 psig.

ITS 5.5.2

ITS 3.5.3

f. By verifying that each of the following pumps develops the indicated differential pressure at or greater than their respective minimum allowable recirculation flow when tested pursuant to Specification 4.0.5:

1. High pressure safety injection pump greater than or equal to 1761 psid.

2. Low pressure safety injection pump greater than or equal to 165 psid.

DISCUSSION OF CHANGES
SPECIFICATION 3.5.6

ADMINISTRATIVE CHANGES

A.1 All reformatting and renumbering is in accordance with the Combustion Engineering Plant (CE) Standard Technical Specifications NUREG-1432, Rev. 1 (NUREG-1432). As a result, the Palo Verde Nuclear Generating Station (PVNGS) Improved Technical Specifications (ITS) should be more readable, and therefore understandable, by plant operators as well as other users. During the reformatting and renumbering of the ITS, no technical changes (either actual or interpretational) to the PVNGS Current Technical Specifications (CTS) were made unless they were identified and justified.

Editorial rewording (either adding or deleting) is made consistent with NUREG-1432. During NUREG-1432 development, certain wording preferences or English language conventions were adopted which resulted in no technical changes (either actual or interpretational) to the CTS.

Additional information has also been added to more fully describe each subsection. This wording is consistent with NUREG-1432. Since the design is already approved by the NRC, adding more detail does not result in a technical change.

A.2 The change from a minimum of 464 to 524 cubic feet of TSP incorporates the changes made by the TS change request dated June 28, 1996.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - RELOCATIONS

LA.1 CTS SR 4.5.2.d.3 provides specific details (sample size, volume of borated water, etc.) for verifying that a sample from a TSP basket raises the pH of the mixed solution to greater than or equal to 7 within 4 hours. ITS SR 3.5.6.2 requires verification that a sample from the TSP baskets provides adequate pH adjustment of RWT water. This requirement is not required to determine the OPERABILITY of a system, component, or structure and therefore is being relocated to the Bases. Relocating the details to the Bases will not impact nuclear safety. Any changes to the requirements in the Bases will be governed by the provisions of the Bases control program. This provides an equivalent level of regulatory control and is an administrative change with no impact on the margin of safety. This requirement is not required to be in the ITS to provide adequate protection of public health and safety. Therefore, relocation of this requirement to the Bases is acceptable and is consistent with NUREG-1432.

TECHNICAL CHANGES - LESS RESTRICTIVE

L.1 CTS 3.5.2 does not have a specific Action if the TSP does not meet its SR, therefore both ECCS trains would be considered inoperable and entry into 3.0.3 would be required. ITS 3.5.6 Action A allows 72 hours to restore TSP to within limits. The completion time of 72 hours for restoring the TSP to operable is reasonable since it is the same time allowed for restoration of other ECCS components. CTS 3.5.2 and 3.5.3, which require 4.5.2.d.2 and 4.5.2.d.3 (TSP 18 month surveillance requirement) are applicable in Modes 1-4. ITS 3.5.6 is applicable in Modes 1-3. The elimination of the Mode 4 applicability is acceptable since the potential for a LOCA is reduced, and TSP is not required. This change is consistent with NUREG-1432.

NO SIGNIFICANT HAZARDS CONSIDERATION
SPECIFICATION 3.5.6

ADMINISTRATIVE CHANGES
(ITS 3.5.6 Discussion of Changes Labeled A.1 and A.2)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3, is converting to the ITS as outlined in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants." The proposed changes involve the reformatting, renumbering, rewording of the Technical Specifications (TS) and Bases with no change in intent, and the incorporation of current operating practices consistent with NUREG-1432. These changes, since they do not involve technical changes to the Current TS (CTS), are administrative. Below are the No Significant Hazards Consideration (NSHC) for the conversion of this Section/Chapter to NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes involve reformatting, renumbering, and rewording of the CTS and Bases along with incorporation of PVNGS current operating practices and other changes to the CTS as discussed in the specific Discussion of Changes listed above in order to be consistent with NUREG-1432. The reformatting, renumbering, and rewording along with the other changes listed above, involves no technical changes to the CTS. Specifically, there will be no change in the requirements imposed on PVNGS due to these changes. During development of NUREG-1432, certain wording preferences or English language conventions were adopted. The proposed changes to this Section/Chapter are administrative in nature and do not impact initiators of any analyzed events. They also do not impact the assumed mitigation of accidents or transient events. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

