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102-04635-SAB/TNW/DWG
December 14, 2001

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Technical Specifications Bases Revision 14 Update

Pursuant to PVNGS Technical Specification (TS) 5.5.14, "Technical Specifications Bases Control Program," Arizona Public Service Company (APS) is submitting changes to the TS Bases incorporated into Revision 14, implemented on December 06, 2001. The Revision 14 insertion instructions and replacement pages are provided in the Enclosure.

No commitments are being made to the NRC by this letter.

Should you have any questions, please contact Thomas N. Weber at (623) 393-5764.

Sincerely,

SAB/TNW/DWG/kg

Enclosure: PVNGS Technical Specification Bases Revision 14
Insertion Instructions and Replacement Pages

cc: E. W. Merschoff (all w/o enclosure)
L. R. Wharton
J. H. Moorman

A001
Rec'd 01/31/02

ENCLOSURE

PVNGS
Technical Specification Bases
Revision 14

Insertion Instructions and
Replacement Pages

PVNGS Technical Specifications Bases
Revision 14
Insertion Instructions

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PVNGS

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

Technical Specification Bases

Revision 14
December 6, 2001

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B 3.7.10-4	1	B 3.8.1-24	6
B 3.7.11-1	0	B 3.8.1-25	6
B 3.7.11-2	0	B 3.8.1-26	6
B 3.7.11-3	1	B 3.8.1-27	6
B 3.7.11-4	10	B 3.8.1-28	6
B 3.7.11-5	10	B 3.8.1-29	6
B 3.7.11-6	10	B 3.8.1-30	6
B 3.7.12-1	1	B 3.8.1-31	6
B 3.7.12-2	1	B 3.8.1-32	6
B 3.7.12-3	10	B 3.8.1-33	6
B 3.7.12-4	10	B 3.8.1-34	6
B 3.7.13-1	0	B 3.8.1-35	6
B 3.7.13-2	0	B 3.8.1-36	6
B 3.7.13-3	0	B 3.8.1-37	6
B 3.7.13-4	0	B 3.8.1-38	6
B 3.7.13-5	0	B 3.8.1-39	6
B 3.7.14-1	0	B 3.8.1-40	6

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B 3.8.1-41	6	B 3.8.9-6	0
B 3.8.2-1	0	B 3.8.9-7	0
B 3.8.2-2	0	B 3.8.9-8	0
B 3.8.2-3	0	B 3.8.9-9	0
B 3.8.2-4	0	B 3.8.9-10	0
B 3.8.2-5	0	B 3.8.9-11	0
B 3.8.2-6	0	B 3.8.10-1	0
B 3.8.3-1	0	B 3.8.10-2	0
B 3.8.3-2	0	B 3.8.10-3	0
B 3.8.3-3	0	B 3.8.10-4	0
B 3.8.3-4	0	B 3.9.1-1	0
B 3.8.3-5	1	B 3.9.1-2	0
B 3.8.3-6	0	B 3.9.1-3	0
B 3.8.3-7	0	B 3.9.1-4	0
B 3.8.3-8	0	B 3.9.2-1	0
B 3.8.3-9	0	B 3.9.2-2	0
B 3.8.4-1	0	B 3.9.2-3	1
B 3.8.4-2	0	B 3.9.2-4	1
B 3.8.4-3	0	B 3.9.3-1	0
B 3.8.4-4	2	B 3.9.3-2	0
B 3.8.4-5	2	B 3.9.3-3	0
B 3.8.4-6	2	B 3.9.3-4	0
B 3.8.4-7	2	B 3.9.3-5	1
B 3.8.4-8	2	B 3.9.4-1	0
B 3.8.4-9	2	B 3.9.4-2	1
B 3.8.4-10	2	B 3.9.4-3	0
B 3.8.4-11	2	B 3.9.4-4	0
B 3.8.5-1	1	B 3.9.5-1	0
B 3.8.5-2	1	B 3.9.5-2	1
B 3.8.5-3	1	B 3.9.5-3	0
B 3.8.5-4	1	B 3.9.5-4	0
B 3.8.5-5	2	B 3.9.6-1	0
B 3.8.5-6	2	B 3.9.6-2	0
B 3.8.6-1	0	B 3.9.6-3	0
B 3.8.6-2	0	B 3.9.7-1	0
B 3.8.6-3	0	B 3.9.7-2	0
B 3.8.6-4	6	B 3.9.7-3	0
B 3.8.6-5	6		
B 3.8.6-6	6		
B 3.8.6-7	0		
B 3.8.7-1	0		
B 3.8.7-2	0		
B 3.8.7-3	0		
B 3.8.7-4	0		
B 3.8.8-1	1		
B 3.8.8-2	1		
B 3.8.8-3	1		
B 3.8.8-4	1		
B 3.8.8-5	1		
B 3.8.9-1	0		
B 3.8.9-2	0		
B 3.8.9-3	0		
B 3.8.9-4	0		
B 3.8.9-5	0		

