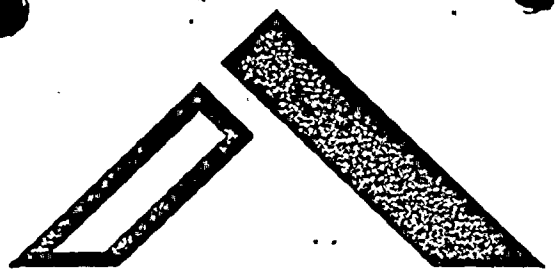

Arizona Nuclear Power Project

SPECIAL PLANT EVENT EVALUTION REPORT

SP-88-02-006

INCORRECT RELOAD DATA BLOCK CONSTANTS IN CPC B WHILE LOW DNBR AND HIGH LPD WERE STILL INOPERABLE

Prepared by: Vernon A. Marshall / 7/14/88
V.A. Marshall — Date

Reviewed by: David Hoppes / 7-14-88
D.F. Hoppes — Date

Reviewed by: John F. Schmadeke / 7-14-88
J.F. Schmadeke — Date

Reviewed by: G W Sowers / 7.15.88
G.W. Sowers — Date

Reviewed by: Alan Butler / 7-15-88
R.M. Butler — Date

Reviewed by: Paul F. Crawley / 7/15/88
P.F. Crawley — Date

Approved by: W E Ide / 7-18-88
W.E. Ide — Date

EVENT DESCRIPTION

On June 19, 1988, Palo Verde Unit 2 personnel were performing low power testing, in Mode 2, after a refueling outage. Channel B CPC was INOPERABLE due to a failed RTD, RCB-TT-122CB. LOW DNBR and HI LPD parameters were bypassed at the Plant Protection System.

On June 20, 1988, at approximately 01:00, while performing 42ST-2ZZ32, Mode 2 Surveillance Logs (channel correlation check), Operations personnel determined that Channel B CPC DNBR was reading higher than expected. (Concern 1 and 2). Had Channel B been OPERABLE, the correlation check would have failed. A work request was initiated to troubleshoot this discrepancy. The discrepancy was added to TSCCR #2-88-348. Further evaluations were performed by Reactor Engineering, Nuclear Fuel Management and Operations Computer Systems personnel, throughout June 20 - 21, 1988. The evaluations included, generation of CPC Reports, verifying Addressable Constants, verifying the Data Acquisition System reference voltages were in tolerance, performing correlation checks on the CPC inputs, and inputting the field values and constants into the CPC Simulator program to run test cases. The DNBR margin generated by the CPC Simulator program correlated the values indicated on Channels A, C and D CPCs. By using the default Reload Data Block constants in the CPC Simulator program the DNBR margin matched the value in CPC B. On June 21, 1988, it was determined that the incorrect Reload Data Block Constants (RDB) had been installed into CPC B (Concern 1).

The software and RDB constants were reloaded per 72MT-2SB01, CPC/CEAC Software Maintenance. Reactor Engineering and Operations personnel compared the DNBR margin, Radial Peaking Factors and other parameters on CPC B to the expected values from the test cases and determined that the channel was operating correctly. 42ST-2ZZ33, Mode 1 Surveillance Logs (channel correlation check) was performed. (Concern 3.) On June 21st at 19:35, Channel B LOW DNBR and HI LPD were declared OPERABLE. TSCCR #2-88-348 was closed, as RTD RCB-TT-122CB rework had already been completed.

Channel B LOW DNBR and HI LPD were bypassed and declared INOPERABLE prior to entry into Mode 2 and not placed into service until after the correct RDB constants had been installed.

