PALO VERDE
NUCLEAR GENERATION STATION

SIMULATOR

1991
CERTIFICATION SUBMITTAL

APS

Arizona Public Service Company

PVNGS SIMULATOR
1991
CERTIFICATION SUBMITTAL

SECTION 1

CERTIFICATION PACKAGE OVERVIEW AND TABLE OF CONTENTS

CERTIFICATION PACKAGE OVERVIEW

This Simulator Certification Package contains supporting documentation for the Certification of Arizona Public Service's (APS) Palo Verde Nuclear Generating Station (PVNGS) Unit 1 Plant-Referenced Simulator. Three NRC Forms 474 have been submitted to Certify the Simulator for the three Units at PVNGS; this Certification Package contains the supporting information for all three Certifications.

The Certification Package is separated into individual sections as shown in the Table of Contents. APS has organized these sections to correspond as closely as possible to the requirements of NRC Form 474 and the Simulator documentation guidelines of ANSI/ANS-3.5-1985, Appendix A. To facilitate review of the Certification Package, the contents of each of the sections is briefly described in the following paragraphs.

Section 1, Certification Package Overview and Table of Contents, contains this overview of the package, and listing of the sections of the Certification Package.

Section 2 of the Certification Package, **Exceptions to the Requirements and Justification,** lists the exceptions which we have identified to the Certification requirements and the justification for these exceptions.

A description of the PVNGS Simulator, its features and capabilities, and the Simulator configuration management programs implemented by APS are addressed in Sections 3, 4, 5, and 6. **Section 3, General Simulator Information,** provides an overview of the Simulator layout and manufacturing information. **Section 4, Description of Simulator Programs,** includes a synopsis of the procedures implemented by APS for the operation, maintenance, upgrade, and Certification of the Simulator. **Section 5, Instructor Interface,** describes the Training features and capabilities of the PVNGS Simulator accessed through the Instructor's Station. Lists of the Initial Conditions, Malfunctions, and Remote Functions are also provided in this section. The Simulator operating limits and software modeling simplifications and assumptions are included in **Section 6, Simulator Functional Fidelity Limits.**

Section 7, Test Abstracts, provides abstracts of the tests conducted to verify the accuracy and fidelity of the Simulator response. Each abstract includes a brief description of the test, the conditions under which the test was conducted, the expected results of the test, and any deficiencies identified during the conduct of the test. Testing included normal evolutions, malfunctions, transients, and steady state conditions, as well as real time and instructor station tests.

Section 8, Periodic Test Schedule, includes the projected schedule for the performance testing to be conducted during the next 4 years. This schedule has been designed to perform approximately 25% of the tests per year such that all tests are completed within 4 years.

Section 9 contains summaries of Simulator **Discrepancy Reports.** Discrepancy Reports identify differences noted between the Simulator and the Simulator design data or known plant response. Typically, Discrepancy Reports indicate needed corrections to the simulation software or hardware. The procedures described in Section 4 of the Certification Package detail the processing of Discrepancy Reports.

Section 10, Simulator to Unit Differences, identifies the differences noted between the Simulator and each of the three PVNGS Units. The analysis of differences included hardware, environment, design, procedures, Technical Specifications, and operational characteristics.

Several APS and contractor technical and expert personnel participated in the review, analysis and evaluation of the Simulator to the design data and PVNGS units. A brief description of the qualifications and experience of those personnel is included in Section 3 of the Certification Package.

APS has included in the Certification Package all documentation required to be submitted for the Certification of the PVNGS Simulator. Additional supporting information, including Simulator design data, test procedures, and specific test results are available at the PVNGS Simulator site if required.

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SECTION 2

EXCEPTIONS TO THE REQUIREMENTS AND JUSTIFICATIONS

CERTIFICATION EXCEPTIONS AND JUSTIFICATIONS

The Certification Package Exceptions and Justifications were developed to document the exceptions to the requirements of ANSI/ANS-3.5-1985. These exceptions primarily deal with items related to Boiling Water Reactors, Power Operated Relief Valves, and sustained critical operations with less than full reactor coolant flow.

1. All items in ANSI/ANS-3.5-1985 specific to Boiling Water Reactor (BWR) Plants.

   An exception for this is justified because Palo Verde is a Pressurizer Water Reactor. No BWR training is provided to the Palo Verde Operators.

2. Malfunctions affecting the operation of reactor coolant system Power Operated Relief Valves (PORV's).

   Palo Verde does not have PORV's installed in the reactor coolant system. No training on reactor coolant system PORV's is provided to the Palo Verde Operators.

3. Startup, shutdown and power operations with less than full reactor coolant flow.

   Palo Verde's reactor protection system does not permit power operation with less than full reactor coolant flow. Palo Verde is not analyzed for startup, shutdown, or power operations with less than full reactor coolant flow. No training is provided to the Palo Verde operators on startup, shutdown, or power operations with less than full reactor coolant flow.

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SECTION 3

GENERAL SIMULATOR INFORMATION

REFERENCE PLANT GENERAL INFORMATION

Owners:	Arizona Public Service Company Salt River Project Agricultural Improvement and Power District El Paso Electric Company Southern California Edison Company Public Service Company of New Mexico Los Angeles Department of Water and Power Southern California Public Power Authority
Docket:	50-528
Operator:	Arizona Public Service
Location:	Palo Verde Nuclear Generating Station Wintersburg, Arizona
Manufacturer:	Combustion Engineering (NSSS) Bechtel (AE)
MW Output:	1270 MWe
NSSS:	2-Loop PWR
Commercial Operation:	1985 (Unit 1)

SIMULATOR GENERAL INFORMATION

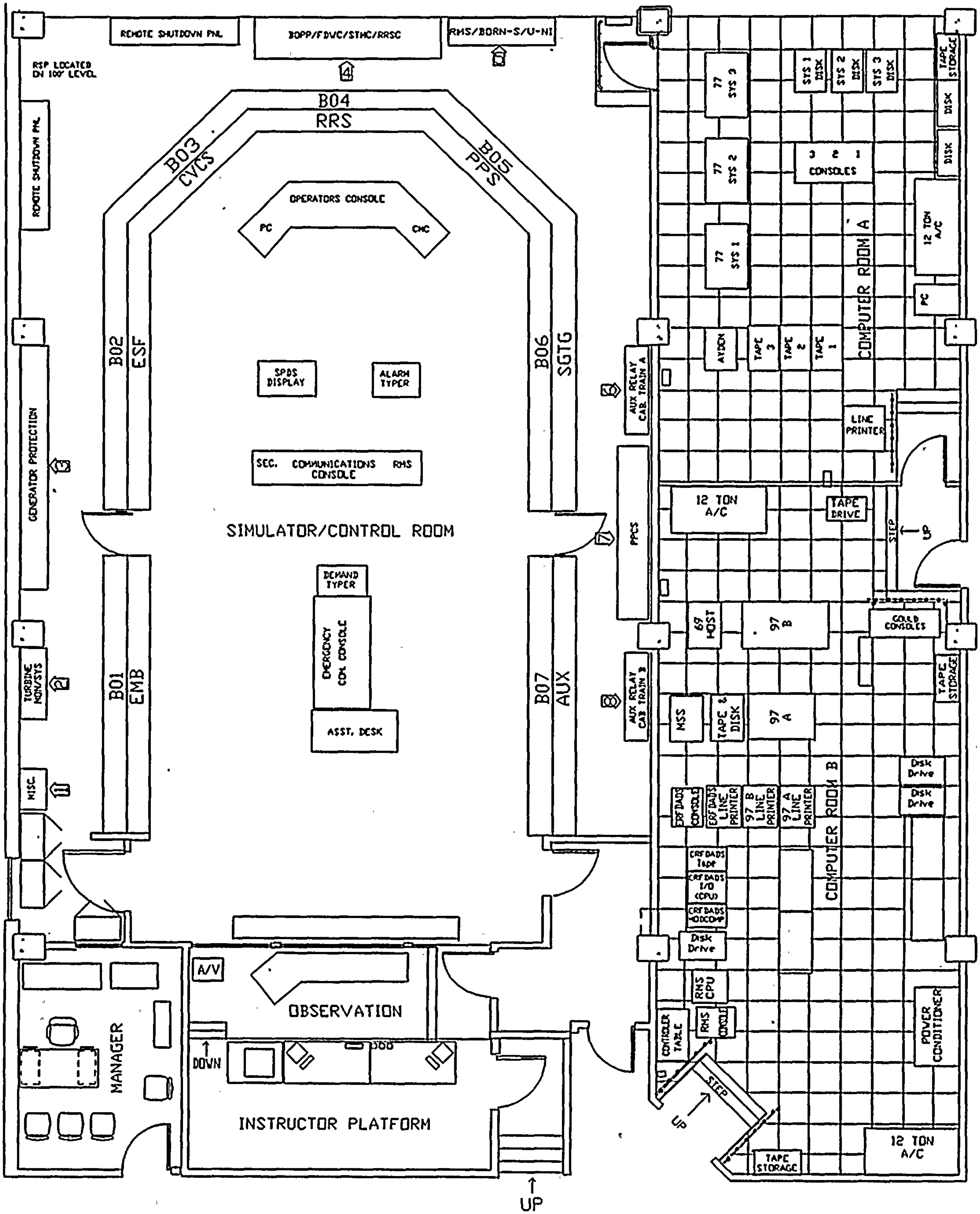
Owners:	Arizona Public Service Company Salt River Project Agricultural Improvement and Power District El Paso Electric Company Southern California Edison Company Public Service Company of New Mexico Los Angeles Department of Water and Power Southern California Public Power Authority
Operator:	Arizona Public Service
Location:	Palo Verde Nuclear Generating Station Wintersburg, Arizona
Manufacturer:	Electronic Associates Incorporated
1991 Model Upgrade:	S3 Technologies
Initial Ready for Training:	October, 1980

COMPUTER CONFIGURATION

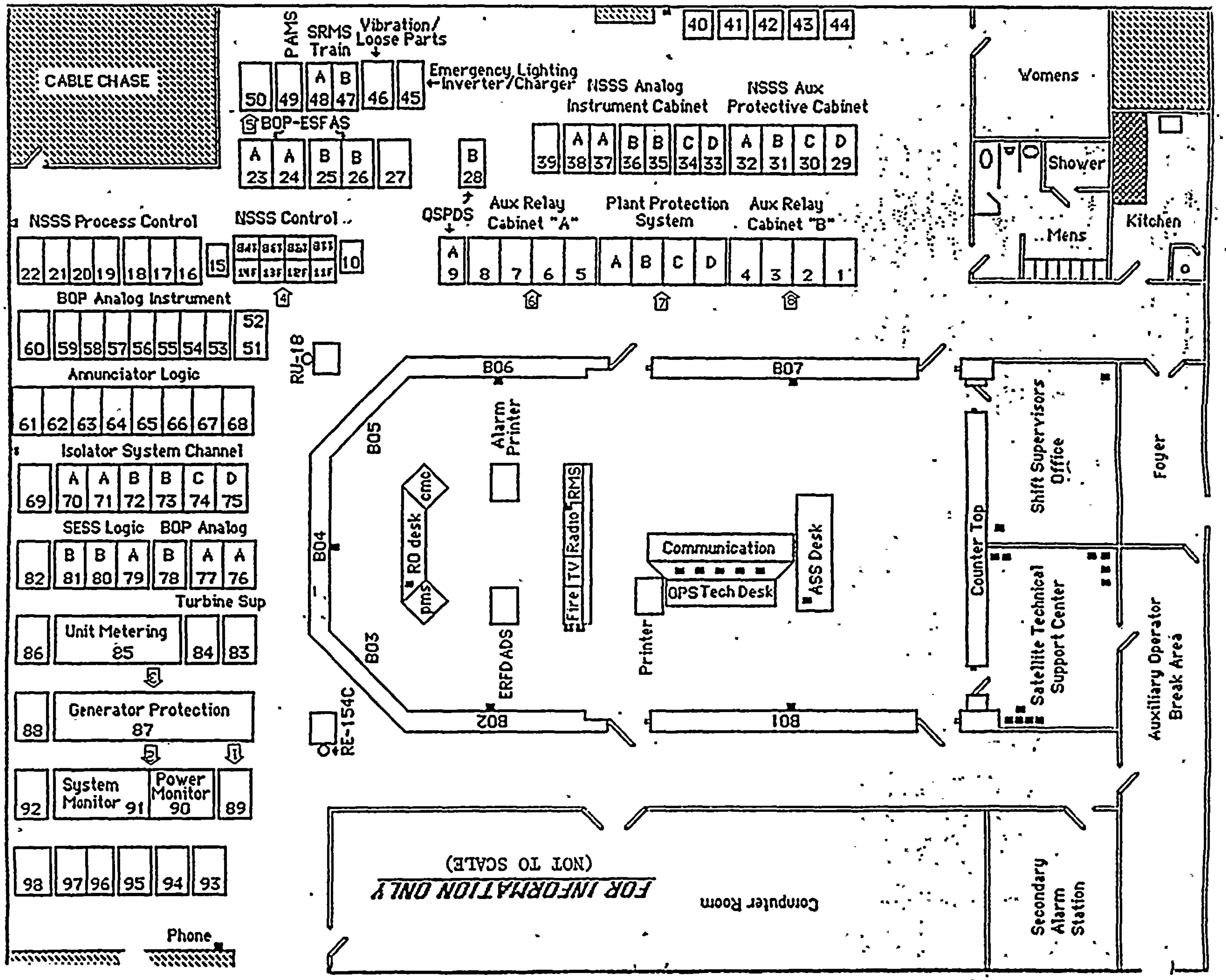
Encore/9780		Dual 32 Bit Processors
97A		SEL BUS
		MP BUS
	w/	10 MB Main Memory
		16 KB Cache Memory
		12 MB Shadow Memory
		High Speed Data Interface (1)
Encore/9780		Dual 32 Bit Processors
97B		SEL BUS
		MP BUS
	w/	16 MB Main Memory
		64 KB Cache Memory
		High Speed Data Interface (2)
		8 MB Shadow Memory
Encore/7780		Dual 32 Bit Processors
		SEL BUS
	w/	1.8 MB Main Memory
		High Speed Data Interface (1)
Encore MS2		1MB Shared Memory (3)
MODCOMP (2)		
DEC/PDP 11/34 (4)		
Compac 386/33 (5)		Single 32 Bit Processor with Weitek 3167 Co-Processor
		Math Co-Processors
		8 MB Main Memory
		Unix-X/IS X-Window Operating System

(1) The 97A and 77 machines are linked together via the HSD link. The 77 provides Input/Output to the Simulator panels.
(2) Stimulated MODCOMP ERFDADS computer receiving process data via HSD to the 97B.
(3) The 9780 machines are linked together through shared memory.
(4) Stimulated DEC Radiation Monitoring System receiving process data via ACM ports from 97B.
(5) There are a total of three (3) instructor station PC's

PVNGS SIMULATOR BOARD AND COMPUTER LAYOUT



PVNGS UNIT 1 CONTROL ROOM LAYOUT



ARIZONA PUBLIC SERVICE COMPANY PERSONNEL CREDENTIALS

Project Management

David C. Brown
Control Room Simulator Upgrade Project Manager

Mr. Brown has been in this position for 2 years. Mr. Brown has over 23 years with the Arizona Public Service Company in computer programming and project management. Mr. Brown's previous assignment was the Corporate Computer Services Manager of Arizona Public Service's Real-Time Energy Management System Computer Network. Mr. Brown has a Bachelor of Science Degree in Electronics Technology from Northern Arizona University and has completed graduate work in Power Systems Engineering.

Thomas C. Cannon
PVNGS Simulator Support Supervisor

The Simulator Support Supervisor has the Simulator Senior Software, Hardware, Testing and Configuration Management Engineers reporting directly to him. Mr. Cannon has been in this position for 1 year. Mr. Cannon has over 15 years experience in the Nuclear industry. Since 1981, Mr. Cannon has been involved in Startup, Testing, Operations and Training at PVNGS. Mr. Cannon currently holds a Senior Reactor Operator License at PVNGS. Mr. Cannon also holds a Bachelor of Science Degree in Physics from the University of the State of New York. Prior to this assignment, Mr. Cannon held the Lead Licensed Operator Simulator Instructor position. Mr. Cannon was directly involved with Simulator test development, performance, review, and evaluation.

ARIZONA PUBLIC SERVICE COMPANY PERSONNEL CREDENTIALS

Performance Testing and Evaluation

Bradley Lee
PVNGS Senior Nuclear Instructor

Mr. Lee has over 9 years Commercial and 5 years Military nuclear power plant experience. Mr. Lee acquired a PVNGS Senior Reactor Operators Certification and is a qualified Nuclear Instructor at PVNGS. Mr. Lee was instrumental in the development of the Simulator startup and shutdown test procedures.

Mark McGhee
PVNGS Reactor Operator

Mr. McGhee has over 6 years Commercial and 6 years Military nuclear power plant experience. Mr. McGhee currently holds a PVNGS Reactor Operators License. Mr. McGhee was instrumental in the development and performance of the Simulator Acceptance Test procedures. Mr. McGhee was also involved with the PDS review and the development of the remote functions and malfunctions list.

Charles Oliver
PVNGS Senior Reactor Operator

Mr. Oliver has over 8 years Commercial and 6 years Military nuclear power plant experience. Mr. Oliver currently holds a PVNGS Senior Reactor Operators License. Mr. Oliver was involved with the Acceptance Testing of the PVNGS Simulator.

Greg Reynolds
PVNGS Reactor Operator

Mr. Reynolds has over 7 years Commercial and 9 years Military nuclear power plant experience. Mr. Reynolds currently holds a PVNGS Reactor Operators License. Mr. Reynolds was involved with the Acceptance Testing of the PVNGS Simulator. Mr. Reynolds is a member in good standing of the Professional Reactor Operator Society.

ARIZONA PUBLIC SERVICE COMPANY PERSONNEL CREDENTIALS

<u>Performance Testing and Evaluation</u>

William Rudolph
Supervisor Operations Training

Mr. Rudolph has more than 20 years of Commercial nuclear power plant experience. Mr. Rudolph currently holds a PVNGS Senior Reactor Operator License. Mr. Rudolph is an Certified PWR Simulator Instructor (CE, PVNGS). Mr. Rudolph conducted the unit design differences evaluation for the Simulator Certification Submittal.

Eric Shouse
Simulator Tester III

Mr. Shouse has over 8 years Commercial and 6 years Military nuclear power plant experience. Mr. Shouse currently holds a PVNGS Senior Reactor Operators License, and is a qualified Nuclear Instructor at PVNGS. Mr. Shouse was instrumental in the development and performance of the Simulator Acceptance Test procedures. Mr. Shouse was also involved with the PDS review and the development of the Initial Conditions sets.

Thomas Stahler
PVNGS Nuclear Instructor III

Mr. Stahler has over 8 years Commercial and 6 years Military nuclear power plant experience. Mr. Stahler currently holds a PVNGS Senior Reactor Operators License. Mr. Stahler was involved with the Acceptance Testing of the PVNGS Simulator.

Kenneth Thommen
PVNGS Reactor Operator

Mr. Thommen has over 7 years Commercial and 6 years Military nuclear power plant experience. Mr. Thommen currently holds a PVNGS Reactor Operators License. Mr. Thommen was instrumental in the development and performance of the Simulator Acceptance Test procedures. Mr. Thommen was also involved with the PDS review.

ARIZONA PUBLIC SERVICE COMPANY PERSONNEL CREDENTIALS

Simulator Hardware

Mons Ellingson
Senior Simulator Computer Engineer

Mr. Ellingson has been in this position for over 1-1/2 years. Mr. Ellingson has been with Arizona Public Service Company for over 20 years. Prior to this assignment, Mr. Ellingson was a Senior Control and Instrumentation Engineer with the Arizona Public Service Company's Energy Management System Department, responsible for hardware installation, maintenance, and repair. Mr. Ellingson performed hardware upgrades and maintenance on the PVNGS Simulator. Mr. Ellingson was responsible for the Simulator computer complex and participated in the comparison and review of hardware differences between the Simulator and the Reference-Plant.

Steve Lindner
Simulator Computer Engineer II

Mr. Lindner has over 13 years of computer and electronics installation, repair, and maintenance experience. Mr. Lindner has been in his current position for over 1-1/2 years. Mr. Lindner has completed Customer Relations and Service courses for 1700 systems, Cyber 1800 systems, IBM Series I systems, and magnetic storage devices and peripherals offered by Control Data Corporation. Mr. Lindner performed hardware upgrades and maintenance on the PVNGS Simulator.

Charles McDuffie
Simulator Computer Engineer I

Mr. McDuffie has over 15 years of Simulator Hardware maintenance experience, 10 of which have been on the PVNGS Simulator. Mr. McDuffie has completed the SEL computer architecture and peripherals training course offered by Gould Computer Systems (currently ENCORE). Mr. McDuffie has completed multiple Air Force electronic maintenance and Simulation technology courses. Mr. McDuffie performed hardware upgrades and maintenance on the PVNGS Simulator.

ARIZONA PUBLIC SERVICE COMPANY PERSONNEL CREDENTIALS

Simulator Software

Dr. Majid Saba
Senior Simulator Engineer

Dr. Saba is currently a Senior Software Engineer and Senior Safety Analysis Engineer at PVNGS. He has over 9 years of Commercial power plant experience. Dr. Saba held a title of Senior Design Engineer at Combustion Engineering Incorporated before joining PVNGS. Dr. Saba has had extensive experience in modeling and running reactor thermal hydraulics, reactor protection and monitoring system computer codes (RETRAN, VIPER, ESCORE, FREY, DATATRAN, CEPAC, and Combustion Engineering codes such as LOCA, CPC, COLSS and HRISE). Dr. Saba has been directly involved with RETACT, Core, CPC, COLSS and containment simulation models and developed the service water simulation model for the PVNGS Simulator Upgrade Project. He received his Bachelor of Science Degree in Electrical Engineering from the University of Washington and received his Master of Science Degree and Ph.D. in Nuclear Engineering from Rensselaer Polytechnic Institute.

Dr. Saba is the author of publications in Journals of International Multiphase Flow, Nuclear Technology, ANS, and NUREG/CR-2590.

John Caraway
Simulator Engineer I

Mr. Caraway has over 16 years Commercial and Military nuclear power Operations and Training experience, and 3 years Computer Programmer/Analyst experience. Mr. Caraway was a Certified Senior Reactor Operator at Detroit Edison. Mr. Caraway was involved with the modification and maintenance of the SATAR data acquisition software. Mr. Caraway performed modifications and enhancements to the Simulator service water model.

ARIZONA PUBLIC SERVICE COMPANY PERSONNEL CREDENTIALS

Configuration Management

Brian McAuliffe
Simulator CMS Engineer III

Mr. McAuliffe has over 6 years Commercial and 6 years Military nuclear power plant experience. Prior to this assignment, Mr. McAuliffe was an INPO certified NLO Instructor. Mr. McAuliffe has successfully completed the PVNGS Licensed Operator Academic Fundamentals course. Mr. McAuliffe has held positions in PVNGS Operations, Work Control, and the Procedure Group. Mr. McAuliffe was involved with development of the Simulator CMS program, the Simulator Certification Administrative Control procedure, and the Simulator Configuration Control Procedures. Mr. McAuliffe coordinated the Simulator Certification Submittal development.

Deborah McGuire
Simulator CMS Technician

Ms. McGuire has worked for Arizona Public Service Company for over 10 years. Ms. McGuire has held the CMS Technician position for over a year. Ms. McGuire was responsible for tracking and maintenance of the CMS computerized databases. Ms. McGuire performed the data conversions on TDAS raw data for use by the SATAR software.

ARIZONA PUBLIC SERVICE CONTRACTOR PERSONNEL CREDENTIALS

Consultant

Fred Grams
Vice President, Simulation Services
General Physics Corporation

Mr. Grams has over 12 years Commercial and 8 years Military nuclear power plant experience. He has been a Certified Senior Reactor Operator at three different boiling water reactor plants. Mr. Grams is also a member of ANSI/ANS 3.5 Committee for Nuclear Power Plant Simulators for use in Operator Training. Mr. Grams served as a Technical Advisor for the duration of the PVNGS Simulator Upgrade Project and participated in the review of documentation collected for the Certification Package to be submitted with the NRC Form 474.

Performance Testing and Evaluation

Michael Kelley
Simulator Performance Consultant

Mr. Kelley has over 15 years Commercial nuclear power plant experience. Mr. Kelley has had over 9 years Simulator Test Operator experience during that time. Mr. Kelley holds a CE PWR Senior Reactor Operator License. Mr. Kelley has a Bachelor of Science Degree in Mathematics and Psychology from Eastern Michigan University. Mr. Kelley was involved with the development and performance of Simulator Acceptance Tests.

Arthur Oxfurth
Training & Maintenance Management Corporation (Consultant)

Mr. Oxfurth has over 30 years experience in various aspects of the power generation industry. Mr. Oxfurth holds a General Electric BWR Operator Certification. Mr. Oxfurth spent seven years as a member of the Office of Nuclear Reactor Regulation and the Office of Inspection and Enforcement (USNRC). Mr. Oxfurth assisted in development of Simulator Acceptance Test Procedures.

S3 TECHNOLOGIES PERSONNEL CREDENTIALS

Mark Ives
Program Manager S3 Technologies

Mr. Ives has over 21 years of Commercial and Military nuclear power plant experience. Mr. Ives has formerly held a Reactor Operators License from the H. B. Robinson Nuclear Power Plant. Mr. Ives has been a Staff Test Operator with S3 Technologies (formerly Singer Link-Miles Corporation) for 6 years. Mr. Ives has successfully completed the Reactor Operations Training Course at North Carolina State University. Mr. Ives is a member in good standing of the American Nuclear Society. Mr. Ives has all S3 Technologies personnel reporting to him and was the S3 Technologies Program Manager for the PVNGS Simulator Upgrade Project. Mr. Ives participated in Acceptance Test Procedure development and performance.

Jerry Stephens
Staff Test Operator, S3 Technologies

Mr. Stephens has 6 years Commercial and 8 years Military nuclear power plant experience. Mr. Stephens has formerly held a Reactor Operators License from Arkansas Nuclear One. Mr. Stephens has been a Staff Test Operator with S3 Technologies for over 4 years. Mr. Stephens was involved with Acceptance Test Procedure development and performance.

Christopher Narmi
Certification Consultant, S3 Technologies

Mr. Narmi has 9 years experience in Commercial nuclear power. Mr. Narmi has formerly held a Senior Reactor Operator License for a multi-unit Westinghouse facility and was a Certified Shift Technical Advisor for a multi-unit Combustion Engineering facility. Mr. Narmi was a Training Specialist for Simulator Certification of both Westinghouse and CE facilities, and a Technical Staff Engineer. Mr. Narmi holds a Bachelor of Science Degree in Nuclear Engineering from the University of Florida. Mr. Narmi participated in Acceptance Test development and performance, various evaluations of Unit differences, and Simulator Program (CMS) development.

Thomas Suttner
Engineering Services, S3 Technologies

Mr. Suttner was a Licensed Reactor Operator on a Westinghouse Reactor for 9 years. Mr. Suttner has held a Test Operator and Program Manager with S3 Technologies for over 9 years. Mr. Suttner was the vendor consultant during the NRC Main Yankee Simulator Audit. Mr. Suttner was the Manager of the Certification effort on the PVNGS Simulator.

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SECTION 4

DESCRIPTION OF SIMULATOR PROGRAMS

DESCRIPTION OF SIMULATOR PROGRAMS

ANSI/ANS-3.5-1985 requires that a Simulator Configuration Management system be in place to ensure continued fidelity with the Reference Plant. The Certification program for the PVNGS Unit 1 Plant-Referenced Simulator is established by the Simulator Certification Administrative Control procedure. This procedure outlines the methods and process to achieve and maintain Certification as required by 10 CFR 55.45. Additional configuration control programs for the Simulator are divided into five functional areas: Design Control, Performance Testing, Operator Feedback, Load Control, and Instructor's Guide and Reporting. These programs are briefly described in the following sections.

1. Design Control

   A. Simulator Design Database

      The Simulator Design Database consists of all documents required to establish the current design configuration of the Simulator. This includes those documents contained in the Final Design Specifications (FDS) developed by S3 Technologies during the upgrade of the Simulator.

   B. Simulator Update Design Database

      In the period of time between the data freeze and ready-for-training dates of the PVNGS Simulator Upgrade Project, a number of revisions to the design documents have occurred. These revisions have been collected and stored in the Simulator Update Design Database. Following Initial Certification, these design revisions will be evaluated to determine if a Simulator Upgrade is required to incorporate the change. For required changes, Simulator Work Orders shall be generated and used to implement modifications to the Simulator hardware and software. All elements in the Update Design Database at Initial Certification will be evaluated for Simulator impact within twelve (12) months. Those determined to have Simulator impact will be incorporated into the Simulator design within twelve (12) months following their review.

      On a continuing basis, changes to the plant design are received and stored in the Simulator Update Design Database. At the annual meeting of the Simulator Oversight Committee, a determination of the Simulator impact of each change is reached. Plant design changes requiring Simulator modifications are scheduled for implementation within twelve months following the annual meeting.

C. Simulator Deficiency Reports

The Simulator Deficiency Report Program establishes and controls a method which facilitates corrections to the Simulator's design. Simulator Deficiency Reports are used to correct the hardware and software to more accurately reflect the Simulator Design Database.

D. Simulator Work Orders

The Simulator Work Order Program establishes a method of updating the Simulator's design to keep pace with design changes in the Plant. Simulator Work Orders are used to upgrade, expand, or replace portions of the scope of simulation. As documentation of plant design changes are received, they are included in the Simulator Update Design Database. As described above, these design changes are reviewed annually to determine if a modification to the Simulator design is required. For those design changes which require Simulator modifications, Simulator Work Orders are prepared which provide instructions for the implementation of the modification. Upon completion of a Simulator Work Order, the modification is fully tested. Following satisfactory completion of the testing, the Work Order design documents are removed from the Simulator Update Design Database and added to the Simulator Design Database.

2. Performance Testing

Performance testing validates the functional fidelity of the Simulator relative to its design database. While it is impractical to analyze the Simulator's performance for every imaginable scenario, it is possible to produce a high level of confidence in the Simulator's functional fidelity by conducting a broad range of tests. The range of testing consists of the areas of plant operations for which Licensed Operators are trained and examined. This includes Normal, Abnormal and Emergency Operations.

Two approaches are used in testing. The first uses a prepared test procedure. The test procedure defines the Initial Conditions, the actions to be taken, and the expected Simulator response. The second approach uses the Plant's own operating procedures as the test procedure. The Plant procedures have been thoroughly researched and in many cases have been performed in the Simulator. Performance of the procedures on the Simulator demonstrates the Simulator's capability to support those evolutions which are proceduralized in the Plant.

The Simulator's performance is compared to Palo Verde plant data whenever possible. When no Palo Verde plant data is available, the Simulator's performance is compared to engineering code analysis or best estimates of Palo Verde performance. Best estimates are based on Palo Verde design data, similar plant performance data, or the professional opinion of Subject Matter Experts, namely Licensed Reactor Operators and Senior Reactor Operators.

The basic elements of simulation are also validated. These include the real-time dynamic simulation capability, the man-machine interface functions, and the simulation control functions.

3. Operator Feedback

For the Simulator to be an effective training and examination resource, it must be responsive to the needs of the Licensed Operator Training program. A programmatic approach to the communication between the Simulator Support staff and the Simulator's users ensures that requests from the users are evaluated, dispositioned, justified, documented, and the results fed-back to the initiators. The program is open to all Simulator users including Instructors and trainees. The principal benefit of such an approach is the closed loop. Simulator users who take the time to comment can be assured that the Simulator Support staff will thoroughly consider their comments. The Simulator Support staff records the evaluation results of any comments and provides this information back to the initiator.

An added benefit of this programmatic approach is the ability to solicit assessments of Simulator performance by plant performance Subject Matter Experts.

A Simulator Oversight Committee has been established to make recommendations to Palo Verde management regarding the simulation facility. The Committee is composed of Simulator Support, Licensed Operator Training, and Operations personnel. The group's activities focus on the long range assessment and planning relative to Simulator use and maintenance needs. The committee will meet periodically. The purpose of the monthly meeting is to discuss Simulator training and examination use, maintenance scheduling, and budgetary concerns. The meeting also offers the Simulator users another opportunity to voice concerns which they feel have not been adequately addressed via the feedback process. An annual meeting of the Committee is also held to focus on long term Simulator planning.

The final element of the Simulator users interface is the Training Load Report. This report summarizes all the improvements incorporated in a new training load and is sent to the Licensed Operator Training Group before any new load is made available for training. Upon receipt of the report, Licensed Operator Training may request an opportunity to preview the new load.

4. Load Control

Following Initial Certification, it is necessary to control the method by which software changes are made. This protects the fidelity of the load used for Operator training and examinations. All development and corrective work are completed on a development load. After a period of time, all new work on the development load is stopped and the changes are tested and tuned as necessary to produce the correct response. When all changes have been satisfactorily tested, they are incorporated into a new training load. New training loads are created at the discretion of the Simulator Support Supervisor.

5. Instructor's Guide and Reporting

The Simulator Instructor's Guide describes the status of several Simulator maintenance programs and provides a comprehensive listing of the Simulator's capabilities. This Guide serves as a primary interface between the Simulator Support Group and the Simulator users.

The documentation and reporting requirements relative to the Initial Certification Report are also specified in this program. Additionally, the documentation and schedule requirements for quadrennial Certification Reporting are included in this program.

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SECTION 5

INSTRUCTOR INTERFACE

Location and Operation of Instructor Controls

Initial Conditions

Malfunctions

Remote Functions

LOCATION AND OPERATION OF INSTRUCTOR CONTROLS

The primary location for operating and monitoring the Simulator is the Instructor Station in the Instructor area. The Instructor area is located behind a one-way glass partition which forms the back wall of the Simulator. Available in this area are:

1. Two Control Monitor CRTs and keyboards.

2. Communications equipment supporting the simulation of the control room environment:

   a. A multi-line telephone which simulates various in-plant departments.

   b. A radio 'repeater' which allows simulation of in-plant radio communications.

The primary method of Simulator control is the X Window Instructor Station (X/IS). X/IS is an advanced man-machine interface based on the X Window system. The X/IS interface consists of a color monitor, keyboard, and pointing device (mouse).

The color monitor is used to display Simulator status and control options. The keyboard and mouse are used to control the X/IS display and select Simulator control options. The mouse is used to activate control options graphically represented on the color monitor. This is accomplished by "pointing" to an option and "clicking" the mouse to activate the option. The keyboard can also be used to directly input control options by means of the Expert Control Mode. The Expert Control Mode accepts keyword control commands from any display and activates them immediately.

The following functions are included in the X/IS and are available to the Instructor in support of simulation:

1. <u>Remote Functions</u>

   Remote functions are classified into two broad categories: Local Operator Actions (LOA) and Environmental Parameters (EP).

   Local Operator Action are remote functions which allow the Instructor to implement simulated system control operations which cannot be performed from the Simulator control boards. LOAs are either digital or analog functions. The digital functions generally consist of OPEN/CLOSED or ON/OFF operations. Analog functions can be assigned any value over a specified range (e.g., 0-100%, 0-360 degrees, etc).