BASES

LCO 3.0.6 (continued)

However, there are instances where a support system's Required Action may either direct a supported system to be declared inoperable or direct entry into Conditions and Required Actions for the supported system. This may occur immediately or after some specified delay to perform some other Required Action. Regardless of whether it is immediate or after some delay, when a support system's Required Action directs a supported system to be declared inoperable or directs entry into Conditions and Required Actions for a supported system, the applicable Conditions and Required Actions shall be entered in accordance with LCO 3.0.2.

Specification 5.5.15, "Safety Function Determination Program (SFDP)," ensures loss of safety function is detected and appropriate actions are taken. Upon entry into LCO 3.0.6, an evaluation shall be made to determine if loss of safety function exists. Additionally, other limitations, remedial actions, or compensatory actions may be identified as a result of the support system inoperability and corresponding exception to entering supported system Conditions and Required Actions. The SFDP implements the requirements of LCO 3.0.6.

Cross train checks to identify a loss of safety function for those support systems that support multiple and redundant safety systems are required. The cross train check verifies that the supported systems of the redundant OPERABLE support system are OPERABLE, thereby ensuring safety function is retained. A loss of safety function may exist when a support system is inoperable, and:

a. A required system redundant to system(s) supported by the inoperable support system is also inoperable; or (EXAMPLE B3.0.6-1)

b. A required system redundant to system(s) in turn supported by the inoperable supported system is also inoperable; or (EXAMPLE B3.0.6-2)

c. A required system redundant to support system(s) for the supported systems (a) and (b) above is also inoperable. (EXAMPLE B3.0.6-3)

(continued)

BASES

LCO 3.0.6 (continued)

If this evaluation determines that a loss of safety function exists, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

This loss of safety function does not require the assumption of additional single failures or loss of offsite power. Since operation is being restricted in accordance with the ACTIONS of the support system, any resulting temporary loss of redundancy or single failure protection is taken into account. Similarly, the ACTIONS for inoperable offsite circuit(s) and inoperable diesel generator(s) provide the necessary restriction for cross train inoperabilities. This explicit cross train verification for inoperable AC electrical power sources also acknowledges that supported system(s) are not declared inoperable solely as a result of inoperability of a normal or emergency electrical power source (refer to the definition of OPERABILITY).