An investigation into how the incorrect RDB constants were installed was commenced. It was determined from review of work documents and reports that the June 2, 1988, Channel Functional Surveillance Test was the last activity that could have effected the software. Through a review of test data, it was determined that while performing 77ST-2SB08,

CPC B Functional Test, an error message occurred ("Floppy I/O Error"), indicating a test equipment failure and halting of the CPC computer (Concern 4). The computer was reinitialized, instead of being restarted, causing the test software and default RDB constants to be loaded from the Periodic Test Disk. The technician did not properly assess the significance of the messages which indicated that the software had been loaded, versus just restarting the computer. (Note: There were no indications that the default RDB constants were loaded or that the correct RDB constants had been overwritten.) Therefore, according to the Surveillance Test printouts, the technician did not re-establish the correct initial conditions, which bypassed steps that would have correctly restarted the Periodic Test or have reloaded the correct software and RDB constants.

SEQUENCE OF EVENTS SUMMARY

	EVENTS
1 June ____	Cycle 2 DNBR/LPD software was initially loaded into CPC B.
2 June ____	Software was reloaded as part of Surveillance Test 77ST-2SB08.
16 June 1815	RTD RCB-TT-122CB was determined to be defective and corrective maintenance initiated under Work Order 300963.
16 June 1830	Channel B LOW DNBR and HI LPD parameters were BYPASSED on the PPS, due to the faulty RTD RCB-TT-122CB and CPC B was declared INOPERABLE. TSCCR #2-88-348.
18 June 0126	Unit 2 entered Mode 2.
20 June 0042	Operations determined that Channel B DNBR was indicating approximately 1.2 units higher than the other three channels, during the performance of 42ST-2ZZ32, Mode 2 Surveillance Logs (channel correlation checks).
20 June 0100	Shift Computer Technician notified. WR 224245 initiated but retained by Operations.
20 June 0815	Operations Computer Systems personnel informed Reactor Engineering personnel of the problem.

20 June 0900 OCS Maintenance Supervisor evaluated CPC B with Unit 2 Lead Reactor Engineer. The only unusual indications found, were slightly higher excore values, when compared to other CPC channels.

20 June 0920 Informed the Shift Supervisor and Operations Support Supervisor of findings. Recommended I/C look at excores and Reactor Engineering perform further evaluations.

20 June ____ Reactor Engineering and OCS System Engineer verified Addressable Constants.

20 June ____ Reactor Engineering verified on the CPC Simulator (a program on a Personal Computer) that the Channel B DNBR was abnormally high and the value should agree with the other channels.

21 June 1000 Reactor Engineering with assistance from Nuclear Fuel Management identified. apparent problems with RDB values.

21 June 1240 Unit 2 entered Mode 1.

21 June 1400 Reactor Engineering personnel independently theorized that certain default RDB values were installed. Requested confirmation by checking the computers memory using a Hexadecimal Display Panel.

21 June ____ WCP 00301672 was generated by Computer personnel to assist Reactor Engineering in the investigation.

21 June 1800 Investigation confirmed certain RDB memory locations contained default values rather than those of the approved RDB disk.

21 June ____ Reloaded software and RDB constants in accordance with 72MT-2SB01. Verified addressable constants.

21 June 1935 Operations personnel performed 42ST-2ZZ33, Mode 1 Surveillance Logs (channel correlation checks). Reactor Engineering reevaluated CPC parameters on all CPCs to verify that they matched the values they had calculated and correlated with CPC B.

21 June 1935 Channel B LOW DNBR and HI LPD declared OPERABLE. Cleared TSCCR #2-88-348 and removed bypasses from CPC B LOW DNBR/ HI LPD.

22 June 1330 Reactor Engineering ascertained by evaluation of certain parameters that default (test) RDB constants were not being used in the Unit One CPCs. Reference EER 88-RX-033.

CONCERN SUMMARY

1) Incorrect and nonconservative Reload Data Block Constants were found in CPC B, which effect the LOW DNBR and HI LPD trip parameters. (LOW DNBR and HI LPD parameters were bypassed prior to entering into Mode 2 and the RDB constants were corrected prior to putting LOW DNBR and HI LPD parameters back into service in Mode 1.)