Environmental Parameters (EP) are remote functions which allow the Instructor to control simulation variables which correspond to site environmental conditions (e.g., wind speed, ambient temperature, etc).

Remote functions can be activated either immediately, after a specified delay, or contingent upon another event. The event contingent insertion of a remote function is commonly referred to as "event triggering".

2. <u>Malfunctions</u>

The Simulator has the capability to simultaneously or sequentially insert a maximum of sixty (60) malfunctions.

Malfunctions may be conveniently inserted either by activating the malfunction symbol on the system's X/IS simulation diagram or directly from the command line via an Expert Mode command. Malfunctions can be inserted either immediately, after a specified delay, or contingent upon an event (event triggered). Event triggers are available only from Expert Mode commands.

Where the Operator actions required by a malfunction are a function of the severity of the malfunction, the Simulator has incorporated a variable (analog) severity malfunction capability. Where the Reference-Plant malfunction would be expected to proceed from some condition of minimum severity to a more severe condition, an adjustable severity ramp rate capability has also been provided. The ramp allows the Instructor to specify the initial and final severities and the time to ramp from initial to final.

Recoverable malfunctions can be deleted at any point in a simulation scenario. Recoverable malfunctions are generally those which can be remedied by some postulated local action at the malfunction site.

Nonrecoverable malfunctions are generally those which would require some activity beyond the scope of simulation. Most piping leaks/ruptures are considered non-recoverable since it would be unrealistic to assume that a piping failure could be repaired within the time frame of most simulation scenarios. Isolation valves can be used to isolate leaks if the valves are within the simulated system's scope and can be controlled either from the control board or by remote function. Non-recoverable malfunctions can only be deleted by reset to an Initial Condition.

The introduction of any malfunction does not alert the Operator (Trainees) to the impending malfunction in any manner other than would occur in the actual plant.

3. Input/Output Overrides

Input/Output (I/O) overrides allow the Instructor to simulate the failure of control panel devices. All panel devices except multi-point recorders, CRT displays, synchroscopes, and numeric (BCD) read-outs can be overridden. A maximum of sixty (60) overrides may be active at one time. Overrides can be inserted either immediately, after a specified delay, or contingent upon an event (event triggered).

Because I/O overrides interrupt the normal operation of the simulation model, they are considered valid only in the context in which they are tested. Except for the scenarios in which an override has been tested and evaluated, it is generally considered outside the scope of Certification. It is the responsibility of the Instructor using an override to ensure that the fidelity of simulation remains valid in the context in which the override is used.

4. Initial Conditions

The Simulator is capable of initializing to any of sixty (60) pre-set Initial Conditions (IC's). Twenty-nine (29) of the IC's are "operational" for training purposes and are password protected to prevent inadvertent corruption. The "operational" or validated status of the protected IC's is established by the performance of a plant startup or shutdown in accordance with the Plant's operating procedures.

Initial Conditions are established by resetting to the IC set and performing a switch check verification. The Simulator will not automatically transfer to an operational status until all switches are properly aligned to the IC set. A manual switch check override feature is available to allow reset and transfer to the operational status without proper switch alignment.

5. Snapshot

The snapshot function allows the Instructor to record the current Simulator status in an unprotected IC set. Snapshots may be stored in the protected IC's only if the correct password is employed.

6. Backtrack

When placed in Run mode, the Simulator status is automatically recorded and stored at a frequency selected by the Instructor. The default frequency is once per minute. The backtrack function allows the Instructor to re-initialize the Simulator to any of these previously recorded conditions of the current simulation run.

A maximum of sixty (60) backtrack records are maintained. If the current simulation run extends beyond sixty (60) update periods, only the most recent sixty (60) backtrack records will be available to the Instructor.

The Simulator is capable of replaying the current simulation run by self stimulation from the backtrack records. All Operator and Instructor manipulations are recorded and used in the stimulation.

7. Archive IC/BC

The Simulator is capable of saving to, or restoring from magnetic tape, a group of Initial Conditions or backtrack conditions. Entire simulation runs can be saved and replayed at a later time.

8. Daily Operational Readiness Test

The Simulator is capable of entering a test mode which enables the Instructor to verify the functionality of all Simulator panel lamps and recorder calibration.

9. Freeze and Run

The Freeze and Run functions of the Simulator allow the Instructor to start and stop the progress of dynamic simulation.

10. Time

The Simulator is capable of operating in four time modes. Real time is the mode of operation in which simulation time corresponds to actual time.

Slow time is the mode of operation in which simulation time corresponds to an Instructor selectable fraction (1/2 to 1/10) of actual time.

Fast time is the mode of operation in which simulation time corresponds to an Instructor selectable multiple of actual time. The multiple of fast time can be independently set for a number of different models and operated concurrently.

Step time is the mode of operation in which simulation is placed in Run and automatically transfers to freeze after an Instructor selectable time interval.

11. Annunciator Control

The Instructor Station is capable of activating the following functions on all annunciators simultaneously: Annunciator Silence, Annunciator Acknowledge, Annunciator Test, and Annunciator Reset.

12. Monitored Parameters

The Instructor Station is capable of simultaneously displaying up to forty (40) Instructor selectable parameters. Any database variable may be selected for monitor display.

The Simulator is also capable of the simultaneous trend plotting of up to six (6) of the forty (40) selected parameters. Parameter resolution is greater than that available to the Operators on the control panels. The trend data is recorded at one half second intervals. A permanent copy of the trend data can be made by a color copier linked to the Instructor Station.

The Simulator is also capable of printing the collation of monitored parameter data collected over a period of time.

13. Simulator Fault

When a Simulator fault is detected, the Instructor is informed of the fault condition via a pop-up window on the Simulator control CRT. The Simulator is automatically transferred to the Fail mode which stops the progress of dynamic simulation. The following conditions will cause a Simulator fault: Simulator Operating Limit Exceeded, Computer Halt, Frame Overtime, Module Stall, or Module Kickout.

The list of known Simulator Operating Limits is presented in Listing of Simulator Functional Fidelity Limits in Section 6 of this Report.

14. Instrument Noise

The Instructor Station is capable of inserting or removing random instrument noise for all instruments modeled with noise capability.

The Simulator is also equipped with the Simulator Automated Testing And Reverification (SATAR) software system. SATAR simultaneously collects up to sixty-four (64) Simulator computed values at a frequency of twice per second and stores the information in a downloadable file. At the completion of a Simulator evolution, the SATAR file can be downloaded to a desktop computer. The desktop computer converts the data to a standardized format and plots the results on either a desktop plotter or laser jet printer.

INITIAL CONDITIONS

The Initial Condition (IC) set was developed by a PVNGS Licensed Senior Reactor Operator utilizing the requirements of ANSI/ANS-3.5-1985, section 3.4.1. The PVNGS Simulator exceeds the minimum requirements of this section.

INITIAL CONDITIONS

01	MOC	5	MID LOOP CONDITION WITH "A" LPSI IN SERVICE
02	MOC	5	RCS FILL AND VENT COMPLETE,CONTAINMENT SPRAY "B" ON SDC, PRESSURIZER AT 90% PRIOR TO STEAM BUBBLE OR NITROGEN BLANKET FORMATION. RCS TEMP 122 DEGREES AND PRESSURE 14.7 PSIA.
03	MOC	5	RCS FILL AND VENT COMPLETE, PRESSURIZER BUBBLE FORMED, SHUTDOWN COOLING ON "A" LPSI, RCS TEMP 130 DEGREES AND PRESSURE 228 PSIA. (NON-CONDENSIBLES STILL EXIST IN PRESSURIZER), STEAM GENERATORS ARE DRAINING.
04	MOC	5	COLD SHUTDOWN WITH "A" LPSI RUNNING, LONG PATH RECIRCULATION ESTABLISHED. NO VACUUM ESTABLISHED.
05	MOC	5	COLD SHUTDOWN WITH "A" LPSI RUNNING, RCP's "1A" AND "1B" RUNNING, PREPARING TO GO ON SHUTDOWN COOLING. CONDENSER VACUUM ESTABLISHED.
06	MOC	5	COLD SHUTDOWN WITH "A" LPSI RUNNING, RCS PRESSURE ELEVATED TO SUPPORT STARTING RCP's, SECONDARY AUXILIARIES RUNNING, NORMAL LETDOWN ESTABLISHED.
07	MOC	4	RCS TEMP 269 DEGREES, SDC SECURED. STEAM LINE WARMUP IN PROGRESS.
08	MOC	3	RCS TEMP GREATER THAN 400 DEGREES, PRESSURIZER PRESSURE AT 1200 PSIA.

INITIAL CONDITIONS

09	MOC	3	NORMAL OPERATING TEMP. AND PRESS., S/G BLOWDOWN IN SERVICE, CRITICAL BORON CONCENTRATION, RTSG OPEN, MAIN TURBINE TRIPPED, 4 RCP's RUNNING, AFN-P01 RUNNING.
10	MOC	3	REACTOR STARTUP, ALL SHUTDOWN AND PL GROUPS WITHDRAWN TO UEL-3, REG. GROUPS FULLY INSERTED.
11	MOC	2	1% POWER, MAIN TURBINE TRIPPED, COMPLETED 41OP-1ZZ03. EQUILIBRIUM XENON.
12	MOC	1	5% POWER, SHELL WARMING COMPLETE, MFWP RUNNING. EQUILIBRIUM XENON.
13	MOC	1	10% POWER, MAIN TURBINE CHEST WARMING COMPLETE. EQUILIBRIUM XENON.
14	MOC	1	10% POWER, MAIN TURBINE AT 1800 RPM READY TO SYNC. EQUILIBRIUM XENON.
15	MOC	1	MAIN TURBINE ON LINE SUPPLYING 80 MW. NAN-SO3 AND NAN-SO4 ON S/U TRANSFORMER. EQUILIBRIUM XENON.
16	MOC	1	MODE 2 TO 1 COMPLETE. EQUILIBRIUM XENON.
17	MOC	1	25% POWER, HEATER DRAIN PUMPS WARMED UP, MSR's BEING PLACED IN SERVICE. EQUILIBRIUM XENON.
18	MOC	1	50% POWER, DOWNCOMER VALVES CLOSED, HEATER DRAIN PUMPS RUNNING, 2 CONDENSATE PUMPS RUNNING, 1 MFWP RUNNING. EQUILIBRIUM XENON.
19	MOC	1	75% POWER, EQUILIBRIUM XENON.
20	MOC	1	100% POWER, EQUILIBRIUM XENON.

INITIAL CONDITIONS

21	BOC	3	REACTOR STARTUP, ALL SHUTDOWN AND PL GROUPS WITHDRAWN TO UEL, REG. GROUPS FULLY INSERTED.
22	BOC	1	10% POWER, MAIN TURBINE AT 1800 RPM READY TO SYNC. EQUILIBRIUM XENON.
23	BOC	1	MAIN TURBINE ON LINE SUPPLYING 80 MW. NAN-SO3 AND NAN-SO4 ON S/U TRANSFORMER. EQUILIBRIUM XENON.
24	BOC	1	MODE 2 TO 1 COMPLETE. EQUILIBRIUM XENON.
25	BOC	1	POWER 50%. EQUILIBRIUM XENON.
26	BOC	1	POWER 100%. EQUILIBRIUM XENON.
27	EOC	3	REACTOR STARTUP, ALL SHUTDOWN AND PL GROUPS WITHDRAWN TO UEL-5 , REG. GROUPS FULLY INSERTED.
28	EOC	1	POWER 50%. EQUILIBRIUM XENON.
29	EOC	1	POWER 100%. EQUILIBRIUM XENON.

MALFUNCTIONS

The Malfunctions listing was developed by several PVNGS Licensed Senior Reactor Operators and Reactor Operators utilizing the requirements of section 3.1.2 of ANSI/ANS-3.5-1985. To meet the requirements of section 3.1.2, the Licensed Operator Training Task list, the Licensed Operator Requalification two year training schedule (91-92), the PVNGS FSAR, the Requalification and Examination Scenario lists, and other documentation which is on file in the Simulator CMS office were used.

MALFUNCTIONS

1. CC02 NUCLEAR COOLING WATER PUMP TRIP (PUMP "A" & "B")
2. CC06 ESSENTIAL COOLING WATER PUMP TRIP (PUMP "A" & "B")
3. CC12 SPRAY POND PUMP BREAKER FAILS TO CLOSE (PUMP "A" & "B")
4. CC16 NCW LEAK INSIDE CONTAINMENT ON COMMON RETURN HEADER IMMEDIATELY UPSTREAM OF NCN-UV-403 (DISCRETE)
5. CH04 CEDM NORMAL ACU FAN MOTOR TRIPS (ALL 4 FANS)
6. CV02 LETDOWN TEMPERATURE CONTROLLER FAILURE (DISCRETE)
7. CV10 CHARGING PUMP TRIP (ALL 3 PUMPS)
8. CV15 LD CONTROL VALVE FAILURE (BOTH VALVES)
9. CV16 RCP SEAL #1 FAILURE (ALL 4 RCP's)
10. CV17 RCP SEAL #2 FAILURE (ALL 4 RCP's)
11. CV18 RCP SEAL #3 FAILURE (ALL 4 RCP's)
12. CV23 LOCA ON LETDOWN LINE DOWNSTREAM OF RHX OUTLET ISOLATION VALVE, CH-UV-523. (DISCRETE)
13. CW01 CW PUMP TRIP (ALL 4 PUMPS)
14. CW02 CONDENSER TUBE RUPTURE (SECTION 1A & 1C)
15. ED01 FAST·BUS TRANSFER RELAY FAILS TO ACTUATE (BOTH BUSES)
16. ED02 UNIT AUXILIARY TRANSFORMER TRIP ON TRANSFORMER FAULT (DISCRETE)

MALFUNCTIONS

17.	ED03	STARTUP TRANSFORMER TRIPS ON TRANSFORMER FAULT (ALL 3 TRANSFORMERS)
18.	ED04	13.8KV BUS UNDER VOLTAGE PROTECTION (NAN-S01 & S02)
19.	ED05	13.8KV INTERMEDIATE BUS TRIP (NAN-S05 & S06)
20.	ED09	LOSS OF POWER TO NON-CLASS 125 VDC BUS (NKN-M45 & M46)
21.	ED10	LOSS OF POWER TO NON-CLASS 120 VAC BUS (NNN-D11, D12, D15, & D16)
22.	ED11	CLASS 4160 VOLT BUS TRIP (PBA-S03 & PBB-S04; NORM & ALT SUPPLY BKRS)
23.	ED12	LOSS OF POWER TO CLASS 125 VDC BUS (PK M41, M42, M43, & M44)
24.	ED14	LOSS OF POWER TO CLASS 120 VAC BUS (PN D25, D26, D27, & D28)
25.	EG02	DG DIFFERENTIAL RELAY TRIP (BOTH DG's)
26.	EG06	DG BREAKER FAILS TO CLOSE (BOTH DG's)
27.	EG08	LOSS OF LOAD DUE TO GENERATOR TRIP (DISCRETE)
28.	EG09	MAIN GENERATOR AC REGULATOR SETPOINT FAILURE (DISCRETE)
29.	EG10	TURBINE FAILS TO TRIP (DISCRETE)
30.	FW01	MOTOR DRIVEN AUX FEED PUMP TRIP (AFN & AFB-P01)
31.	FW03	AFA-P01 SPEED CONTROL FAILURE (DISCRETE)
32.	FW11	CLASS AUX FW PUMP DISCHARGE LINE LEAK (AFA-P01)
33.	FW17	CD PUMP TRIP (ALL 3 PUMPS)

MALFUNCTIONS

34.	FW19	HOTWELL MAKEUP CONTROLLER FAILURE (BOTH)
35.	FW21	CONDENSER AIR IN LEAKAGE (ALL 3 SHELLS)
36.	FW42	FW LP HEATER LEVEL SWITCH FAILURE (EDN-LSHH-425 & 426)
37.	FW53	FW HEADER RUPTURE (DISCRETE)
38.	FW57	FW PUMP-TURBINE SHAFT SHEAR (BOTH PUMPS)
39.	FW61	ECONOMIZER FW RUPTURE INSIDE CONTAINMENT DOWNSTREAM OF CHECK VALVE (BOTH SG's)
40.	FW73	DOWNCOMER FWIV FAILS CLOSED (ALL 4 VALVES)
41.	HV06	CR ESSENTIAL AFU FAN TRIPS (BOTH FANS)
42.	IA01	IA COMPRESSOR TRIP (ALL 3 COMPRESSORS)
43.	IA04	IA HEADER RUPTURE BETWEEN IAN-V215 AND IAN-V311 (DISCRETE)
44.	IA05	IA N_2 BACKUP CONTROL VALVE STICKS CLOSED (DISCRETE)
45.	MS08	MSIV FAILS AS-IS (ALL 4 MSIV's)
46.	MS09	ADV FAILS AS-IS (ALL 4 ADV's)
47.	MS10	STEAM LINE SAFETY VALVE FAILS OPEN (SG-PSV-556, 557, 558, 559, 574, 575, 576, 577, 691, 692, 694, & 695)
48.	MS11	STEAM LINE RUPTURE UPSTREAM OF MSIV (SG1 LINE 1 & SG2 LINE 1)
49.	MS12	STEAM LINE RUPTURE DOWNSTREAM OF MSIV (DISCRETE)
50.	NI01	STARTUP NI PRE-AMP FAILURE (BOTH CHANNELS)

MALFUNCTIONS

51.	NI02	CONTROL CHANNEL NI DETECTOR FAILURE (BOTH CHANNELS, BOTH DETECTORS)
52.	NI04	SAFETY CHANNEL NI MIDDLE DETECTOR FAILURE (CH's "B" & "D")
53.	NI05	SAFETY CHANNEL NI LOWER DETECTOR FAILURE (CH's "B" & "D")
54.	RC01	PRESSURIZER SAFETY VALVE FAILS (RCE-PSV-200 & 201)
55.	RC02	PRESSURIZER SPRAY VALVE FAILS (BOTH VALVES)
56.	RC05	LOCKED ROTOR ON REACTOR COOLANT PUMP (RCP "1A" & "2A")
57.	RD01	DROP/SLIP OF CEA (CEA's "60", "19")
58.	RD02	STUCK CEA (CEA's "04", "87", "21", & "02")
59.	RD03	CEA PULSE COUNTER PROGRAM FAILS (DISCRETE)
60.	RD06	INOPERABLE CEA GROUP (ALL GROUPS)
61.	RD07	UNCOUPLED CEA SPIDER (CEA's "62" & "68")
62.	RD12	UNCONTROLLED REG GROUP MOTION (WITHDRAWAL) (AS & MS)
63.	RD13	UNCONTROLLED REG GROUP MOTION (INSERTION) (AS & MS)
64.	RH05	CONTAINMENT SPRAY PUMP TRIP (BOTH PUMPS)
65.	RH06	LPSI PUMP TRIP (BOTH PUMPS)
66.	RJ02	PLANT (PMS) COMPUTER FAILURE (BOTH COMPUTERS)
67.	RM01	RADIATION MONITOR OUTPUT IS HIGH (RU-29, 30, 31, 145, 37, 38, & 1)

MALFUNCTIONS

68.	RP01	ESFAS ACTUATION CIRCUIT FUSE FAILURE (MSIA TRAIN A LEG 1-3, MSIS-A-2-4, SIAS-A-1-3, SIAS-A-2-4, CIAS-B-1-3, CIAS-B-2-4, CSAS-A-1-3, CSAS-A-2-4, RAS-B-1-3, RAS-B-2-4, AFAS1-B-1-3, AFAS1-B-2-4, AFAS2-A-1-3 AND AFAS2-A-2-4)
69.	RP03	PPS REACTOR PROTECTION SETPOINT FAILURE FOR LOW STEAM GENERATOR LEVEL (ALL 8 DETECTORS)
70.	RP05	BOP ESFAS SEQUENCER FAILURE (BOTH TRAINS)
71.	RP26	PPS REACTOR PROTECTION SETPOINT FAILURE FOR LOW RCS FLOW (ALL 8 DETECTORS)
72.	RP34	RTSG FAILS AS IS (ALL 4 BREAKERS)
73.	RP35	RTSG TRIP (ALL 4 BREAKERS)
74.	RX01	FAILURE TO INITIATE RPCB (DISCRETE)
75.	RX03	RRS T_{AVE} FAILURE (DISCRETE)
76.	RX04	RRS TURBINE FIRST STAGE PRESSURE INPUT FAILS (BOTH DETECTORS)
77.	RX06	RRS COLD LEG TEMPERATURE INPUT FAILS (BOTH DETECTORS)
78.	RX07	SBCS TURBINE RUNBACK CIRCUIT FAILS (PRODUCES RUNBACK) (DISCRETE)
79.	RX08	SBCS QUICK OPEN CIRCUITS FAILS (DISCRETE)
80.	RX09	STEAM HEADER PRESSURE TRANSMITTER FAILS (BOTH DETECTORS)
81.	RX10	SBCS MASTER CONTROLLER FAILS (DISCRETE)
82.	RX13	FWCS S/G LEVEL TRANSMITTER FAILS (ALL 4 DETECTORS)

MALFUNCTIONS

83.	RX14	FWCS STEAM FLOW TRANSMITTER FAILS (ALL 4 DETECTORS)
84.	RX17	FWCS MASTER CONTROLLER FAILS (BOTH CONTROLLERS)
85.	RX18	FWCS REFILL DEMAND CONTROLLER FAILS (BOTH CONTROLLERS)
86.	RX23	PRESSURIZER LEVEL TRANSMITTER FAILS (ALL 3 TRANSMITTERS)
87.	RX24	PLCS MASTER CONTROLLER SETPOINT FAILS (DISCRETE)
88.	RX26	PRESSURIZER PRESSURE TRANSMITTER FAILS (RCN-PT-100Y & X)
89.	RX34	RCS T-HOT TRANSMITTER FAILURE (RC-TT-112HA & HD, 122HB & HC)
90.	RX37	PZR NR PRESSURE TRANSMITTER FAILURE (RC-PT-101A, B, C, & D)
91.	RX40	S/G PRESSURE TRANSMITTER FAILURE (SG-PT-1013A, D, & 1023B)
92.	RX41	S/G NR LEVEL TRANSMITTER FAILURE (ALL 8 TRANSMITTERS)
93.	SB01	CPC FAILURES (ALL 4 CPC's)
94.	SB02	CEAC FAILURE (DEFAULT PF SENT TO CPC) (BOTH CEAC's)
95.	SI02	HPSI PUMP TRIP (BOTH PUMPS)
96.	SI04	SIT WATER LEAK (ALL 4 SIT's)
97.	SI05	HPSI PUMP DEGRADED PERFORMANCE (BOTH PUMPS)
98.	SW01	PLANT COOLING WATER PUMP TRIP (BOTH PUMPS)

MALFUNCTIONS

99.	SW03	PW HEADER RUPTURE (DISCRETE)
100.	TC12	TURBINE TRIP (DISCRETE)
101.	TC15	TURBINE CONTROL VALVE NO. 2 STOP-VALVE FAILURE (CV2 & 4 AND SV-2)
102.	TC19	CONTROL OIL RUPTURE (DISCRETE)
103.	TH01	LOCA - COLD LEG (LOOP 1A)
104.	TH02	LOCA - HOT LEG (LOOP 2)
105.	TH03	STEAM GENERATOR TUBE RUPTURE (BOTH SG's)
106.	TH09	FUEL ROD DEFECT (DISCRETE)
107.	TP01	STATOR COOLING PUMP TRIP (BOTH PUMPS)
108.	TP03	HYDROGEN LEAK FROM MAIN GENERATOR CASING (DISCRETE)
109.	TP08	TC HEADER RUPTURE (DISCRETE)
110.	WD01	GR DECAY TANK RUPTURE (DISCRETE)
111.	WD04	S/G BLOWDOWN LINE RUPTURE INSIDE CONTAINMENT (SG1)
112.	WD05	S/G BLOWDOWN ISOLATION VALVE FAILS AS-IS (SG-UV-500R & Q)

REMOTE FUNCTIONS

The Remote Functions listing was provided as a part of each simulated system's Preliminary Design Specification (PDS) and was individually reviewed on a system by system basis.

The Remote Functions were selected to fulfill the requirements of section 3.3.2 of ANSI/ANS-3.5-1985.

REMOTE FUNCTIONS

CC

CCR01	"A" EC CHILLER CONTROL POWER DISC (ECA-W01)
	RANGE: OPEN/CLOSE
CCR02	"B" EC CHILLER CONTROL POWER DISC (ECB-W01)
	RANGE: OPEN/CLOSE
CCR03	ESSENTIAL SPRAY POND PUMP "B" BREAKER (CS-3)
	RANGE: LOCAL/LOC. REMOTE
CCR04	ESSENTIAL CHILLER "B" BREAKER (CS-3)
	RANGE: LOCAL/LOC. REMOTE
CCR05	"B" ESSENTIAL COOLING WATER PUMP BREAKER (CS-3)
	RANGE: LOCAL/LOC. REMOTE
CCR06	OPERATE COOLING WATER SUPPLY TO RCP "1A" PUMP COOLER (NCN-V153)
	RANGE: 0-100% OPEN
CCR07	RACK IN/OUT EWA-PO1
	RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

CCR08	RACK IN/OUT EWB-PO1 RANGE: RACK IN/RACK OUT
CCR09	EW PUMP EWA-PO1 CONTROL POWER RANGE: ON/OFF
CCR10	EW PUMP EWB-PO1 CONTROL POWER RANGE: ON/OFF
CCR11	EW PUMP EWA-PO1 LOCAL OPERATION (AT SWITCHGEAR) RANGE: START/NORMAL/STOP
CCR12	EW PUMP EWB-PO1 LOCAL OPERATION (AT SWITCHGEAR) RANGE: START/NORMAL/STOP
CCR13	MANUALLY OPERATE VALVE EW-HCV-53 "A" SDCHX OUTLET RANGE: OPEN/CLOSE
CCR14	MANUALLY OPERATE VALVE EW-HCV-41 "A" SDCHX INLET RANGE: OPEN/CLOSE
CCR15	MANUALLY OPERATE VALVE EW-HCV-66 NC TO "B" EW RANGE: OPEN/CLOSE

[illegible]

REMOTE FUNCTIONS

CCR16 MANUALLY OPERATE VALVE EW-HCV-133 "A" EW TO PC

RANGE: OPEN/CLOSE

CCR17 MANUALLY OPERATE VALVE EW-HCV-134 "B" EW TO PC

RANGE: OPEN/CLOSE

CCR18 MANUALLY OPERATE VALVE EW-HCV-67 PC TO "A" EW

RANGE: OPEN/CLOSE

CCR19 MANUALLY OPERATE VALVE EW-HCV-68 PC TO "B" EW

RANGE: OPEN/CLOSE

CCR20 MANUALLY OPERATE VALVE EW-HCV-54 "B" SDCHX OUTLET

RANGE: OPEN/CLOSE

CCR21 MANUALLY OPERATE VALVE EW-HCV-42 "B" SDCHX INLET

RANGE: OPEN/CLOSE

CCR22 MANUALLY OPERATE VALVE EW-HCV-146 "B" EW TO NC

RANGE: OPEN/CLOSE

CCR23 LOCALLY OVERRIDE VALVE EW-UV-145 "A" EW TO NC

RANGE: OPEN/NORMAL/CLOSE

REMOTE FUNCTIONS

CCR24 LOCALLY OVERRIDE VALVE UV-65 NC TO "A" EW

RANGE: OPEN/NORMAL/CLOSE

CCR25 FILL/DRAIN NC SURGE TANK

RANGE: OPEN DRAIN/CLOSE DRAIN

CCR26 OPERATE NC PUMP "A" DISCHARGE VALVE (NC-HCV-9)

RANGE: OPEN/CLOSE

CCR27 OPERATE NC PUMP "B" DISCHARGE VALVE (NC-HCV-10)

RANGE: OPEN/CLOSE

CCR28 OPERATE NC COOLER "A" OUTLET VALVE (NC-HCV-93)

RANGE: 0-100%

CCR29 OPERATE NC COOLER BYPASS VALVE (NC-HCV-102)

RANGE: 0-100%

CCR30 OPERATE NC COOLER "B" OUTLET VALVE (NC-HCV-94)

RANGE: 0-100%

CCR31 OPERATE PC HX CROSS TIE VALVE (NC-HCV-258)

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

CCR32 OPERATE PC HX CROSS TIE VALVE (NC-HCV-259)

RANGE: OPEN/CLOSE

CCR33 OPERATE PC HX CROSS TIE VALVE (NC-HCV-244)

RANGE: OPEN/CLOSE

CCR34 OPERATE PC HX CROSS TIE VALVE (NC-HCV-245)

RANGE: OPEN/CLOSE

CCR35 OPERATE LD HX TEMPERATURE CONTROL BYPASS VALVE (NC-VO88)

RANGE: 0-100%

CCR36 OPERATE COOLING WATER SUPPLY FLOW TO RCP "1A" MOTOR COOLER (NCN-V151)

RANGE: 0-100% OPEN

CCR37 OPERATE COOLING WATER SUPPLY FLOW TO RCP "1B" MOTOR COOLER (NCN-V129)

RANGE: 0-100% OPEN

CCR38 OPERATE COOLING WATER SUPPLY FLOW TO RCP "2A" MOTOR COOLER (NCN-V157)

RANGE: 0-100% OPEN

[illegible]

REMOTE FUNCTIONS

CCR39 OPERATE COOLING WATER SUPPLY FLOW TO RCP "2B" MOTOR COOLER (NCN-V147)

RANGE: 0-100% OPEN

CCR40 RACK IN/OUT BREAKER FOR NC PUMP (NCN-PO1A)

RANGE: RACK IN/RACK OUT

CCR41 RACK IN/OUT BREAKER FOR NC PUMP (NCN-PO1B)

RANGE: RACK IN/RACK OUT

CCR42 TURN ON/OFF CONTROL POWER FOR NC PUMP NCN-PO1A BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

CCR43 TURN ON/OFF CONTROL POWER FOR NC PUMP NCN-PO1B BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

CCR44 NC PUMP NCN-PO1A LOCAL OPERATION (AT SWITCHGEAR)

RANGE: START/NORMAL/STOP

CCR45 NC PUMP NCN-PO1B LOCAL OPERATION (AT SWITCHGEAR)

RANGE: START/NORMAL/STOP

REMOTE FUNCTIONS

CCR46	PC CLEANUP PUMP "A"
	RANGE: START/STOP
CCR47	PC CLEANUP PUMP "B"
	RANGE: START/STOP
CCR48	PC COOLING PUMP "A"
	RANGE: START/STOP
CCR49	PC COOLING PUMP "B"
	RANGE: START/STOP
CCR50	ADJUST FUEL POOL HEAT LOAD EFFECTS (SET THE FUEL POOL TEMPERATURE)
	RANGE: 80°F-150°F
CCR51	OPERATE RWT CROSS TIE VALVE PC-VO24 PC TO RWT
	RANGE: OPEN/CLOSE
CCR52	OPERATE RWT CROSS TIE VALVE PC-VO36 RWT TO PC
	RANGE: OPEN/CLOSE
CCR53	OPERATE FILL VALVE FROM CT (PC-VO78)
	RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

CCR54	OPERATE COOLING WATER SUPPLY TO RCP "1B" PUMP COOLER (NCN-V131) RANGE: 0-100% OPEN
CCR55	FILL SPRAY POND "A" RANGE: START FILL/STOP FILL
CCR56	FILL SPRAY POND "B" RANGE: START FILL/STOP FILL
CCR57	OPERATE COOLING WATER SUPPLY TO RCP "2A" PUMP COOLER (NCN-V159) RANGE: 0-100% OPEN
CCR58	OPEN/CLOSE BREAKER FOR MOV (SP-HV-50A) RANGE: OPEN/CLOSE
CCR59	OPEN/CLOSE BREAKER FOR MOV (SP-HV-50B) RANGE: OPEN/CLOSE
CCR60	OPEN/CLOSE BREAKER FOR MOV (SP-HV-49A) RANGE: OPEN/CLOSE
CCR61	OPEN/CLOSE BREAKER FOR MOV (SP-HV-49B) RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

CCR62 RACK IN/OUT BREAKERS FOR SP PUMP (SPA-PO1)

RANGE: RACK IN/RACK OUT

CCR63 RACK IN/OUT BREAKERS FOR SP PUMP (SPB-PO1)

RANGE: RACK IN/RACK OUT

CCR64 TURN CONTROL POWER ON/OFF FOR SP PUMP SPA-PO1 BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

CCR65 TURN CONTROL POWER ON/OFF FOR SP PUMP SPB-PO1 BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

CCR66 SP PUMP SPA-PO1 LOCAL OPERATION (AT SWITCHGEAR)

RANGE: START/NORMAL/STOP

CCR67 SP PUMP SPB-PO1 LOCAL OPERATION (AT SWITCHGEAR)

RANGE: START/NORMAL/STOP

CCR68 EC CHILLER "A" BREAKER

RANGE: RACK IN/RACK OUT

CCR69 EC CHILLER "B" BREAKER

RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

CCR70	EC CHILLER "A" BREAKER CONTROL POWER
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
CCR71	EC CHILLER "B" BREAKER CONTROL POWER
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
CCR72	EC CHILLER "A" LOCAL OPS (SWITCHGEAR)
	RANGE: START/NORMAL/STOP
CCR73	EC CHILLER "B" LOCAL OPS (SWITCHGEAR)
	RANGE: START/NORMAL/STOP
CCR74	DRAIN EW "A" SURGE TANK
	RANGE: OPEN DRAIN/CLOSE DRAIN
CCR75	DRAIN EW "B" SURGE TANK
	RANGE: OPEN DRAIN/CLOSE DRAIN
CCR76	PC CLEAN-UP PUMP "A" SUCTION FROM SPENT FUEL POOL (PC-V038)
	RANGE: OPEN/CLOSE

[illegible]

[illegible]

REMOTE FUNCTIONS

CCR77 PC CLEAN-UP PUMP "A" SUCTION FROM REFUELING POOL (PC-V037)

RANGE: OPEN/CLOSE

CCR78 PC CLEAN-UP PUMP "B" SUCTION FROM REFUELING POOL (PC-V054)

RANGE: OPEN/CLOSE

CCR79 PC CLEAN-UP PUMP "B" SUCTION FROM SPENT FUEL POOL (PC-V053)

RANGE: OPEN/CLOSE

CCR80 OPERATE "A" SPRAY PONDS CROSS TIE (SP-HCV-207)

RANGE: OPEN CROSS TIE/CLOSE CROSS TIE

CCR81 OPERATE "B" SPRAY PONDS CROSS TIE (SP-HCV-208)

RANGE: OPEN CROSS TIE/CLOSE CROSS TIE

CCR82 OPERATE COOLING WATER SUPPLY TO RCP "2B" PUMP COOLER (NCN-V149)

RANGE: 0-100% OPEN

CCR83 OPERATE THE "A" ECWS HX INLET (EWA-HCV-71)

RANGE: OPEN/CLOSED

REMOTE FUNCTIONS

CCR84 OPERATE THE "B" ECWS HX INLET (EWA-HCV-72)

RANGE: OPEN/CLOSED

CCR85 OPERATE THE "A" ECWS PUMP DISCHARGE VALVE (EWA-HCV-135)

RANGE: OPEN/CLOSED

CCR86 OPERATE THE "B" ECWS PUMP DISCHARGE VALVE (EWA-HCV-136)