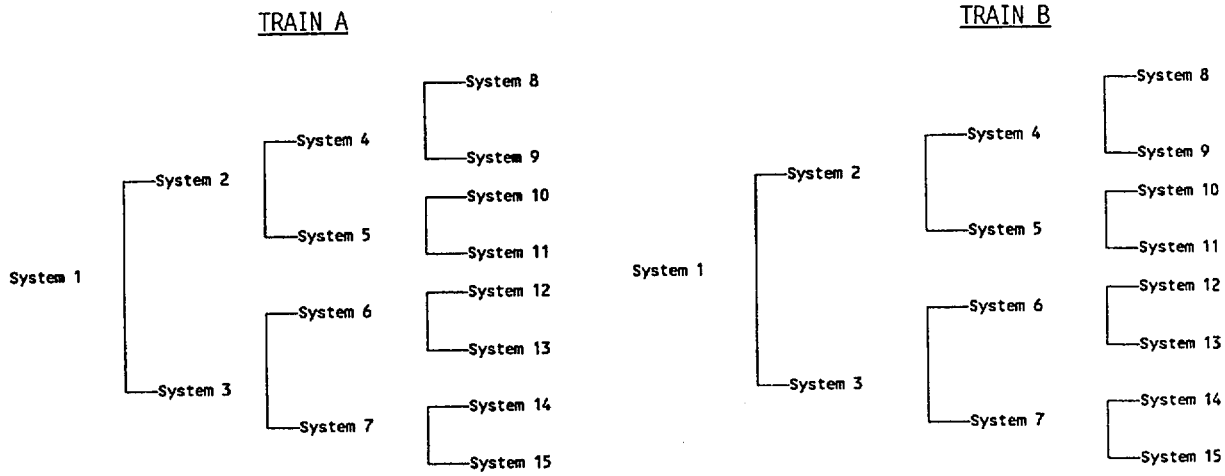
When a loss of safety function is determined to exist, and the SFDP requires entry into the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists, consideration must be given to the specific type of function affected. Where a loss of function is solely due to a single Technical Specification support system (e.g., loss of automatic start due to inoperable instrumentation, or loss of pump suction source due to low tank level) the appropriate LCO is the LCO for the support system. The ACTIONS for a support system LCO adequately addresses the inoperabilities of that system without reliance on entering its supported system LCO. When the loss of function is the result of multiple support systems, the appropriate LCO is the LCO for the supported system.

(continued)

BASES

LCO 3.0.6
(continued)

EXAMPLES



EXAMPLE B3.0.6-1
If System 2 of Train A is inoperable, and System 5 of Train B is inoperable, a loss of safety function exists in supported Systems 5, 10 and 11.

EXAMPLE B3.0.6-2
If System 2 of Train A is inoperable, and System 11 of Train B is inoperable, a loss of safety function exists in System 11 which is in turn supported by System 5.

EXAMPLE B3.0.6-3
If System 2 of Train A is inoperable, and System 1 of Train B is inoperable, a loss of safety function exists in Systems 2,4,5,8,9,10, and 11.

For the examples above, support systems are to the left of the supported systems (i.e., System 1 supports System 2 and System 3).

LCO 3.0.7 Special tests and operations are required at various times over the unit's life to demonstrate performance characteristics, to perform maintenance activities, and to perform special evaluations. Because TS normally preclude these tests and operations, Special Test Exceptions (STEs) allow specified requirements to be changed or suspended under controlled conditions. STEs are included in applicable sections of the Specifications. Unless

(continued)

LCO 3.0.7 (continued)

otherwise specified, all other TS requirements remain unchanged and in effect as applicable. This will ensure that all appropriate requirements of the MODE or other specified condition not directly associated with or required to be changed or suspended to perform the special test or operation will remain in effect.

The Applicability of an STE LCO represents a condition not necessarily in compliance with the normal requirements of the TS. Compliance with STE LCOs is optional.

A special test may be performed under either the provisions of the appropriate STE LCO or the other applicable TS requirements. If it is desired to perform the special test under the provisions of the STE LCO, the requirements of the STE LCO shall be followed. This includes the SRs specified in the STE LCO.