2) The incorrect RDB constants were not identified until a channel correlation check (42ST-2ZZ32) was performed in Mode 2. There appears to be no method of verifying the correct RDB constants are installed, after installation.

3) Unit 1 and 2 CPCs and CEACs may have the default RDB constants installed without this being apparent. Note: Unit Three has a different version of software (Cycle 1), which does not have separate RDB constants.

4) During the performance of Surveillance Test 77ST-2SB08 a "Floppy I/O Error" was received. The technician did not properly re-establish the initial conditions to reperform the affected steps.

CONCERNS

CONCERN #1

Incorrect and nonconservative Reload Data Block Constants were found in CPC B, which effect the Low DNBR and High LPD trip parameters. (LOW DNBR and HI LPD parameters were bypassed prior to entering into Mode 2 and the RDB constants were corrected prior to putting LOW DNBR and HI LPD parameters back into service in Mode 1.)

ACTION PLAN:

1.) Review all work activities that could have changed or loaded software into the CPC, to determine when and how they were installed.

2.) Investigate to determine what RDB values were in Channel B CPC.

3.) Determine whether the RDB values were conservative or nonconservative and the impact on DNBR and LPD.

4.) Analyze the impact on the plant if the channel had not already Been declared INOPERABLE due to the RTD problems.

REFERENCE DOCUMENT NUMBERS:

73AC-9ZZ04, Surveillance Testing

77ST-1,2,3, SB01-12, CPC/CEAC Functionals and Channel Calibrations

72MT-1,2,3SB01, CPC/CEAC Software Maintenance.

NRC Confirmatory Action Letter received 6-23-88.

RESOLUTION/ANALYSIS:

All work documents and activities that affected CPC B, since the initial loading of the Cycle 2 Software were reviewed. The only discrepancy found was in STWO # 291346 which was Surveillance Test 77ST-2SB08, CPC B Functional Test. Reviewing the printouts attached to this Surveillance Test package, it was noted that a Floppy I/O Error had occurred and the data indicates the initial conditions were not properly re-established. This was determined to be the most likely scenario explaining how the default values from the Periodic Test Disk were loaded into the effected CPC.

The initial investigation into the RDB constants in CPC B determined that they matched the default, or "test" values, used by the Periodic Test Software during the Functional Test. Since the only method to load the RDB constants into the CPC memory is through the use of a floppy disk, it is most likely that the RDB constants were loaded into memory from one of the disks used for testing or software loading.

An evaluation was performed to determine if the software load floppy disk had the "default" values of RDB constants. This was done by loading the RDB constants into memory and displaying several constants on a Hexadecimal Display Panel, (test equipment not normally installed), to verify that they did not match the "default" values.

An evaluation was performed to determine if the Periodic Test Disk had the "default" RDB constants, and if it was possible to load and run the Periodic Test software and RDB. The evaluation demonstrated that it is possible to load and run online, without being in "TEST". The examination of the RDB constants, matched the constants found in CPC B, and the "default" values.

The incorrect (default) RDB constants resulted in nonconservative values of DNBR and LPD. This made Channel B LOW DNBR and HI LPD INOPERABLE, because it was not capable of properly performing its specified functions relating to core protection. These default values were sufficiently different from those of the other CPC channels that Channel B failed the channel correlation check.

Technical Specifications require that an INOPERABLE channel be placed in BYPASS or TRIP. (Technical Specifications 3/4.3.1 Action 3.a.)

During the time that channel B CPC had the incorrect RDB constants installed, Channel D had minor problems with an excore input and later, with the loss of a speed probe signal. Both of these items caused Channel D LOW DNBR and HI LPD to be declared INOPERABLE, for short periods of time. Channel D was placed into TRIP, since Channel B was in BYPASS. Channel D being INOPERABLE would have made two channels of LOW DNBR and HI LPD INOPERABLE. During this time there always were two OPERABLE channel of LO DNBR and

HI LPD. Therefore the 2 out of 3 criteria was always met. Technical Specifications 3/4.3.1 allow operation with up to two channels Inoperable, if one is in bypass and the other is Tripped.