RANGE: OPEN/CLOSED

CCR87 LOCALLY OPERATE EW/NC CROSS TIE VALVE (EW-UV-145)

RANGE: OPEN/CLOSED

<u>CH</u>

CHR01 OPERATE RU-34 INLET VALVE CPN-VO23

RANGE: OPEN/CLOSE

CHR02 OPERATE RU-34 INLET VALVE CPN-VO24

RANGE: OPEN/CLOSE

CHR03 OPERATE IA SUPPLY TO CP-UV-4A, IA-VB47

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

CHR04	OPERATE IA SUPPLY TO CP-UV-5B, IA-VB45 RANGE: OPEN/CLOSE
CHR05	OPERATE BREAKER FOR MOV FOR CPA-UV-2A RANGE: OPEN/CLOSE
CHR06	OPERATE BREAKER FOR MOV (CPA-UV-2B) RANGE: OPEN/CLOSE
CHR07	OPERATE BREAKER FOR MOV (CPB-UV-3A) RANGE: OPEN/CLOSE
CHR08	OPERATE BREAKER FOR MOV (CPB-UV-3B) RANGE: OPEN/CLOSE
CHR09	MSSS VENTILATION FAN (HCN-A05A, HCN-HS-200A) RANGE: START/AUTO/STOP
CHR10	MSSS VENTILATION FAN (HCN-A05B HCN-HS-200B) RANGE: START/AUTO/STOP
CHR11	ACKNOWLEDGE ALARMS ON HYDROGEN MONITOR "A" RANGE: ACKNOWLEDGE/NORMAL

REMOTE FUNCTIONS

CHR12 ACKNOWLEDGE ALARMS ON HYDROGEN MONITOR "B"

RANGE: ACKNOWLEDGE/NORMAL

CHR14 PLACE HYDROGEN RECOMBINER HPA-D01 IN SERVICE

RANGE: ON/OFF

CHR15 PLACE HYDROGEN RECOMBINER HPB-D01 IN SERVICE

RANGE: ON/OFF

CHR16 RESET HEAT TRACE ALARMS ON HYDROGEN MONITOR SYSTEM TRAIN "A"

RANGE: RESET/NORMAL

CHR17 RESET HEAT TRACE ALARMS ON HYDROGEN MONITOR SYSTEM TRAIN "B"

RANGE: RESET/NORMAL

<u>CV</u>

CVR01 LOCALLY OPERATE MOV (CH-HV-524)

RANGE: OPEN/NORMAL/CLOSE

CVR02 OPERATE LD FLOW CONTROL ISOLATION VALVE (CH-V340)

RANGE: 0-100% OPEN

REMOTE FUNCTIONS

CVR03	OPERATE LD FLOW CONTROL ISOLATION VALVE (CH-V342) RANGE: 0-100% OPEN
CVR04	OPERATE LD BACKPRESSURE CONTROL ISOLATION VALVE (CH-V349) RANGE: 0-100% OPEN
CVR05	OPERATE LD BACKPRESSURE CONTROL ISOLATION VALVE (CH-V350) RANGE: 0-100% OPEN
CVR06	LOCALLY OVERRIDE LD CONTROL VALVE (CH-UV-110P) RANGE: OVERRIDE/NORMAL
CVR07	LOCALLY OVERRIDE LD CONTROL VALVE (CH-UV-110Q) RANGE: OVERRIDE/NORMAL
CVRO8	LOCALLY OVERRIDE LD BACKPRESSURE CONTROL VALVE (CH-UV-201P) RANGE: OVERRIDE/NORMAL
CVR09	LOCALLY OVERRIDE LD BACKPRESSURE CONTROL VALVE (CH-UV-201Q) RANGE: OVERRIDE/NORMAL

[illegible]

CVR10 OPERATE "A" PURIFICATION ION EXCHANGER OUTLET VALVE (CH-V378/V369)

RANGE: 0-100% OPEN

CVR11 OPERATE "B" PURIFICATION ION EXCHANGER OUTLET VALVE (CH-V389/V383)

RANGE: 0-100% OPEN

CVR12 OPERATE DEBORATING ION EXCHANGER OUTLET VALVE (CH-V398/V404)

RANGE: 0-100% OPEN

CVR13 OPERATE VCT INLET ISOLATION VALVE (CH-V418)

RANGE: OPEN/CLOSE

CVR14 OPERATE "A" SEAL INJECTION FILTER ISOLATION VALVE (CH-V818)

RANGE: OPEN/CLOSE

CVR15 OPERATE "B" SEAL INJECTION FILTER ISOLATION VALVE (CH-V821)

RANGE: OPEN/CLOSE

CVR16 OPERATE VCT HYDROGEN ISOLATION VALVE (CH-V108)

RANGE: OPEN/CLOSE

[illegible]

REMOTE FUNCTIONS

CVR17 OPERATE VCT NITROGEN ISOLATION VALVE (CH-V644)

RANGE: OPEN/NORMAL/CLOSE

CVR18 LOCALLY OPERATE CH-UV-501 MOTOR OPERATOR SUPPLY BREAKER

RANGE: OPEN/NORMAL/CLOSE

CVR19 LOCALLY OVERRIDE VALVE (CH-UV-501) (IN LOCAL MANUAL)

RANGE: OPEN/NORMAL/CLOSE

CVR20 LOCALLY OPERATE CH-UV-536 MOTOR OPERATOR SUPPLY BREAKER

RANGE: OPEN/NORMAL/CLOSE

CVR21 LOCALLY OVERRIDE VALVE (CH-UV-536) (IN LOCAL MANUAL)

RANGE: OPEN/NORMAL/CLOSE

CVR22 OPERATE "A" CHARGING PUMP SUCTION VALVE (CH-V316)

RANGE: OPEN/CLOSE

CVR23 OPERATE "B" CHARGING PUMP SUCTION VALVE (CH-V319)

RANGE: OPEN/CLOSE

CVR24 OPERATE "C" CHARGING PUMP SUCTION VALVE (CH-V322)

RANGE: OPEN/CLOSE

CVR25 OPERATE "A" CHARGING PUMP ALTERNATE SUCTION VALVE (CH-V755)

RANGE: OPEN/CLOSE

CVR26 OPERATE "B" CHARGING PUMP ALTERNATE SUCTION VALVE (CH-V756)

RANGE: OPEN/CLOSE

CVR27 OPERATE "C" CHARGING PUMP ALTERNATE SUCTION VALVE (CH-V757)

RANGE: OPEN/CLOSE

CVR28 OPERATE RWT CHARGING PUMP ALTERNATE SUCTION VALVE (CH-V327)

RANGE: OPEN/CLOSE

CVR29 OPERATE "A" CHARGING PUMP ALTERNATE DISCHARGE VALVE (CH-V796)

RANGE: OPEN/CLOSE

CVR30 OPERATE "B" CHARGING PUMP ALTERNATE DISCHARGE VALVE (CH-V797)

RANGE: OPEN/CLOSE

[illegible]

CVR31 OPERATE "C" CHARGING PUMP ALTERNATE DISCHARGE VALVE (CH-V798)

RANGE: OPEN/CLOSE

CVR32 OPERATE "A" CHARGING PUMP NORMAL DISCHARGE VALVE (CH-V335)

RANGE: OPEN/CLOSE

CVR33 OPERATE "B" CHARGING PUMP NORMAL DISCHARGE VALVE (CH-V337)

RANGE: OPEN/CLOSE

CVR34 OPERATE "C" CHARGING PUMP NORMAL DISCHARGE VALVE (CH-V339)

RANGE: OPEN/CLOSE

CVR35 OPERATE PRE-HOLDUP IX TO HOLDUP TANK ISOLATION VALVE (CH-V001)

RANGE: OPEN/CLOSE

CVR36 OPERATE PRE-HOLDUP IX TO RWT ISOLATION VALVE (CH-V124)

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

CVR37 SET THE PERFORMANCE OF THE DEBORATING ION EXCHANGER

RANGE: 0-100%

NOTE: BED OUTLET BORON CONCENTRATION = (RANGE%) X (PPM BORON AT BED INLET).

CVR38 OPERATE EMERGENCY BORATION VALVE (CH-V144)

RANGE: OPEN/CLOSE

CVR39 OPERATE EMERGENCY BORATION VALVE (CH-V753)

RANGE: OPEN/CLOSE

CVR40 OPERATE BAMP DISCHARGE TO PC (CH-V164)

RANGE: OPEN/CLOSE

CVR41 OPERATE EMERGENCY BORATION VALVE (PC-V215)

RANGE: OPEN/CLOSE

CVR42 OPERATE CHN-UV-514 BYPASS VALVE (CH-V174)

RANGE: OPEN/CLOSE

CVR43 OPERATE VCT INLET FROM RMW VALVE (CH-183)

RANGE: OPEN/CLOSE

CVR44 OPERATE HOLDUP PUMPS TO RX DRAIN FILTER ISOLATION VALVE (CH-V686)

RANGE: OPEN/CLOSE

CVR45 OPERATE DEMIN WTR TO RMWT VALVE (CH-V770)

RANGE: OPEN/CLOSE

CVR46 SET THE BORON CONCENTRATION OF THE PURIFICATION ION EXCHANGER VESSEL VOLUME (CHN-D01B)

RANGE: 0-1500 PPM

NOTE: THE PROCESS AT THE ION EXCHANGER OUTLET WILL REACH EQUILIBRIUM BASED ON THE ION EXCHANGER VOLUME, THE ION EXCHANGER FLOW RATE AND THE INITIAL BORON CONCENTRATION SET BY THE REMOTE FUNCTION.

EACH TIME THE CHN-D01B BED IS REMOVED FROM SERVICE, THE VESSEL INTERNAL CONCENTRATION IS RESET TO THE CURRENT VALUE OF THE REMOTE FUNCTION RANGE.

CVR47 OPERATE RMW FILTER BYPASS VALVE (CH-V779)

RANGE: OPEN/CLOSE

CVR48 OPERATE CH-UV-566 ISOLATION VALVE (CH-V496)

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

CVR49	OPERATE GAS STRIPPER BYPASS VALVE (CH-V655)
	RANGE: OPEN/CLOSE
CVR50	RACK OUT BREAKER (CHA-P01)
	RANGE: RACKED IN/RACKED OUT
CVR51	RACK OUT BREAKER (CHB-P01)
	RANGE: RACKED IN/RACKED OUT
CVR52	RACK OUT BREAKER (CHE-P01)
	RANGE: RACKED IN/RACKED OUT
CVR53	SWAP POWER TO CHE-P01 BREAKER
	RANGE: "A" TRAIN POWER/"B" TRAIN POWER
CVR54	OPERATE PHIX TO RWT VALVE (CH-V495)
	RANGE: OPEN/CLOSE
CVR55	ADJUST RWT BORON CONCENTRATION
	RANGE: (3000 TO 4500 PPM)
CVR56	ADJUST RWT LEVEL
	RANGE: (0-100%)

REMOTE FUNCTIONS

CVR57 ACKNOWLEDGE GAS STRIPPER ALARMS

RANGE: ACKNOWLEDGE/NORMAL

CVR58 SWITCH DISCONNECT PGE-U36, "E" CHARGING PUMP TRANSFER SWITCH TO CONNECT TO "A" OR "B" TRAIN POWER SUPPLY

RANGE: TRAIN "A" POWER/TRAIN "B" POWER

CVR59 NITROGEN SUPPLY VALVE TO REACTOR DRAIN TANK (CH-V483)

RANGE: OPEN/CLOSED

CVR61 VCT OUTLET ISOLATION VALVE (CHN-UV-501) (CS-3)

RANGE: LOCAL/LOC. REMOTE

CVR62 RWT GRAVITY FEED VALVE (CHN-HV-536) (CS-3)

RANGE: LOCAL/LOC. REMOTE

CVR63 OPERATE RMW VALVE (V861) TO EQUIPMENT DRAIN TANK

RANGE: OPEN/CLOSED

CVR64 OPERATE RMW VALVE (V691) TO REACTOR DRAIN TANK

RANGE: OPEN/CLOSED

CVR65 OPERATE THE BREAKER FOR THE CHARGING HEADER ISOLATION VALVE (CHA-HV-524)

RANGE: OPEN/CLOSED

CVR66 BLOCK OPEN THE BORIC ACID MAKEUP PUMP SUCTION VALVE FROM THE RFWT (CH-HV-532)

RANGE: BLOCKED OPEN/NORMAL

NOTE: THIS RF WILL BLOCK THE VALVE OPEN IF THE VALVE IS ALREADY OPEN. HOWEVER, IF THE REMOTE OPERATION OF THE VALVE IS ATTEMPTED WHILE THE VALVE IS BLOCKED OPEN, THE VALVE WILL GO CLOSED AS SOON AS THE BLOCK IS REMOVED AND THE REMOTE CLOSE SIGNAL IS STILL ACTIVE.

CVR67 RESTART THE NORMALLY RUNNING HOLDUP PUMP (AFTER A LOSS OF POWER)

RANGE: RESTART/NORMAL

NOTE: THE SYSTEM WILL BE SIMPLIFIED SO THAT ONLY ONE PUMP IS ACTUALLY MODELED.

CVR68 LOCALLY OPERATE LD CONTROL VALVE (CH-UV-110P)

RANGE: 0-100% OPEN

CVR69 LOCALLY OPERATE LD CONTROL VALVE (CH-UV-110Q)

RANGE: 0-100% OPEN

CVR70 LOCALLY OPERATE LD BACKPRESSURE CONTROL VALVE (CH-UV-201P)

RANGE: 0-100% OPEN

REMOTE FUNCTIONS

CVR71 (START/STOP) THE BORIC ACID CONCENTRATOR

RANGE: START/STOP

CVR72 LOCALLY OPERATE LD BACKPRESSURE CONTROL VALVE (CH-UV-201Q)

RANGE: 0-100% OPEN

CVR73 CHARGING PUMP 2 BREAKER (CS-2)

RANGE: LOCAL/LOC. REMOTE

CVR74 SET BORON CONCENTRATION (IN RCS, CVCS, AND SI)

RANGE: 0-2000 PPM BORON

CW

CWR01 RACK IN/OUT CW PUMP CWN-PO1A MOTOR CIRCUIT BREAKER

RANGE: RACK IN/RACK OUT

CWR02 RACK IN/OUT CW PUMP CWN-PO1B MOTOR CIRCUIT BREAKER

RANGE: RACK IN/RACK OUT

CWR03 RACK IN/OUT CW PUMP CWN-PO1C MOTOR CIRCUIT BREAKER

RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

CWR04 RACK IN/OUT CW PUMP CWN-PO1D MOTOR CIRCUIT BREAKER

RANGE: RACK IN/RACK OUT

CWR05 TURN CONTROL POWER ON/OFF FOR CW PUMP (CWN-PO1A)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

CWR06 TURN CONTROL POWER ON/OFF FOR CW PUMP (CWN-PO1B)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

CWR07 TURN CONTROL POWER ON/OFF FOR CW PUMP (CWN-PO1C)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

CWR08 TURN CONTROL POWER ON/OFF FOR CW PUMP (CWN-PO1D)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

CWR09 RESET HIGH VIBRATION TRIP ON CW COOLING TOWER FANS

RANGE: RESET/NORMAL

CWR10 OPERATE COOLING TOWER ISOLATION VALVE (CWN-HCV-27)

RANGE: OPEN/CLOSE

[illegible]

REMOTE FUNCTIONS

CWR11 OPERATE COOLING TOWER ISOLATION VALVE (CWN-HCV-28)

RANGE: OPEN/CLOSE

CWR12 OPERATE COOLING TOWER ISOLATION VALVE (CWN-HCV-29)

RANGE: OPEN/CLOSE

CWR13 SET AMBIENT TEMPERATURE

RANGE: 35°F-115°F

CWR14 SET WIND VELOCITY

RANGE: 0 MPH TO 50 MPH

NOTE: CWR 14 AFFECTS ONLY METEOROLOGY TOWER INDICATIONS.

CWR15 SET WIND DIRECTION

RANGE: COMPASS POINTS

CWR16 SET THE RELATIVE HUMIDITY

RANGE: 25-100%

[illegible]

[illegible]

REMOTE FUNCTIONS

ED

EDR01	PLACE UNIT TWO ON LINE	
	RANGE: ON LINE/OFF LINE	
EDR02	PLACE UNIT THREE ON LINE	
	RANGE: ON LINE/OFF LINE	
EDR03	ADJUST 525KV SYSTEM VOLTAGE 510 TO 540KV	
EDR04	OPERATE WESTWING #1 LINE BREAKER, PL-922, FROM PDO	
	RANGE: OPEN/NORMAL/CLOSED	
EDR05	OPERATE WESTWING #2 LINE BREAKER, PL-932, FROM PDO	
	RANGE: OPEN/NORMAL/CLOSED	
EDR06	OPERATE THE KYRENE LINE BREAKER, PL-942, FROM PDO	
	RANGE: OPEN/NORMAL/CLOSED	
EDR07	OPERATE NORTH GILA LINE BREAKER, PL-982, FROM PDO	
	RANGE: OPEN/NORMAL/CLOSED	
EDR08	OPERATE THE DEVERS LINE BREAKER, PL-992, FROM PDO	
	RANGE: OPEN/NORMAL/CLOSED	

REMOTE FUNCTIONS

EDR09 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL MAN-X02

RANGE: ACKNOWLEDGE/NORMAL

EDR10 RACK IN/RACK OUT BREAKER (NAN-SO5A)

RANGE: RACK IN/RACK OUT

EDR11 RACK IN/RACK OUT BREAKER (NAN-SO5B)

RANGE: RACK IN/RACK OUT

EDR12 RACK IN/RACK OUT BREAKER (NAN-SO5D)

RANGE: RACK IN/RACK OUT

EDR13 RACK IN/RACK OUT BREAKER (NAN-SO5J)

RANGE: RACK IN/RACK OUT

EDR14 RACK IN/RACK OUT BREAKER (NAN-SO6B)

RANGE: RACK IN/RACK OUT

EDR15 RACK IN/RACK OUT BREAKER (NAN-SO6F)

RANGE: RACK IN/RACK OUT

EDR16 RACK IN/RACK OUT BREAKER (NAN-SO6H)

RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

EDR17	RACK IN/RACK OUT BREAKER (NAN-SO6K)
	RANGE: RACK IN/RACK OUT
EDR18	RACK IN/RACK OUT BREAKER (NAN-SO3A)
	RANGE: RACK IN/RACK OUT
EDR19	RACK IN/RACK OUT BREAKER (NAN-SO3B)
	RANGE: RACK IN/RACK OUT
EDR20	RACK IN/RACK OUT BREAKER (NAN-SO4A)
	RANGE: RACK IN/RACK OUT
EDR21	RACK IN/RACK OUT BREAKER (NAN-SO4B)
	RANGE: RACK IN/RACK OUT
EDR22	RACK IN/RACK OUT BREAKER (NAN-SO1A)
	RANGE: RACK IN/RACK OUT
EDR23	RACK IN/RACK OUT BREAKER (NAN-SO1N)
	RANGE: RACK IN/RACK OUT
EDR24	RACK IN/RACK OUT BREAKER (NAN-SO1D)
	RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

EDR25	RACK IN/RACK OUT BREAKER (NAN-SO1E)
	RANGE: RACK IN/RACK OUT
EDR26	RACK IN/RACK OUT BREAKER (NAN-SO1F)
	RANGE: RACK IN/RACK OUT
EDR27	RACK IN/RACK OUT BREAKER (NAN-SO1G)
	RANGE: RACK IN/RACK OUT
EDR28	RACK IN/RACK OUT BREAKER (NAN-SO1H)
	RANGE: RACK IN/RACK OUT
EDR29	RACK IN/RACK OUT BREAKER (NAN-SO2A)
	RANGE: RACK IN/RACK OUT
EDR30	RACK IN/RACK OUT BREAKER (NAN-SO2D)
	RANGE: RACK IN/RACK OUT
EDR31	RACK IN/RACK OUT BREAKER (NAN-SO2E)
	RANGE: RACK IN/RACK OUT
EDR32	RACK IN/RACK OUT BREAKER (NAN-SO2F)
	RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

EDR33	RACK IN/RACK OUT BREAKER (NAN-SO2G)
	RANGE: RACK IN/RACK OUT
EDR34	RACK IN/RACK OUT BREAKER (NAN-SO2H)
	RANGE: RACK IN/RACK OUT
EDR35	RACK IN/RACK OUT BREAKER (NAN-SO2N)
	RANGE: RACK IN/RACK OUT
EDR36	RACK IN/RACK OUT BREAKER (NBN-SO1A)
	RANGE: RACK IN/RACK OUT
EDR37	RACK IN/RACK OUT BREAKER (NBN-SO1C)
	RANGE: RACK IN/RACK OUT
EDR38	RACK IN/RACK OUT BREAKER (NBN-SO2A)
	RANGE: RACK IN/RACK OUT
EDR39	RACK IN/RACK OUT BREAKER (PBA-SO3H)
	RANGE: RACK IN/RACK OUT
EDR40	RACK IN/RACK OUT BREAKER (PBA-SO3J)
	RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

EDR41	RACK IN/RACK OUT BREAKER (PBA-SO3K)
	RANGE: RACK IN/RACK OUT
EDR42	RACK IN/RACK OUT BREAKER (PBA-SO3L)
	RANGE: RACK IN/RACK OUT
EDR43	RACK IN/RACK OUT BREAKER (PBB-SO4H)
	RANGE: RACK IN/RACK OUT
EDR44	RACK IN/RACK OUT BREAKER (PBB-SO4J)
	RANGE: RACK IN/RACK OUT
EDR45	RACK IN/RACK OUT BREAKER (PBB-SO4K)
	RANGE: RACK IN/RACK OUT
EDR46	RACK IN/RACK OUT BREAKER (PBB-SO4L)
	RANGE: RACK IN/RACK OUT
EDR47	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO5A)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR48	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO5B)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR49	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO5D)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR50	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO5J)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR51	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO6B)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR52	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO6F)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR53	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO6H)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR54	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO6K)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR55	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO3A)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR56	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO3B)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF

REMOTE FUNCTIONS

EDR57 TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO4A)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR58 TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO4B)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR59 TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO1A)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR60 TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO1N)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR61 TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO1D)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR62 TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO1E)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR63 TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO1F)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR64 TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO1G)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

REMOTE FUNCTIONS

EDR65	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO1H) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR66	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO2A) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR67	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO2D) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR68	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO2E) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR69	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO2F) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR70	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO2G) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR71	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO2H) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR72	TURN CONTROL POWER ON/OFF FOR BREAKER (NAN-SO2N) RANGE: CONTROL POWER ON/CONTROL POWER OFF

REMOTE FUNCTIONS

EDR73	TURN CONTROL POWER ON/OFF FOR BREAKER (NBN-SO1A) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR74	TURN CONTROL POWER ON/OFF FOR BREAKER (NBN-SO1C) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR75	TURN CONTROL POWER ON/OFF FOR BREAKER (NBN-SO2A) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR76	TURN CONTROL POWER ON/OFF FOR BREAKER (PBA-SO3H) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR77	TURN CONTROL POWER ON/OFF FOR BREAKER (PBA-SO3J) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR78	TURN CONTROL POWER ON/OFF FOR BREAKER (PBA-SO3K) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR79	TURN CONTROL POWER ON/OFF FOR BREAKER (PBA-SO3L) RANGE: CONTROL POWER ON/CONTROL POWER OFF
EDR80	TURN CONTROL POWER ON/OFF FOR BREAKER (PBB-SO4H) RANGE: CONTROL POWER ON/CONTROL POWER OFF

REMOTE FUNCTIONS

EDR81 TURN CONTROL POWER ON/OFF FOR BREAKER (PBB-SO4J)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR82 TURN CONTROL POWER ON/OFF FOR BREAKER (PBB-SO4K)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR83 TURN CONTROL POWER ON/OFF FOR BREAKER (PBB-SO4L)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EDR84 LOCAL OPEN/CLOSE CONTROL FOR BREAKER (PBA-SO3K)

RANGE: OPEN/NORMAL/CLOSE

EDR85 LOCAL OPEN/CLOSE CONTROL FOR BREAKER (PBA-SO3L)

RANGE: OPEN/NORMAL/CLOSE

EDR86 LOCAL OPEN/CLOSE CONTROL FOR BREAKER (PBB-SO4K)

RANGE: OPEN/NORMAL/CLOSE

EDR87 LOCAL OPEN/CLOSE CONTROL FOR BREAKER (PBB-SO4L)

RANGE: OPEN/NORMAL/CLOSE

EDR88 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (NAN-X01)

RANGE: ACKNOWLEDGE/NORMAL

REMOTE FUNCTIONS

EDR89 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (NAN-X02)

RANGE: ACKNOWLEDGE/NORMAL

EDR90 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (NAN-X03)

RANGE: ACKNOWLEDGE/NORMAL

EDR91 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (NBN-X01)

RANGE: ACKNOWLEDGE/NORMAL

EDR92 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (NBN-X02)

RANGE: ACKNOWLEDGE/NORMAL

EDR93 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (NBN-X03)

RANGE: ACKNOWLEDGE/NORMAL

EDR94 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (NBN-X04)

RANGE: ACKNOWLEDGE/NORMAL

EDR95 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (NAN-S05)

RANGE: RESET/NORMAL

EDR96 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (NAN-S06)

RANGE: RESET/NORMAL

EDR97 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (NAN-S03)

RANGE: RESET/NORMAL

EDR98 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (NAN-S04)

RANGE: RESET/NORMAL

EDR99 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (NAN-S01)

RANGE: RESET/NORMAL

EDR100 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (NAN-S02)

RANGE: RESET/NORMAL

EDR101 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (NBN-S01)

RANGE: RESET/NORMAL

EDR102 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (NBN-S02)

RANGE: RESET/NORMAL

EDR103 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (PBA-S03)

RANGE: RESET/NORMAL

EDR104 RESET BUS LOCKOUT AND UNDER VOLTAGE RELAYS (PBB-S04)

RANGE: RESET/NORMAL

EDR105 PLACE MCC SUPPLY BREAKER M71 IN OVERRIDE AND CLOSE THE BREAKER

RANGE: OVERRIDE CLOSED/NORMAL

EDR106 PLACE MCC SUPPLY BREAKER M72 IN OVERRIDE AND CLOSE THE BREAKER

RANGE: OVERRIDE CLOSED/NORMAL

EDR107 PLACE MCC SUPPLY BREAKER M19 IN OVERRIDE AND CLOSE THE BREAKER

RANGE: OVERRIDE CLOSED/NORMAL

EDR108 PLACE MCC SUPPLY BREAKER M20 IN OVERRIDE AND CLOSE THE BREAKER

RANGE: OVERRIDE CLOSED/NORMAL

[illegible]

REMOTE FUNCTIONS

EDR109 PLACE MCC SUPPLY BREAKER D90 IN OVERRIDE AND CLOSE THE BREAKER

RANGE: OVERRIDE CLOSED/NORMAL

EDR110 PLACE MCC SUPPLY BREAKER D91 IN OVERRIDE AND CLOSE THE BREAKER

RANGE: OVERRIDE CLOSED/NORMAL

EDR111 TRANSFER DC CONTROL POWER TO NAN-S05

RANGE: M45 ON/M46 ON

EDR112 TRANSFER DC CONTROL POWER TO NAN-S06

RANGE: M45 ON/M46 ON

EDR113 PLACE CLASS CHARGER "A" IN/OUT OF SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

EDR114 PLACE CLASS CHARGER "B" IN/OUT OF SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

EDR115 PLACE CLASS CHARGER "C" IN/OUT OF SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

REMOTE FUNCTIONS

EDR116 PLACE CLASS CHARGER "D" IN/OUT OF SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

EDR117 PLACE CLASS CHARGER "A"-"C" IN/OUT OF SERVICE

RANGE: OUT OF SERVICE/M41/M43

EDR118 PLACE CLASS CHARGER "B"-"D" IN/OUT OF SERVICE

RANGE: OUT OF SERVICE/M42/M44

EDR119 PLACE NON-CLASS CHARGER "E" IN/OUT OF SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

EDR120 PLACE NON-CLASS CHARGER "E1" IN/OUT OF SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

EDR121 PLACE NON-CLASS CHARGER "F" IN/OUT OF SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

EDR122 PLACE NON-CLASS CHARGER "E"-"F" IN/OUT OF SERVICE

RANGE: OUT OF SERVICE/M45/M46

EDR123 SWITCH PN SYSTEM INVERTER "A" BYPASS SWITCH BETWEEN OFF/BYPASS/INVERTER

RANGE: OFF/BYPASS/INVERTER

EDR124 SWITCH PN SYSTEM INVERTER "B" BYPASS SWITCH BETWEEN OFF/BYPASS/INVERTER

RANGE: OFF/BYPASS/INVERTER

EDR125 SWITCH PN SYSTEM INVERTER "C" BYPASS SWITCH BETWEEN OFF/BYPASS/INVERTER

RANGE: OFF/BYPASS/INVERTER

EDR126 SWITCH PN SYSTEM INVERTER "D" BYPASS SWITCH BETWEEN OFF/BYPASS/INVERTER

RANGE: OFF/BYPASS/INVERTER

EDR127 RESET LOSS OF SYNCHRONIZATION ALARMS ON CLASS INVERTER "A"

RANGE: RESET/NORMAL

EDR128 RESET LOSS OF SYNCHRONIZATION ALARMS ON CLASS INVERTER "B"

RANGE: RESET/NORMAL

EDR129 RESET LOSS OF SYNCHRONIZATION ALARMS ON CLASS INVERTER "C"

RANGE: RESET/NORMAL

EDR130 RESET LOSS OF SYNCHRONIZATION ALARMS ON CLASS INVERTER "D"

RANGE: RESET/NORMAL

REMOTE FUNCTIONS

EDR131 PLACE CLASS INVERTER "A" IN SERVICE

RANGE: IN SERVICE/NORMAL

EDR132 PLACE CLASS INVERTER "B" IN SERVICE

RANGE: IN SERVICE/NORMAL

EDR133 PLACE CLASS INVERTER "C" IN SERVICE

RANGE: IN SERVICE/NORMAL

EDR134 PLACE CLASS INVERTER "D" IN SERVICE

RANGE: IN SERVICE/NORMAL

EDR135 OPERATE TRANSFER SWITCH ON NN-D11 BUS

RANGE: ALTERNATE/NORMAL

EDR136 OPERATE TRANSFER SWITCH ON NN-D12 BUS

RANGE: ALTERNATE/NORMAL

EDR137 OPERATE TRANSFER SWITCH ON NN-D15 BUS

RANGE: ALTERNATE/NORMAL

EDR138 OPERATE TRANSFER SWITCH ON NN-D16 BUS

RANGE: ALTERNATE/NORMAL

REMOTE FUNCTIONS

EDR139	SHIFT PMS POWER SUPPLY RANGE: INVERTER SUPPLY/ALTERNATE AC SUPPLY
EDR140	4.16KV TO 480V LC34 SUPPLY BREAKER (CS-3) RANGE: LOCAL/LOC. REMOTE
EDR141	4.16KV TO 480V LC32 SUPPLY BREAKER (CS-3) RANGE: LOCAL/LOC. REMOTE
EDR142	4.16KV BUS NORM SOURCE FROM NBN-X04 BREAKER (CS-3) RANGE: LOCAL/LOC. REMOTE
EDR143	4.16KV BUS ALT SOURCE FROM NBN-X03 BREAKER (CS-3) RANGE: LOCAL/LOC. REMOTE
EDR144	4.16KV TO 480V LC36 SUPPLY BREAKER (CS-3) RANGE: LOCAL/LOC. REMOTE
EDR145	480V L32 MAIN FEEDER BREAKER (PBB-SO4) (CS-1) RANGE: LOCAL/LOC. REMOTE
EDR146	RESET ALL LOCKOUTS (BELOW 4.16KV) RANGE: RESET/NORMAL

[illegible]

REMOTE FUNCTIONS

EDR147	480V L34 MAIN FEEDER BREAKER FROM (PBB-SO4) (CS-1)
	RANGE: LOCAL/LOC. REMOTE
EDR148	480V L36 MAIN FEEDER BREAKER FROM PBB-SO4 (CS-2)
	RANGE: LOCAL/LOC. REMOTE
EDR149	BATTERY CHARGER "D" SUPPLY BREAKER (CS-1)
	RANGE: LOCAL/LOC. REMOTE
EDR151	BATTERY CHARGER "D" VOLTS AND AMPS INDIC (CS-2)
	RANGE: LOCAL/LOC. REMOTE
EDR153	BATTERY CHARGER "BD" SUPPLY BREAKER (CS-1)
	RANGE: LOCAL/LOC. REMOTE
EDR154	BATTERY CHARGER "B" SUPPLY BREAKER. (CS-1)
	RANGE: LOCAL/LOC. REMOTE
EDR155	RACK BREAKER (PBA-S03N)
	RANGE: RACKED IN/RACKED OUT
EDR156	OPERATE CONTROL POWER BREAKER (PBA-S03N)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF

REMOTE FUNCTIONS

EDR157	RACK BREAKER (PBA-S04N)	
	RANGE: RACKED IN/RACKED OUT	
EDR158	OPERATE CONTROL POWER BREAKER (PBA-S04N)	
	RANGE: CONTROL POWER ON/CONTROL POWER OFF	
EDR159	OPERATE THE BREAKER (925) FOR THE WESTWING #1 LINE	
	RANGE: OPEN/NORMAL/CLOSED	
EDR160	OPERATE THE BREAKER (935) FOR THE WESTWING #2 LINE	
	RANGE: OPEN/NORMAL/CLOSED	
EDR161	OPERATE THE BREAKER (945) FOR THE KYRENE LINE	
	RANGE: OPEN/NORMAL/CLOSED	
EDR162	OPERATE THE BREAKER (985) FOR THE NORTH GILA LINE	
	RANGE: OPEN/NORMAL/CLOSED	
EDR163	OPERATE THE BREAKER (995) FOR THE DEVERS LINE	
	RANGE: OPEN/NORMAL/CLOSED	
EDR164	RESET MISCELLANEOUS PLANT ALARMS	
	RANGE: RESET/NORMAL	

[illegible]

REMOTE FUNCTIONS

EG

EGR01 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (MAN-X01A)

RANGE: ACKNOWLEDGE/NORMAL

EGR02 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (MAN-X01B)

RANGE: ACKNOWLEDGE/NORMAL

EGR03 ACKNOWLEDGE ALARMS ON TRANSFORMER ANNUNCIATOR PANEL (MAN-X01C)

RANGE: ACKNOWLEDGE/NORMAL

EGR04 RACK IN/RACK OUT BREAKER (PBA-SO3B)

RANGE: RACK IN/RACK OUT

EGR05 RACK IN/RACK OUT BREAKER (PBB-S04B)