ADMINISTRATIVE CHANGES
(ITS 3.5.6 Discussion of Changes Labeled (A.1 and A.2)

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed) or change the methods governing normal plant operation. The proposed changes will not impose any new or different requirements or eliminate any existing requirements. Therefore, these changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes involve reformatting, renumbering, and rewording of the CTS, along with the incorporation of PVNGS current operating practices and other changes, as discussed, in order to be consistent with NUREG-1432. The proposed changes are administrative in nature and will not involve any technical changes. The proposed changes will not reduce a margin of safety because they have no impact on any safety analysis assumptions. Also, because these changes are administrative in nature, no question of safety is involved. Therefore, these changes do not involve a significant reduction in a margin of safety.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.6 Discussion of Changes Labeled LA.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed changes, since detail is being removed from the CTS to a Licensee Controlled Document, are less restrictive. The descriptions of these changes are in the Discussion of Changes listed above.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

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

> The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes do not result in any hardware changes or changes to plant operating practices. The details being relocated are not assumed to be an initiator of any analyzed event. The Licensee Controlled Document containing the relocated requirements will be maintained using the provisions of 10 CFR 50.59 or other specified control processes and is subject to the change control process in the Administrative Controls Section of the ITS. Since any changes to a Licensee Controlled Document will be evaluated, no increase in the probability or consequences of an accident previously evaluated will be allowed. Therefore, these changes will not involve a significant increase in the probability or consequences of an accident previously evaluated.

TECHNICAL CHANGES - RELOCATIONS
(ITS 3.5.6 Discussion of Changes Labeled LA.1) (continued)

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. These changes will not impose different requirements and adequate control of information will still be maintained. These changes will not alter assumptions made in the safety analysis or licensing basis. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed changes relocate requirements from the CTS to a Licensee Controlled Document. These changes will not reduce a margin of safety since they have no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the CTS to the Licensee Controlled Document are the same as the CTS. Since any future changes to this Licensee Controlled Document will be evaluated per the requirements of 10 CFR 50.59, or other specified control processes, no reduction (significant or insignificant) in a margin of safety will be allowed. Therefore, these changes will not involve a significant reduction in a margin of safety.

The NRC review provides a certain margin of safety, and although this review will no longer be performed prior to submittal, the NRC still inspects the 10 CFR 50.59 process. The proposed changes are consistent with NUREG-1432, which was approved by the NRC Staff. The change controls for proposed relocated details and requirements provide an acceptable level of regulatory authority. Revising the CTS to reflect the approved level of detail per NUREG-1432 reinforces the conclusion that there is not a significant reduction in the margin of safety. Therefore, revising the CTS to reflect the NRC accepted level of detail and requirements ensures no reduction in a margin of safety.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.6 Discussion of Changes Labeled L.1)

Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3 is converting to the ITS as outlined in NUREG-1432. The proposed change involves making the CTS less restrictive. Below is the description of this less restrictive change and the NSHC for the conversion to NUREG 1432.

L.1 CTS 3.5.2 does not have a specific Action if the TSP does not meet its SR, therefore both ECCS trains would be considered inoperable and entry into 3.0.3 would be required. ITS 3.5.6 Action A allows 72 hours to restore TSP to within limits. The completion time of 72 hours for restoring the TSP to operable is reasonable since it is the same time allowed for restoration of other ECCS components. CTS 3.5.2 and 3.5.3, which require 4.5.2.d.2 and 4.5.2.d.3 (TSP 18 month surveillance requirement) are applicable in Modes 1-4. ITS 3.5.6 is applicable in Modes 1-3. The elimination of the Mode 4 applicability is acceptable since the potential for a LOCA is reduced, and TSP is not required. This change is consistent with NUREG-1432.