RECOMMENDED CORRECTIVE ACTION:

1.) Determine if the Periodic Test Disk software should be allowed to run when not in Test, according to the design documentation. Document on an EER.

2.) Determine if previous versions of the CPC software allowed the Test Disk software to run while not in Test. Document on an EER.

3.) Evaluate if a software change which will prevent the use of the Test Disk software while not in Test, is practical. Document on an EER.

4.) Resolve discrepancies in the "14273-ICE-3931 Program Listing for CPC/CEAC Executive System" documentation and the Combustion Engineering QA documentation for the floppy disks, which do not identify that there are two different versions of the "System Loader Module". Obtain the missing documentation for the System Load disk version of the "System Loader Module"."

5.) As required by the NRC Confirmatory Action Letter received 6-23-88, item #1, an evaluation and analysis of the circumstances surrounding the introduction of nonconservative information into Unit 2 CPC B shall be performed.

6.) Evaluate whether the software should be changed to limit the reoccurrence of the wrong Reload Data Block Constants being installed into a CPC/CEAC. Document on an EER.

7.) Evaluate having the Periodic Test Disk, "default" RDB constants be changed to conservative values, or that cause LOW DNBR and HI LPD to generate TRIP signals. Document on an EER.

8.) Evaluate 72MT-1,2SB01, Unit 1,2 CPC/CEAC Software Maintenance procedure, to determine if changes can be made that would reduce the potential for reoccurrence of running the Test software or the default RDB constants.

9.) Evaluate 77ST-1,2,SB06 through 12, CPC/CEAC Functional Tests, to determine if changes can be made that would limit the potential for reoccurrence of running the Test software or the default RDB constants.

MANAGEMENT REVIEW CORRECTIVE ACTION

10.) Evaluate the results of Corrective Actions 6 - 9 and select an appropriate method for the detection of the incorrect RDB constants in the CPCs. Review the selected method with the Plant Review Board and initiate implementation.

RESPONSIBLE ORGANIZATION:

1.) Operations Computer Systems/Reactor Engineering

2.) Operations Computer Systems/Reactor Engineering

3.) Nuclear Fuel Management/Reactor Engineering
Operations Computer Systems

4.) Nuclear Fuel Management/Operations Computer Systems

5.) Operations Computer Systems/Reactor Engineering

6.) Nuclear Fuel Management/Reactor Engineering
Operations Computer Systems

7.) Nuclear Fuel Management/Reactor Engineering

8.) Reactor Engineering

9.) Operations Computer Systems

10.) Reactor Engineering/Operations Computer Systems/
Nuclear Fuel Management

MODE RESTRAINT/DUE DATE:

1.) 30 days following report approval

2.) 30 days following report approval

3.) 120 days following report approval

4.) 120 days following report approval

5.) 7-23-88 (30 days following commitment)

6.) 120 days following report approval

7.) 120 days following report approval

8.) 30 days following report approval

9.) 30 days following report approval

10.) 150 days following report approval

CONCERN #2

The incorrect RDB constants were not identified until a channel correlation check (42ST-2ZZ32) was performed in Mode 2. There appears to be no method of verifying the correct RDB constants are installed after installation.

ACTION PLAN:

1.) Determine if there is a requirement to verify the RDB constants are installed.

2.) Determine if there is a method of verifying the correct RDB constants are installed, in the CPCs and CEAC's, when the plant is not in MODEs 1 or 2.

3.) Determine if there is a method of verifying the correct RDB constants are installed, in the CPCs and CEAC's, when the plant is in MODEs 1 and 2.

4.) NRC Confirmatory Action Letter received 6-23-88, item #4, specify actions to be taken to preclude reoccurrence of the condition or actions that resulted in the errors in the CPC software.