RANGE: RACKED IN/RACKED OUT

EGR06 TURN CONTROL POWER ON/OFF BREAKER (PBA-S03B)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

EGR07 TURN CONTROL POWER ON/OFF BREAKER (PBB-S04B)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

REMOTE FUNCTIONS

EGR08	LOCAL OPEN/CLOSE CONTROL BREAKER (PBA-S03B)
	RANGE: OPEN/NORMAL/CLOSE
EGR09	LOCAL OPEN/CLOSE CONTROL BREAKER (PBB-S04B)
	RANGE: OPEN/NORMAL/CLOSE
EGR10	ACKNOWLEDGE ALARMS ON "A" DIESEL GENERATOR CONTROL PANEL
	RANGE: ACKNOWLEDGE/NORMAL
EGR11	"A" DIESEL CONTROL PANEL MODE SWITCH
	RANGE: OFF/LOCAL/REMOTE
EGR12	"A" DIESEL EMERGENCY STOP
	RANGE: STOP/NORMAL
EGR13	"A" DIESEL EMERGENCY START (LOP)
	RANGE: START/NORMAL
EGR14	"A" DIESEL EMERGENCY START (ESF)
	RANGE: START/NORMAL
EGR15	"A" DIESEL PANEL FIRST OUT/SYSTEM RESET
	RANGE: RESET/NORMAL

REMOTE FUNCTIONS

EGR16	"A" DIESEL CONTROL PANEL EMERGENCY MODE DEFEAT RANGE: RESET/NORMAL
EGR17	"A" DIESEL CONTROL PANEL EMERGENCY STOP RESET RANGE: RESET/NORMAL
EGR18	"A" DIESEL CONTROL PANEL 86D RESET RANGE: RESET/NORMAL
EGR19	ACKNOWLEDGE ALARMS ON "B" DIESEL GENERATOR CONTROL PANEL RANGE: ACKNOWLEDGE/NORMAL
EGR20	"B" DIESEL CONTROL PANEL MODE SWITCH RANGE: OFF/LOCAL/REMOTE
EGR21	"B" DIESEL EMERGENCY STOP RANGE: STOP/NORMAL
EGR22	"B" DIESEL EMERGENCY START (LOP) RANGE: START/NORMAL
EGR23	"B" DIESEL EMERGENCY START (ESF) RANGE: START/NORMAL

EGR24 "B" DIESEL PANEL FIRST OUT/SYSTEM RESET

RANGE: RESET/NORMAL

EGR25 "B" DIESEL CONTROL PANEL EMERGENCY MODE DEFEAT

RANGE: RESET/NORMAL

EGR26 "B" DIESEL CONTROL PANEL EMERGENCY STOP RESET

RANGE: RESET/NORMAL

EGR27 "B" DIESEL CONTROL PANEL 86D RESET

RANGE: RESET/NORMAL

EGR28 OPERATE "A" DAY TANK DRAIN TO STORAGE TANK VALVE (DGB-VO46)

RANGE: OPEN/CLOSE

EGR29 OPERATE "B" DAY TANK DRAIN TO STORAGE TANK VALVE (DGA-VO47)

RANGE: OPEN/CLOSE

EGR30 OPERATE "A" DIESEL "B" STARTING AIR SUPPLY VALVE (DGA-HCV-9)

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

EGR31 OPERATE "B" DIESEL "A" STARTING AIR SUPPLY VALVE (DGB-HCV-10)

RANGE: OPEN/CLOSE

EGR32 OPERATE "A" DIESEL "A" STARTING AIR SUPPLY VALVE (DGA-HCV-11)

RANGE: OPEN/CLOSE

EGR33 OPERATE "B" DIESEL "B" STARTING AIR SUPPLY VALVE (DGB-HCV-12)

RANGE: OPEN/CLOSE

EGR34 "A" DIESEL MANUAL FUEL RACK SHUTOFF

RANGE: SHUTOFF/NORMAL

EGR35 "A" DIESEL MANUAL GOVERNOR SPEED SET

RANGE: 500 RPM TO 700 RPM

EGR36 "B" DIESEL FUEL RACK SHUTOFF

RANGE: SHUTOFF/NORMAL

EGR37 "B" DIESEL MANUAL GOVERNOR SPEED SET

RANGE: 500 RPM TO 700 RPM

EGR38 OPERATE THE FUEL OIL TRANSFER CROSS CONNECT VALVES (DFN-VO15 AND DFN-VO21)

RANGE: OPEN/CLOSE

EGR39 "B" DG BREAKER (CS-3)

RANGE: LOCAL/LOC. REMOTE

EGR40 "B" DIESEL ENGINE CONTROL (1J-DGB-HS-2A; CS-4)

RANGE: LOCAL/LOC. REMOTE

EGR41 "B" DIESEL ENGINE CONTROL (IJ-DGB-HS-2B; CS-5)

RANGE: LOCAL/LOC. REMOTE

EGR42 "B" DIESEL ENGINE CONTROL (IE-PEB-HS-2)

RANGE: LOCAL/LOC. REMOTE

EGR43 "B" DIESEL GEN FUEL OIL TRANSFER PUMP (IJ-DFB-HS-22C)

RANGE: LOCAL/LOC. REMOTE

FP

FPR01 TEST START OF THE DIESEL FIRE PUMP (FPN-PO1A)

RANGE: AUTO/OFF/MANUAL

REMOTE FUNCTIONS

FPR02 TEST START OF THE DIESEL FIRE PUMP (FPN-PO1B)

RANGE: AUTO/OFF/MANUAL

FPR03 SHUTDOWN THE ELECTRIC MOTOR DRIVEN FIRE PUMP

RANGE: STOP/NORMAL

<u>FW</u>

FWR01 RESET OVERSPEED TRIP TO AFA-PO1

RANGE: RESET/NORMAL

FWR02 MANUALLY ACTUATE OVERSPEED TRIP OF AFA-PO1

RANGE: TRIP/NORMAL

FWR03 RACK IN/RACK OUT BREAKER FOR MOTOR DRIVEN AUXILIARY FWP (AFN-PO1)

RANGE: RACK IN/RACK OUT

FWR04 RACK IN/RACK OUT BREAKER FOR MOTOR DRIVEN AUXILIARY FWP (AFB-PO1)

RANGE: RACK IN/RACK OUT

FWR05 TURN CONTROL POWER ON/OFF BREAKERS FOR MOTOR DRIVEN AUXILIARY FWP (AFN-PO1)

RANGE: CONTROL POWER ON/CONTROL POWER OFF

[illegible]

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REMOTE FUNCTIONS

FWR06	TURN CONTROL POWER ON/OFF BREAKERS FOR MOTOR DRIVEN AUXILIARY FWP (AFB-PO1)
	RANGE: CONTROL POWER ON/CONTROL POWER OFF
FWR07	LOCALLY OPERATE MOTOR DRIVEN AF PUMP AFN-PO1 FROM SWITCHGEAR
	RANGE: START/NORMAL/STOP
FWR08	LOCALLY OPERATE MOTOR DRIVEN AF PUMP AFB-PO1 FROM SWITCHGEAR
	RANGE: START/NORMAL/STOP
FWR09	OPEN/CLOSE BREAKER FOR VALVE AFA-HV-54 AT MCC
	RANGE: OPEN/CLOSE
FWR10	OPEN/CLOSE BREAKER FOR VALVE AFA-HV-32 AT MCC
	RANGE: OPEN/CLOSE
FWR11	OPEN/CLOSE BREAKER FOR VALVE AFA-UV-37 AT MCC
	RANGE: OPEN/CLOSE
FWR12	OPEN/CLOSE BREAKER FOR VALVE AFB-HV-30 AT MCC
	RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

FWR13	OPEN/CLOSE BREAKER FOR VALVE AFB-HV-31 AT MCC
	RANGE: OPEN/CLOSE
FWR14	OPEN/CLOSE BREAKER FOR VALVE AFC-HV-33 AT MCC
	RANGE: OPEN/CLOSE
FWR15	OPEN/CLOSE BREAKER FOR VALVE AFB-HV-34 AT MCC
	RANGE: OPEN/CLOSE
FWR16	OPEN/CLOSE BREAKER FOR VALVE AFB-UV-35 AT MCC
	RANGE: OPEN/CLOSE
FWR17	OPEN/CLOSE BREAKER FOR VALVE AFC-UV-36 AT MCC
	RANGE: OPEN/CLOSE
FWR18	CHANGE FLANGE POSITION (AF-F0098)
	RANGE: OPEN/CLOSE
FWR19	CHANGE FLANGE POSITION (AF-F0099)
	RANGE: OPEN/CLOSE
FWR20	OPERATE FLOW TEST VALVE (AF-V0133)
	RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

FWR21 OPERATE FLOW TEST VALVE (AF-V017)

RANGE: OPEN/CLOSE

FWR22 OPERATE FLOW TEST VALVE (AF-V026)

RANGE: OPEN/CLOSE

FWR23 OVERRIDE SG FEED CONTROL VALVE (AF-HV-030)

RANGE: OPEN/NORMAL/CLOSE

FWR24 OVERRIDE SG FEED CONTROL VALVE (AF-HV-031)

RANGE: OPEN/NORMAL/CLOSE

FWR25 OVERRIDE SG FEED CONTROL VALVE (AF-HV-032)

RANGE: OPEN/NORMAL/CLOSE

FWR26 OVERRIDE SG FEED CONTROL VALVE (AF-HV-033)

RANGE: OPEN/NORMAL/CLOSE

FWR27 OVERRIDE SG FEED CONTROL VALVE (AF-UV-034)

RANGE: OPEN/NORMAL/CLOSE

FWR28 OVERRIDE SG FEED CONTROL VALVE (AF-UV-035)

RANGE: OPEN/NORMAL/CLOSE

REMOTE FUNCTIONS

FWR29	OVERRIDE SG FEED CONTROL VALVE (AF-UV-036) RANGE: OPEN/NORMAL/CLOSE
FWR30	OVERRIDE SG FEED CONTROL VALVE (AF-UV-037) RANGE: OPEN/NORMAL/CLOSE
FWR31	OPERATE AUX FPT AUX STEAM SUPPLY VALVE (AF-V055) RANGE: OPEN/CLOSE
FWR32	OPERATE AUX FPT MAIN STEAM SUPPLY VALVE (AF-V002) RANGE: OPEN/CLOSE
FWR33	OPERATE AFA-PO1 CST SUCTION VALVE (AF-V006) RANGE: OPEN/CLOSE
FWR34	OPERATE AFA-PO1 RMWT SUCTION VALVE (AF-V058) RANGE: OPEN/CLOSE
FWR35	OPERATE AFB-PO1 RMWT SUCTION VALVE (AF-V028) RANGE: OPEN/CLOSE

FWR36 OPERATE AFB-PO1 CST VALVE (AF-V021)

RANGE: OPEN/CLOSE

NOTE: RF's FWR31 THROUGH FWR36 ARE INTERLOCKED SO THAT ONE FLOW PATH IS ALWAYS OPEN.

FWR37 RACK IN/RACK OUT AR PUMP "A" BREAKER

RANGE: RACK IN/RACK OUT

FWR38 RACK IN/RACK OUT AR PUMP "B" BREAKER

RANGE: RACK IN/RACK OUT

FWR39 RACK IN/RACK OUT AR PUMP "C" BREAKER

RANGE: RACK IN/RACK OUT

FWR40 RACK IN/RACK OUT AR PUMP "D" BREAKER

RANGE: RACK IN/RACK OUT

FWR41 REMOVE/INSERT CONTROL POWER FUSES FOR AR PUMP "A" BREAKER

RANGE: REMOVE/INSERT

FWR42 REMOVE/INSERT CONTROL POWER FUSES FOR AR PUMP "B" BREAKER

RANGE: REMOVE/INSERT

FWR43 REMOVE/INSERT CONTROL POWER FUSES FOR AR PUMP "C" BREAKER

RANGE: REMOVE/INSERT

FWR44 REMOVE/INSERT CONTROL POWER FUSES FOR AR PUMP "D" BREAKER

RANGE: REMOVE/INSERT

FWR45 OPERATE AIR HOGGING VALVE (AR-HCV-010)

RANGE: OPEN/CLOSE

FWR46 RACK IN/RACK OUT CD PUMP "A" BREAKER

RANGE: RACK IN/RACK OUT

FWR47 RACK IN/RACK OUT CD PUMP "B" BREAKER

RANGE: RACK IN/RACK OUT

FWR48 RACK IN/RACK OUT CD PUMP "C" BREAKER

RANGE: RACK IN/RACK OUT

FWR49 TURN CONTROL POWER ON/OFF FOR CD PUMP "A" BREAKER

RANGE: CONTROL ON/CONTROL POWER OFF

REMOTE FUNCTIONS

FWR50 TURN CONTROL POWER ON/OFF FOR CD PUMP "B" BREAKER.

RANGE: CONTROL POWER ON/CONTROL POWER OFF

FWR51 TURN CONTROL POWER ON/OFF FOR CD PUMP "C" BREAKER

RANGE: CONTROL POWER ON/CONTROL

FWR52 PERFORM REGEN ON CONDENSATE DEMINERALIZER RESIN BED

RANGE: REGEN/NORMAL

FWR53 PERFORM RINSE ON CONDENSATE DEMINERALIZER BED "A"

RANGE: RINSE/NORMAL

FWR54 PERFORM RINSE ON CONDENSATE DEMINERALIZER BED "B"

RANGE: RINSE/NORMAL

FWR55 PERFORM RINSE ON CONDENSATE DEMINERALIZER BED "C"

RANGE: RINSE/NORMAL

FWR56 PERFORM RINSE ON CONDENSATE DEMINERALIZER BED "D"

RANGE: RINSE/NORMAL

REMOTE FUNCTIONS

FWR57 PERFORM RINSE ON CONDENSATE DEMINERALIZER BED "E"

RANGE: RINSE/NORMAL

FWR58 PERFORM RINSE ON CONDENSATE DEMINERALIZER BED "F"

RANGE: RINSE/NORMAL

FWR59 EQUALIZE PRESSURE ACROSS THE LP HEATERS

RANGE: OPEN EQUALIZE/CLOSE EQUALIZE

FWR60 SWAP OFF UNIT INFINITE CONDENSATE CROSS TIE SUPPLY

RANGE: PS1/OFF/PS2

FWR61 SWAP UNIT 1 CROSS TIE SUPPLY

RANGE: PV208 IN SERVICE/OFF/V252 OPEN

FWR62 OPERATE CONDENSATE DUMP VALVE (CD-V194)

RANGE: 0-100% OPEN

FWR63 OPERATE HOTWELL #1 FILL BYPASS VALVE (CD-HCV-154)

RANGE: 0-100% OPEN

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[illegible]

REMOTE FUNCTIONS

FWR64 OPERATE HOTWELL #2 FILL BYPASS VALVE (CD-HCV-155)

RANGE: 0-100% OPEN

FWR65 OPERATE "A"-"B" EQUALIZING DUCT FILL VALVE (CD-V056)

RANGE: OPEN/CLOSE

FWR66 OPERATE "B"-"C" EQUALIZING DUCT FILL VALVE (CD-V057)

RANGE: OPEN/CLOSE

FWR67 OPERATE CONDENSATE MAKEUP CROSS TIE VALVE (AS-V164)

RANGE: OPEN/CLOSE

FWR68 OPERATE "A" COND. PP DISCHARGE BYPASS VALVE (CD-V136)

RANGE: OPEN/CLOSE

FWR69 OPERATE "B" COND. PP DISCHARGE BYPASS VALVE (CD-V136)

RANGE: OPEN/CLOSE

FWR70 OPERATE "C" CONC. PP DISCHARGE BYPASS VALVE (CD-V138)

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

FWR71 ADJUST SETPOINT OF SEAL WATER SUPPLY CONTROLLER (CD-PIC-200)

RANGE: 0-100 PSIG

FWR72 OPERATE CST LEVEL CONTROLLER ISOLATION VALVE (CT-V004)

RANGE: 0-100% OPEN

FWR73 OPERATE DWST FEED CONTROL ISOLATION VALVE (DW-V036)

RANGE: 0-100% OPEN

FWR74 OPERATE DWST FEED FROM WRF BYPASS VALVE (DW-V092)

RANGE: 0-100% OPEN

FWR75 RACK IN/RACK OUT BREAKERS FOR HEATER DRAIN PUMP "A"

RANGE: RACK IN/RACK OUT

FWR76 RACK IN/RACK OUT BREAKERS FOR HEATER DRAIN PUMP "B"

RANGE: RACK IN/RACK OUT

FWR77 TURN ON/OFF CONTROL POWER FOR HEATER DRAIN PUMP "A"

RANGE: CONTROL POWER ON/CONTROL POWER OFF

REMOTE FUNCTIONS

FWR78 TURN ON/OFF CONTROL POWER FOR HEATER DRAIN PUMP "B"

RANGE: CONTROL POWER ON/CONTROL POWER OFF

FWR79 OPERATE HEATER DRAIN TANK VAPOR CROSS CONNECT VALVE (ED-V482)

RANGE: OPEN/CLOSE

FWR80 OPERATE HEATER DRAIN TANK WATER CROSS TIE VALVE (ED-V483)

RANGE: OPEN/CLOSE

FWR81 OPERATE "A" DRAIN PUMP WARMUP VALVE (ED-V834)

RANGE: OPEN/CLOSE

FWR82 OPERATE "B" DRAIN PUMP WARMUP VALVE (ED-V835)

RANGE: OPEN/CLOSE

FWR85 PERFORM TEST OF THRUST BEARING WEAR DETECTOR FOR FWPT "A"

RANGE: TEST/NORMAL

FWR86 PERFORM TEST OF THRUST BEARING WEAR DETECTOR FOR FWPT "B"

RANGE: TEST/NORMAL

REMOTE FUNCTIONS

FWR87 LOCAL MANUAL TRIP "A" FWPT

RANGE: TRIP/NORMAL

FWR88 LOCAL MANUAL TRIP "B" FWPT

RANGE: TRIP/NORMAL

FWR89 ADJUST SETPOINT ON OIL COOLER TEMP CONTROLLER LO-TIC-101 FOR FPT "A"

RANGE: 70°F TO 150°F

FWR90 ADJUST SETPOINT ON OIL COOLER TEMP. CONTROLLER LO-TIC-102 FOR FPT "B"

RANGE: 70°F TO 150°F

FWR91 "B" AFP BREAKER

RANGE: LOCAL/LOC. REMOTE

FWR92 OPERATE "B" FWPT EXHAUST VALVE (FT-HCV-061)

RANGE: OPEN/NOT FULLY OPEN

FWR93 OPERATE "A" FWPT EXHAUST VALVE (FT-HCV-060)

RANGE: OPEN/NOT FULLY OPEN

REMOTE FUNCTIONS

NOTE: EACH FWPT EXHAUST IS SIMULATED ONLY TO THE POINT OF PREVENTING THE RESPECTIVE FWPT FROM RESETTING IF NOT FULLY OPEN.

THE TWO REMOTE FUNCTIONS (FWR92 AND FWR93) SIMULATE ONLY THE VALVE POSTION LIMIT AND SWITCHES THAT PREVENT A FWPT FROM BEING RESET IF THE RESPECTIVE EXHAUST VALVE IS NOT FULLY OPEN. THE FWPT EXHAUST VALVE ITSELF IS NOT SIMULATED.

FWR94 OPERATE HP FEEDWATER HEATER BYPASS VALVE EQUALIZING VALVE (FW-V072)

RANGE: OPEN/CLOSE

FWR95 OPERATE "A" FWP LONG PATH RECIRC VALVE (FW-V008)

RANGE: OPEN/CLOSE

FWR96 OPERATE "B" FWP LONG PATH RECIRC VALVE (FW-V013)

RANGE: OPEN/CLOSE

FWR99 OPERATE "A" FWP RECIRC ISOLATION VALVE (FW-V005)

RANGE: OPEN/CLOSE

FWR100 OPERATE "B" FWP RECIRC ISOLATION VALVE (FW-V010)
RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

FWR101 OPERATE VALVE SG-V125 (LONG PATH RECIRC)

RANGE: OPEN/CLOSE

FWR102 OPERATE VALVE SG-V124 (LONG PATH RECIRC)

RANGE: OPEN/CLOSE

FWR103 OPERATE SG #1 DOWNCOMER CONTROL VALVE ISOLATION (SG-V097)

RANGE: OPEN/CLOSE

FWR104 OPERATE SG #2 DOWNCOMER CONTROL VALVE ISOLATION (SG-V098)

RANGE: OPEN/CLOSE

FWR105 OPERATE LONG PATH RECIRC CONTROL VALVE (SG-HV46)

RANGE: 0-100% OPEN

FWR106 LOCALLY OVERRIDE AND OPERATE FWIV (SG-UV175)

RANGE: OPEN/NORMAL/CLOSE

FWR107 LOCALLY OVERRIDE AND OPERATE FWIV (SG-UV135)

RANGE: OPEN/NORMAL/CLOSE

FWR108 LOCALLY OVERRIDE AND OPERATE FWIV (SG-UV172)

RANGE: OPEN/NORMAL/CLOSE

REMOTE FUNCTIONS

FWR109 LOCALLY OVERRIDE AND OPERATE FWIV (SG-UV130)

RANGE: OPEN/NORMAL/CLOSE

FWR110 OPERATE AIR SUPPLY VALVE (IA-V953) TO FWIV (UV-174) OIL PUMP

RANGE: AIR ON/AIR OFF

FWR111 OPERATE AIR SUPPLY VALVE (IA-V952) TO FWIV (UV-132) OIL PUMP

RANGE: AIR ON/AIR OFF

FWR112 OPERATE AIR SUPPLY VALVE (IA-V964) TO FWIV (UV-177) OIL PUMP

RANGE: AIR ON/AIR OFF

FWR113 OPERATE AIR SUPPLY VALVE (IA-V963) TO FWIV (UV-137) OIL PUMP

RANGE: AIR ON/AIR OFF

FWR114 OPERATE THE NON ESSENTIAL AUX FEED WATER PUMP DISCHARGE VALVE (AFN-V013)

RANGE: OPEN/CLOSED

FWR115 BYPASS THE LOW FW PUMP SUCTION PRESSURE INTERLOCK

RANGE: BYPASS/NORMAL

FWR116 OPERATE AIR REMOVAL SUCTION FROM SECTION 1A (ARN-V003)

RANGE: OPEN/CLOSED

FWR117 OPERATE AIR REMOVAL SUCTION FROM SECTION 2A (ARN-V001)

RANGE: OPEN/CLOSED

FWR118 OPERATE AIR REMOVAL SUCTION FROM SECTION 1B (ARN-V004)

RANGE: OPEN/CLOSED

FWR119 OPERATE AIR REMOVAL SUCTION FROM SECTION 2B (ARN-V006)

RANGE: OPEN/CLOSED

FWR120 OPERATE AIR REMOVAL SUCTION FROM SECTION 1C (ARN-V009)

RANGE: OPEN/CLOSED

FWR121 OPERATE AIR REMOVAL SUCTION FROM SECTION 2C (ARN-V007)

RANGE: OPEN/CLOSED

FWR122 SWAP CONDENSATE CROSS TIE HEADER FLOW PATHS

RANGE: AS-V088 OPEN/AS-V024 OPEN

[illegible]

FWR123 LOCALLY OVERRIDE THE LONG PATH RECIRC CONTROL VALVE (SG-HV-46)

RANGE: OVERRIDE/NORMAL

FWR124 BYPASS THE LOW FEED PUMP SUCTION PRESSURE INTERLOCK TO THE HOTWELL LEVEL CONTROL DRAWOFF VALVE (CDN-LV75)

RANGE: BYPASS/NORMAL

<u>HV</u>

HVR01 ACKNOWLEDGE HT SYSTEM PANEL ALARMS

RANGE: ACKNOWLEDGE/NORMAL

HVR03 ACKNOWLEDGE HD LOCAL ANNUNCIATOR PANELS

RANGE: ACKNOWLEDGE/NORMAL

HVR04 ELECTRICAL PENETRATION ACU ROOM FAN (HAB-Z06)

RANGE: ON/OFF

HVRO5 ELECTRICAL PENETRATION ACU ROOM FAN (HAA-Z06)

RANGE: ON/OFF

HVR06 "B" ESF SWITCHGEAR ROOM ESSENTIAL AHU FAN M-HJB-Z-3 BREAKER (CS-3)

RANGE: LOCAL/LOC. REMOTE

[illegible]

HVR07 CONTROL BUILDING BATTERY ROOM "D" ESSENTIAL EXHAUST FAN (CS-3) M-HJ-JO1A BREAKER

RANGE: LOCAL/LOC. REMOTE

HVR08 CONTROL BUILDING BATTERY ROOM "B" ESSENTIAL EXHAUST FAN (CS-3) M-HJ-JO1B BREAKER

RANGE: LOCAL/LOC. REMOTE

HVR09 "B" DIESEL ESSENTIAL EXHAUST FAN (IJ-HDB-HS-14A)

RANGE: LOCAL/LOC. REMOTE

<u>IA</u>

IAR01 IAN-V219 TURBINE BLDG LOOP ISOLATION VALVE

RANGE: OPEN/CLOSE

IAR02 IAN-V311 TURBINE BLDG LOOP ISOLATION VALVE

RANGE: OPEN/CLOSE

IAR03 IAN-V215 TURBINE BLDG LOOP ISOLATION VALVE

RANGE: OPEN/CLOSE

IAR04 IAN-V055 AUXILIARY BLDG LOOP ISOLATION VALVE

RANGE: OPEN/CLOSE

IAR05	OPERATE N_2 SUPPLY BYPASS (IAN-V591)
	RANGE: 0-100%
IAR06	SWITCH SENSING POINT FOR IA UNLOADERS FROM MSSS TO RECEIVER
	RANGE: MSSS/RECEIVERS
IAR07	SELECT LEAD COMPRESSOR
	RANGE: (ABC/BCA/CAB)
IAR08	PLACE IN SERVICE THE STANDBY IA COMPRESSOR (120 PSIG DISCHARGE)
	RANGE: START/NORMAL/STOP
IAR09	IA COMPRESSOR (IAN-C01A)
	RANGE: AUTO/MANUAL
IAR10	IA COMPRESSOR (IAN-C01B)
	RANGE: AUTO/MANUAL
IAR11	IA COMPRESSOR (IAN-CO1C)
	RANGE: AUTO/MANUAL
IAR13	SET THE MASS IN THE N_2 TANK
	RANGE: 75" TO 150"

IAR14 RESET ALL THE IA LOCAL RESETS/TRIPS.

RANGE: RESET/NORMAL

MS

MSR01 OPERATE AUXILIARY STEAM SUPPLY TO MSR's VALVE (AS-V019)

RANGE: OPEN/CLOSE

MSR02 OPERATE AUXILIARY STEAM DUMP VALVE

RANGE: 0-100% OPEN

MSR03 OPERATE AUXILIARY STEAM SUPPLY FROM UNITS 2 AND 3

RANGE: 0-100% OPEN

MSR04 OPERATE AUXILIARY STEAM SUPPLY FROM THE AUXILIARY BOILERS 1 AND 2

RANGE: 0-100% OPEN

MSR05 OPERATE GLAND EXHAUSTER FANS SUCTION VALVES

RANGE: 0-100% OPEN

MSR06 FPT "A" GLAND STEAM

RANGE: ON/OFF

[illegible]

REMOTE FUNCTIONS

MSR08	FPT "B" GLAND STEAM RANGE: ON/OFF
MSR09	OPERATE ADV ISOLATION VALVE (SG-V955) RANGE: OPEN/CLOSE
MSR10	OPERATE ADV ISOLATION VALVE (SG-V949) RANGE: OPEN/CLOSE
MSR11	OPERATE ADV ISOLATION VALVE (SG-V958) RANGE: OPEN/CLOSE
MSR12	OPERATE ADV ISOLATION VALVE (SG-V952) RANGE: OPEN/CLOSE
MSR13	ADV (HY-184C) N_2 ISOLATION (SG-V341) RANGE: OPEN/CLOSE
MSR14	ADV (HY-179C) N_2 ISOLATION (SG-V336) RANGE: OPEN/CLOSE
MSR15	ADV (HY-185C) N_2 ISOLATION (SG-V362) RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

MSR16 ADV (HY-178C) N_2 ISOLATION (SG-V356)

RANGE: OPEN/CLOSE

MSR17 ADV (HY-179/184) IA ISOLATION (SG-V965)

RANGE: OPEN/CLOSE

MSR18 SG #1 5 PSIG N_2 SUPPLY (SG-PCV10)

RANGE: IN SERVICE/OUT OF SERVICE

MSR19 SG #2 5 PSIG N_2 SUPPLY (SG-PCV11)

RANGE: IN SERVICE/OUT OF SERVICE

MSR20 MSIV UV-181 OIL PUMP AIR SUPPLY VALVE (IA-V958)

RANGE: AIR ON/AIR OFF

MSR21 MSIV UV-171 OIL PUMP AIR SUPPLY VALVE (IA-V956)

RANGE: AIR ON/AIR OFF

MSR22 MSIV UV-170 OIL PUMP AIR SUPPLY VALVE (IA-V801)

RANGE: AIR ON/AIR OFF

MSR23 MSIV UV-180 OIL PUMP AIR SUPPLY VALVE (IA-V944)

RANGE: AIR ON/AIR OFF

REMOTE FUNCTIONS

MSR24	OVERRIDE MSIV BYPASS (SG-UV183)	
	RANGE: OPEN/NORMAL/CLOSE	
MSR25	OVERRIDE MSIV BYPASS (SG-UV169)	
	RANGE: OPEN/NORMAL/CLOSE	
MSR26	MSIV BYPASS ISOLATION (SG-V084)	
	RANGE: OPEN/CLOSE	
MSR27	MSIV BYPASS ISOLATION (SG-V048)	
	RANGE: OPEN/CLOSE	
MSR28	ADV AIR ISOLATION (SG-V063)	
	RANGE: OPEN/CLOSE	
MSR29	SBCV (1007) ISOLATION (SG-V066)	
	RANGE: OPEN/CLOSE	
MSR30	SBCV (1008) ISOLATION (SG-V069)	
	RANGE: OPEN/CLOSE	
MSR31	SBCV (1002) ISOLATION (SG-V063)	
	RANGE: OPEN/CLOSE	

[illegible]

REMOTE FUNCTIONS

MSR32	SBCV (1006) ISOLATION (SG-V080)
	RANGE: OPEN/CLOSE
MSR33	SBCV (1005) ISOLATION (SG-V077)
	RANGE: OPEN/CLOSE
MSR34	SBCV (1004) ISOLATION (SG-V075)
	RANGE: OPEN/CLOSE
MSR35	SBCV (1003) ISOLATION (SG-V073)
	RANGE: OPEN/CLOSE
MSR36	SBCV (1001) ISOLATION (SG-V060)
	RANGE: OPEN/CLOSE
MSR37	OPERATE MT-PV-349, MSR "A" LOW LOAD VALVE
	RANGE: 0-100% OPEN
MSR38	OPERATE MT-PV-350, MSR "B" LOW LOAD VALVE
	RANGE: 0-100%
MSR39	OPERATE MT-PV-351, MSR "C" LOW LOAD VALVE
	RANGE: 0-100%

REMOTE FUNCTIONS

MSR40 OPERATE MT-PV-352, MSR "D" LOW LOAD VALVE

RANGE: 0-100% OPEN

MSR41 START/STOP AUXILIARY BOILER #1

RANGE: START/STOP

MSR42 START/STOP AUXILIARY BOILER #2

RANGE: START/STOP

MSR43 AUXILIARY STEAM TO THE CONDENSATE SPARGERS

RANGE: ON/OFF

MSR44 OPERATE THE SEAL INJECTION AUX STEAM ISOLATION VALVE

RANGE: OPEN/CLOSED

NOTE: A PDS CHANGE WILL BE IMPLEMENTED TO ACCOUNT FOR THE ADDITION OF SIMULATION OF THE SEAL INJECTION HEAT EXCHANGER.