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with a proposed amendment, would not 1) involve a significant increase in the probability or consequences of an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows:

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.6 Discussion of Changes Labeled L.1) (continued)

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

The proposed change adds specific LCO and Action requirements for TSP. CTS 3.5.2 does not have a specific Action if the TSP does not meet its SR, therefore both ECCS trains would be considered inoperable and entry into 3.0.3 would be required. ITS 3.5.6 Action A allows 72 hours to restore TSP to within limits. The completion time of 72 hours for restoring the TSP to operable is reasonable since it is the same time allowed for restoration of other ECCS components. CTS 3.5.2 and 3.5.3, which require 4.5.2.d.2 and 4.5.2.d.3 (TSP 18 month surveillance requirement) are applicable in Modes 1-4. ITS 3.5.6 is applicable in Modes 1-3. The elimination of the Mode 4 applicability is acceptable since the potential for a LOCA is reduced, and TSP is not required. This change is consistent with NUREG-1432. This change does not result in any hardware changes or changes to plant operating practices nor does it affect plant operation. Therefore, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

The proposed change adds specific LCO and Action requirements for TSP. CTS 3.5.2 does not have a specific Action if the TSP does not meet its SR, therefore both ECCS trains would be considered inoperable and entry into 3.0.3 would be required. ITS 3.5.6 Action A allows 72 hours to restore TSP to within limits. The completion time of 72 hours for restoring the TSP to operable is reasonable since it is the same time allowed for restoration of other ECCS components. CTS 3.5.2 and 3.5.3, which require 4.5.2.d.2 and 4.5.2.d.3 (TSP 18 month surveillance requirement) are applicable in Modes 1-4. ITS 3.5.6 is applicable in Modes 1-3. The elimination of the Mode 4 applicability is acceptable since the potential for a LOCA is reduced, and TSP is not required. This change is consistent with NUREG-1432. This change will not alter the plant configuration (no new or different type of equipment will be installed) or change the methods governing normal plant operation. This change will not alter assumptions made in the safety analysis or licensing basis. Therefore, this change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

TECHNICAL CHANGES - LESS RESTRICTIVE
(ITS 3.5.6 Discussion of Changes Labeled L.1) (continued)

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

The proposed change adds specific LCO and Action requirements for TSP. CTS 3.5.2 does not have a specific Action if the TSP does not meet its SR, therefore both ECCS trains would be considered inoperable and entry into 3.0.3 would be required. ITS 3.5.6 Action A allows 72 hours to restore TSP to within limits. The completion time of 72 hours for restoring the TSP to operable is reasonable since it is the same time allowed for restoration of other ECCS components. CTS 3.5.2 and 3.5.3, which require 4.5.2.d.2 and 4.5.2.d.3 (TSP 18 month surveillance requirement) are applicable in Modes 1-4. ITS 3.5.6 is applicable in Modes 1-3. The elimination of the Mode 4 applicability is acceptable since the potential for a LOCA is reduced, and TSP is not required. This change will not reduce a margin of safety since it has no impact on any safety analysis assumptions. This change is consistent with NUREG-1432, which was approved by the NRC Staff. Therefore, this change does not result in a reduction in a margin of safety.

ENVIRONMENTAL ASSESSMENT

These proposed TS changes have been evaluated against the criteria for and identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. It has been determined that the proposed changes meet the criteria for categorical exclusion as provided for under 10 CFR 51.22(c)(9). The following is a discussion of how the proposed TS changes meet the criteria for categorical exclusion.

10 CFR 51.22(c)(9): Although the proposed changes involve changes to requirements with respect to inspection or Surveillance Requirements with;

(i) the proposed changes involve No Significant Hazards Consideration (refer to the No Significant Hazards Consideration Section of this Technical Specification Change Request),

(ii) there is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite since the proposed changes do not affect generation of any radioactive effluent not do they affect any of the permitted release paths, and

(iii) there is no significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed changes meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Based on the aforementioned and pursuant to 10 CFR 51.22(b), no environmental assessment or environmental impact statement need be prepared in connection with issuance of an amendment to the Technical Specifications incorporating the proposed changes of this request.