REFERENCE DOCUMENT NUMBERS:

NRC Confirmatory Action Letter received 6-23-88

73AC-9ZZ04, Surveillance Testing

77ST-1,2,3, SB01-12, CPC/CEAC Functionals and Calibrations

72MT-1,2SB01, Unit 1,2 CPC/CEAC Software Maintenance

72OP-1,2SB01, CPC/CEAC Addressable Constants and Reload Data Block Constants

Unit Two Technical Specifications

14273-ICE-3572, Test and Operational Procedures for DNBR/LPD Calculator System For PVNGS

14273-ICE-3010, Project Specification for Software Design for Core Protection Calculators

14273-ICE-3931, Program Listing for CPC/CEAC Executive System.

RESOLUTION/ANALYSIS:

Both the Surveillance Test, 77ST-2SB08 and the software maintenance procedure, 72MT-2SB01 have steps that ensure that the correct RDB constants disk is used during installation. But neither procedure has any final check to verify that the correct RDB constants were successfully loaded into the computer after the installation has been completed. Further analysis has shown that there is no direct method of determining the value of the RDB constants are installed once the computer is running. An indirect method can be used to verify the value of certain RDB constants installed in a CPC when in Mode 1 or 2, which infers whether or not the default RDB constants are loaded. Previously there was basically no method known of determining if the correct RDB constants were installed, therefore no check was performed.

During the channel correlation check that is performed when in Mode 1 and 2, all procedures, 42ST-2ZZ32, 42ST-2ZZ33, 72MT-2SB01, 77ST-2SB08, check the correlation of DNBR margin on all Operable channels. This check identifies any significant differences in DNBR, which could be caused by differences in constants or input parameters.
Since the software load and the Surveillance Test were both performed when the plant was not in Modes 1 or 2, therefore the channel correlation was not required.

When performing 42ST-2ZZ32, Operations personnel evaluated the difference between other channels and the DNBR margin from Channel B CPC. They found that had the channel been OPERABLE, it would have failed the check. A Work Request was initiated to have the discrepancy evaluated, and it was also added to the open TSCCR.

RECOMMENDED CORRECTIVE ACTION:

1.) Evaluate a software change that will allow the Block E checksum (location of the RDB in memory), to be displayed as a Point ID, to provide a method to verify that the correct RDB has been installed. Document on an EER.

2.) Evaluate any software change that will allow the RDB constants to be displayed by the Operators Module, or printed on the terminal, to provide a method to verify that the correct RDB has been installed. Document on an EER.

3.) Evaluate a method of printing the RDB constants, to verify the values on the disk match the documentation. Document on an EER.

4.) Evaluate the present software, to determine if a method can be found to verify the correct RDB constants are installed. Document on an EER.

5.) Establish a review program that will evaluate the entire CPC software development - testing - implementation "from Cradle to Grave" process. Identify any other weak areas or other areas where something could go wrong."

RESPONSIBLE ORGANIZATION:

1.) Nuclear Fuel Management/Reactor Engineering

2.) Nuclear Fuel Management/Reactor Engineering

3.) Nuclear Fuel Management/Reactor Engineering
Operations Computer Systems

4.) Reactor Engineering/Operations Computer Systems

5.) Nuclear Fuel Management/Reactor Engineering
Operations Computer Systems

MODE RESTRAINT/DUE DATE:

1.) 120 days following report approval

2.) 120 days following report approval

3.) 120 days following report approval

4.) 60 days following report approval

5.) 120 days following report approval initiate review program

CONCERN #3

Unit 1 and 2 CPCs and CEACs may have the default RDB constants installed without this being apparent. Note: Unit Three has a different version of software, (Cycle 1) and doesn't have separate RDB constants.

ACTION PLAN:

1.) Evaluate Unit 2 CPCs and CEACs to verify that the correct RDB constants are installed.