MSR45 PLACE STEAM SUPPLY TO FOURTH POINT HEATERS (PV-103) IN SERVICE

RANGE: 0-125 PSIG

MSR46 OPERATE EDN-V251 (ISOLATION FOR ED-FV-711A)

RANGE: OPEN/CLOSED

MSR47 OPERATE EDN-V314 (ISOLATION FOR ED-FV-712A)

RANGE: OPEN/CLOSED

MSR48 OPERATE EDN-V271 (ISOLATION FOR ED-FV-611A)

RANGE: OPEN/CLOSED

MSR49 OPERATE EDN-V299 (ISOLATION FOR ED-FV-612A)

RANGE: OPEN/CLOSED

MSR50 BLEED IA SUPPLY TO ADV's (SG-HY-178 AND SG-HY-185)

RANGE: BLEED AIR/NORMAL

MSR51 BLEED IA SUPPLY TO ADV's (SG-HY-179 AND SG-HY-184)

RANGE: BLEED AIR/NORMAL

MSR52 REPRESSURIZE N_2 ACCUMULATORS FOR ALL ADV's

RANGE: REPRESSURIZE/NORMAL

MSR53 OVERRIDE THE STEAM ISOLATION FOR 7A FW HEATER (ED-UV-31)

RANGE: OVERRIDE/NORMAL

MSR54 OPERATE THE STEAM ISOLATION FOR 7A FW HEATER (ED-UV-31)

RANGE: 0-100% OPEN

[illegible]

MSR55 OVERRIDE THE STEAM ISOLATION FOR 7B FW HEATER (ED-UV-32)

RANGE: OVERRIDE/NORMAL

MSR56 OPERATE THE STEAM ISOLATION FOR 7B FW HEATER (ED-UV-32)

RANGE: 0-100% OPEN

MSR57 OPERATE EXT STEAM SUPPLY TO 3A FW HEATER (EDN-V019)

RANGE: OPEN/CLOSED

MSR58 OPERATE EXT STEAM SUPPLY TO 3B FW HEATER (EDN-V021)

RANGE: OPEN/CLOSED

MSR59 OPERATE EXT STEAM SUPPLY TO 3C FW HEATER (EDN-V506)

RANGE: OPEN/CLOSED

MSR60 OPERATE EXT STEAM SUPPLY TO 4A FW HEATER (EDN-V508)

RANGE: OPEN/CLOSED

REMOTE FUNCTIONS

MSR61 OPERATE EXT STEAM SUPPLY TO 4B FW HEATER (EDN-V023)

RANGE: OPEN/CLOSED

MSR62 OPERATE EXT STEAM SUPPLY TO 4C FW HEATER (EDN-V507)

RANGE: OPEN/CLOSED

MSR63 OPERATE TRAIN "A" DC CONTROL POWER DISCONNECT SWITCH (DS-08-01) TO MSIV (SG-UV-170)

RANGE: DC POWER ON/DC POWER OFF

MSR64 OPERATE TRAIN "A" DC CONTROL POWER DISCONNECT SWITCH (DS-08-02) TO MSIV (SG-UV-180)

RANGE: DC POWER ON/DC POWER OFF

MSR65 OPERATE TRAIN "A" DC CONTROL POWER DISCONNECT SWITCH (DS-08-03) TO MSIV (SG-UV-171)

RANGE: DC POWER ON/DC POWER OFF

MSR66 OPERATE TRAIN "A" DC CONTROL POWER DISCONNECT SWITCH (DS-08-04) TO MSIV (SG-UV-181)

RANGE: DC POWER ON/DC POWER OFF

MSR67 LOCALLY OVERRIDE SECOND STAGE STEAM SUPPLY VALVE TO MSR "A" (MTN-PV-349)

RANGE: OVERRIDE/NORMAL

MSR68	LOCALLY OVERRIDE SECOND STAGE STEAM SUPPLY VALVE TO MSR "B" (MTN-PV-350) RANGE: OVERRIDE/NORMAL
MSR69	LOCALLY OVERRIDE SECOND STAGE STEAM SUPPLY VALVE TO MSR "C" (MTN-PV-351) RANGE: OVERRIDE/NORMAL
MSR70	LOCALLY OVERRIDE SECOND STAGE STEAM SUPPLY VALVE TO MSR "D" (MTN-PV-352) RANGE: OVERRIDE/NORMAL
MSR75	READ ACCUMULATOR N_2 PRESSURE (PI-314) ADV (SG-HV-184) RANGE: 0-800 PSIG
MSR76	READ ACCUMULATOR N_2 PRESSURE (PI-300) ADV (SG-HV-178) RANGE: 0-800 PSIG
MSR77	READ ACCUMULATOR N_2 PRESSURE (PI-320) ADV (SG-HV-185) RANGE: 0-800 PSIG

MSR78 READ ACCUMULATOR N_2 PRESSURE (PI-307) ADV (SG-HV-179)

RANGE: 0-800 PSIG

MSR79 READ N_2 SUPPLY PRESSURE (PI-318) DOWNSTREAM OF THE NITROGEN SOLENOID ADV (SG-HV-184)

RANGE: 0-160 PSIG

MSR80 READ N_2 SUPPLY PRESSURE (PI-304) DOWNSTREAM OF THE NITROGEN SOLENOID ADV (SG-HV-178)

RANGE: 0-160 PSIG

MSR81 READ N_2 SUPPLY PRESSURE (PI-324) DOWNSTREAM OF THE NITROGEN SOLENOID ADV (SG-HV-185)

RANGE: 0-160 PSIG

MSR82 READ N_2 SUPPLY PRESSURE (PI-311) DOWNSTREAM OF THE NITROGEN SOLENOID ADV (SG-HV-179)

RANGE: 0-160 PSIG

<u>NI</u>

NIR01 HEATED JUNCTION THERMOCOUPLE HEATERS (HCA-HCB) IN CABINET J-SHA-C01

RANGE: ENERGIZED/DEENERGIZED

[illegible]

[illegible]

REMOTE FUNCTIONS

NIR02 HEATED JUNCTION THERMOCOUPLE HEATERS (HCA-HCB) IN CABINET J-SHB-C01

RANGE: ENERGIZED/DEENERGIZED

<u>RC</u>

RCR01 RACK IN/RACK OUT RCP NAN-SO1M BREAKER (RCP 2A)

RANGE: RACK IN/RACK OUT

RCR02 RACK IN/RACK OUT RCP NAN-SO1L BREAKER (RCP 1A)

RANGE: RACK IN/RACK OUT

RCR03 RACK IN/RACK OUT RCP NAN-SO2L BREAKER (RCP 2B)

RANGE: RACK IN/RACK OUT

RCR04 RACK IN/RACK OUT RCP NAN-SO2M BREAKER (RCP 1B)

RANGE: RACK IN/RACK OUT

RCR05 TURN CONTROL POWER ON/OFF FOR RCP NAN-SO1M (RCP 2A) BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

RCR06 TURN CONTROL POWER ON/OFF FOR RCP NAN-SO1L (RCP 1A) BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

[illegible]

[illegible]

REMOTE FUNCTIONS

RCR07 TURN CONTROL POWER ON/OFF FOR RCP NAN-SO2L (RCP 2B) BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

RCR08 TURN CONTROL POWER ON/OFF FOR RCP NAN-SO2M (RCP 1B) BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

RCR09 RESET LOCKOUT (286) RELAY ON RCP NAN-SO1M (RCP 2A) BREAKER

RANGE: RESET/NORMAL

RCR10 RESET LOCKOUT (286) RELAY ON RCP NAN-SO1L (RCP 1A) BREAKER

RANGE: RESET/NORMAL

RCR11 RESET LOCKOUT (286) RELAY ON RCP NAN-SO2L (RCP 2B) BREAKER

RANGE: RESET/NORMAL

RCR12 RESET LOCKOUT (286) RELAY ON RCP NAN-SO2M (RCP 1B) BREAKER

RANGE: RESET/NORMAL

RCR13 OPEN/CLOSE BREAKER PGA-L33D3 FOR PRESSURIZER HEATERS

RANGE: OPEN/CLOSE

RCR14	OPEN/CLOSE BREAKER PGA-L32E3 FOR PRESSURIZER HEATERS RANGE: OPEN/CLOSE
RCR15	OPEN/CLOSE BREAKER PGA-L11C2 FOR PRESSURIZER HEATERS RANGE: OPEN/CLOSE
RCR16	OPEN/CLOSE BREAKER PGA-L11C3 FOR PRESSURIZER HEATERS RANGE: OPEN/CLOSE
RCR17	OPEN/CLOSE BREAKER PGA-L11C4 FOR PRESSURIZER HEATERS RANGE: OPEN/CLOSE
RCR18	OPEN/CLOSE BREAKER PGA-L12C2 FOR PRESSURIZER HEATERS RANGE: OPEN/CLOSE
RCR19	OPEN/CLOSE BREAKER PGA-L12C3 FOR PRESSURIZER HEATERS RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

RCR20 OPEN/CLOSE BREAKER PGA-L12C4 FOR PRESSURIZER HEATERS

RANGE: OPEN/CLOSE

RCR21 START/STOP RCP "1A" LOCALLY AT BREAKER

RANGE: START/NORMAL/STOP

RCR22 START/STOP RCP "1B" LOCALLY AT BREAKER

RANGE: START/NORMAL/STOP

RCR23 START/STOP RCP "2A" LOCALLY AT BREAKER

RANGE: START/NORMAL/STOP

RCR24 START/STOP RCP "2B" LOCALLY AT BREAKER

RANGE: START/NORMAL/STOP

RCR25 PLACE REGULATED N_2 ON PRESSURIZER (INTERLOCKED SO THAT IT WILL NOT BE ON UNLESS RCN-V090 IS OPEN)

RANGE: 0-400 PSIG

RCR26 PRESSURE SPRAY ISOLATION RCN-V243

RANGE: OPEN/CLOSE

RCR27 PRESSURE SPRAY ISOLATION RCN-V242

RANGE: OPEN/CLOSE

RCR28 PRESSURE VENT ISOLATION RCN-V090

RANGE: OPEN/CLOSE

RCR29 RX HEAD VENT ISOLATION RCN-V212

RANGE: OPEN/CLOSE

RCR30 PLACE PERMANENT REFUELING LEVEL MONITORING (RFLMS) INDICATOR IN SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

RCR31 RESET LOOSE PARTS AND VIBRATION MONITORING SYSTEM ALARMS

RANGE: RESET/NORMAL

RCR34 OPERATE THE LARGE PATH PRESSURIZER VENT (GREATER THAN 16 SQUARE INCHES)

RANGE: OPEN/CLOSED

<u>RD</u>

RDR01 TRANSFER SUBGROUP 1 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

RDR02 TRANSFER SUBGROUP 2 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

REMOTE FUNCTIONS

RDR03	TRANSFER SUBGROUP 3 TO HOLD BUS
	RANGE: HOLD BUS/NORMAL
RDR04	TRANSFER SUBGROUP 4 TO HOLD BUS
	RANGE: HOLD BUS/NORMAL
RDR05	TRANSFER SUBGROUP 5 TO HOLD BUS
	RANGE: HOLD BUS/NORMAL
RDR06	TRANSFER SUBGROUP 6 TO HOLD BUS
	RANGE: HOLD BUS/NORMAL
RDR07	TRANSFER SUBGROUP 7 TO HOLD BUS
	RANGE: HOLD BUS/NORMAL
RDR08	TRANSFER SUBGROUP 8 TO HOLD BUS
	RANGE: HOLD BUS/NORMAL
RDR09	TRANSFER SUBGROUP 9 TO HOLD BUS
	RANGE: HOLD BUS/NORMAL
RDR10	TRANSFER SUBGROUP 10 TO HOLD BUS
	RANGE: HOLD BUS/NORMAL

REMOTE FUNCTIONS

RDR11 TRANSFER SUBGROUP 11 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

RDR12 TRANSFER SUBGROUP 12 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

RDR13 TRANSFER SUBGROUP 13 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

RDR14 TRANSFER SUBGROUP 14 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

RDR15 TRANSFER SUBGROUP 15 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

RDR16 TRANSFER SUBGROUP 16 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

RDR17 TRANSFER SUBGROUP 17 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

RDR18 TRANSFER SUBGROUP 18 TO HOLD BUS

RANGE: HOLD BUS/NORMAL

REMOTE FUNCTIONS

RDR19	TRANSFER SUBGROUP 19 TO HOLD BUS RANGE: HOLD BUS/NORMAL
RDR20	TRANSFER SUBGROUP 20 TO HOLD BUS RANGE: HOLD BUS/NORMAL
RDR21	TRANSFER SUBGROUP 21 TO HOLD BUS RANGE: HOLD BUS/NORMAL
RDR22	TRANSFER SUBGROUP 22 TO HOLD BUS RANGE: HOLD BUS/NORMAL
RDR23	CEDMCS MG SET "A" RANGE: START/STOP
RDR24	CEDMCS MG SET "B" RANGE: START/STOP
RDR25	ACKNOWLEDGE ALARMS ON MG SET CONTROL PANEL "A" RANGE: ACKNOWLEDGE/NORMAL

RDR26 ACKNOWLEDGE ALARMS ON MG SET CONTROL PANEL "B"

RANGE: ACKNOWLEDGE/NORMAL

NOTE: THE TWO REMOTE FUNCTIONS (RDR25 AND RDR26) ARE NEEDED ONLY TO RESET THE "CEDM MOTOR GENERATOR A/B TROUBLE" ALARM (PMS POINTS SFYS31 AND SFYS32).

RH

RHR01 SI-V458 PC CLG "A" TRAIN RETURN CROSS TIE

RANGE: OPEN/CLOSE

RHR02 SI-V455 PC CLG "B" TRAIN RETURN CROSS TIE

RANGE: OPEN/CLOSE

RHR03 SI-V298 COMMON FULL FLOW RECIRC TO RWT VALVE

RANGE: OPEN/CLOSE

RHR04 SI-V464 "B" TRAIN FULL FLOW RECIRC TO RWT VALVE

RANGE: OPEN/CLOSE

RHR05 SI-V460 "A" TRAIN FULL FLOW RECIRC TO RWT VALVE

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

RHR06 SI-V421 "A" TRAIN TO SDC PURIFICATION

RANGE: OPEN/CLOSE

RHR07 SI-V420 "B" TRAIN TO SDC PURIFICATION

RANGE: OPEN/CLOSE

RHRO8 SI-V442 PC CLG CROSS TIE TO TRAIN "B" SUCTION

RANGE: OPEN/CLOSED

RHR09 SI-V418 "B" TRAIN FROM SDC PURIFICATION

RANGE: OPEN/CLOSED

RHR10 SI-V419 "A" TRAIN FROM SDC PURIFICATION

RANGE: OPEN/CLOSED

RHR11 SI-V256 PC CLG CROSS TIE TO TRAIN "A" SUCTION

RANGE: OPEN/CLOSED

RHR12 SI-V985 "B" TRAIN CHEMICAL ADDITION RECIRC VALVE

RANGE: OPEN/CLOSED

RHR13 SI-V984 "A" TRAIN CHEMICAL ADDITION RECIRC VALVE

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

RHR14 SWAP CS "B" TRAIN SUCTION

RANGE: V-185 OPEN/V-104 OPEN

RHR15 SWAP CS "A" TRAIN SUCTION

RANGE: V-184 OPEN/V-105 OPEN

RHR16 TURN CONTROL POWER ON/OFF TO LPSI PUMP "A" BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

RHR17 TURN CONTROL POWER ON/OFF TO LPSI PUMP "B" BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

RHR18 TURN CONTROL POWER ON/OFF TO CS PUMP "A"

RANGE: CONTROL POWER ON/CONTROL POWER OFF

RHR19 TURN CONTROL POWER ON/OFF TO CS PUMP "B"

RANGE: CONTROL POWER ON/CONTROL POWER OFF

RHR20 RACK IN/RACK OUT BREAKER FOR LPSI PUMP "A"

RANGE: RACK IN/RACK OUT

RHR21 RACK IN/RACK OUT BREAKER FOR LPSI PUMP "B"

RANGE: RACK IN/RACK OUT

RHR22	RACK IN/RACK OUT BREAKER FOR CS PUMP "A"
	RANGE: RACK IN/RACK OUT
RHR23	RACK IN/RACK OUT BREAKER FOR CS PUMP "B"
	RANGE: RACK IN/RACK OUT
RHR24	(START/STOP) LPSI PUMP "A" FROM SWITCHGEAR
	RANGE: START/NORMAL/STOP
RHR25	(START/STOP) LPSI PUMP "B" FROM SWITCHGEAR
	RANGE: START/NORMAL/STOP
RHR26	(START/STOP) CS PUMP "A" FROM SWITCHGEAR
	RANGE: START/NORMAL/STOP
RHR27	(START/STOP) CS PUMP "B" FROM SWITCHGEAR
	RANGE: START/NORMAL/STOP
RHR28	OPERATE SDC HX BYPASS VALVE SI-HV-688 FROM CONTROLS AT MCC
	RANGE: OPEN/NORMAL/CLOSE

REMOTE FUNCTIONS

RHR29 OPERATE SDC HX ISOLATOR TRAIN "A" VALVE SI-HV-684 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR30 OPERATE CS ISOLATION TRAIN "A" VALVE SI-HV-687 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR31 OPERATE SDC HX "A" OUTLET TO RC LOOPS 1A AND 1B VALVE SI-HV-657 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR32 OPERATE LPSI PUMP "A" ISOLATION VALVE SI-HV-683 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR33 OPERATE LPSI-SDC HX "A" BYPASS VALVE SI-HV-306 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR34 OPERATE SDC HX "B" BYPASS VALVE SI-HV-693 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR35 OPERATE SDC HX TRAIN "B" ISOLATION VALVE SI-HV-689 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR36 OPERATE CS TRAIN "B" ISOLATION VALVE SI-HV-695 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR37 OPERATE SDC TRAIN "B" TEMPERATURE CONTROL VALVE SI-HV-658 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR38 OPERATE LPSI PUMP "B" ISOLATION VALVE SI-HV-692 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR39 OPERATE LPSI PUMP "B" HEADER DISCHARGE VALVE SI-HV-307 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR40 OPERATE SDC LOOP 1 CONTAINMENT ISOLATION VALVE SI-UV-655 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR41 OPERATE SDC LOOP 1 WARMUP BYPASS VALVE SI-UV-691 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

[illegible]

[illegible]

REMOTE FUNCTIONS

RHR42 OPERATE LPSI-CS CROSS CONNECT VALVE SI-UV-685 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR43 OPERATE CS "A" CROSS CONNECT VALVE SI-UV-686 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR44 OPERATE LPSI PUMP "A" RECIRC TO RFWT VALVE SI-UV-669 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR45 OPERATE SDC LOOP 1 ISOLATION VALVE SI-UV-651 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR46 OPERATE RC LOOP 1 SDC-LPSI PUMP "A" SUCTION VALVE SI-UV-653 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR47 OPERATE LPSI HEADER "A" TO RC LOOP 1A VALVE SI-UV-635 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR48 OPERATE LPSI HEADER "B" TO RC LOOP 1B VALVE SI-UV-645 FROM CONTROLS AT MCC CLOSE

RANGE: OPEN/NORMAL/CLOSE

REMOTE FUNCTIONS

RHR49	OPERATE SDC LOOP 2 CONTAINMENT ISOLATION VALVE SI-UV-656 FROM CONTROLS AT MCC RANGE: OPEN/NORMAL/CLOSE
RHR50	OPERATE SDC LOOP 1 WARMUP BYPASS VALVE SI-UV-690 FROM CONTROLS AT MCC RANGE: OPEN/NORMAL/CLOSE
RHR51	OPERATE LPSI-CS PUMP "B" CROSS CONNECT VALVE SI-UV-694 FROM CONTROLS AT MCC RANGE: OPEN/NORMAL/CLOSE
RHR52	OPERATE CS "B" CROSS CONNECT VALVE SI-UV-696 FROM CONTROLS AT MCC RANGE: OPEN/NORMAL/CLOSE
RHR53	OPERATE LPSI PUMP "B" TO RFWT ISOLATION VALVE SI-UV-668 FROM CONTROLS AT MCC RANGE: OPEN/NORMAL/CLOSE
RHR54	OPERATE SDC LOOP 2 ISOLATION VALVE SI-UV-652 FROM CONTROLS AT MCC RANGE: OPEN/NORMAL/CLOSE
RHR55	OPERATE RC LOOP 2 SDC-LPSI PUMP "B" SUCTION VALVE SI-UV-654 FROM CONTROLS AT MCC RANGE: OPEN/NORMAL/CLOSE

RHR56 OPERATE LPSI HEADER "B" TO RC LOOP 2A VALVE SI-UV-615 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR57 OPERATE LPSI HEADER "B" TO RC LOOP 2B VALVE SI-UV-625 FROM CONTROLS AT MCC

RANGE: OPEN/NORMAL/CLOSE

RHR58 OPEN/CLOSE CONTROL POWER DISCONNECTS FOR SDC SUCTION ISOLATION VALVE (PKC-B43)

RANGE: OPEN/CLOSE

RHR59 OPEN/CLOSE CONTROL POWER DISCONNECTS FOR SDC SUCTION ISOLATION VALVE (PKD-B44)

RANGE: OPEN/CLOSE

RHR60 OPERATE THE SUPPLY BREAKER FOR THE CONTAINMENT SPRAY VALVE (SIA-UV-672) (BREAKER PHA-M3511)

RANGE: OPEN/CLOSED

RHR61 OPERATE THE SUPPLY BREAKER FOR THE CONTAINMENT SPRAY VALVE (SIA-UV-671) (BREAKER PHB-M3612)

RANGE: OPEN/CLOSED

RHR62 DISABLE THE LTOP ALARM CONTACTS

RANGE: DISABLE/NORMAL

REMOTE FUNCTIONS

RHR63	DISABLE THE SHUTDOWN COOLING AUTOMATIC CLOSURE INTERLOCKS RANGE: DISABLE/NORMAL
RHR66	LPSI PUMP "B" BREAKER (CS-3) RANGE: LOCAL/LOC. REMOTE
RHR67	SHUTDOWN COOLING ISOLATION VALVE (SID-UV-654) (CS-3) RANGE: LOCAL/LOC. REMOTE
RHR69	LPSI PUMP CROSS CONNECT VALVE (SIB-HV-694) (CS-3) RANGE: LOCAL/LOC. REMOTE
RHR70	SHUTDOWN COOLING TEMPERATURE CONTROL VALVE (SIB-HV-658) (CS-3) RANGE: LOCAL/LOC. REMOTE
RHR71	SHUTDOWN COOLING HX "B" BYPASS VALVE (SIB-HV-693) (CS-3) RANGE: LOCAL/LOC. REMOTE
RHR72	SHUTDOWN COOLING ISOLATION VALVE (SIB-UV-652) (CS-3) RANGE: LOCAL/LOC. REMOTE

[illegible]

[illegible]

REMOTE FUNCTIONS

RHR73 SHUTDOWN COOLING CONTAINMENT ISOLATION VALVE (SIB-UV-656) (CS-3)

RANGE: LOCAL/LOC. REMOTE

RHR74 LPSI FLOW CONTROL TO RX CLNT VALVE (SIB-UV-615) (CS-3)

RANGE: LOCAL/LOC. REMOTE

RHR75 "B" LPSI MINIFLOW VALVE (CS-3)

RANGE: LOCAL/LOC. REMOTE

RHR76 LPSI FLOW CONTROL TO RX CLNT VALVE (SIB-UV-625) (CS-3)

RANGE: LOCAL/LOC. REMOTE

RHR78 CS TO SHUTDOWN COOLING HX ISOLATION VALVE (SIB-HV-689) (CS-3)

RANGE: LOCAL/LOC. REMOTE

RHR79 LPSI PUMP ISOLATION VALVE (SIB-HV-692) (CS-3)

RANGE: LOCAL/LOC. REMOTE

RHR80 SHUTDOWN COOLING WARMUP VALVE (SIB-HV-690) (CS-3)

RANGE: LOCAL/LOC. REMOTE

RHR81 CS ISOLATION VALVE (SIB-HV-695) (CS-3)

RANGE: LOCAL/LOC. REMOTE

RHR82 SET THE LEVEL IN THE CONTAINMENT SPRAY HEADER

RANGE: 105 TO 120 FEET

NOTE: THE INTERFACE BETWEEN DW AND CS AT THIS POINT WILL BE REMOVED. THE REMOTE FUNCTION WILL SIMPLY SET THE LEVEL WITH NO ACTUAL MASS TRANSFER OCCURRING.

RM

RMR01 RADIATION MONITOR RU-1 LOCALLY OPERATED BY RP TECHNICIAN

RANGE; ON LINE/OFF LINE

RMR02 RADIATION MONITOR RU-2 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR03 RADIATION MONITOR RU-3 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR04 RADIATION MONITOR RU-4 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

REMOTE FUNCTIONS

RMR05 RADIATION MONITOR RU-5 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR06 RADIATION MONITOR RU-6 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR07 RADIATION MONITOR RU-9 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR08 RADIATION MONITOR RU-10 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR09 RADIATION MONITOR RU-12 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR10 RADIATION MONITOR RU-19 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR11 RADIATION MONITOR RU-29 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

[illegible]

[illegible]

REMOTE FUNCTIONS

RMR12	RADIATION MONITOR RU-30 LOCALLY OPERATED BY RP TECHNICIAN RANGE: ON LINE/OFF LINE
RMR13	RADIATION MONITOR RU-31 LOCALLY OPERATED BY RP TECHNICIAN RANGE: ON LINE/OFF LINE
RMR14	RADIATION MONITOR RU-37 LOCALLY OPERATED BY RP TECHNICIAN RANGE: ON LINE/OFF LINE
RMR15	RADIATION MONITOR RU-51 LOCALLY OPERATED BY RP TECHNICIAN RANGE: ON LINE/OFF LINE
RMR16	RADIATION MONITOR RU-38 LOCALLY OPERATED BY RP TECHNICIAN RANGE: ON LINE/OFF LINE
RMR17	RADIATION MONITOR RU-139 LOCALLY OPERATED BY RP TECHNICIAN RANGE: ON LINE/OFF LINE
RMR18	RADIATION MONITOR RU-140 LOCALLY OPERATED BY RP TECHNICIAN RANGE: ON LINE/OFF LINE

REMOTE FUNCTIONS

RMR19 RADIATION MONITOR RU-141 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR20 RADIATION MONITOR RU-142 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR21 RADIATION MONITOR RU-143 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR22 RADIATION MONITOR RU-144 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR23 RADIATION MONITOR RU-145 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

RMR24 RADIATION MONITOR RU-146 LOCALLY OPERATED BY RP TECHNICIAN

RANGE: ON LINE/OFF LINE

[illegible]

[illegible]

REMOTE FUNCTIONS

RP

RPR01	INSTALL PPS JUMPERS TO PREVENT ESFAS ACTUATION
	RANGE: JUMPERS INSTALLED/NORMAL
RPR02	RACK IN/RACK OUT RTSG "A"
	RANGE: RACK IN/RACK OUT
RPR03	RACK IN/RACK OUT RTSG "B"
	RANGE: RACK IN/RACK OUT
RPR04	RACK IN/RACK OUT RTSG "C"
	RANGE: RACK IN/RACK OUT
RPR05	RACK IN/RACK OUT RTSG "D"
	RANGE: RACK IN/RACK OUT

SI

SIR01	SI-V463 SIT FILL AND DRAIN OPS
	RANGE: OPEN/CLOSE
SIR02	SI-V459 SIT FILL AND DRAIN OPS
	RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

SIR03 SI-V400 SIT FILL AND DRAIN OPS

RANGE: OPEN/CLOSE

SIR04 SI-V508 CHARGE PUMP DISCHARGE TO TRAIN "A"

RANGE: OPEN/CLOSE

SIR05 SI-V509 CHARGE PUMP DISCHARGE TO TRAIN "B"

RANGE: OPEN/CLOSE

SIR06 SI-V218 "A" HPSI DISCHARGE FLOW ORIFICE BYPASS

RANGE: 0-100% OPEN

SIR07 SI-V219 "B" HPSI DISCHARGE FLOW ORIFICE BYPASS

RANGE: 0-100% OPEN

SIR08 TURN CONTROL POWER ON/OFF TO HPSI PUMP "A" BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

SIR09 TURN CONTROL POWER ON/OFF TO HPSI PUMP "B" BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

SIR10 RACK/IN RACK/OUT BREAKER FOR HPSI PUMP "A"

RANGE: RACKED IN/RACKED OUT

SIR11	RACK IN/RACK OUT BREAKER FOR HPSI PUMP "B" RANGE: RACKED IN/RACKED OUT
SIR12	(START/STOP) HPSI PUMP "A" FROM SWITCHGEAR RANGE: START/NORMAL/STOP
SIR13	(START/STOP) HPSI PUMP "B" FROM SWITCHGEAR RANGE: START/NORMAL/STOP
SIR14	OPEN/CLOSE BREAKER ON MCC FOR SIT OUTLET VALVE (SI-UV-614) (M3619) RANGE: OPEN/CLOSE
SIR15	OPEN/CLOSE BREAKER ON MCC FOR SIT OUTLET VALVE (SI-UV-624) (M3618) RANGE: OPEN/CLOSE
SIR16	OPEN/CLOSE BREAKER ON MCC FOR SIT OUTLET VALVE (SI-UV-634) (M3316) RANGE: OPEN/CLOSE
SIR17	OPEN/CLOSE BREAKER ON MCC FOR SIT OUTLET VALVE (SI-UV-644) (M3318) RANGE: OPEN/CLOSE

SIR18 LOCALLY OVERRIDE THE "B" HPSI PUMP DISCHARGE MOV (SIB-UV-667)

RANGE: OVERRIDE/NORMAL

SIR19 LOCALLY OPERATE THE "B" HPSI PUMP DISCHARGE MOV (SIB-UV-667)

RANGE: 0-100% OPEN

SW

SWR01 SWAP PLANT COOLING WATER SYSTEM RETURN FLOW PATH: CIRCULATING WATER RETURN (HCV-92) OPEN/CLUB TWR RTN (HCV-93)

RANGE: HCV-92 OPEN/HCV-93 OPEN

SWR02 A PLANT COOLING WATER PUMP DISCHARGE VALVE (PWN-HCV-11)

RANGE: 0-100%

SWR03 B PLANT COOLING WATER PUMP DISCHARGE VALVE (PWN-HCV-12)

RANGE: 0-100%

SWR04 RACK IN/RACK OUT THE "A" PW PUMP NBN-SO1H SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

SWR05 RACK IN/RACK OUT THE "B" PW PUMP NBN-SO2H SUPPLY BREAKER.

RANGE: RACK IN/RACK OUT

SWR06 TURN CONTROL POWER ON/OFF TO "A" PW PUMP NBN-SO1H SUPPLY BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

SWR07 TURN CONTROL POWER ON/OFF TO "B" PW PUMP NBN-SO2H SUPPLY BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

SWR08 "A" TURBINE COOLING HX PW OUT (PWN-HCV-56)

RANGE: 0-100% OPEN

SWR09 "B" TURBINE COOLING HX PW OUT (PWN-HCV-57)

RANGE: 0-100% OPEN

SWR10 "A" NUCLEAR COOLING HX PW OUT (PWN-HCV-54)

RANGE: 0-100% OPEN

SWR11 "B" NUCLEAR COOLING HX PW OUT (PWN-HCV-55)

RANGE: 0-100% OPEN

REMOTE FUNCTIONS

SWR12 OPEN/CLOSE CHILLER WCN-E01A CONTROL POWER SWITCH

RANGE: OPEN/CLOSE

SWR13 OPEN/CLOSE CHILLER WCN-E01B CONTROL POWER SWITCH

RANGE: OPEN/CLOSE

SWR14 OPEN/CLOSE CHILLER WCN-E01C CONTROL POWER SWITCH

RANGE: OPEN/CLOSE

SWR15 OPEN/CLOSE CHILLER WCN-E02 CONTROL POWER SWITCH

RANGE: OPEN/CLOSE

SWR16 RACK IN/RACK OUT CHILLER M-WCN-E01A SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

SWR17 RACK IN/RACK OUT CHILLER M-WCN-E01B SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

SWR18 RACK IN/RACK OUT CHILLER M-WCN-E01C SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

REMOTE FUNCTIONS

SWR19 RACK IN/RACK OUT CHILLER M-WCN-E02 SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

SWR20 TURN CONTROL POWER ON/OFF TO CHILLER WCN-E01A SUPPLY BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

SWR21 TURN CONTROL POWER ON/OFF TO CHILLER WCN-E01B SUPPLY BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

SWR22 TURN CONTROL POWER ON/OFF TO CHILLER WCN-E01C SUPPLY BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

SWR23 TURN CONTROL POWER ON/OFF TO CHILLER WCN-E02 SUPPLY BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

SWR24 OPERATE THE DW SUPPLY VALVE, WCN-VO18, TO THE NORMAL CHILLED WATER SYSTEM EXPANSION TANK

RANGE: OPEN/CLOSED

SWR25 OPERATE THE DRAIN VALVE, WCN-VO86, FROM THE NORMAL CHILLED WATER SYSTEM EXPANSION TANK

RANGE: OPEN/CLOSED

[illegible]

[illegible]

SWR26 OPERATE THE VENT VALVE, WCN-V106, FROM THE NORMAL CHILLED WATER SYSTEM EXPANSION TANK

RANGE: OPEN/CLOSED

SWR27 OPERATE THE N_2 ISOLATION VALVE, WCN-VO19, TO THE NORMAL CHILLED WATER SYSTEM EXPANSION TANK

RANGE: OPEN/CLOSED

TC

TCR01 OPERATE MANUAL TRIP LEVER AT MT FRONT STANDARD

RANGE: TRIP/NORMAL

TCR02 DISABLE MT HI VIBRATION TRIP

RANGE: DISABLE/NORMAL

TCR03 EHC PUMPS DISCHARGE BYPASS VALVE (CO-V212)

RANGE: OPEN/CLOSED

TCR04 AUTO START TEST VALVE

RANGE: TEST HFPM-A/NORMAL/TEST HFPM-B

TH

THR01 PLUG TUBES IN STEAM GENERATOR 1

RANGE: 0-20% PLUGGED

[illegible]

[illegible]

CANNOT BE USED UNLESS ALL RCP's ARE OFF

THR02 PLUG TUBES IN STEAM GENERATOR 2

RANGE: 0-20% PLUGGED

CANNOT BE USED UNLESS ALL RCP's ARE OFF

TP

TPR01 "A" STATOR COOLING PUMP DISCHARGE VALVE (CEN-V207)

RANGE: 0-100% OPEN

TPR02 "B" STATOR COOLING PUMP DISCHARGE VALVE (CEN-V206)

RANGE: 0-100% OPEN

TPR03 RACK IN/RACK OUT THE "A" CE PUMP NGN-L15C4 SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

TPR04 RACK IN/RACK OUT THE "B" CE PUMP NGN-L14D4 SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

TPR05 REMOVE/INSERT THE CONTROL POWER FUSES FOR "A" CE PUMP NGN-L15C4 SUPPLY BREAKER

RANGE: REMOVE FUSES/INSERT FUSES

REMOTE FUNCTIONS

TPR06 REMOVE/INSERT THE CONTROL POWER FUSES FOR "B" CE PUMP NGN-L14D4 SUPPLY BREAKER

RANGE: REMOVE FUSES/INSERT FUSES

TPR07 OPEN HYDROGEN SUPPLY, GH-V200, TO MAIN GENERATOR

RANGE: 0-100% OPEN

TPR08 OPEN CARBON DIOXIDE SUPPLY TO MAIN GENERATOR

RANGE: 0-100% OPEN

TPR09 OPEN VENT FROM MAIN GENERATOR TO ATMOSPHERE

RANGE: 0-100% OPEN

TPR10 PLACE MAIN GENERATOR CORE MONITOR IN-SERVICE

RANGE: IN SERVICE/OUT OF SERVICE

TPR11 OPEN/CLOSE EMERGENCY SEAL OIL PUMP BREAKER (M4607)

RANGE: OPEN/CLOSE

TPR12 PERFORM LOCAL TEST START OF THE EMERGENCY SEAL OIL PUMP USING HS-13A

RANGE: TEST/NORMAL

REMOTE FUNCTIONS

TPR13 TURBINE COOLING HX TC BYPASS (TCN-HCV-37)

RANGE: 0-100% OPEN

TPR14 A TURBINE COOLING HX TC OUT (TCN-HCV-9)

RANGE: 0-100% OPEN

TPR15 B TURBINE COOLING HX TC OUT (TCN-HCV-10)

RANGE: 0-100% OPEN

TPR16 DRAIN THE TC SURGE TANK

RANGE: CLOSE DRAIN/OPEN DRAIN

TPR17 ADJUST SETPOINT ON LO-TIC-32 (MAIN TURBINE LUBE OIL TEMP. CONTROLLER)

RANGE: 70°F TO 150°F

TPR18 RACK IN/RACK OUT THE "A" TC PUMP NBN-SO1J SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

TPR19 RACK IN/RACK OUT THE "B" TC PUMP NBN-SO2J SUPPLY BREAKER

RANGE: RACK IN/RACK OUT

TPR20 TURN CONTROL POWER ON/OFF TO "A" TC PUMP NBN-SO1J SUPPLY BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

TPR21 TURN CONTROL POWER ON/OFF TO "B" TC PUMP NBN-SO2J SUPPLY BREAKER

RANGE: CONTROL POWER ON/CONTROL POWER OFF

TPR22 RESET THE GENERATOR MONITORING SYSTEM ALARMS

RANGE: RESET/NORMAL

TPR23 PLACE THE HYDROGEN GAS ANALYZER INTO THE SHUTDOWN LINEUP

RANGE: SHUTDOWN/NORMAL

<u>TU</u>

TUR01 OPERATE HOOD SPRAY BYPASS (MT-V913)

RANGE: 0-100% OPEN

TUR02 PERFORM LOCAL TEST OF EMERGENCY BEARING OIL PUMP AUTO START

RANGE: TEST/NORMAL

TUR03 PERFORM LOCAL TEST OF TURNING GEAR OIL PUMP AUTO START USING HS-53B

RANGE: TEST/NORMAL

TUR04 PERFORM LOCAL TEST OF MOTOR SUCTION PUMP AUTO START

RANGE: TEST/NORMAL

TUR05 MAIN TURBINE LUBE OIL VAPOR EXTRACTOR

RANGE: START/STOP

TUR06 EMERGENCY BEARING OIL PUMP (EBOP) BREAKER

RANGE: OPEN/CLOSED

TUR07 TEST START THE TGOP LOCALLY USING HS-167.