Some of the STE LCOs require that one or more of the LCOs for normal operation be met (i.e., meeting the STE LCO requires meeting the specified normal LCOs). The Applicability, ACTIONS, and SRs of the specified normal LCOs, however, are not required to be met in order to meet the STE LCO when it is in effect. This means that, upon failure to meet a specified normal LCO, the associated ACTIONS of the STE LCO apply, in lieu of the ACTIONS of the normal LCO. Exceptions to the above do exist. There are instances when the Applicability of the specified normal LCO must be met, where its ACTIONS must be taken, where certain of its Surveillances must be performed, or where all of these requirements must be met concurrently with the requirements of the STE LCO.

Unless the SRs of the specified normal LCOs are suspended or changed by the special test, those SRs that are necessary to meet the specified normal LCOs must be met prior to performing the special test. During the conduct of the special test, those Surveillances need not be performed unless specified by the ACTIONS or SRs of the STE LCO.

ACTIONS for STE LCOs provide appropriate remedial measures upon failure to meet the STE LCO. Upon failure to meet these ACTIONS, suspend the performance of the special test and enter the ACTIONS for all LCOs that are then not met. Entry into LCO 3.0.3 may possibly be required, but this determination should not be made by considering only the failure to meet the ACTIONS of the STE LCO.

BASES

LCO (continued)

8. Containment Isolation Valve Position

Containment Isolation Valve Position is provided for verification of containment OPERABILITY.

CIV position is provided for verification of containment integrity. In the case of CIV position, the important information is the isolation status of the containment penetration. The LCO requires one channel of valve position indication in the control room to be OPERABLE for each active CIV in a containment penetration flow path, i.e., two total channels of CIV position indication for a penetration flow path with two active valves. For containment penetrations with only one active CIV having control room indication, Note (b) requires a single channel of valve position indication to be OPERABLE. This is sufficient to redundantly verify the isolation status of each isolable penetration via indicated status of the active valve, as applicable, and prior knowledge of passive valve or system boundary status. If a penetration flow path is isolated, position indication for the CIV(s) in the associated penetration flow path is not needed to determine status. Therefore, the position indication for valves in an isolated penetration flow path is not required to be OPERABLE.

The PVNGS design uses three indications for each valve that receives an automatic close signal from the ESFAS. Each of these indications use a different contact on the position switch. One contact provides an open/close indication on the valve control handswitch in the main control room. This indication uses the same Class 1E power that is used by the valve control circuit. A second contact is used by the Safety Equipment Status System (SESS). This system receives inputs from each valve and the ESFAS system. After an ESFAS actuation any valve that does not reposition to the fully closed position is indicated and annunciated in the main control room. There are two channels of SESS, one channel receives power from the A Train Class 1E DC Bus and indicates the status of the A Train actuated equipment, and one channel receives power from the B Train Class 1E DC Bus and indicates the status of the B Train actuated equipment.

(continued)

BASES

LCO

8. Containment Isolation Valve Position (continued)

The third contact provides an indication of valve position to the Emergency Response Facility Data Acquisition and Display System (ERFDADS). This signal is Class 1E until it goes through a qualified isolator.

The ERFDADS computer and displays are non-Class 1E. For the purpose of this Specification either the SESS indication or the handswitch indication in the main control room may be used.

For some solenoid operated Containment Isolation Valves, the SESS and ERFDADS indications are not independent. Although the SESS and ERFDADS indications are driven off of separate field contacts, both contacts are not directly actuated based upon valve position, but instead are actuated by a relay in the solenoid's control circuitry. When the valve is taken from the closed seat or if control power is lost, the relay is de-energized and the SESS and ERFDADS field contacts change state to illuminate the SESS status and indicate open on ERFDADS. Therefore, upon a loss of control power, the valve will fail close with the SESS and ERFDADS indicating the valve to be open.

This condition presents a problem when one of the identified solenoid operated valves loses open indication in the control room. In this case, there is no light indication on the control room handswitch, and the SESS status is illuminated (when STATUS DISPLAY is pressed) and ERFDADS indicates the valve is open. So either the open limit reed switch for the solenoid has broken continuity and the valve is open, or the control power has been lost (blown fuse) and the valve is closed. Given proper control power, the SESS and ERFDADS indication will be correct for the valves position. Therefore, if it can be verified that control power is present, the SESS indication can be used to verify valve position. To determine the valve position, the operator will need to verify if control power is present at the valve. The solenoid operated Containment Isolation Valves with relay driven SESS and ERFDADS position indication are denoted by an '*' in the following listing.