2.) As stated in the NRC Confirmatory Action Letter received 6-23-88, item #2, verify that the inputs to and operation of all Unit 2 CPCs are correct at 70% power. (Perform CEDIPS).

3.) As stated in the NRC Confirmatory Action Letter received 6-23-88, item #3, verify the operation of Unit 1 CPC channels are acceptable.

REFERENCE DOCUMENT NUMBERS:

72PA-2ZZ07, Reload Power Ascension Test

NRC Confirmatory Action Letter received 6-23-88.

EER 88-RX-033

RESOLUTION/ANALYSIS:

The RDB constants in Channel B CPC were verified to be the correct values, by loading from the correct Reload Data Block Disk, verifying the checksum during installation, and by examining the data in the computer's memory to not be the default values. After the correct values were loaded into the CPC, the DNBR margin was evaluated to match the expected value from the "CPC Simulator program", with the inputs at the time. Also the DNBR margin was within the channel correlation check tolerance.

The other CPC channels matched the values in channel B CPC, indicating the default values were not installed.

A review had been performed of all work since the initial Cycle 2 software had been installed, and no discrepancies were found that indicated that the default values could have been installed.

At 70% power, Reactor Engineering performed 72PA-2ZZ07, Reload Power Ascension Test. The results of which were input into a "validated" vendor (Combustion Engineering) off-line computer program, CEDIPS, which verified that the indications and margins being calculated by the CPCs were correct.

On June 22, a Reactor Engineer verified by observing calculated Radial Peaking Factors, an indirect method, and documented on EER 88-RX-033, that the Unit One CPCs did not have the default RDB constants installed.

RECOMMENDED CORRECTIVE ACTION:

1.) Evaluate the Unit 2 CPCs and CEACs by performing channel comparisons and correlating parameters to the values calculated on the CPC Simulator program, to verify that the correct RDB constants are installed. Document on an EER.

2.) Verify that the inputs to and the operation of the Unit 2 CPC channels are correct at 70% power by performing a CEDIPS test. 72PA-2ZZ07.

3.) Verify the operation of the Unit 1 CPC channels are acceptable and document on an EER.

RESPONSIBLE ORGANIZATION:

1.) Reactor Engineering

2.) Reactor Engineering

3.) Reactor Engineering

MODE RESTRAINT/DUE DATE:

1.) Immediate/Complete

2.) 70% power/Complete

3.) Immediate verification/Document on EER 30 days following report approval

CONCERN #4

During the performance of Surveillance Test 77ST-2SB08 a "Floppy I/O Error" was received. The technician did not properly re-establish the initial conditions to reperform the affected steps.

ACTION PLAN:

1.) NRC Confirmatory Action Letter received 6-23-88, item #4, specify actions to be taken to preclude reoccurrence of the condition or actions that resulted in the errors in the CPC software.

2.) Determine the impact of receiving a "Floppy I/O Error" during Surveillance Testing and Software Maintenance. Document on an EER.

3.) Evaluate all procedures which perform software maintenance, which do not contain sufficient information to recover from "I/O Errors" on the CPCs, which could lead to inadvertently loading the incorrect software or RDB constants.

4.) Determine the cause of the Floppy I/O Error, received during 77ST-2SB08. Document on an EER.

REFERENCE DOCUMENT NUMBERS:

NRC Confirmatory Action Letter received 6-23-88

73AC-9ZZ04, Surveillance Testing

77ST-1,2,9, SB01-12, CPC/CEAC Functionals and Calibrations

72MT-1,2SB01, Unit 1,2 CPC/CEAC Software Maintenance

14273-ICE-3572, Test and Operational Procedures for DNBR/LPD Calculator System For PVNGS

14273-ICE-3931, Program Listing for CPC/CEAC Executive System.