RANGE: TEST START/NORMAL

WD

WDR01 ACKNOWLEDGE ALARMS ON RADWASTE SYSTEM COMMON ANNUNCIATOR PANEL

RANGE: ACKNOWLEDGE/NORMAL

WDR03 LOCALLY OVERRIDE AND OPERATE GASEOUS RADWASTE EXHAUST VALVE GRN-UV-34A AND GRN-UV-34B AT THE AIR SUPPLY SOLENOID

RANGE: OPEN/NORMAL/CLOSE

WDR06 OPERATE RU-4 SAMPLE INLET (SCN-V636)

RANGE: OPEN/CLOSE

[illegible]

[illegible]

REMOTE FUNCTIONS

WDR07	OPERATE RU-4 SAMPLE INLET (SCN-V637) RANGE: OPEN/CLOSE
WDR08	OPERATE RU-4 SAMPLE INLET (SCN-V638) RANGE: OPEN/CLOSE
WDR09	OPERATE RU-5 SAMPLE INLET (SCN-VR15) RANGE: OPEN/CLOSE
WDR10	OPERATE RU-5 SAMPLE INLET (SCN-VR16) RANGE: OPEN/CLOSE
WDR11	OPERATE RU-5 SAMPLE INLET (SCN-VR17) RANGE: OPEN/CLOSE
WDR12	SG1 TO CONDENSER HIGH RATE VALVE (SC-VO88) RANGE: OPEN/CLOSE
WDR13	SG1 TO CONDENSER NORMAL RATE VALVE (SC-V019) RANGE: OPEN/CLOSE
WDR14	SG1 TO CONDENSER ABNORMAL RATE VALVE (SC-V071) RANGE: OPEN/CLOSE

WDR15	SG2 TO CONDENSER HIGH RATE VALVE (SC-V103) RANGE: OPEN/CLOSE
WDR16	SG2 TO CONDENSER NORMAL RATE VALVE (SC-V020) RANGE: OPEN/CLOSE
WDR17	SG2 TO CONDENSER ABNORMAL RATE VALVE (SC-V073) RANGE: OPEN/CLOSE
WDR18	SG2 TO FLASH TANK ABNORMAL RATE VALVE (SC-V055) RANGE: OPEN/CLOSE
WDR19	SG2 TO FLASH TANK NORMAL RATE VALVE (SC-V005) RANGE: OPEN/CLOSE
WDR20	SG2 TO FLASH TANK HIGH RATE VALVE (SC-V115) RANGE: OPEN/CLOSE
WDR21	SG2 TO FLASH TANK ABNORMAL RATE VALVE (SC-V054) RANGE: OPEN/CLOSE
WDR22	SG1 TO FLASH TANK NORMAL RATE VALUE (SC-V002) RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

WDR23 SG1 TO FLASH TANK HIGH RATE VALVE (SC-V110)

RANGE: OPEN/CLOSE

WDR24 WET LAYUP VALVE (SC-V046)

RANGE: OPEN/CLOSE

WDR25 WET LAYUP VALVE (SC-V047)

RANGE: OPEN/CLOSE

WDR26 WET LAYUP VALVE (SC-V048)

RANGE: OPEN/CLOSE

WDR27 WET LAYUP VALVE (SC-V049)

RANGE: OPEN/CLOSE

WDR28 WET LAYUP RECIRC VALVE (SG-V029)

RANGE: OPEN/CLOSE

WDR29 WET LAYUP RECIRC VALVE (SG-V121)

RANGE: OPEN/CLOSE

WDR30 WET LAYUP RECIRC VALVE (SG-V023)

RANGE: OPEN/CLOSE

REMOTE FUNCTIONS

WDR31 WET LAYUP RECIRC PUMP "A"

RANGE: START/STOP

WDR32 WET LAYUP RECIRC PUMP "B"

RANGE: START/STOP

WDR33 PUMP THE LRS HOLDUP TANKS

RANGE: TANK "A"/TANK "B"/TANK "C"

WDR37 ACKNOWLEDGE ALARMS AT SC LOCAL ALARM PANEL

RANGE: ACKNOWLEDGE/NORMAL

NOTE: ANY OTHER LOCAL ALARM PANELS IN THIS SYSTEM WILL REQUIRE A RF TO PERFORM THE ACKNOWLEDGE FUNCTION.

WDR38 OPERATE LRS RECYCLE MONITOR TANK DISCHARGE TO THE CST (LR-V251)

RANGE: OPEN/CLOSED

WDR39 OPERATE LRS RECYCLE MONITOR TANK DISCHARGE TO THE RMWT (LR-V252)

RANGE: OPEN/CLOSED

WDR40 OPERATE LRS RECYCLE MONITOR TANK DISCHARGE TO THE FUEL POOL (LR-V250)

RANGE: OPEN/CLOSED

[illegible]

[illegible]

REMOTE FUNCTIONS

WDR41	OPERATE BDFT ISOLATION TO 3A FW HEATER (SC-V017) RANGE: OPEN/CLOSED
WDR42	RESTART THE LRS EVAPORATOR AFTER LOSS OF POWER RANGE: RESTART/NORMAL
WDR43	OPERATE BDFT ISOLATION TO 3B FW HEATER (SC-V018) RANGE: OPEN/CLOSED
WDR44	OPERATE BDFT ISOLATION TO 3C FW HEATER (SC-V016) RANGE: OPEN/CLOSED
WDR45	SG1 BLOWDOWN ISOLATION VALVE (SC-V289) RANGE: OPEN/CLOSE
WDR46	SG2 BLOWDOWN ISOLATION VALVE (SC-V290) RANGE: OPEN/CLOSE
WDR47	COOLING WATER HOLD-UP TANK PUMP "B" RANGE: PUMP ON/NORMAL/PUMP OFF

PVNGS SIMULATOR
1991
CERTIFICATION SUBMITTAL

SECTION 6

SIMULATOR FUNCTIONAL FIDELITY LIMITS

Simulator Operating Limits

General Modeling Assumptions and Simplifications

Specific Model Assumptions and Simplifications

SIMULATOR OPERATING LIMITS

To meet the constraints imposed by finite computational resources, the simulation models employ mathematical simplifications of the equations that model the Plant's dynamic performance. These simplifications may, at times, make it possible for the dynamic simulation to progress beyond the Reference-Plant's design limits.

The Plant design limits which may be exceeded, have been identified and are presented in the below listing of Simulator Operating Limits (SOL).

When the Simulator's computed values exceed an identified SOL, the Simulator transitions to the FREEZE mode. A message is displayed on the Instructor Station console which describes which limit has been exceeded. The Instructor then has the option to continue the progress of dynamic simulation or reset to an Initial Condition.

Simulator Operating Limits

I. Containment pressure greater than 60 psig.

II. Reactor coolant system pressure greater than 5000 psia.

III. Fuel temperature greater than 2300 degrees Fahrenheit.

GENERAL MODELING ASSUMPTIONS AND SIMPLIFICATIONS

The Simulator software contains a number of modules which predict the dynamic performance of the simulated plant in response to stimuli from the Operator's interface (i.e., the control panels), and the Instructor's interface (i.e., the Simulator control console).

The basis for the design of simulation modules is the Reference-Plant design documentation and performance data. Where plant design documentation, and/or performance data is not available, an assumption about the Reference-Plant has to be made.

Some assumptions are generic to the design of any simulated system. These are identified as Generic Assumptions and can be assumed to apply to all simulated systems. Where specific plant design or performance data was incorporated in the development of a particular simulated system, the plant data takes precedence over the Generic Assumption.

To meet the constraints imposed by finite computational resources, design simplifications are also employed. Some simplifications are generic to the design of any simulated system. These are identified as Generic Simplifications and can be assumed to apply to all simulated systems.

Listings of Generic Assumptions and Simplifications are provided in the following paragraphs to enhance the understanding of the Simulator's capabilities.

<u>Generic Assumptions</u>

1. Assumption: Schematic and wiring diagrams have priority over all other documents as a source of plant logic information. The highest revision level (or latest data) in the Simulator database is used.

   Rationale: Prior experience indicates that schematic and wiring diagrams are kept more current than other data types.

2. Assumption: Where pump run-up/coast down data is not available, linear times are simulated. The RCP's are an exception. General guidelines for run-up/coast down time versus brake horsepower are:

bhp	run-up/coast downtime
0-100	3 to 5 seconds
100-4000	a function of brake horsepower

Time is rounded to an integer number of seconds with adjustments to achieve the desired dynamic response for the fluid system based on plant Operator experience.

Rationale: Run-up/coast down times are based on prior experience for centrifugal pumps based on bhp of the pump motor.

3. Assumption: Where data is not available for motors greater than 20 hp, the operating current will be determined by a calculation involving brake horsepower, motor voltage, power factor, and pump power.

Rationale: This relationship provides a close approximation to the actual value of operating current at steady state conditions.

4. Assumption: Valves for which data is not available, or which are not identified as an exception to the standardize simulation of the valve types established by S3 Technologies will use the following open/close rate criteria. All valve stroke times will be rounded up to the nearest integer.

A. Motor Operated Valves

1. Valves which cycle on a safety injection signal

a. Up to 8", cycle open or close in 10 sec
b. Greater than 8", cycle at 48 in/min

2. All Other Valves

a. Gate valves, 12 in/min
b. Globe valves, 4 in/min
c. Butterfly or ball valves, up to 8", 10 sec; greater than 8", 30 sec

B. Pneumatic Valves

1. Trip action (full stroke), 5 in/sec

2. All other valves, 1 in/sec maximum

C. Solenoid valves, one second maximum

D. Remote valves, see A.2 above

[illegible]

Rationale: Valve stroke rates are based on industrial manufacturing specifications for the valve type.

5. Assumption: In lieu of flow data for a system piping/duct, the flow will be estimated from material characteristics, cross sectional area, and differential pressure.

Rationale: Standard engineering practice.

6. Assumption: Heat exchanger tube leaks will be modeled at the inlet end of the bundle.

Rationale: This area of the heat exchanger endures the greatest thermal stress.

7. Assumption: Pump cavitation resulting from insufficient NPSH for five (5) minutes will result in motor heating sufficient to actuate any thermal overload protection devices. Pumps without thermal overload protection will not fail.

Rationale: Violent pressure/flow oscillations occur during cavitation. Frequent rapid changes in motor speed will result in significant motor heating.

8. Assumption: In the absence of pump NPSH requirement data, pump cavitation will not be modeled.

Rationale: Where no minimum NPSH design requirement data exists, cavitation was not considered in the plant design.

9. Assumption: Controllers outside the control room which cannot be switched from Auto to Manual from the control room panels are assumed to be in the Auto mode. Setpoints for these controllers will be fixed unless modifiable by remote functions.

Rationale: This aspect of component functionality is not required for control system hardware located outside the control room.

10. Assumption: In the absence of tank level instrumentation data, the following is assumed:

    a. Bottom of tank is 0% level
    b. Top of tank is 100% level
    c. Low level alarm, 25%
    d. High level alarm, 75%

    Rationale: These levels approximate upper and lower tap locations. Alarm setpoints provide adequate operating band.

11. Assumption: In the absence of data describing the fail state of an air operated valve, the valve is assumed to fail closed on loss of power and/or air supply.

    Rationale: Experience indicates this is the most common fail state.

<u>Generic Simplifications</u>

1. Simplification: Fluid system check valves do not leak unless modified by a malfunction to simulate leakage.

   Rationale: Actual check valve back-leakage is minimal.

2. Simplification: All fluid systems are modeled with zero system leakage unless modified by a malfunction to simulate a break.

   Rationale: Actual system leakage is minimal.

3. Simplification: Flow admittances are a linear function of valve position/unless specifically identified for critical valves.

   Rationale: Valve position versus flow is not readily discernible to the Operator.

4. Simplification: Pump motors of less than 50 bhp do not have pump surge current calculated unless the current is instrumented.

   Rationale: Motors of less than 50 bhp provide negligible surge load on the electrical distribution (ED) system.

GENERAL MODELING ASSUMPTIONS AND SIMPLIFICATIONS

5. Simplification: All filters are assumed to be new with no clogging or depletion unless modified by a malfunction.

   Rationale: Clogging and depletion are long term effects which do not change appreciably over the course of a typical simulation scenario.

6. Simplification: When multiple temperature sensors are located on the same process equipment, the same temperature will be calculated for all instruments. A constant deviation factor of +/- 2% may be applied to the displayed values of separate instruments to enhance realism. When separate indications would be different under malfunction conditions, separate indicated values are calculated.

   Rationale: Redundant calculations of process variables serves no useful purpose.

7. Simplification: On loss of cooling water to an instrumented pump, except reactor coolant pumps, the observed effects are limited to the bearing(s) temperature increase, vibration and bearing seizure which results in pump trip.

   Rationale: For most cases this is a representative of predicted component response.

8. Simplification: Liquid systems are initially liquid filled and completely vented.

   Rationale: System fill and vent operations are not normally practiced on the Simulator.

9. Simplification: Motor-operated valve overload is not simulated, unless a malfunction to simulate valve binding is modeled.

   Rationale: Motor-operated valve motors are sized to operate the valves without overload. Limit and/or torque switches open the control circuit when the valve travel limits are reached.

10. Simplification: Instrument noise on selected meters will be observable only in the range of 15% to 98%.

	Rationale:	Excessive movement against meter stops may result in hardware damage.
11.	Simplification:	Pump motor instantaneous overcurrent setpoint is 10 times normal operating current unless specific setpoints are provided.
	Rationale:	This limit precludes motor trip on normal starts.

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

The Simulator software contains a number of modules which predict the dynamic performance of the simulated plant in response to stimuli from the Operator's interface (i.e., the control panels) and the Instructor's interface (i.e., the Simulator control console).

The basis for the design of simulation modules is the Reference-Plant design documentation and performance data. Where plant design documentation, and/or performance data is not available, an assumption about the Reference-Plant has to be made.

The degree of differentiation among simulated systems necessitates a unique design for every system. The unique design of a simulated system requires specific plant design and performance data. Where the required data is not available, a Specific Model Assumption is made.

To meet the constraints imposed by finite computational resources, design simplifications are also employed. The unique design of each simulated system requires specific simplifications to be developed.

The specific Model Assumptions and Simplifications incorporated into each simulated model is provided in the following paragraphs to fully describe the Simulator's capabilities.

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Containment Purge System

S3T System Designator: CF
APS System Designator: CP, HC, Containment Building

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1.	Simplification:	Charcoal filters will operate at an efficiency of 99.996%.
	Rationale:	Pre-filter efficiency is 85% and HEPA efficiency is 99.97%. Therefore, the overall efficiency is 99.996%.
2.	Simplification:	The suction or discharge dampers of each fan work ideally, unless they are controlled separately or there is a malfunction associated with them.
	Rationale:	No discernible effect can be seen from the main control room.
3.	Simplification:	The MSSS ventilation system exhaust fans are assumed to be continuously running as long as there is electric power available.
	Rationale:	There is no control function from the main control room.
4.	Simplification:	The Main Steam Support Structure (MSSS) ventilation system fans will be modeled logically, but not dynamically.
	Rationale:	There are no analog control indications associated with this equipment. Local DP switches are monitored by the PPC.
5.	Simplification:	The tendon gallery ventilation system fans will be modeled logically, but not dynamically.
	Rationale:	There is no flow, pressure, or temperature instrumentation in the tendon gallery.

6. Simplification: The containment hydrogen purge subsystem is excluded from the model of the containment hydrogen control system, leaving only the hydrogen recombiner subsystem.

   Rationale: Operating procedures require that the hydrogen purge subsystem be used only if both hydrogen recombiners in the hydrogen recombiner system are out of service. There are no means in the simulation to place the recombiners out of service.

7. Simplification: Radiation monitoring instruments (RU-155 to RU-158) will not have interfaces to the containment system.

   Rationale: RU-155 to RU-158 are in the Main Steam Support Structure (MSSS). No penetration leakage from the containment to the MSSS is modeled.

8. Simplification: The Post Accident Sampling System (PASS) will not be simulated.

   Rationale: There are no PASS indications in the control room.

9. Simplification: Hydrogen control system calibration/surveillance equipment (compressed oxygen tank, tank containing 4% hydrogen in nitrogen, associated piping and valves leading to the hydrogen monitor) are assumed to be always available, always full, and operate perfectly.

   Rationale: Hydrogen concentration in the calibration tanks cannot be affected from the control room.

<u>Essential Cooling Water System</u>

S3T System Designator: CH
APS System Designator: EW, EC, NC, SP, PC

Design Assumptions and Rationale

None

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Design Simplifications and Rationale

1. Simplification: Domestic water supply for spray ponds A and B will be assumed to be available at a constant pressure.

   Rationale: Domestic water system is not a simulated system. Two remote functions are available to operate domestic water supply valves.

2. Simplification: Spent fuel pool boric acid concentration is a constant value.

   Rationale: Significant changes in boric acid concentration cannot be effected in the typical amount of time afforded a simulation scenario.

<u>Core</u>

S3T System Designator: CR
APS System Designator: Core

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: The space-time kinetics model is based on a modified one-energy group diffusion theory.

   Rationale: This approach is valid because the neutron slowing down process effects have been accounted for in the migration area.

2. Simplification: The ANS Standard 11-group decay heat constants are adopted.

   Rationale: These constants have been shown to provide excellent results for real-time simulation purposes.

3. Simplification: The adiabatic approximation is used in separating the flux distribution into a spatially dependent function that is slowly varying in time and a spatially independent function that varies rapidly with time.

Rationale: This approach is valid because the shape function evolves comparatively slowly.

4. Simplification: Nodal approach is based on the observation that adequate flux behavior can be obtained by subdividing the reactor core into regions. Each region (node) is assumed to be of homogeneous material composition and neutron transfer between regions is represented by cell coupling coefficients.

   Rationale: This approach is well suited for multi-dimensional problems since it significantly reduces the space points required. It has also been widely adopted and proven to be adequate.

Chemical and Volume Control System

S3T System Designator: CV
APS System Designator: CH, QM

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: Gas stripper package is lumped together.

   Rationale: No control or indication available in the control room.

2. Simplification: Boric acid concentrator package is lumped together. Only the effects of LOP for tripping the BAC is modeled.

   Rationale: No control or indication exists in the control room.

3. Simplification: Chemical addition unit is not simulated.

   Rationale: No controls available in the control room and no discernible effects will be observed.

4.	Simplification:	Batching tank is not simulated.
	Rationale:	No controls available in the control room and no discernible effects will be observed.
5.	Simplification:	Purification filter CHN-F36 is not simulated.
	Rationale:	The only function is to remove particulate material and there is no malfunction for clogging.
6.	Simplification:	Only hold up pump A will be simulated.
	Rationale:	One pump is sufficient to process hold up tank contents.
7.	Simplification:	Boric acid condensate ion exchanger is not simulated.
	Rationale:	As per procedure, approximately 96% of the output of the BAC package is diverted to the stack and the remaining 4% is sent to the RWT.
8.	Simplification:	Flow from BAC to HV is not simulated.
	Rationale:	BAC is lumped together and no discernible effects will be observed.

<u>Circulating Water System</u>

S3T System Designator: CW
APS System Designator: CW, MX, CI, QH, TB

Design Assumptions and Rationale

None

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Design Simplifications and Rationale

1. Simplification: Makeup water source from TB system will always be available. The cooling water makeup water pumps will be in service when the offsite power is available. The makeup flow rate depends on the level control valve position and the pressure source from the TB system.

   Rationale: There is no control room indication for the TB system.

<u>Electrical Distribution System</u>

S3T System Designator: ED
APS System Designator: MA, DG, MB, NA, NB, NH, NG, NN, NK, PB, PH, PG, PN, PK, PE, DF, MX, NQ, QA, QB, QD, NZ

Design Assumptions and Rationale

1. Assumption: 525KV switchyard is connected to an infinite bus.

   Rationale: The transmission and distribution network capacity is much larger than any individual generating Unit.

2. Assumption: All the analog points for future lines will display a value of zero.

   Rationale: No data is available for the future lines.

3. Assumption: All Unit 2 and Unit 3 buses which cannot be controlled from Unit 1 main control room are energized at normal operating values.

   Rationale: These buses cannot be controlled from Unit 1 main control room, and no malfunction for loss of grid is modeled.

4. Assumption: DC bus will be lost when its voltage is decreased to less than 80% of its nominal voltage.

   Rationale: DC powered devices do not function reliably below this voltage.

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Design Simplifications and Rationale

1.	Simplification:	Generated real power, reactive power and current will be equally distributed to each outgoing line at the 525KV switchyard.
	Rationale:	With the infinite bus assumption, all the outgoing lines have the same system voltage and equivalent impedance.
2.	Simplification:	PMS pulse points will not respond to a backfeed condition.
	Rationale:	Backfeed is not an operating method, normal or emergency, employed at Palo Verde.

<u>Main Generation System</u>

S3T System Designator: EG
APS System Designator: MA, DG, MB, NA, NB, NH, NG, NN, NK, PB, PH, PG, PN, PK, PE, DF, MX, NQ, QA, QB, QD, NZ

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1.	Simplification:	The fuel oil storage tank of each diesel generator will be full all the time.
	Rationale:	Typical simulation scenarios do not progress to a point where the tanks would need to be refilled.

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Fire Protection System

S3T System Designator: FP
APS System Designator: FP

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: Fire protection halon system will not be simulated.

   Rationale: There is no malfunction which would require the halon system to actuate.

2. Simplification: The fuel oil day tank of each diesel-driven fire pump will be full all the time.

   Rationale: Typical simulation scenarios do not progress to a point where the tanks would need to be refilled.

3. Simplification: Sufficient water is available in the fire water reserve tank for all fire protection purposes.

   Rationale: During normal operation, each fire water reserve tank has at least 434,000 gallons. When water level is decreased, operation of well water booster pumps and/or deep well pumps will provide makeup water to the reserve tank rapidly.

4. Simplification: Fire protection system jockey pump will not be simulated.

   Rationale: No system leakage is assumed. Thus, there is no need for a jockey pump to maintain system pressure.

[illegible]

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Feedwater System

S3T System Designator: FW
APS System Designator: AR, FW, FT, CD, DW, CT, AF, SG, ED, QJ, LO, SC

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: CST flow to condensate polishers for resin bed regeneration will be modeled as a constant when regeneration is in process.

   Rationale: There is no control room panel instrumentation to measure this flow.

Containment Hydrogen Control System

S3T System Designator: HV
APS System Designator: HP, HA, HD, HF, HJ, HR, HT

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: Control building, turbine building and diesel generator building air flow and pressure are not dynamically modeled.

   Rationale: No indication available in control room for air flow and pressure. The system will be simulated logically based on fan status and damper positions.

2. Simplification: No fan filters high differential pressure alarms are simulated.

   Rationale: No controls available in the control room and filter clogging is assumed not to occur.

3.	Simplification:	Radwaste building fans are always running.
	Rationale:	No control or remote function available to trip the fans.
4.	Simplification:	Duct heaters are modeled considering only the power to the heaters.
	Rationale:	It is assumed the duct heaters maintain the proper temperature setpoint as long as power is available.
5.	Simplification:	Atmospheric pressure transmitter is fixed.
	Rationale:	Ambient barometric pressure is not modeled.

Instrument and Service Air System

S3T System Designator: IA
APS System Designator: IA, GA

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1.	Simplification:	Air is always dry.
	Rationale:	Moisture buildup is a long term process with no discernible effects in the course of a typical simulation scenario.
2.	Simplification:	After coolers are not simulated.
	Rationale:	No controls or indications are available in the control room.
3.	Simplification:	Service air receivers are lumped together.
	Rationale:	No controls or indications are available in the control room.

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

4. Simplification: The nitrogen system is lumped together.

   Rationale: No controls or indications are available in the control room.

5. Simplification: The hydrogen system is lumped together.

   Rationale: No controls or indications are available in the control room.

6. Simplification: Service air usage will be assumed to be constant.

   Rationale: No malfunctions or controls are associated with the service air system.

<u>Auxiliary Steam System</u>

S3T System Designator: MS
APS System Designator: SG, MT, SC, AS, GS, SBCS, ED

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: Chemistry in the main steam system will not be modeled except for indication of radiation, sodium and conductivity.

   Rationale: Other chemical properties are not indicated in the control room.

2. Simplification: Supply of auxiliary steam at 250 psig from plant cross tie and demand of auxiliary steam to plant cross tie are always available when the remote functions are properly set.

   Rationale: Palo Verde Units 2 and 3 are not dynamically simulated.

3. Simplification: Flow paths for gland steam leakoff from the control valves will not be simulated.

   Rationale: These flow rates are negligible.

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Ex-Core Neutron Monitoring System

S3T System Designator: NI
APS System Designator: SE, RI, CET, HJTC, MICD

Design Assumptions and Rationale

None

Design Simplifications and Rationale

None

Control Element Drive Mechanism Control System

S3T System Designator: RD
APS System Designator: CEDMCS

Design Assumptions and Rationale

None

Design Simplifications and Rationale

None

Shutdown Cooling System

S3T System Designator: RH
APS System Designator: LPSI, CS, SDC

Design Assumptions and Rationale

None

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Design Simplifications and Rationale

None

Radiation Monitoring System

S3T System Designator: RM
APS System Designator: RMS

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1.	Simplification:	Radiation levels of monitors RU-29 and RU-30 (control room air intake) will be affected by the plant vent only. However, if wind speed is greater than 5 MPH and wind direction is from south, southwest or west, RU-29 and RU-30 will not be affected.
	Rationale:	Control room air intake is to the southwest of the plant vent.
2.	Simplification:	The radiation levels of the following monitors will not be dynamically modeled: RU-19, RU-24, RU-27, RU-28, RU-33, RU-145, RU-146, RU-155, RU-156, RU-157, and RU-158.
	Rationale:	RU-24, RU-27 and RU-28 are not in service. RU-19, RU-33, RU-146, RU-155, RU-156, RU-157 and RU-158..No significant change of radiation levels can be expected from simulated malfunctions.

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Engineered Safety Features Actuation System

S3T System Designator: RP
APS System Designator: SA, SB, SPS

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: The following areas will not be simulated: display generator, teletype, optical isolators (except for loss of power), mass storage unit, CPC test panel.

   Rationale: This equipment is not required in the conduct of normal evolutions or malfunctions.

2. Simplification: The periodic self tests of a CPC or a CEAC are not included in the simulation.

   Rationale: Not required for the conduct of normal evolutions or malfunctions.

Reactor Power Cutback System

S3T System Designator: RX
APS System Designator: SBCS, FWCS, RPCB, RRS

Design Assumptions and Rationale

None

Design Simplifications and Rationale

None

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Safety Injection System

S3T System Designator: SI
APS System Designator: SIT, HPSI, LPSI

Design Assumptions and Rationale

None

Design Simplifications and Rationale

None

Stator Cooling System

S3T System Designator: SW
APS System Designator: CE

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: Chemical Additional Tank WCN-X01 will not be modeled.

   Rationale: There is no control room instrumentation for the tank.

Main Turbine Control Oil System

S3T System Designator: TC
APS System Designator: EHC, CO, MT, OS, LO, TSI

Design Assumptions and Rationale

None

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

Design Simplifications and Rationale

None

Reactor Coolant System

S3T System Designator: TH
APS System Designator: RC

Design Assumptions and Rationale

None

Design Simplifications and Rationale

None

Stator Cooling System

S3T System Designator: TP
APS System Designator: CE, GH, SO, TC

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: The deionizer will not be modeled in the stator cooling system.

   Rationale: No malfunction simulated will increase ion level in the stator cooling water.

2. Simplification: The air flow rate to isophase bus cooling is assumed to be constant.

   Rationale: The air flow rate variation is negligible.

3. Simplification: The chemical additional tank in the turbine plant cooling system will not be modeled.

   Rationale: No controls or indications for this equipment are located in the control room.

Main Turbine System

S3T System Designator: TU
APS System Designator: EHC,CO, MT, OS, LO, TSI

Design Assumptions and Rationale

None

Design Simplifications and Rationale

None

Gaseous Radwaste System

S3T System Designator: WD
APS System Designator: GR, LR, RD, SS, SC, CM, SR, OW

Design Assumptions and Rationale

None

Design Simplifications and Rationale

1. Simplification: Only sodium and conductivity will be modeled in the non-nuclear sampling system.

   Rationale: Other chemical properties are not expected to change significantly.

SPECIFIC MODEL ASSUMPTIONS AND SIMPLIFICATIONS

2.	Simplification:	Sodium ion concentration will be a function of the modeled process conductivity levels for the effects of the CW tube rupture.
	Rationale:	Sodium is the most significant indication of a CW tube rupture.
3.	Simplification:	Radwaste building sump, PASS, and solid waste processing will not be simulated.
	Rationale:	No controls or indications for this equipment are located in the control room.
4.	Simplification:	Control building sump and diesel generator building sump will not be simulated.
	Rationale:	No malfunction leak flow into these sumps. The fire protection deluge is the only possible water source and the water is automatically pumped to the oil/water separator under this condition.

PVNGS SIMULATOR
1991
CERTIFICATION SUBMITTAL

SECTION 7

TEST ABSTRACTS

Normal Evolution Tests

Malfunction Tests

Transient Tests

Steady State Tests

Other Simulator Tests

- Instructor Station
- Real Time

TEST ABSTRACTS

The Requirements for Simulator Performance Testing are contained in Section 4, Section 5.4, Appendix A3, and Appendix B of ANSI/ANS-3.5-1985. Further guidance for the documentation requirements is contained in a letter from Neal K. Hunemuller. This letter describes the use of 'Test Abstracts' in lieu of sending the actual tests to the NRC. The PVNGS Certification Package test abstracts are consistent with the format outlined in this letter.

The acceptance criteria for these tests consists primarily of actual plant design and performance documentation, or Best Estimate data. In those instances for which data was not available, the evaluation of Simulator response was performed by personnel identified in Section 3 of this Submittal.

Preceding the test abstracts are summary pages to assist locating specific tests.

SUMMARY OF NORMAL EVOLUTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF MALFUNCTION TEST ABSTRACTS

SUMMARY OF TRANSIENT TEST ABSTRACTS

SUMMARY OF STEADY STATE TEST ABSTRACTS

SUMMARY OF OTHER TEST ABSTRACTS

TEST ABSTRACT ACRONYM AND ABBREVIATION LIST

ACU -	Air Cooling Unit
AFAS -	Auxiliary Feedwater Actuation Signal
AFW -	Auxiliary Feed Water
AHU -	Air Handling Unit
AMI -	Automatic Motion Inhibit
AUX -	Auxiliary
BFT -	Blowdown Flash Tank
BOC -	Beginning of Cycle (Life)
BOP -	Balance of Plant (Secondary)
CEA -	Control Element Assembly
CEAC -	Control Element Assembly Calculator
CEDM -	Control Element Drive Mechanism
CEDMCS -	Control Element Drive Mechanism Control System
CHGR -	Charger
CIAS -	Containment Isolation Actuation Signal
CLG -	Cooling
CKT -	Circuit
CMC -	Core Monitoring Computer
CPC -	Core Protection Calculator
CPU -	Central Processing Unit
CPIAS -	Containment Purge Isolation Actuation Signal
CPS -	Counts per Second
CREFAS -	Control Room Essential Filtration Actuation Signal
CSAS -	Containment Spray Actuation Signal
CST -	Condensate Storage Tank
CW -	Circulating Water (System)
DG -	Diesel Generator
DNBR -	Departure from Nucleate Boiling Ratio
DISCH -	Discharge
ECWS -	Essential Cooling Water System
EDG -	Emergency Diesel Generator (DG)
EOC -	End of Cycle (Life)
ESFAS -	Essential Safety Features Actuation Signal
EXTR -	Extraction
FBEVAS -	Fuel Building Essential Ventilation Actuation Signal
FWCS -	Feed Water Control System
FWPT -	Feed Water Pump Turbine
FWIV -	Feed Water (Containment) Isolation Valve
HDR -	Header
HPSI -	High Pressure Safety Injection
HX -	Heat Exchanger
IA -	Instrument Air (System)
LD -	Let Down
LPSI -	Low Pressure Safety Injection
LSHH -	Level Switch High-High

TEST ABSTRACT ACRONYM AND ABBREVIATION LIST

MALF -	Malfunction
MOC -	Middle of Cycle (Life)
MSIS -	Main Steam Isolation Actuation Signal
MSIV -	Main Steam (Containment) Isolation Valve
MSLB -	Main Steam Line Break
MWe -	Mega-Watts (Electric)
NCW -	Nuclear Cooling Water
NI -	Nuclear Instrumentation
NOP -	Normal Operating Pressure
NOT -	Normal Operating Temperature
PC -	Personal Computer
PCW -	Plant Cooling Water
PLCS -	Pressurizer Level Control System
PNL -	Panel
PW -	Plant (Cooling) Water (System)
RAS -	Recirculation Actuation Signal
RCP -	Reactor Coolant Pump
RCS -	Reactor Coolant System
REAC -	Reactor, Reactivity
RHX -	Regenerative Heat Exchanger
RMWT -	Reactor Make-up Water Tank
RPCB -	Reactor Power Cut Back
RPCS -	Reactor Power Cutback System
RRS -	Reactor Regulating System
RTP -	Rated Thermal Power
RTSG -	Reactor Trip Switch Gear (Breaker)
SBCS -	Steam Bypass Control System
SGBD -	Steam Generator Blow Down
SIAS -	Safety Injection Actuation Signal
SIT -	Safety Injection Tank
STM -	Steam
SU -	Start Up
SWGR -	Switchgear
SYS -	System
TCW -	Turbine Cooling Water
TDAFWP -	Turbine Driven Auxiliary Feed Water Pump
TRBL -	Trouble
VAC -	Vacuum
VARS -	Volts-Amps Reactive
VCT -	Volume Control Tank
VDC -	Volts DC
WTR -	Water
XFMR -	Transformer

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: **Cold Shutdown to Hot Standby (NET001)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.1(1)**

3. Description of Test (Cause and Effects if malfunction):

   THE TEST OF THE NORMAL PLANT EVOLUTION WHICH MANEUVERS THE RCS FROM COLD SHUTDOWN TO HOT STANDBY WAS PERFORMED BY COMPLETING THE REFERENCE-PLANT GENERAL OPERATING PROCEDURE WHICH GUIDES THIS EVOLUTION.

4. Date Tested: **3/18/91**

5. Test Initial Conditions: **Cold Shutdown**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Mode 3, NOP and NOT.**

7. Reference Data: **41OP-1ZZ01 "Cold Shutdown to Hot Standby"**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: Nuclear Startup to Rated Thermal Power (NET002)

2. ANS 3.5-1985 Section Requiring Test: 3.1.1(2)

3. Description of Test (Cause and Effects if malfunction):

   THE TEST OF THE NORMAL PLANT EVOLUTION WHICH MANEUVERS THE PLANT FROM MODE 3 THROUGH NUCLEAR STARTUP AND ON TO RATED THERMAL POWER WAS PERFORMED BY COMPLETING THE REFERENCE-PLANT GENERAL OPERATING PROCEDURE WHICH GUIDES THIS EVOLUTION.

4. Date Tested: 3/18/91

5. Test Initial Conditions: Mode 3 NOP and NOT

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Mode 1, 100% RTP

7. Reference Data: 41OP-1ZZ03 "Reactor Startup," 41OP-1ZZ04 "Plant Startup Mode 2 to Mode 1," 41OP-1ZZ05 "Power Operations"

8. Deficiencies identified by the test: 3379 & 3380

   a. Schedule DR correction: The schedule for correction of Deficiency Reports is presented in the section devoted to Outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: Nuclear Startup to Rated Thermal Power (NET003)

2. ANS 3.5-1985 Section Requiring Test: 3.1.1(3)

3. Description of Test (Cause and Effects if malfunction):

   THE TEST OF THE NORMAL PLANT EVOLUTION WHICH MANEUVERS THE PLANT THROUGH TURBINE STARTUP AND MAIN GENERATOR SYNCHRONIZATION WAS PERFORMED BY COMPLETING THE REFERENCE-PLANT GENERAL OPERATING PROCEDURE WHICH GUIDES THIS EVOLUTION.