(continued)

BASES

LCO (continued)

8. Containment Isolation Valve Position (continued)

At PVNGS the Containment Isolation Valve position instrumentation consist of:

CPA-UV-2A	Containment Refueling Purge Supply
CPA-UV-2B	Containment Refueling Purge Exhaust
CPB-UV-3A	Containment Refueling Purge Supply
CPB-UV-3B	Containment Refueling Purge Exhaust
CPA-UV-4A	Containment Power Access Purge Supply
CPA-UV-4B	Containment Power Access Purge Exhaust
CPB-UV-5A	Containment Power Access Purge Supply
CPB-UV-5B	Containment Power Access Purge Exhaust
CHB-UV-505	RCP Controlled Bleedoff to VCT
CHA-UV-506	RCP Controlled Bleedoff to VCT
CHA-UV-516	Letdown to Regen HX
CHB-UV-523	Letdown from Regen HX
CHA-UV-560	Reactor Drain Tank Outlet
CHB-UV-561	Reactor Drain Tank Outlet
CHA-UV-580	Make-Up Supply to Reactor Drain Tank
CHA-UV-715*	Sample Return to Reactor Drain Tank
CHB-UV-924*	Letdown Line Sample PASS
GAA-UV-1	HP Nitrogen to Safety Injection Tanks
GAA-UV-2	LP Nitrogen to Containment
GRA-UV-1	Waste Gas Header
GRB-UV-2	Waste Gas Header
HCB-UV-44*	Radiation Monitor RU-1 Supply
HCA-UV-45*	Radiation Monitor RU-1 Supply
HCA-UV-46*	Radiation Monitor RU-1 Return
HCB-UV-47*	Radiation Monitor RU-1 Return
HPA-UV-1	Containment Hydrogen Control System
HPB-UV-2	Containment Hydrogen Control System
HPA-UV-3	Hydrogen Recombiner Supply
HPB-UV-4	Hydrogen Recombiner Supply
HPA-UV-5	Hydrogen Recombiner Return
HPB-UV-6	Hydrogen Recombiner Return
HPA-UV-23*	Hydrogen Monitor Return
HPA-UV-24*	Hydrogen Monitor Supply
IAA-UV-2*	Instrument and Service Air

(continued)

BASES

LCO (continued)

8. Containment Isolation Valve Position (continued)

NCB-UV-401	Nuclear Cooling Water
NCA-UV-402	Nuclear Cooling Water
NCB-UV-403	Nuclear Cooling Water
RDA-UV-23	Containment Sumps
RDB-UV-24	Containment Sumps
RDB-UV-407*	Containment Radwaste Sumps
SGB-HV-200	Steam Generator #1 Chemical Injection
SGB-HV-201	Steam Generator #2 Chemical Injection
SIA-UV-708	Containment Recirc Sump PASS
SSB-UV-200	Hot Leg Sample PASS
SSB-UV-201	Surge Line PASS
SSB-UV-202	Pressurizer Steam Space PASS
SSA-UV-203	Hot Leg Sample PASS
SSA-UV-204	Surge Line PASS
SSA-UV-205	Pressurizer Steam Space PASS
WCB-UV-61	Normal Chilled Water Return Header
WCA-UV-62	Normal Chilled Water Return Header
WCB-UV-63	Normal Chilled Water Supply Header

*-Solenoid operated valves with relay driven SESS/ERFDADS indication.

9. Containment Area Radiation (high range)

Containment Area Radiation is provided to monitor for the potential of significant radiation releases and to provide release assessment for use by operators in determining the need to invoke site emergency plans. The alarm setpoints shall be set within the limits specified in the UFSAR.