N001-13.03-185, System Operation and Maintenance Instructions

RESOLUTION/ANALYSIS:

"I/O Errors" are error messages generated by the CPC computer software to inform the technician that it was unable to successfully complete an operation with an Input/Output device. When this occurs, the computer halts all operation and waits for the technician to correct the problem and restart the computer. During testing, I/O Errors can be generated by printer malfunctions, (loss of paper, pressing the wrong keys, loss of power, etc.) or floppy drive malfunctions, (no floppy disk in the drive, drive door still open, disk inserted improperly, defective disks, the incorrect disk is installed, loose cable connections, or other disk drive malfunctions).

A technician was performing Surveillance Test 77ST-2SB08, CPC B Functional Test, on June 2, when near the end of the test while still in Periodic Test, steps 8.8.48, 8.8.49, or 8.8.50, a Floppy I/O Error occurred and the computer halted. These steps direct the removal of one floppy disk and to exchange it for the Periodic Test Disk, enter a 1 on the Test Cart Printer, then directs the technician to reset the CPC TEST INITIATE switch within 15 seconds. After the switch is reset, the computer verifies the software agrees with data on the floppy disk, and prints "END SYSTEM TEST".

From analysis of the attached Surveillance Test printouts, the computer was then reinitialized. The Periodic Test Disk was still in the floppy drive and the test software was loaded into the computer's memory overwriting the application software as well as the Reload Data Block constants.

The technician did not properly assess the significance of the messages which indicated the software had loaded versus, just restarting the computer. The knowledge level of the technician did not include two important facts, that the software could be loaded from the Periodic Test disk and that the RDB constants are overwritten when reloading software. Additionally no entry was made into the Surveillance Test Log concerning the Floppy I/O Error as required by Contingencies section in 77ST-2SB08 section 10.4 and 73AC-9ZZ04, 5.3.5.

Pressing the INIT switch should have only reinitialized the computer and put the computer back into test, not reloading the software. The reloading of the software is dependant on the Automatic Load Option Switch being ENABLED. Previous steps in the Surveillance Test verify that this toggle switch is disabled. It is possible that this switch

was incorrectly verified, since it is difficult operate and cannot be directly observed, or the technician enabled the ALO switch in error. Conversations with the technician demonstrated that he was aware of the correct function and operation of the switch.

The operation of the ALO switch and the floppy drive were found to operate correctly during the investigation and the software reloading. Work Order 303413 has been generated to further test the operation of the ALO switch and the Floppy drive interface.

The plant was not in MODES 1 or 2, so there was no check of the DNBR correlation between channels during the restoration from testing. There is presently no method to verify the operational software or RDB constants are loaded, once the computer is out of test. So the Test software and default RDB constants were not detected in the final steps of the Surveillance Test, which check to ensure that the computer has been correctly restored from testing.

RECOMMENDED CORRECTIVE ACTION:

1.) Perform a Root Cause Analysis on the Channel B CPC Floppy I/O Error. Document on an EER.

2.) Brief the Computer Technicians who perform Surveillance Testing on actions to be taken on a discrepancy in a Surveillance Test, per 73AC-9ZZ04, Surveillance Testing and section 10 of 77ST-2SB08, CPC B Functional Test. Additionally stress the management philosophy at PVNGS that when a problem or discrepancy in a procedure is experienced or equipment operates in an unexplained manner, stop and obtain direction/discuss the discrepancy with supervision.

3.) Review with the Computer Technicians the changes in operation, software loading and maintenance aspects of Cycle 2 software.

4.) Evaluate potential modifications to the Surveillance Tests and Software Maintenance procedures, that will clarify the process to be followed when I/O Errors occur.

5.) Evaluate adding to Surveillance Test procedures and Software Maintenance procedure steps that will verify the operating software and RDB constants are loaded, when a method to check the RDB is implemented.