4. Date Tested: 3/18/91

5. Test Initial Conditions: Mode 3

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Mode 1, Turbine and Generator online.

7. Reference Data: 41OP-1ZZ04 "Plant Startup Mode 2 to Mode 1,"

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: Reactor Trip and Recovery to Rated Thermal Power (NET004)

2. ANS 3.5-1985 Section Requiring Test: 3.1.1(4)

3. Description of Test (Cause and Effects if malfunction):

   THE TEST OF THE NORMAL PLANT EVOLUTION WHICH MANEUVERS THE PLANT THROUGH A REACTOR TRIP AND SUBSEQUENT RECOVERY TO RATED THERMAL POWER WAS PERFORMED BY COMPLETING THE REFERENCE-PLANT GENERAL OPERATING PROCEDURE WHICH GUIDES THIS EVOLUTION.

4. Date Tested: 3/18/91

5. Test Initial Conditions: Mode 1 100% RTP

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Mode 1, 100% RTP

7. Reference Data: 41EP-1ZZ01 "Reactor Trip," 41OP-1ZZ03 "Reactor Startup," 41OP-1ZZ04 "Plant Startup Mode 2 to Mode 1," 41OP-1ZZ05 "Power Operations"

8. Deficiencies identified by the test: 3379 & 3380

   a. Schedule DR correction: The schedule for correction of Deficiency Reports is presented in the section devoted to Outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: **Operations at Hot Standby (NET005)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.1(5)**

3. Description of Test (Cause and Effects if malfunction):

   THE TEST OF THE NORMAL PLANT EVOLUTION WHICH CONDUCTS OPERATIONS AT HOT STANDBY WAS PERFORMED BY COMPLETING THE REFERENCE-PLANT GENERAL OPERATING PROCEDURE WHICH GUIDES THIS EVOLUTION.

4. Date Tested: **3/18/91**

5. Test Initial Conditions: **Mode 3, NOP and NOT**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Mode 3, NOP and NOT.**

7. Reference Data: **41OP-1ZZ01 "Cold Shutdown to Hot Standby"**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: Load Changes (NET006)

2. ANS 3.5-1985 Section Requiring Test: 3.1.1(6)

3. Description of Test (Cause and Effects if malfunction):

   THE TEST OF THE NORMAL PLANT EVOLUTION WHICH CONDUCTS LOAD CHANGES WAS PERFORMED BY COMPLETING THE REFERENCE-PLANT GENERAL OPERATING PROCEDURE WHICH GUIDES THIS EVOLUTION.

4. Date Tested: 3/18/91

5. Test Initial Conditions: Mode 1, 20 % RTP.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Mode 1, 100% RTP

7. Reference Data: 41OP-1ZZ05 "Power Operations"

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: **Plant Shutdown from Rated Thermal Power to Cold Shutdown (NET007)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.1(8)**

3. Description of Test (Cause and Effects if malfunction):

   THE TEST OF THE NORMAL PLANT EVOLUTION WHICH CONDUCTS PLANT SHUTDOWN FROM RATED THERMAL POWER TO COLD SHUTDOWN WAS PERFORMED BY COMPLETING THE REFERENCE-PLANT GENERAL OPERATING PROCEDURE WHICH GUIDES THIS EVOLUTION.

4. Date Tested: **3/18/91**

5. Test Initial Conditions: **Mode 1, 100 % RTP.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Mode 5**

7. Reference Data: **41OP-1ZZ05 "Power Operations," 41OP-1ZZ08 "Reactor Shutdown," 41OP-1ZZ10 "Hot Standby to Cold Shutdown Mode 3 to Mode 5"**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: Core Physics Test (NET009)

2. ANS 3.5-1985 Section Requiring Test: 3.1.1(9)

3. Description of Test (Cause and Effects if malfunction):

   CORE PHYSICS TESTS WERE CONDUCTED ON THE PALO VERDE SIMULATOR TO EVALUATE THE ACCURACY OF CORE PARAMETERS. THE FOLLOWING TESTS WERE CONDUCTED USING INSTALLED PLANT INSTRUMENTATION:

   a. CRITICAL BORON CONCENTRATION
   b. GROUP ROD WORTH
   c. OVERLAP ROD WORTH
   d. ISOTHERMAL TEMPERATURE COEFFICIENT
   e. POWER DEFECT
   f. XENON WORTH
   g. XENON OSCILLATION
   h. DECAY HEAT

4. Date Tested: 03/18/91

5. Test Initial Conditions: Mode 3 NOP & NOT, 100 % RTP, BOC, MOC, EOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Required data taken

7. Reference Data: PVNGS Unit 1 Cycle 2 Core Data Book, PVNGS "Test Results Report U1C2" procedure 72PY-9RX01, ANSI/ANS-5.1, 1979, "Decay Heat Program"

8. Deficiencies identified by the test: 2934

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

NORMAL EVOLUTION TEST ABSTRACTS

1. Test Title: Operator Conducted Surveillance Tests (NET010)

2. ANS 3.5-1985 Section Requiring Test: 3.1.1(10)

3. Description of Test (Cause and Effects if malfunction):

ALL OR PART OF FORTY FOUR OF THE UNIT 1 SURVEILLANCE TESTS WERE PERFORMED ON THE SIMULATOR. THE SURVEILLANCES WERE CONDUCTED IN THE FOLLOWING AREAS:

AUXILIARY FEEDWATER
CHEMICAL & VOLUME CONTROL SYSTEM
DIESEL GENERATOR
VENTILATION SYSTEMS
ELECTRICAL DISTRIBUTION
MAIN STEAM
SAFETY INJECTION
ESSENTIAL COOLING WATER SYSTEMS
OPERATIONS LOGS
ASME SECTION XI TESTS

4. Date Tested: Through 3/18/91

5. Test Initial Conditions: As specified by the surveillance test procedure.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: As specified by the surveillance test procedure.

7. Reference Data: As specified by the surveillance test procedure.

8. Deficiencies identified by the test: by surveillance test:

Test Procedure	Deficiency Report
41ST-1CH04	2560
41ST-1SI01	2506
41ST-1SI11	2393
41ST-1ZZ19	3088
41ST-1ZZ33	3088
73ST-1XI08	2195

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None
    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Nuclear Cooling Water Pump A Trip (CC02A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(8)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: GROUND FAULT PROTECTION FAILS (RELAY 450G)

   EFFECTS: THIS MALFUNCTION FAILS THE GROUND FAULT RELAY WHICH TRIPS THE NCW PUMP 486 LOCKOUT RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE PUMP BREAKER TRIPS AND NCW SYSTEM TRBL IS ANNUNCIATED. PUMP DISCHARGE HEADER PRESSURE DROPS. NCW PUMP DISCHARGE HEADER PRESSURE LOW IS ANNUNCIATED ON B07. THE STANDBY NCW PUMP AUTO-STARTS DUE TO LOW PRESSURE AND RESTORES SYSTEM PRESSURE AND FLOW. THE LOW PRESSURE ANNUNCIATOR CLEARS. THE NCW PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. MALFUNCTION REMOVAL REPAIRS THE GROUND FAULT RELAY. THE PUMP BREAKER CAN BE CLOSED AFTER THE 486 LOCKOUT RELAY IS RESET.

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **100% RTP, BOC, NCN-P01A running, NCN-P01B in standby**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, malfunction removed, pump lockout reset and pump restarted**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Nuclear Cooling Water Pump B Trip (CC02B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(8)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUND FAULT PROTECTION FAILS (RELAY 450G)**

   EFFECTS: **THIS MALFUNCTION FAILS THE GROUND FAULT RELAY WHICH TRIPS THE NCW PUMP 486 LOCKOUT RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE PUMP BREAKER TRIPS AND NCW SYSTEM TRBL IS ANNUNCIATED. PUMP DISCHARGE HEADER PRESSURE DROPS. NCW PUMP DISCHARGE HEADER PRESSURE LOW IS ANNUNCIATED ON B07. THE STANDBY NCW PUMP AUTO-STARTS DUE TO LOW PRESSURE AND RESTORES SYSTEM PRESSURE AND FLOW. THE LOW PRESSURE ANNUNCIATOR CLEARS. THE NCW PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. MALFUNCTION REMOVAL REPAIRS THE GROUND FAULT RELAY. THE PUMP BREAKER CAN BE CLOSED AFTER THE 486 LOCKOUT RELAY IS RESET.**

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **100% RTP, BOC, NCN-P01A running, NCN-P01B in standby**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, malfunction removed, pump lockout reset and pump restarted**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **Essential Cooling Water Pump A Trip (CC06A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(6)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUND FAULT PROTECTION ACTIVATES (750G)**

   EFFECTS: **THE GROUND FAULT PROTECTION RELAY 750 TRIPS THE AFFECTED ESSENTIAL COOLING PUMP BREAKER 786 LOCKOUT RELAY. THE PUMP BREAKER TRIPS. NO FAULT INDICATION IS OBSERVED PRIOR TO THE TRIP. PUMP FLOW INDICATION ON B02 DECREASES TO 0. LOW PUMP DISCHARGE PRESSURE ALARM (B02) SOUNDS. ESSENTIAL COOLING TO SUPPLIED COMPONENTS IS LOST. ALTERNATE EW PUMP CAN BE MANUALLY STARTED AND OPPOSITE TRAIN ALIGNED TO PROVIDE ESSENTIAL COOLING. MALFUNCTION REMOVAL REMOVES THE GROUND FAULT TRIP. THE PUMP CAN BE STARTED AFTER THE 786 LOCKOUT IS RESET.**

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, essential chiller tripped, malfunction removed and pump restarted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **Essential Cooling Water Pump B Trip (CC06B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(6)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUND FAULT PROTECTION ACTIVATES (750G)**

   EFFECTS: **THE GROUND FAULT PROTECTION RELAY 750 TRIPS THE AFFECTED ESSENTIAL COOLING PUMP BREAKER 786 LOCKOUT RELAY. THE PUMP BREAKER TRIPS. NO FAULT INDICATION IS OBSERVED PRIOR TO THE TRIP. PUMP FLOW INDICATION ON B02 DECREASES TO 0. LOW PUMP DISCHARGE PRESSURE ALARM (B02) SOUNDS. ESSENTIAL COOLING TO SUPPLIED COMPONENTS IS LOST. ALTERNATE EW PUMP CAN BE MANUALLY STARTED AND OPPOSITE TRAIN ALIGNED TO PROVIDE ESSENTIAL COOLING. MALFUNCTION REMOVAL REMOVES THE GROUND FAULT TRIP. THE PUMP CAN BE STARTED AFTER THE 786 LOCKOUT IS RESET.**

4. Date Tested: **01/18/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, essential chiller tripped, malfunction removed and pump restarted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Spray Pond Pump A Fails to Start (CC12A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(8)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAILED CLOSING COIL**

   EFFECTS: **THIS MALFUNCTION FAILS THE BREAKER CLOSING COIL (52X) SO THAT IT CANNOT ENERGIZE TO CLOSE THE AFFECTED SPRAY POND PUMP BREAKER. THE BREAKER CANNOT BE CLOSED ON EITHER A MANUAL START SIGNAL (CONTROL SWITCH) OR AUTO-START SIGNAL. INDICATION OF BREAKER FAILURE TO CLOSE ARE PUMP STATUS LIGHTS AND NO BUILDUP OF SYSTEM PRESSURE AND FLOW (SP-PI-3 AND FI-5 ON B02). SPRAY POND PUMP COOLING FLOW TO DG AND ECWS HX CANNOT BE ESTABLISHED. MALFUNCTION ACTIVATION ON A CLOSED BREAKER DOES NOT TRIP THE BREAKER, HOWEVER, SUBSEQUENT RECLOSURE OF THE BREAKER IS PREVENTED. MALFUNCTION REMOVAL RESTORES NORMAL CIRCUIT BREAKER OPERATION.**

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **Mode 3, NOP & NOT**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with DG running without cooling flow established.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **Spray Pond Pump B Fails to Start (CC12B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(8)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **FAILED CLOSING COIL**

EFFECTS: **THIS MALFUNCTION FAILS THE BREAKER CLOSING COIL (52X) SO THAT IT CANNOT ENERGIZE TO CLOSE THE AFFECTED SPRAY POND PUMP BREAKER. THE BREAKER CANNOT BE CLOSED ON EITHER A MANUAL START SIGNAL (CONTROL SWITCH) OR AUTO-START SIGNAL. INDICATION OF BREAKER FAILURE TO CLOSE ARE PUMP STATUS LIGHTS AND NO BUILDUP OF SYSTEM PRESSURE AND FLOW (SP-PI-3 AND FI-5 ON B02). SPRAY POND PUMP COOLING FLOW TO DG AND ECWS HX CANNOT BE ESTABLISHED. MALFUNCTION ACTIVATION ON A CLOSED BREAKER DOES NOT TRIP THE BREAKER, HOWEVER, SUBSEQUENT RECLOSURE OF THE BREAKER IS PREVENTED. MALFUNCTION REMOVAL RESTORES NORMAL CIRCUIT BREAKER OPERATION.**

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **Mode 3, NOP & NOT**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with DG running without cooling flow established.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **NCW Leak Inside Containment (CC16)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(8)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **WELD FAILURE ON THE PIPE**

   EFFECTS: **THIS LEAK IS INSIDE THE CONTAINMENT ON THE NCW COMMON RETURN HEADER UPSTREAM OF NCN-UV-403. ASSUMING 100% MALFUNCTION SEVERITY, NCW SYSTEM PRESSURE DROPS. LOW PUMP DISCHARGE PRESSURE ANNUNCIATES AT 80 PSIG (B07) AND THE STANDBY NCW PUMP AUTO-STARTS. NCW SURGE TANK LEVEL DECREASES RAPIDLY, AND TANK LOW LEVEL IS ANNUNCIATED (B07). NCW PUMPS CAVITATE. TEMPERATURES ON EQUIPMENT COOLED BY NCW INCREASE. ESSENTIAL COOLING WATER CAN BE ALIGNED TO SUPPLY THE CONTAINMENT COMPONENTS BUT WILL ALSO CONTINUE TO SUPPLY THE LEAK. LEAKAGE GOES TO THE CONTAINMENT SUMPS. LEAK ISOLATION CAN BE ACCOMPLISHED BY CLOSING NCW SUPPLY AND RETURN VALVES TO THE CONTAINMENT (NC-UV-402/403 AND UV-401). MALFUNCTION IS NON-RECOVERABLE.**

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **2-100%**

6. Test Termination Conditions: **Stable plant with EW cross tied to supply unaffected NCW loads.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **CEDM ACU Fan Motor Trip (CH04A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(8)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAULTY 50G RELAY TRIPS FAN**

   EFFECTS: **AFFECTED CEDM NORMAL ACU FAN BREAKER TRIPS DUE TO A FAULTY 50G RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE BREAKER 86 LOCKOUT RELAY TRIPS. CEDM ACU COOLING SYSTEM TROUBLE ANNUNCIATES ON B07. CEDM ACU A LOW DP CAUSES AUTO START OF REDUNDANT FANS AFTER 120 SECOND TIME DELAY. NO SIGNIFICANT AFFECT IS OBSERVED ON CEDM AREA TEMPERATURE IF THE STANDBY FANS ARE AVAILABLE. USE OF MULTIPLE GENERICS WILL CAUSE CEDM AREA TEMPERATURE INCREASE (HC-TI-57 ON B07). MALFUNCTION REMOVAL ALLOWS FAN RESTART AFTER RESETTING THE 86 LOCKOUT.**

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, affected fan tripped and standby fans started.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **CEDM ACU Fan Motor Trip (CH04B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(8)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAULTY 50G RELAY TRIPS FAN**

   EFFECTS: **AFFECTED CEDM NORMAL ACU FAN BREAKER TRIPS DUE TO A FAULTY 50G RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE BREAKER 86 LOCKOUT RELAY TRIPS. CEDM ACU COOLING SYSTEM TROUBLE ANNUNCIATES ON B07. CEDM ACU A LOW DP CAUSES AUTO START OF REDUNDANT FANS AFTER 120 SECOND TIME DELAY. NO SIGNIFICANT AFFECT IS OBSERVED ON CEDM AREA TEMPERATURE IF THE STANDBY FANS ARE AVAILABLE. USE OF MULTIPLE GENERICS WILL CAUSE CEDM AREA TEMPERATURE INCREASE (HC-TI-57 ON B07). MALFUNCTION REMOVAL ALLOWS FAN RESTART AFTER RESETTING THE 86 LOCKOUT.**

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, affected fan tripped and standby fans started.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: CEDM ACU Fan Motor Trip (CH04C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(8)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAULTY 50G RELAY TRIPS FAN

   EFFECTS: AFFECTED CEDM NORMAL ACU FAN BREAKER TRIPS DUE TO A FAULTY 50G RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE BREAKER 86 LOCKOUT RELAY TRIPS. CEDM ACU COOLING SYSTEM TROUBLE ANNUNCIATES ON B07. CEDM ACU A LOW DP CAUSES AUTO START OF REDUNDANT FANS AFTER 120 SECOND TIME DELAY. NO SIGNIFICANT AFFECT IS OBSERVED ON CEDM AREA TEMPERATURE IF THE STANDBY FANS ARE AVAILABLE. USE OF MULTIPLE GENERICS WILL CAUSE CEDM AREA TEMPERATURE INCREASE (HC-TI-57 ON B07). MALFUNCTION REMOVAL ALLOWS FAN RESTART AFTER RESETTING THE 86 LOCKOUT.

4. Date Tested: 01/14/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, affected fan tripped and standby fans started.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **CEDM ACU Fan Motor Trip (CH04D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(8)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAULTY 50G RELAY TRIPS FAN**

   EFFECTS: **AFFECTED CEDM NORMAL ACU FAN BREAKER TRIPS DUE TO A FAULTY 50G RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE BREAKER 86 LOCKOUT RELAY TRIPS. CEDM ACU COOLING SYSTEM TROUBLE ANNUNCIATES ON B07. CEDM ACU A LOW DP CAUSES AUTO START OF REDUNDANT FANS AFTER 120 SECOND TIME DELAY. NO SIGNIFICANT AFFECT IS OBSERVED ON CEDM AREA TEMPERATURE IF THE STANDBY FANS ARE AVAILABLE. USE OF MULTIPLE GENERICS WILL CAUSE CEDM AREA TEMPERATURE INCREASE (HC-TI-57 ON B07). MALFUNCTION REMOVAL ALLOWS FAN RESTART AFTER RESETTING THE 86 LOCKOUT.**

4. Date Tested: **01/14/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, affected fan tripped and standby fans started.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Letdown Temp Controller Failure (CV02)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: CHN-TIC-223 SETPOINT FAILURE AT SELECTED VALUE

EFFECTS: TEMPERATURE CONTROLLER CHN-TIC-223 (B03) CONTROLS COOLING WATER FLOW THROUGH THE LETDOWN HX BY CONTROLLING THE POSITION OF NUCLEAR COOLING VALVE NCN-TV-223. THE MALFUNCTION CAN FAIL THE CONTROLLER SETPOINT TO ANY VALUE WITHIN THE RANGE OF 50-200$_{o}$F. HIGH MALF SEVERITY (HI TEMP SETPOINT), COOLING FLOW IS DECREASED TO THE LETDOWN HX. INCREASING OUTLET TEMPERATURE IS DISPLAYED ON THE CONTROLLER. LETDOWN HX OUTLET TEMPERATURE HI AND HI-HI ANNUNCIATES ON B03. AT THE HI-HI TEMPERATURE, LD FLOW IS BYPASSED AROUND THE PURIFICATION ION EXCHANGERS, BORONOMETER, AND RAD MONITOR, AND LETDOWN BACKPRESSURE VALVES CH-PV-201P AND 201Q ARE CLOSED. LOW SEVERITY (LOW SETPOINT) CAUSES INCREASED COOLING FLOW TO THE LETDOWN HEAT EXCHANGER AND A DECREASE IN THE LD HX OUTLET TEMPERATURE. MALFUNCTION REMOVAL RESTORES THE NORMAL SETPOINT VALUE.

4. Date Tested: **01/15/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **5% & 100%**

6. Test Termination Conditions: **Stable plant with letdown flow isolated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Charging Pump Trip (CV10A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **CHARGING PUMP CHA-P01 BREAKER TRIPS DUE TO FAULTY 50G RELAY**

   EFFECTS: **CHARGING PUMP 1 BREAKER TRIPS (IF OPERATING) DUE TO A FAULTY 50G RELAY WHICH TRIPS THE 86-1 LOCKOUT RELAY. NO INDICATION OF A FAULT OCCURS PRIOR TO THE TRIP. THE BREAKER CANNOT BE RECLOSED WITH THE MALFUNCTION ACTIVE. THE PUMP TRIP IS ANNUNCIATED. THE DECREASE IN CHARGING LINE FLOW (CH-FI-212 ON B03) CAUSES A DECREASING PZR LEVEL AND INCREASED REGEN HX OUTLET TEMPERATURE (CH-TI-221 ON B03). THE PLCS RESPONDS BY CLOSING THE LETDOWN CONTROL VALVES (CH-110P/Q) TO MAINTAIN PZR LEVEL. MALFUNCTION REMOVAL REMOVES THE FAULT. THE PUMP CAN BE RESTARTED AFTER RESETTING THE 86 LOCKOUT.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC, VCT makeup in Auto, two charging pumps operating ((1,2,3) on CHN-HS-4), control switches for running and standby pumps in Auto-After-Stop**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Pump trip reset and pump restarted**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Charging Pump Trip (CV10B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: CHARGING PUMP CHB-P01 BREAKER TRIPS DUE TO FAULTY 50G RELAY

EFFECTS: CHARGING PUMP 2 BREAKER TRIPS (IF OPERATING) DUE TO A FAULTY 50G RELAY WHICH TRIPS THE 86-1 LOCKOUT RELAY. NO INDICATION OF A FAULT OCCURS PRIOR TO THE TRIP. THE BREAKER CANNOT BE RECLOSED WITH THE MALFUNCTION ACTIVE. THE PUMP TRIP IS ANNUNCIATED. THE DECREASE IN CHARGING LINE FLOW (CH-FI-212 ON B03) CAUSES A DECREASING PZR LEVEL AND INCREASED REGEN HX OUTLET TEMPERATURE (CH-TI-221 ON B03). THE PLCS RESPONDS BY CLOSING THE LETDOWN CONTROL VALVES (CH-110P/Q) TO MAINTAIN PZR LEVEL. MALFUNCTION REMOVAL REMOVES THE FAULT. THE PUMP CAN BE RESTARTED AFTER RESETTING THE 86 LOCKOUT.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC, VCT makeup in Auto, two charging pumps operating ((2,3,1) on CHN-HS-4), control switches for running and standby pumps in Auto-After-Stop

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Pump trip reset and pump restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

1. Test Title: **Charging Pump Trip (CV10C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **CHARGING PUMP CHE-P01 BREAKER TRIPS DUE TO FAULTY 50G RELAY**

   EFFECTS: **CHARGING PUMP 1 BREAKER TRIPS (IF OPERATING) DUE TO A FAULTY 50G RELAY WHICH TRIPS THE 86-1 LOCKOUT RELAY. NO INDICATION OF A FAULT OCCURS PRIOR TO THE TRIP. THE BREAKER CANNOT BE RECLOSED WITH THE MALFUNCTION ACTIVE. THE PUMP TRIP IS ANNUNCIATED. THE DECREASE IN CHARGING LINE FLOW (CH-FI-212 ON B03) CAUSES A DECREASING PZR LEVEL AND INCREASED REGEN HX OUTLET TEMPERATURE (CH-TI-221 ON B03). THE PLCS RESPONDS BY CLOSING THE LETDOWN CONTROL VALVES (CH-110P/Q) TO MAINTAIN PZR LEVEL. MALFUNCTION REMOVAL REMOVES THE FAULT. THE PUMP CAN BE RESTARTED AFTER RESETTING THE 86 LOCKOUT.**

4. Date Tested: **01/19/91**

5. Test Initial Conditions: **100% RTP, BOC, VCT makeup in Auto, two charging pumps operating ((3,1,2) on CHN-HS-4), control switches for running and standby pumps in Auto-After-Stop**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Pump trip reset and pump restarted**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Letdown Control Valve Failure (CV15A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **VALVE POSITIONER FAILURE**

   EFFECTS: **LETDOWN CONTROL VALVE CHN-LV-110P FAILS TO THE SELECTED SEVERITY POSITION IF IT IS SELECTED BY CH-HS-110-1 (B03). THE VALVE POSITION SIGNAL FROM PLCS MASTER CONTROLLER RCN-LIC-110 DOES NOT AFFECT THE VALVE'S POSITION. AT 100% SEVERITY FULL-OPENS CHN-LV-110P. LETDOWN FLOW INCREASES (CH-FI-202 ON B03). LETDOWN FROM PURIF FILTER FLOW HI (LD HDR SYS TRBL) ANNUNCIATOR ON B03 MAY ALARM. REGENERATIVE HEAT EXCHANGER OUTLET TEMP (CH-TI-221 ON B03) INCREASES. PZR LEVEL DECREASES. MALFUNCTION REMOVAL RESTORES NORMAL VALVE POSITIONER OPERATION.**

4. Date Tested: **01/11/91**

5. Test Initial Conditions: **100% RTP, BOC, VCT makeup in Auto, RCN-HS-110-1 selected to CH-110P.**

   a. Severity tested (if variable malfunction): **80% and 0%**

6. Test Termination Conditions: **(80%)-Restoration of normal letdown flow control upon removal of the malfunction.**
   (0%)-Letdown flow fully isolated.

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: Letdown Control Valve Failure (CV15B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: VALVE POSITIONER FAILURE

   EFFECTS: LETDOWN CONTROL VALVE CHN-LV-110Q FAILS TO THE SELECTED SEVERITY POSITION IF IT IS SELECTED BY CH-HS-110-1 (B03). THE VALVE POSITION SIGNAL FROM PLCS MASTER CONTROLLER RCN-LIC-110 DOES NOT AFFECT THE VALVE'S POSITION. AT 100% SEVERITY FULL-OPENS CHN-LV-110Q. LETDOWN FLOW INCREASES (CH-FI-202 ON B03). LETDOWN FROM PURIF FILTER FLOW HI (LD HDR SYS TRBL) ANNUNCIATOR ON B03 MAY ALARM. REGENERATIVE HEAT EXCHANGER OUTLET TEMP (CH-TI-221 ON B03) INCREASES. PZR LEVEL DECREASES. MALFUNCTION REMOVAL RESTORES NORMAL VALVE POSITIONER OPERATION.

4. Date Tested: 01/16/91

5. Test Initial Conditions: 100% RTP, BOC, VCT Makeup in Auto, RCN-HS-110-1 selected to CH-110Q.

   a. Severity tested (if variable malfunction): 80% and 0%

6. Test Termination Conditions: (80%)-Restoration of normal letdown flow control upon removal of the malfunction.
   (0%)-Letdown flow fully isolated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RCP 1A Seal #1 Failure (CV16A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL DAMAGE TO SEAL FACE**

   EFFECTS: **RCP-1A LOWER (#1) SEAL FAILS. AT 100% SEVERITY PRESSURE DROP ACROSS THE LOWER SEAL IS ALMOST 0 PSID. MIDDLE SEAL PRESSURE INCREASES TO NEAR RCS PRESSURE. DIFFERENTIAL PRESSURES ACROSS THE MIDDLE AND UPPER SEALS INCREASE. CONTROLLED BLEEDOFF FROM PUMP 1A INCREASES. RCP-1A SEAL COOLER 2 PRESSURE HI ANNUNCIATOR SOUNDS. RCP-1A CONTROLLED BLEEDOFF FLOW HI ANNUNCIATOR (B04) MAY OCCUR. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and restoration of nominal system parameters.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RCP 1B Seal #1 Failure (CV16B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL DAMAGE TO SEAL FACE

   EFFECTS: RCP-1B LOWER (#1) SEAL FAILS. AT 100% SEVERITY PRESSURE DROP ACROSS THE LOWER SEAL IS ALMOST 0 PSID. MIDDLE SEAL PRESSURE INCREASES TO NEAR RCS PRESSURE. DIFFERENTIAL PRESSURES ACROSS THE MIDDLE AND UPPER SEALS INCREASE. CONTROLLED BLEEDOFF FROM PUMP 1B INCREASES. RCP-1B SEAL COOLER 2 PRESSURE HI ANNUNCIATOR SOUNDS. RCP-1B CONTROLLED BLEEDOFF FLOW HI ANNUNCIATOR (B04) MAY OCCUR. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and restoration of nominal system parameters.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RCP 2A Seal #1 Failure (CV16C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL DAMAGE TO SEAL FACE

   EFFECTS: RCP-2A LOWER (#1) SEAL FAILS. AT 100% SEVERITY PRESSURE DROP ACROSS THE LOWER SEAL IS ALMOST 0 PSID. MIDDLE SEAL PRESSURE INCREASES TO NEAR RCS PRESSURE. DIFFERENTIAL PRESSURES ACROSS THE MIDDLE AND UPPER SEALS INCREASE. CONTROLLED BLEEDOFF FROM PUMP 2A INCREASES. RCP-2A SEAL COOLER 2 PRESSURE HI ANNUNCIATOR SOUNDS. RCP-2A CONTROLLED BLEEDOFF FLOW HI ANNUNCIATOR (B04) MAY OCCUR. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and restoration of nominal system parameters.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RCP 2B Seal #1 Failure (CV16D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL DAMAGE TO SEAL FACE

   EFFECTS: RCP-2B LOWER (#1) SEAL FAILS. AT 100% SEVERITY PRESSURE DROP ACROSS THE LOWER SEAL IS ALMOST 0 PSID. MIDDLE SEAL PRESSURE INCREASES TO NEAR RCS PRESSURE. DIFFERENTIAL PRESSURES ACROSS THE MIDDLE AND UPPER SEALS INCREASE. CONTROLLED BLEEDOFF FROM PUMP 2B INCREASES. RCP-2B SEAL COOLER 2 PRESSURE HI ANNUNCIATOR SOUNDS. RCP-2B CONTROLLED BLEEDOFF FLOW HI ANNUNCIATOR (B04) MAY OCCUR. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.

4. Date Tested: 01/11/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 100%

6. Test Termination Conditions: Malfunction removed and restoration of nominal system parameters.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RCP 1A Seal #2 Failure (CV17A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL DAMAGE TO SEAL FACE

   EFFECTS: RCP-1A MIDDLE (#2) SEAL FAILS. AT 100% SEVERITY. PRESSURE DROP ACROSS THE MIDDLE SEAL IS ALMOST 0 PSID. UPPER SEAL PRESSURE IS INCREASED TO APPROXIMATELY HALF OF RCS PRESSURE AND WILL BE READING THE SAME AS SEAL COOLER 2 PRESSURE. DIFFERENTIAL PRESSURES ACROSS THE LOWER AND UPPER SEALS INCREASES. CONTROLLED BLEEDOFF FROM PUMP A WILL INCREASE. RCP-1A CONTROLLED BLEEDOFF FLOW HI ANNUNCIATOR (B04) MAY OCCUR. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.

4. Date Tested: 01/16/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 100%

6. Test Termination Conditions: Malfunction removed and nominal system parameters restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RCP 1B Seal #2 Failure (CV17B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL DAMAGE TO SEAL FACE

   EFFECTS: RCP-1B MIDDLE (#2) SEAL FAILS. AT 100% SEVERITY. PRESSURE DROP ACROSS THE MIDDLE SEAL IS ALMOST 0 PSID. UPPER SEAL PRESSURE IS INCREASED TO APPROXIMATELY HALF OF RCS PRESSURE AND WILL BE READING THE SAME AS SEAL COOLER 2 PRESSURE. DIFFERENTIAL PRESSURES ACROSS THE LOWER AND UPPER SEALS INCREASES. CONTROLLED BLEEDOFF FROM PUMP A WILL INCREASE. RCP-1B CONTROLLED BLEEDOFF FLOW HI ANNUNCIATOR (B04) MAY OCCUR. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.