At PVNGS, Containment Area Radiation instrumentation consists of the following:

SQA-RU-148
SQB-RU-149

(continued)

BASES

LOC
(continued)

10. Containment Hydrogen Monitors

Containment Hydrogen Monitors are provided to detect high hydrogen concentration conditions that represent a potential for containment breach. This variable is also important in verifying the adequacy of mitigating actions.

At PVNGS, Containment Hydrogen instrumentation consists of the following:

HPA-AI-9
HPB-AI-10

11. Pressurizer Level

Pressurizer Level is used to determine whether to terminate Safety Injection (SI), if still in progress, or to reinitiate SI if it has been stopped. Knowledge of pressurizer water level is also used to verify the plant conditions necessary to establish natural circulation in the RCS and to verify that the plant is maintained in a safe shutdown condition.

At PVNGS, Pressurizer Level instrumentation consists of the following:

RCA-LT-110X
RCB-LT-110Y

(continued)

BASES

LCO
(continued)

12. Steam Generator Water Level

Steam Generator Water Level is provided to monitor operation of decay heat removal via the steam generators. The Category I indication of steam generator level is the wide range level instrumentation. The wide range level covers a span of 143 inches above the lower tubesheet to 55.5 inches above the steam separator deck.

Wide Range Steam Generator Level is a Type A variable because the operator must manually control steam generator level during a Steam Generator Tube Rupture (STGR) event to ensure steam generator tube coverage. At PVNGS wide range Steam Generator Level Instrumentation consists of:

SGA-LT-1113A
SGB-LT-1113B
SGC-LT-1113C
SGD-LT-1113D

SGA-LT-1123A
SGB-LT-1123B
SGC-LT-1123C
SGD-LT-1123D

13. Condensate Storage Tank (CST) Level

CST Level is provided to ensure water supply for AFW. The CST provides the ensured, safety grade water supply for the AFW System. Inventory is monitored by a 3 ft. to 50 ft. level indication. CST Level is displayed on a control room indicator.

At PVNGS CST Level Instrumentation consists of:

CTA-LT-35
CTB-LT-36

(continued)

BASES

LCO
(continued)

14, 15, 16, 17. Core Exit Temperature

Core Exit Temperature is provided for verification and long term surveillance of core cooling.

An evaluation was made of the minimum number of valid core exit thermocouples necessary for inadequate core cooling detection. The evaluation determined the reduced complement of core exit thermocouples necessary to detect initial core recovery and trend the ensuing core heatup. The evaluations account for core nonuniformities including incore effects of the radial decay power distribution and excore effects of condensate runback in the hot legs and nonuniform inlet temperatures.

Based on these evaluations, adequate or inadequate core cooling detection is ensured with two valid core exit thermocouples per quadrant.

The design of the Incore Instrumentation System includes a Type K (chromel alumel) thermocouple within each of the 61 incore instrument detector assemblies.

The junction of each thermocouple is located a few inches above the fuel assembly, inside a structure that supports and shields the incore instrument detector assembly string from flow forces in the outlet plenum region. These core exit thermocouples monitor the temperature of the reactor coolant as it exits the fuel assemblies.

The core exit thermocouples have a usable temperature range from 32°F to 2300°F, although accuracy is reduced at temperatures above 1800°F.

(continued)

BASES

LCO (continued)

18. Steam Generator Pressure

Steam Generator pressure indication is provided for Steam Generator pressure verification. At PVNGS Steam Generator Pressure Instrumentation consists of:

SGA-PT-1013A
SGB-PT-1013B
SGC-PT-1013C
SGD-PT-1013D

SGA-PT-1023A
SGB-PT-1023B
SGC-PT-1023C
SGD-PT-1023D

19. Reactor Coolant System-Subcooling Margin Monitoring

The RCS Subcooling Margin Monitor is a portion of the Inadequate Core Cooling (ICC) Instrumentation required by Item II.F.2 in NUREG-0737, the post-TMI Action Plan. The ICC instrumentation enhances the ability of the Operator to anticipate the approach to, and recovery from, ICC. At PVNGS RCS subcooling Margin Monitoring Instrumentation consists of:

QSPDS A
QSPDS B

20. Reactor Coolant System Activity

The RCS Activity provides an indication of fuel cladding failure. This indicates degradation of the first of three barriers to fission product release to the environment. The three barriers to fission product release are (1) fuel cladding, (2) primary coolant pressure boundary, and (3) containment. At PVNGS the RCS Activity Instrumentation consists of:

SQA-RU-150
SQB-RU-151

21, 22. HPSI System Flow

HPSI System flow indication is provided for HPSI flow verification.

(continued)

BASES

LCO

21, 22 HPSI System Flow (continued)

HPSI System flow is a Type A variable because the operator must manually balance the HPSI flow between the hot and cold legs when switching from cold leg injection to a combined cold/hot leg injection in support of LOCA Long Term Cooling to prevent boron precipitation in stagnate core areas. Monitoring of these instruments is not required for initial operation of HPSI flow. At PVNGS, HPSI System Cold Leg Flow indication consists of:

J-SIB-FT-0311
J-SIB-FT-0321
J-SIA-FT-0331
J-SIA-FT-0341

At PVNGS, HPSI System Hot Leg Flow indication consists of:

J-SIA-FT-0390
J-SIB-FT-0391

Two channels are required to be OPERABLE for all but one Function. Two OPERABLE channels ensure that no single failure within the PAM instrumentation or its auxiliary supporting features or power sources, concurrent with failures that are a condition of or result from a specific accident, prevents the operators from being presented the information necessary for them to determine the safety status of the plant and to bring the plant to and maintain it in a safe condition following that accident.

In Table 3.3.10-1 the exception to the two channel requirement is Containment Isolation Valve Position.

Two OPERABLE channels of core exit thermocouples are required for each channel in each quadrant to provide indication of radial distribution of the coolant temperature rise across representative regions of the core. Power distribution symmetry was considered in determining the specific number and locations provided for diagnosis of local core problems. Plant specific evaluations in response to Item II.F.2 of NUREG-0737 (Ref. 3) have determined that any two thermocouple pairings per quadrant, satisfy these requirements. Two sets of two thermocouples in each quadrant ensure a single failure will not disable the ability to determine the radial temperature gradient.

(continued)

BASES

LCO (continued)

For loop and steam generator related variables, the required information is individual loop temperature and individual steam generator level. In these cases two channels are required to be OPERABLE for each loop of steam generator to redundantly provide the necessary information.

In the case of Containment Isolation Valve Position, the important information is the status of the containment penetrations. The LCO requires one position indicator for each active containment isolation valve. This is sufficient to redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve and prior knowledge of the passive valve or via system boundary status. If a normally active containment isolation valve is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves in this state is not required to be OPERABLE.

APPLICABILITY

The PAM instrumentation LCO is applicable in MODES 1, 2, and 3. These variables are related to the diagnosis and preplanned actions required to mitigate DBAs. The applicable DBAs are assumed to occur in MODES 1, 2, and 3. In MODES 4, 5, and 6, plant conditions are such that the likelihood of an event occurring that would require PAM instrumentation is low; therefore, PAM instrumentation is not required to be OPERABLE in these MODES.

ACTIONS

Note 1 has been added in the ACTIONS to exclude the MODE change restriction of LCO 3.0.4. This exception allows entry into the applicable MODE while relying on the ACTIONS, even though the ACTIONS may eventually require plant shutdown. This exception is acceptable due to the passive function of the instruments, the operator's ability to monitor an accident using alternate instruments and methods, and the low probability of an event requiring these instruments.

Note 2 has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.10-1. The Completion Time(s) of the inoperable channel(s) of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function.