RESPONSIBLE ORGANIZATION:

1.) Operations Computer Systems

2.) Operations Computer Systems

3.) Operations Computer Systems

4.) Operations Computer Systems/Reactor Engineering

5.) Operations Computer Systems/Reactor Engineering

MODE RESTRAINT/DUE DATE:

1.) 30 days following report approval

2.) 30 days following report approval

3.) 30 days following report approval

4.) 30 days following report approval

5.) 60 days following implementation of a method to verify the RDB constants.

THE FOLLOWING PAGES CONTAIN SUPPORTING DOCUMENTATION PERTINENT TO THIS REPORT

Unit 2 TSCCR 2-88-348

NRC Confirmatory Action Letter received 6-23-88

~~* RESTORE WITHIN 7 DAYS OR BE IN HOT STANDBY WITHIN THE NEXT 12 HR~~

~~** RESTORE WITHIN 7 DAYS OR BE IN HOT STBY WITHIN THE NEXT 12 H~~ 48 HOURS PS 6/17/88 SHUTDOWN

UNIT 2 TSCCR

Record #- 2-88-348

Will ACTION be entered If Mode changed? YES NO Mode Restraint (1) (2) 3 4 5 6 NO

EVENT

Equipment "B" CPC

Condition/Deficiency Loop 2B TEMP TT 122 CB READS LOW ChB DNBR TS reading ~1.2 units Higher than other channels

Related Documents W.R. 224183 WR# 224245, TSCCR # 2-88-350

LCO/SR# 3.3.1, ~~3.3.3.5*~~, ~~3.3.3.6**~~ Applicability 1, 2, 3

Action Entered/Equipment Inoperable: Date 061688 Time 1815

Redundant Train verified OPERABLE? (YES) NO NA

ACTION

Action Required 3.3.1. WITH THE NUMBER OF CHANNELS OPERABLE ONE LESS THAN THE TOTAL S/U MAY CONTINUE PROVIDED THE INOP CHANNEL is BYPASSED WITHIN 1 HOUR. Action Due: Date 061688 Time 1915

Responsible Dept. acknowledge Sig. N/A Date/Time N/A

Action Taken to meet Action Required (YES) NO NA IF Yes, list below. IF No, write PRO.

Notes: CH "B" CPC PLACED IN BYPASS

Action Completed: Verified 061688 [signature] DATE/Time 1830

ACTION due to component failure? YES (NO) IF Yes; STA Generate EER

Common System YES (NO) IF Yes, Notify other Units

SEIS Manual Alarm required YES (NO) IF Yes, Train ______ System ______

RPS/EFSAS Channel in Bypass or Trip (YES) NO IF Yes, place copy in Mode 4 section of book and route copy to PRB secretary

PRB Approval to continue Operation (YES) NO ~~(NA)~~ 6/17/88

Approved By: [signature] SS/ASS Reviewed By: [signature] Duty STA

CLOSED OUT

Describe Actions Taken To Restore Equipment to Proper Lineup and OPERABLE Condition: Performed troubleshooting and software reloading per W.O. 301672 & 72MT-2SS01 verified numbers used in calculating DNBR [illegible] 5-21-88 / Satisfies retest [signature] 6-21-88

Work Complete (YES) NO Verified By: [signature] Date/Time 6-21-88 1905

Additional Pages YES (NO) IF Yes, Additional Work Items Complete YES NO

Site Mod./PCP/T-Mod YES (NO) IF Yes, System Engineer Verifies System capable of supporting OPERABLE status, IF No, NA Eng. Signature

System Engineer NA Date/Time N/A

System Lineup/Retest Complete Verified By: [signature] Date/Time 6-21-88 / 1935

Resp.Dept. acknowledge OPERABLE Sig. [signature] Date/Time 6-21-88 / 1935

Equipment Declared Operable: Date 6-21-88 Time 1944

Approved By: [signature] SS/ASS Reviewed By: [signature] Duty STA

SEIS Manual Alarm required YES NO NA IF No, Cancel manual alarm

Common System YES NO IF Yes, Notify other Units