Michael, Glenn A(Z01119)

From: Bushing, Bruce D(Z18659)
Sent: Friday, August 29, 1997 8:28 AM
To: Dedon, John M(Z99965); Kozimor, Russell W(Z57497); Ashton, Jeffrey C(Z03403); Peroutka, Allan P(Z74375); Sharp, Mark A(Z99864); Renn, David N(Z78338); Quihuis, Kenneth P(Z76718); Fluegge, Alan R(Z35687); Johnson, William E(Z54393); Arnold, Steven R(Z02995); Malik, John E(Z62475); Doctor Jr, Oscar (Z32771); Martin, Dennis D(Z63667); Drey, William J(Z98996); Main, John C(Z62346); Lopez, Daniel V(Z61316); Lee, Bradley R(Z59847); Cerkas, Gary A(Z22564); Court, Jeffery E(Z28170); Buzard, Ray E(Z18980); Roberson, Kathleen (Z01116); Pobst, Donald S(Z75420); Napier, Joseph J(Z71881); Moren, Daniel L(Z68568); Arsenault, Joseph G(Z02596); Capehart, Phillip G(Z20561); Hoover, Joseph R(Z50213); Dennis, Gerri A(Z32198); Fan, David C(V99665); Wolfe, William D(Z98491); Taufiq, Arshad M(Z93839); Marks, Daniel G(Z62925); Bernier, Richard A(Z10015); Brewer, Ronald K(Z98697); Bauer, Scott A(Z98866); Roehler, Robert K(Z02043); Michael, Glenn A(Z01119); Selland, Michael G(Z84405)
Subject: Outage 2R7

During outages we experience a number of situations where exempt (not normally eligible for overtime) employees in grade 52 or lower are assigned to work in non-exempt (eligible for overtime) jobs. In these situations, it has been determined that these folks are eligible to be compensated at a special overtime rate for eligible overtime hours worked. Because it is recognized that these individuals who normally work in a higher pay grade would be compensated at a higher rate than the non-exempt crew members working the same job and overtime, a special overtime factor has been identified and communicated to eligible workers and their leaders. Use of this factor is intended to pay these individuals (only during the outage) at a rate more in line with the non-exempt members of the same crew working the same job and overtime. If they're eligible they've either already received a letter or will get it no later than Wednesday next week, telling them so. Letters are being sent by Karen Greiner at X6600.

Michael, Glenn A(Z01119)

From: Borchert, Peter (Z13982)
Sent: Saturday, August 30, 1997 3:47 AM
To: Roberson, Kathleen (Z01116); Pobst, Donald S(Z75420); Napier, Joseph J(Z71881); D'Aunoy, Gerard R(Z99347); Moren, Daniel L(Z68568); Arsenault, Joseph G(Z02596); Capehart, Phillip G(Z20561); Hoover, Joseph R(Z50213); Dennis, Gerri A(Z32198); Fan, David C(V99665); Wolfe, William D(Z98491); Taufiq, Arshad M(Z93839); Marks, Daniel G(Z62925); Bernier, Richard A(Z10015); Brewer, Ronald K(Z98697); Bauer, Scott A(Z98866); Roehler, Robert K(Z02043); Michael, Glenn A(Z01119); Borchert, Peter (Z13982)
Cc: Bushing, Bruce D(Z18659)
Subject: RE: 2R7 outage support.

For nighshift we report at 1900 not 1700, my error. When you come to work, report to the OSB 4th floor where the OPS outage group is. We will set you up from there. Thanks.

pete...

From: Borchert, Peter (Z13982)
Sent: Tuesday, August 19, 1997 12:40 PM
To: Roberson, Kathleen (Z01116); Pobst, Donald S(Z75420); Napier, Joseph J(Z71881); D'Aunoy, Gerard R(Z99347); Moren, Daniel L(Z68568); Arsenault, Joseph G(Z02596); Capehart, Phillip G(Z20561); Hoover, Joseph R(Z50213); Dennis, Gerri A(Z32198); Fan, David C(V99665); Wolfe, William D(Z98491); Taufiq, Arshad M(Z93839); Marks, Daniel G(Z62925); Bernier, Richard A(Z10015); Brewer, Ronald K(Z98697); Bauer, Scott A(Z98866); Roehler, Robert K(Z02043); Michael, Glenn A(Z01119)
Cc: Bushing, Bruce D(Z18659); Borchert, Peter (Z13982)
Subject: 2R7 outage support.

Hello, attached is the schedule for all the AO helpers during 2R7. If anyone has a problem with the shifts or hours contact Bruce or myself and we will adjust as necessary. I would like to thank each of you for your support of Operations during the outage. Looking forward to working with all of you.

The schedule is 10 hour days...7-5 AM/PM. For nighshift, you report to work at 1700 on the day that is shown on the schedule.

Bruce Bushing pager (3847)
Pete Borchert pager (1935)

<<File: Helpers.xls>>