(continued)

BASES

ACTIONS (continued)

A.1

When one or more Functions have one required channel that is inoperable, the required inoperable channel must be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on operating experience and takes into account the remaining OPERABLE channel (or in the case of a Function that has only one required channel, other non-Regulatory Guide 1.97 instrument channels to monitor the Function), the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring PAM instrumentation during this interval.

B.1

This Required Action specifies initiation of actions in accordance with Specification 5.6.6, which requires a written report to be submitted to the Nuclear Regulatory Commission. This report discusses the results of the root cause evaluation of the inoperability and identifies proposed restorative Required Actions. This Required Action is appropriate in lieu of a shutdown requirement, given the likelihood of plant conditions that would require information provided by this instrumentation. Also, alternative Required Actions are identified before a loss of functional capability condition occurs.

C.1

When one or more Functions have two required channels inoperable (i.e., two channels inoperable in the same Function), one channel in the Function should be restored to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrumentation operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation.

(continued)

BASES

ACTIONS

C.1 (continued)

Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur.

D.1

When two required hydrogen monitor channels are inoperable, Required Action D.1 requires one channel to be restored to OPERABLE status. This Required Action restores the monitoring capability of the hydrogen monitor. The 72 hour Completion Time is based on the relatively low probability of an event requiring hydrogen monitoring and the availability of alternative means to obtain the required information. Continuous operation with two required channels inoperable is not acceptable because alternate indications are not available.

E.1

This Required Action directs entry into the appropriate Condition referenced in Table 3.3.10-1. The applicable Condition referenced in the Table is Function dependent. Each time Required Action C.1 or D.1 is not met, and the associated Completion Time has expired, Condition E is entered for that channel and provides for transfer to the appropriate subsequent Condition.

F.1 and F.2

If the Required Action and associated Completion Time of Condition C are not met and Table 3.3.10-1 directs entry into Condition F, 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 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

ACTIONS (continued)

G.1

Alternate means of monitoring Reactor Vessel Water Level, RCS Activity, and Containment Area Radiation have been developed and tested. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. If these alternate means are used, the Required Action is not to shut down the plant, but rather to follow the directions of Specification 5.6.6. The report provided to the NRC should discuss whether the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

SURVEILLANCE REQUIREMENTS

A Note at the beginning of the SR table specifies that the following SRs apply to each PAM instrumentation Function found in Table 3.3.10-1.

SR 3.3.10.1

Performance of the CHANNEL CHECK once every 31 days ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.10.1 (continued)

If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Current loop channels are verified to be reading at the bottom of the range and not failed downscale.

The Frequency of 31 days is based upon plant operating experience with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given Function in any 31 day interval is a rare event. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel during normal operational use of the displays associated with this LCO's required channels.

SR 3.3.10.2

A CHANNEL CALIBRATION is performed every 18 months or approximately every refueling. CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies the channel responds to the measured parameter within the necessary range and accuracy. A Note excludes the neutron detectors from the CHANNEL CALIBRATION.

For the Containment Area Radiation instrumentation, a CHANNEL CALIBRATION as described in UFSAR Sections 18.II.F.1.3 and 11.5.2.1.6.2 will be performed.

The calibration of the Containment Isolation Valve (CIV) position indication channels will consist of verification that the position indication changes from not-closed to closed when the valve is actuated to its isolation position by SR 3.6.3.7. The position switch is the sensor for the CIV position indication channels.

The calibration of the containment hydrogen monitor will use sample gases containing a nominal one volume percent hydrogen, balance nitrogen, and four volume percent hydrogen, balance nitrogen.

The Frequency is based upon operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of an 18 month calibration interval for the determination of the magnitude of equipment drift.

BASES

REFERENCES

1. UFSAR Section 1.8, Table 1.8-1.
2. Regulatory Guide 1.97, Revision 2.
3. NUREG-0737, Supplement 1.

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PACKAGE DIVIDER