4. Date Tested: 01/16/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 100%

6. Test Termination Conditions: Malfunction removed and nominal system parameters restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **RCP 2A Seal #2 Failure (CV17C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **MECHANICAL DAMAGE TO SEAL FACE**

EFFECTS: **RCP-2A MIDDLE (#2) SEAL FAILS. AT 100% SEVERITY. PRESSURE DROP ACROSS THE MIDDLE SEAL IS ALMOST 0 PSID. UPPER SEAL PRESSURE IS INCREASED TO APPROXIMATELY HALF OF RCS PRESSURE AND WILL BE READING THE SAME AS SEAL COOLER 2 PRESSURE. DIFFERENTIAL PRESSURES ACROSS THE LOWER AND UPPER SEALS INCREASES. CONTROLLED BLEEDOFF FROM PUMP A WILL INCREASE. RCP-2A CONTROLLED BLEEDOFF FLOW HI ANNUNCIATOR (B04) MAY OCCUR. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and nominal system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RCP 2B Seal #2 Failure (CV17D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL DAMAGE TO SEAL FACE**

   EFFECTS: **RCP-2B MIDDLE (#2) SEAL FAILS. AT 100% SEVERITY. PRESSURE DROP ACROSS THE MIDDLE SEAL IS ALMOST 0 PSID. UPPER SEAL PRESSURE IS INCREASED TO APPROXIMATELY HALF OF RCS PRESSURE AND WILL BE READING THE SAME AS SEAL COOLER 2 PRESSURE. DIFFERENTIAL PRESSURES ACROSS THE LOWER AND UPPER SEALS INCREASES. CONTROLLED BLEEDOFF FROM PUMP A WILL INCREASE. RCP-2B CONTROLLED BLEEDOFF FLOW HI ANNUNCIATOR (B04) MAY OCCUR. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and nominal system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RCP 1A Seal #3 Failure (CV18A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **MECHANICAL DAMAGE TO SEAL FACE**

EFFECTS: **RCP-1A UPPER (#3) SEAL FAILS. AT 100% SEVERITY. PRESSURE DROP ACROSS THE UPPER SEAL IS 0 PSID. DIFFERENTIAL PRESSURES ACROSS THE LOWER AND MIDDLE SEALS WILL INCREASES. CONTROLLED BLEEDOFF FROM PUMP A DECREASES. RCP-1A CONTROLLED BLEEDOFF LO FLOW AND LO PRESSURE ANNUNCIATORS (B04) OCCUR. SEAL LEAKOFF GOES TO THE REACTOR DRAIN TANK. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and nominal system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RCP 1B Seal #3 Failure (CV18B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL DAMAGE TO SEAL FACE

   EFFECTS: RCP-1B UPPER (#3) SEAL FAILS. AT 100% SEVERITY. PRESSURE DROP ACROSS THE UPPER SEAL IS 0 PSID. DIFFERENTIAL PRESSURES ACROSS THE LOWER AND MIDDLE SEALS WILL INCREASES. CONTROLLED BLEEDOFF FROM PUMP A DECREASES. RCP-1B CONTROLLED BLEEDOFF LO FLOW AND LO PRESSURE ANNUNCIATORS (B04) OCCUR. SEAL LEAKOFF GOES TO THE REACTOR DRAIN TANK. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and nominal system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RCP 2A Seal #3 Failure (CV18C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL DAMAGE TO SEAL FACE**

   EFFECTS: **RCP-2A UPPER (#3) SEAL FAILS. AT 100% SEVERITY. PRESSURE DROP ACROSS THE UPPER SEAL IS 0 PSID. DIFFERENTIAL PRESSURES ACROSS THE LOWER AND MIDDLE SEALS WILL INCREASES. CONTROLLED BLEEDOFF FROM PUMP A DECREASES. RCP-2A CONTROLLED BLEEDOFF LO FLOW AND LO PRESSURE ANNUNCIATORS (B04) OCCUR. SEAL LEAKOFF GOES TO THE REACTOR DRAIN TANK. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and nominal system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RCP 2B Seal #3 Failure (CV18D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL DAMAGE TO SEAL FACE**

   EFFECTS: **RCP-2B UPPER (#3) SEAL FAILS. AT 100% SEVERITY. PRESSURE DROP ACROSS THE UPPER SEAL IS 0 PSID. DIFFERENTIAL PRESSURES ACROSS THE LOWER AND MIDDLE SEALS WILL INCREASES. CONTROLLED BLEEDOFF FROM PUMP A DECREASES. RCP-2B CONTROLLED BLEEDOFF LO FLOW AND LO PRESSURE ANNUNCIATORS (B04) OCCUR. SEAL LEAKOFF GOES TO THE REACTOR DRAIN TANK. MALFUNCTION REMOVAL RESTORES THE SEAL TO NORMAL.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed and nominal system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **LOCA Outside Containment (CV23)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(1)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **WELD FAILURE**

EFFECTS: **THIS MALFUNCTION IS A LEAK OUTSIDE OF CONTAINMENT ON THE LETDOWN LINE IMMEDIATELY DOWNSTREAM OF THE REGENERATIVE HEAT EXCHANGER OUTLET ISOLATION VALVE CH-UV-523. LEAKAGE GOES TO THE AUXILIARY BUILDING. THE LEAK LOCATION CAUSES INCREASED LETDOWN FLOW THROUGH THE RHX. PZR LEVEL DECREASES BASED ON MALFUNCTION SEVERITY. RHX OUTLET TEMPERATURE (CH-TI-221 ON B03) INCREASES. HIGHER SEVERITY WILL CAUSE A HIGH TEMPERATURE ISOLATION OF RHX INLET ISOLATION VALVE CH-UV-515, WHICH ISOLATES THE LEAK FROM THE RC SYSTEM. THE MALFUNCTION IS NON-RECOVERABLE.**

4. Date Tested: **01/26/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **1-100%**

6. Test Termination Conditions: **Stable plant with letdown flow isolated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **2838 & 2845**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **CW Pump Trip (CW01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(6)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PUMP OVERCURRENT RELAY IOC-A FAILS**

   EFFECTS: **THE OVERCURRENT RELAY TRIPS CW PUMP A 286 LOCKOUT RELAY WHICH TRIPS THE BREAKER. NO INDICATION OF OVERCURRENT IS OBSERVED PRIOR TO THE TRIP. THE TRIP IS ANNUNCIATED (CIRC WTR SYS TRBL) ON B07. THE CW PUMP'S DISCHARGE VALVE CLOSES. CONDENSER PRESSURE MAY INCREASE DUE TO LOWER CW FLOW RATE. MALFUNCTION REMOVAL REMOVES THE PUMP TRIP SIGNAL. THE PUMP BREAKER CAN BE CLOSED AFTER THE 286 LOCKOUT RELAY IS RESET.**

4. Date Tested: **01/15/91**

5. Test Initial Conditions: **100% RTP, BOC, all CW pumps operating.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with evidence of increased condenser pressure.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: CW Pump Trip (CW01B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(6)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: PUMP OVERCURRENT RELAY IOC-A FAILS

   EFFECTS: THE OVERCURRENT RELAY TRIPS CW PUMP B 286 LOCKOUT RELAY WHICH TRIPS THE BREAKER. NO INDICATION OF OVERCURRENT IS OBSERVED PRIOR TO THE TRIP. THE TRIP IS ANNUNCIATED (CIRC WTR SYS TRBL) ON B07. THE CW PUMP'S DISCHARGE VALVE CLOSES. CONDENSER PRESSURE MAY INCREASE DUE TO LOWER CW FLOW RATE. MALFUNCTION REMOVAL REMOVES THE PUMP TRIP SIGNAL. THE PUMP BREAKER CAN BE CLOSED AFTER THE 286 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC, all CW pumps operating.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant conditions with evidence of increased condenser pressure.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **CW Pump Trip (CW01C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(6)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PUMP OVERCURRENT RELAY IOC-A FAILS**

   EFFECTS: **THE OVERCURRENT RELAY TRIPS CW PUMP C 286 LOCKOUT RELAY WHICH TRIPS THE BREAKER. NO INDICATION OF OVERCURRENT IS OBSERVED PRIOR TO THE TRIP. THE TRIP IS ANNUNCIATED (CIRC WTR SYS TRBL) ON B07. THE CW PUMP'S DISCHARGE VALVE CLOSES. CONDENSER PRESSURE MAY INCREASE DUE TO LOWER CW FLOW RATE. MALFUNCTION REMOVAL REMOVES THE PUMP TRIP SIGNAL. THE PUMP BREAKER CAN BE CLOSED AFTER THE 286 LOCKOUT RELAY IS RESET.**

4. Date Tested: **01/15/91**

5. Test Initial Conditions: **100% RTP, BOC, all CW pumps operating.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with evidence of increased condenser pressure.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

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MALFUNCTION TEST ABSTRACTS

1. Test Title: CW Pump Trip (CW01D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(6)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: PUMP OVERCURRENT RELAY IOC-A FAILS

   EFFECTS: THE OVERCURRENT RELAY TRIPS CW PUMP D 286 LOCKOUT RELAY WHICH TRIPS THE BREAKER. NO INDICATION OF OVERCURRENT IS OBSERVED PRIOR TO THE TRIP. THE TRIP IS ANNUNCIATED (CIRC WTR SYS TRBL) ON B07. THE CW PUMP'S DISCHARGE VALVE CLOSES. CONDENSER PRESSURE MAY INCREASE DUE TO LOWER CW FLOW RATE. MALFUNCTION REMOVAL REMOVES THE PUMP CAUSE: PUMP OVERCURRENT RELAY IOC-A FAILS

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC, all CW pumps operating.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant conditions with evidence of increased condenser pressure.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Condenser Tube Rupture (CW02A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **TUBE LEAK**

   EFFECTS: **AT 100% SEVERITY, 500 GPM LEAKS FROM THE TUBE SIDE TO SHELL SIDE OF CONDENSER SECTION A. HOTWELL CONDUCTIVITY INCREASES. HOTWELL LEVEL INCREASES SLOWLY FROM CW IN-LEAKAGE. CONDUCTIVITY SPREADS THROUGH THE CONDENSATE SYSTEM. AFTER THE CONDENSATE DEMINS ARE DEPLETED, FW SYSTEM AND STEAM GENERATOR CONDUCTIVITY INCREASE. CD AND FW SYSTEM CONDUCTIVITIES ARE NOT DIRECTLY DISPLAYED IN THE CONTROL ROOM BUT ARE INPUT TO THE PLANT COMPUTER.**

4. Date Tested: **01/25/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **10-100%**

6. Test Termination Conditions: **Stable plant with hotwell level maintained by condenser drawoff.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **2825**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

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MALFUNCTION TEST ABSTRACTS

1. Test Title: Condenser Tube Rupture (CW02C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: TUBE LEAK

   EFFECTS: AT 100% SEVERITY, 500 GPM LEAKS FROM THE TUBE SIDE TO SHELL SIDE OF CONDENSER SECTION C. HOTWELL CONDUCTIVITY INCREASES. HOTWELL LEVEL INCREASES SLOWLY FROM CW IN-LEAKAGE. CONDUCTIVITY SPREADS THROUGH THE CONDENSATE SYSTEM. AFTER THE CONDENSATE DEMINS ARE DEPLETED, FW SYSTEM AND STEAM GENERATOR CONDUCTIVITY INCREASE. CD AND FW SYSTEM CONDUCTIVITIES ARE NOT DIRECTLY DISPLAYED IN THE CONTROL ROOM BUT ARE INPUT TO THE PLANT COMPUTER.

4. Date Tested: 01/26/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 10-100%

6. Test Termination Conditions: Stable plant with hotwell level maintained by condenser drawoff.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 2825

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Failure of NAN-S02 to Fast Transfer (ED01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAILURE OF SYNC CHECK RELAY 225**

   EFFECTS: **THIS MALFUNCTION FAILS THE SYNC CHECK RELAY 225 IN THE NAN-S03-S01 TIE BREAKER CLOSE LOGIC. THE MALFUNCTION IS PASSIVE DURING NORMAL OPERATION. ON A GENERATOR TRIP, THE TIE BREAKER DOES NOT FAST CLOSE WHEN THE AUX TRANSFORMER BREAKER TO NAN-S01 OPENS. BUS NAN-S01 IS DE-ENERGIZED. 13.8KV SWGR S01 TROUBLE IS ANNUNCIATED AND BUS VOLTAGE (NAN-EI-S01) READS 0 ON B01. REACTOR COOLANT PUMPS 1A AND 2A, CIRC WATER PUMPS A AND B, AND SEVERAL 480 V LOAD CENTERS ARE DE-ENERGIZED. THE REACTOR TRIPS. WITH BUS NAN-S01 DEAD, THE TIE BREAKER FROM NAN-S03 CAN BE CLOSED WITH ITS CONTROL SWITCH HS-S03B TO RE-ENERGIZE NAN-S01. WITH THE MALFUNCTION ACTIVE, TIE BREAKER FROM NAN-S03 CANNOT BE CLOSED AS LONG AS NAN-S01 IS ENERGIZED FROM THE AUX TRANSFORMER.**

4. Date Tested: **02/07/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with reactor tripped and NAN-S01 re-energized.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: NAN-S02 Fast Transfer Failure (ED01B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAILURE OF SYNC CHECK RELAY 225

   EFFECTS: THIS MALFUNCTION FAILS THE SYNC CHECK RELAY 225 IN THE NAN-S04-S01 TIE BREAKER CLOSE LOGIC. THE MALFUNCTION IS PASSIVE DURING NORMAL OPERATION. ON A GENERATOR TRIP, THE TIE BREAKER DOES NOT FAST CLOSE WHEN THE AUX TRANSFORMER BREAKER TO NAN-S02 OPENS. BUS NAN-S02 IS DE-ENERGIZED. 13.8KV SWGR S02 TROUBLE IS ANNUNCIATED AND BUS VOLTAGE (NAN-EI-S02) READS 0 ON B01. REACTOR COOLANT PUMPS 1B AND 2B, CIRC WATER PUMPS C AND D, AND SEVERAL 480 V LOAD CENTERS ARE DE-ENERGIZED. THE REACTOR TRIPS. WITH BUS NAN-S02 DEAD, THE TIE BREAKER FROM NAN-S04 CAN BE CLOSED WITH ITS CONTROL SWITCH HS-S04B TO RE-ENERGIZE NAN-S02. WITH THE MALFUNCTION ACTIVE, TIE BREAKER FROM NAN-S04 CANNOT BE CLOSED AS LONG AS NAN-S02 IS ENERGIZED FROM THE AUX TRANSFORMER. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF SYNC CHECK RELAY 225.

4. Date Tested: 02/07/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with reactor tripped and NAN-S02 re-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3194

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Unit Auxiliary Transformer Trip (ED02)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: RELAY 286T1 FAILS

EFFECTS: THIS MALFUNCTION RESULTS IN INADVERTENT ENERGIZATION OF THE AUX TRANSFORMER 286T1 LOCKOUT RELAY. AUX XFMR PROTECTIVE TRIP IS ANNUNCIATED ON B01. THE 286T1 LOCKOUT RELAY PROVIDES SIGNALS FOR THE FOLLOWING:

- TRIP MAIN TURBINE
- TRIP THE GENERATOR EXCITER
- TRIP AND LOCKOUT 525KV BREAKERS 915 AND 918
- TRIP AUX XFMR BREAKERS TO NAN-S01 AND NAN-S02
- INITIATE AUTO-CLOSE OF TIE BREAKERS BETWEEN NAN-S03 AND S01, AND BETWEEN NAN-S04 AND S02.
- STOPS AUX TRANSFORMER COOLING

MALFUNCTION REMOVAL ALLOWS THE 286T1 RELAY TO BE RESET.

4. Date Tested: **01/11/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Plant stable with turbine tripped, reactor power cutback and plant loads supplied from offsite power.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Startup Transformer X01 Trips (ED03A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **TRANSFORMER DIFFERENTIAL RELAY (587T) FAILS**

EFFECTS: **THIS MALFUNCTION TRIPS STARTUP TRANSFORMER NAN-X01 DUE TO A FAULTY 587T DIFFERENTIAL RELAY. THE NAN-X01 586T LOCKOUT RELAY IS TRIPPED. SU XFMR X01 PROTECTION TRIP IS ANNUNCIATED ON B01. THE STANDBY SUPPLY BREAKERS TO 1-E-NAN-S05 AND S06 RECEIVE A TRIP AND A LOCKOUT SIGNAL. IF EITHER OR BOTH OF THESE BREAKERS WERE CLOSED TO SUPPLY THE BUS FROM SU XFMR X01, THE 13.8KV INTERMEDIATE BUS DE-ENERGIZES. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE 587T RELAY. NORMAL BREAKER OPERATION IS RESTORED AFTER THE 586T LOCKOUT RELAY IS RESET.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with NAN-S05 and S06 de-energized.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **2628**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Startup Transformer X02 Trips (ED03B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: TRANSFORMER DIFFERENTIAL RELAY (587T) FAILS

EFFECTS: THIS MALFUNCTION TRIPS STARTUP TRANSFORMER NAN-X02 DUE TO A FAULTY 587T DIFFERENTIAL RELAY. THE NAN-X02 586T LOCKOUT RELAY IS TRIPPED. SU XFMR X02 PROTECTION TRIP IS ANNUNCIATED ON B01. THE STANDBY SUPPLY BREAKERS TO 1-E-NAN-S05 AND S06 RECEIVE A TRIP AND A LOCKOUT SIGNAL. IF EITHER OR BOTH OF THESE BREAKERS WERE CLOSED TO SUPPLY THE BUS FROM SU XFMR X02, THE 13.8KV INTERMEDIATE BUS DE-ENERGIZES. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE 587T RELAY. NORMAL BREAKER OPERATION IS RESTORED AFTER THE 586T LOCKOUT RELAY IS RESET.

4. Date Tested: 01/16/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with NAN-S05 and S06 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 2628

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

1. Test Title: **Startup Transformer X03 Trips (ED03C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **TRANSFORMER DIFFERENTIAL RELAY (587T) FAILS**

   EFFECTS: **THIS MALFUNCTION TRIPS STARTUP TRANSFORMER NAN-X03 DUE TO A FAULTY 587T DIFFERENTIAL RELAY. THE NAN-X03 586T LOCKOUT RELAY IS TRIPPED. SU XFMR X03 PROTECTION TRIP IS ANNUNCIATED ON B01. THE STANDBY SUPPLY BREAKERS TO 1-E-NAN-S05 AND S06 RECEIVE A TRIP AND A LOCKOUT SIGNAL. IF EITHER OR BOTH OF THESE BREAKERS WERE CLOSED TO SUPPLY THE BUS FROM SU XFMR X03, THE 13.8KV INTERMEDIATE BUS DE-ENERGIZES. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE 587T RELAY. NORMAL BREAKER OPERATION IS RESTORED AFTER THE 586T LOCKOUT RELAY IS RESET.**

4. Date Tested: **01/16/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with NAN-S05 and S06 de-energized.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **2628**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: NAN-S01 Undervoltage Trip (ED04A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: POTENTIAL TRANSFORMER TO UV (227) RELAYS FAILS

EFFECTS: THIS MALFUNCTION FAILS THE POTENTIAL TRANSFORMER SUPPLYING ALL THE 227 UNDERVOLTAGE RELAYS ON 13.8 KV BUS NAN-S01. ALL THE 227 RELAYS DE-ENERGIZE. THIS DISCUSSION ASSUMES THAT BUS NAN-S01 IS TIED TO THE UNIT AUX TRANSFORMER. VOLTAGE INDICATION ON NAN-EI-S01 (B01) DROPS TO 0 VOLTS. 13.8 KV SWGR S01 TROUBLE ANNUNCIATES ON B01A. ALL LOADS ON NAN-S01 TRIP. THE REACTOR, TURBINE AND GENERATOR TRIP. POWER TO NAN-S02 TRANSFERS FROM THE AUX TRANSFORMER TO NAN-S04. TIE BREAKER FROM NAN-S03 TO NAN-S01 DOES NOT CLOSE BECAUSE THE 225 SYNCH CHECK RELAY LOSSES BUS NAN-S01 INPUT. NAN-S01 DE-ENERGIZES. MALFUNCTION REMOVAL RESTORES THE FAILED POTENTIAL TRANSFORMER. 227 RELAYS FUNCTION NORMALLY.

4. Date Tested: 01/17/91

5. Test Initial Conditions: 100% RTP, BOC, NAN-S01 energized from Aux Transformer.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, malfunction removed and bus manually re-energized from offsite power.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **NAN-S02 Undervoltage Trip (ED04B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **POTENTIAL TRANSFORMER TO UV (227) RELAYS FAILS**

EFFECTS: **THIS MALFUNCTION FAILS THE POTENTIAL TRANSFORMER SUPPLYING ALL THE 227 UNDERVOLTAGE RELAYS ON 13.8 KV BUS NAN-S02. ALL THE 227 RELAYS DE-ENERGIZE. THIS DISCUSSION ASSUMES THAT BUS NAN-S02 IS TIED TO THE UNIT AUX TRANSFORMER. VOLTAGE INDICATION ON NAN-EI-S02 (B01) DROPS TO 0 VOLTS. 13.8 KV SWGR S01 TROUBLE ANNUNCIATES ON B01A. ALL LOADS ON NAN-S01 TRIP. THE REACTOR, TURBINE AND GENERATOR TRIP. POWER TO NAN-S01 TRANSFERS FROM THE AUX TRANSFORMER TO NAN-S03. TIE BREAKER FROM NAN-S04 TO NAN-S02 DOES NOT CLOSE BECAUSE THE 225 SYNCH CHECK RELAY LOSSES BUS NAN-S02 INPUT. NAN-S02 DE-ENERGIZES. MALFUNCTION REMOVAL RESTORES THE FAILED POTENTIAL TRANSFORMER. 227 RELAYS FUNCTION NORMALLY.**

4. Date Tested: **01/17/91**

5. Test Initial Conditions: **100% RTP, BOC, NAN-S01 energized from Aux Transformer.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant, malfunction removed and bus manually re-energized from offsite power.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

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MALFUNCTION TEST ABSTRACTS

1. Test Title: **13.8 kV Intermediate Bus Trip (ED05A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **RELAY 351TN1 FAILS**

   EFFECTS: **THE 351TN1 RELAY FAILURE CAUSES A TRIP OF THE SUPPLY BREAKER TO 13.8 KV BUS NAN-S05 AND A LOCKOUT OF THE ALTERNATE BREAKER. 13.8 KV SWGR S05 TROUBLE IS ANNUNCIATED ON B01. NAN-S05 VOLTAGE INDICATION ON NAN-EI-S05 (B01) DROPS TO 0 VOLTS. ESSENTIAL SERVICE TRANSFORMER NBN-X03 AND BUS PBA-S03 ARE DE-ENERGIZED. 4.16 KV SWGR S03 TROUBLE IS ANNUNCIATED ON B01. PBA-S03 BUS VOLTAGE AND SUPPLY AMPS INDICATION ON BOARD B01 (PBA-II-S03L, PBA-EI-S03) GO TO 0. LOSS OF PBA-S03 VOLTAGE CAUSES LOAD SHEDDING AND AUTO-START OF DIESEL GENERATOR A. THE DG TIE BREAKER CLOSES TO RE-ENERGIZE BUS PBA-S03. MALFUNCTION REMOVAL REPAIRS THE FAULTY TRIP RELAY.**

4. Date Tested: **01/25/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with malfunction removed and buses re-energized.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **2816**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: 13.8 kV Intermediate Bus Trip (ED05B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: RELAY 351TN1 FAILS

   EFFECTS: THE 351TN1 RELAY FAILURE CAUSES A TRIP OF THE SUPPLY BREAKER TO 13.8 KV BUS NAN-S06 AND A LOCKOUT OF THE ALTERNATE BREAKER. 13.8 KV SWGR S06 TROUBLE IS ANNUNCIATED ON B01. NAN-S06 VOLTAGE INDICATION ON NAN-EI-S06 (B01) DROPS TO 0 VOLTS. ESSENTIAL SERVICE TRANSFORMER NBN-X04 AND BUS PBA-S04 ARE DE-ENERGIZED. 4.16 KV SWGR S04 TROUBLE IS ANNUNCIATED ON B01. PBA-S04 BUS VOLTAGE AND SUPPLY AMPS INDICATION ON BOARD B01 (PBA-II-S04L, PBA-EI-S04) GO TO 0. LOSS OF PBA-S04 VOLTAGE CAUSES LOAD SHEDDING AND AUTO-START OF DIESEL GENERATOR A. THE DG TIE BREAKER CLOSES TO RE-ENERGIZE BUS PBA-S04. MALFUNCTION REMOVAL REPAIRS THE FAULTY TRIP RELAY.

4. Date Tested: 01/25/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with malfunction removed and buses re-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 2820

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of DC Bus M45 (ED09A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: BUS GROUND: 72 BAX RELAY ON BATTERY BREAKER, 50G ON BOTH BATTERY CHARGER BREAKERS

EFFECTS: THIS MALFUNCTION IS A FULL GROUND FAULT ON NON-CLASS 125 VDC BUS NKN-M45. BATTERY E BREAKER AND CHARGERS E AND EI INPUT BREAKERS TRIP WHICH DE-ENERGIZES THE BUS. ANNUNCIATOR 125 VDC CC M45 CHGR E/EI TROUBLE ON B01 SOUNDS. INDICATIONS OF BUS, BATTERY AND CHARGER VOLTS AND AMPS ON B01 (NKN-EI-M45, II-M4502, EI-4504, II-4504) INITIALLY REFLECT THE CURRENT SURGE, THEN GO TO 0 WHEN THE BUS IS ISOLATED. THE MAIN TURBINE TRIPS DUE TO LOSS OF MAIN GENERATOR PRIMARY PROTECTION UNIT TRIPPING POWER.

4. Date Tested: 01/31/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, turbine tripped, reactor tripped.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3753 & 2959

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of Power to NKN-M46 (ED09B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: BUS GROUND: 72 BAX RELAY ON BATTERY BREAKER, 50G ON BOTH BATTERY CHARGER BREAKERS

EFFECTS: NON-CLASS 125 VDC BUS NKN-M46 IS DE-ENERGIZED BY TRIPPING BATTERY F AND CHARGER F BREAKERS. ANNUNCIATOR 125 VDC CC M46 CHGR F/FI TROUBLE ON B01 ALARMS. INDICATIONS OF BUS, BATTERY AND CHARGER VOLTS AND AMPS ON B01 (NKN-EI-M46, II-M4602, EI-4604, II-4604) INITIALLY REFLECT THE CURRENT SURGE, THEN DECREASE TO 0 WHEN THE BUS IS ISOLATED. REFER TO REFERENCES FOR LOADS AFFECTED.

MALFUNCTION REMOVAL REMOVES THE BUS GROUND. BATTERY AND CHARGER BREAKERS CAN BE CLOSED TO RESTORE BUS POWER.

4. Date Tested: 02/01/91

5. Test Initial Conditions:

(1): 100% RTP, BOC, all plant control systems in automatic. Battery charger F in service.
(2): 100% RTP, BOC, all plant control systems in automatic. Battery charger EF in service.

a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions:

(1): NKN-M46 DE-ENERGIZEd

(2): NKN-M46 DE-ENERGIZEd

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

a. Justification for the exceptions: N/A

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MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of NNN-D11 (ED10A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL BUS GROUND FAULT

   EFFECTS: THIS MALFUNCTION PUTS A GROUND ON NON-CLASS 120 VAC BUS NNN-D11. THE BUS IS DE-ENERGIZED DUE TO AN OVERLOAD TRIP OF THE BUS FEEDER BREAKER 52-D11. ANNUNCIATOR 120V AC PNL D11/D12/D15/D16 TROUBLE SOUNDS ON B01. THE CURRENT SURGE FROM THE GROUND FAULT MAY BE OBSERVED ON UPSTREAM INDICATIONS.

4. Date Tested: 02/01/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with NNN-D11 DE-ENERGIZed.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 2972 & 2974

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: Loss of NNN-D12 (ED10B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL BUS GROUND FAULT

   EFFECTS: THIS MALFUNCTION PUTS A GROUND ON NON-CLASS 120 VAC BUS NNN-D12. THE BUS IS DE-ENERGIZED DUE TO AN OVERLOAD TRIP OF THE BUS FEEDER BREAKER 52-D12. ANNUNCIATOR 120V AC PNL D11/D12/D15/D16 TROUBLE SOUNDS ON B01. THE CURRENT SURGE FROM THE GROUND FAULT MAY BE OBSERVED ON UPSTREAM INDICATIONS.

4. Date Tested: 02/02/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with NNN-D12 DE-ENERGIZEd.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3000 & 3007

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of Power to NNN-D15 (ED10C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL BUS GROUND FAULT

   EFFECTS: THIS MALFUNCTION PUTS A GROUND ON NON-CLASS 120 VAC BUS NNN-D15. THE BUS IS DE-ENERGIZED DUE TO AN OVERLOAD TRIP OF THE BUS FEEDER BREAKER 52-D15. ANNUNCIATOR 120V AC PNL D11/D12/D15/D16 TROUBLE SOUNDS ON B01. THE CURRENT SURGE FROM THE GROUND MALFUNCTION REMOVAL REMOVES THE BUS GROUND. THE BUS FEEDER BREAKER MAY BE CLOSED TO RESTORE BUS POWER.

4. Date Tested: 02/01/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, reactor tripped.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

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1. Test Title: Loss of NNN-D16 (ED10D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL BUS GROUND FAULT

   EFFECTS: THIS MALFUNCTION PUTS A GROUND ON NON-CLASS 120 VAC BUS NNN-D16. THE BUS IS DE-ENERGIZED DUE TO AN OVERLOAD TRIP OF THE BUS FEEDER BREAKER 52-D16. ANNUNCIATOR 120V AC PNL D11/D12/D15/D16 TROUBLE SOUNDS ON B01. THE CURRENT SURGE FROM THE GROUND FAULT MAY BE OBSERVED ON UPSTREAM INDICATIONS.

4. Date Tested: 02/02/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with NNN-D16 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3016 & 3017

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Class 4160 Volt Bus Trip (ED11A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: SELECTED BREAKER FAULTY 786 RELAY

EFFECTS: PBA-S03 NORMAL SUPPLY BREAKER TRIPS FROM A FAULTY 786 LOCKOUT RELAY. NO OVERCURRENT CONDITION IS OBSERVED PRIOR TO THE BREAKER TRIP. PBA-S03 SUPPLY BKR LOCKOUT TRIP AND SWGR S03 TROUBLE ARE ANNUNCIATED ON B01. PBA-S03 BUS VOLTAGE AND SUPPLY AMPS INDICATION ON BOARD B01 (PBA-II-S03L, PBA-EI-S03) GO TO 0. THE UNDERVLOTAGE INITIATES AN AUTO START OF DIESEL GENERATOR A. THE 786 LOCKOUT PREVENTS THE ALTERNATE PBA-S03 SUPPLY BREAKER AND DIESEL GENERATOR A TIE BREAKER FROM CLOSING. THE BUS REMAINS DE-ENERGIZED. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE 786 LOCKOUT RELAY. POWER CAN BE RESTORED TO THE BUS AFTER THE LOCKOUT RELAY IS RESET.

4. Date Tested: 01/30/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with all PBA-S03 loads de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **4160 V Bus PBA-S03 Trip (ED11B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **SELECTED BREAKER FAULTY 786 RELAY**

   EFFECTS: **PBA-S03 ALTERNATE SUPPLY BREAKER TRIPS FROM A FAULTY 786 LOCKOUT RELAY. NO OVERCURRENT CONDITION IS OBSERVED PRIOR TO THE BREAKER TRIP. PBA-S03 SUPPLY BKR LOCKOUT TRIP AND SWGR S03 TROUBLE ARE ANNUNCIATED ON B01. PBA-S03 BUS VOLTAGE AND SUPPLY AMPS INDICATION ON B01 (PBA-II-S03L, PBA-EI-S03) GO TO 0. THE UNDERVLOTAGE INITIATES AN AUTO START OF DIESEL GENERATOR. THE 786 LOCKOUT PREVENTS THE NORMAL PBA-S03 SUPPLY BREAKER AND DIESEL GENERATOR TIE BREAKER FROM CLOSING. THE BUS REMAINS DE-ENERGIZED.**

4. Date Tested: **01/30/91**

5. Test Initial Conditions: **100% RTP, BOC, PBA-S03K closed.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Plant stable with PBA-S03 de-energized.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: Class 4160 V Bus Trip (ED11C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SELECTED BREAKER FAULTY 786 RELAY

   EFFECTS: PBA-S04 NORMAL SUPPLY BREAKER TRIPS FROM A FAULTY 786 LOCKOUT RELAY. NO OVERCURRENT CONDITION IS OBSERVED PRIOR TO THE BREAKER TRIP. PBA-S04 SUPPLY BKR LOCKOUT TRIP AND SWGR S04 TROUBLE ARE ANNUNCIATED ON B01. PBA-S04 BUS VOLTAGE AND SUPPLY AMPS INDICATION ON BOARD B01 (PBA-II-S04L, PBA-EI-S04) GO TO 0. THE UNDERVLOTAGE INITIATES AN AUTO START OF THE DIESEL GENERATOR. THE 786 LOCKOUT PREVENTS THE ALTERNATE PBA-S04 SUPPLY BREAKER AND DIESEL GENERATOR TIE BREAKER FROM CLOSING. THE BUS REMAINS DE-ENERGIZED.

4. Date Tested: 02/02/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with NAN-S04 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3015 & 3019

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **4160 V Bus PBB-S04 Trip (ED11D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PBB-S04L BREAKER FAULTY 786 RELAY**

   EFFECTS: **PBB-S04 ALTERNATE SUPPLY BREAKER TRIPS FROM A FAULTY 786 LOCKOUT RELAY. NO OVERCURRENT CONDITION IS OBSERVED PRIOR TO THE BREAKER TRIP. PBB-S04 SUPPLY BKR LOCKOUT TRIP AND SWGR S04 TROUBLE ARE ANNUNCIATED ON B01. PBB-S04 BUS VOLTAGE AND SUPPLY AMPS INDICATION ON B01 (PBB-II-S04L, PBB-EI-S04) GO TO 0. THE UNDERVLOTAGE INITIATES AN AUTO START OF DIESEL GENERATOR. THE 786 LOCKOUT PREVENTS THE NORMAL PBB-S04 SUPPLY BREAKER AND DIESEL GENERATOR TIE BREAKER FROM CLOSING. THE BUS REMAINS DE-ENERGIZED.**

4. Date Tested: **02/02/91**

5. Test Initial Conditions: **100% RTP, BOC, PBB-S04L closed.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Plant stable with PBB-S04 de-energized.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of DC Bus M41 (ED12A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL GROUND FAULT ON BUS

   EFFECTS: THIS MALFUNCTION IS A FULL GROUND FAULT ON CLASS 125 VDC BUS PKA-M41. THE BATTERY A BREAKER AND CHARGER A INPUT BREAKER TRIP WHICH DE-ENERGIZES THE BUS. ANNUNCIATOR 125V 1E CC M41 CHGR A/AC PNL D21 TROUBLE ON B01 SOUNDS. INDICATIONS OF BUS, BATTERY AND CHARGER VOLTS AND AMPS ON B01 (PKA-EI-M41, II-M4102, EI-4104, II-4104) INITIALLY REFLECT THE CURRENT SURGE, THEN GO TO 0 WHEN THE BUS IS ISOLATED.

4. Date Tested: 02/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with M41 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3047, 3051 & 3078

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of DC Bus M42 (ED12B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL GROUND FAULT ON BUS

   EFFECTS: THIS MALFUNCTION IS A FULL GROUND FAULT ON CLASS 125 VDC BUS PKA-M42. THE BATTERY A BREAKER AND CHARGER A INPUT BREAKER TRIP WHICH DE-ENERGIZES THE BUS. ANNUNCIATOR 125V 1E CC M42 CHGR A/AC PNL D21 TROUBLE ON B01 SOUNDS. INDICATIONS OF BUS, BATTERY AND CHARGER VOLTS AND AMPS ON B01 (PKA-EI-M42, II-M4202, EI-4104, II-4104) INITIALLY REFLECT THE CURRENT SURGE, THEN GO TO 0 WHEN THE BUS IS ISOLATED.

4. Date Tested: 02/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with M42 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3047, 3051, 3078 & 3079

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of DC Bus M43 (ED12C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL GROUND FAULT ON BUS

   EFFECTS: THIS MALFUNCTION IS A FULL GROUND FAULT ON CLASS 125 VDC BUS PKA-M43. THE BATTERY A BREAKER AND CHARGER A INPUT BREAKER TRIP WHICH DE-ENERGIZES THE BUS. ANNUNCIATOR 125V 1E CC M43 CHGR A/AC PNL D21 TROUBLE ON B01 SOUNDS. INDICATIONS OF BUS, BATTERY AND CHARGER VOLTS AND AMPS ON B01 (PKA-EI-M43, II-M4302, EI-4104, II-4104) INITIALLY REFLECT THE CURRENT SURGE, THEN GO TO 0 WHEN THE BUS IS ISOLATED.

4. Date Tested: 02/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with M43 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3047

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **Loss of DC Bus M44 (ED12D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **FULL GROUND FAULT ON BUS**

EFFECTS: **THIS MALFUNCTION IS A FULL GROUND FAULT ON CLASS 125 VDC BUS PKA-M44. THE BATTERY A BREAKER AND CHARGER A INPUT BREAKER TRIP WHICH DE-ENERGIZES THE BUS. ANNUNCIATOR 125V 1E CC M44 CHGR A/AC PNL D21 TROUBLE ON B01 SOUNDS. INDICATIONS OF BUS, BATTERY AND CHARGER VOLTS AND AMPS ON B01 (PKA-EI-M44, II-M4402, EI-4104, II-4104) INITIALLY REFLECT THE CURRENT SURGE, THEN GO TO 0 WHEN THE BUS IS ISOLATED.**

4. Date Tested: **02/03/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with M44 de-energized.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3047**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of Power to D25 (ED14A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL GROUND FAULT ON BUS

   EFFECTS: THIS MALFUNCTION PUTS A GROUND ON CLASS 120 VAC BUS PNA-D25. THE BUS IS DE-ENERGIZED DUE TO AN OVERLOAD TRIP OF THE BUS FEEDER BREAKER 52-D26. ANNUNCIATOR 120VAC 1E PNL D25 INVERTOR A TROUBLE SOUNDS ON B01. THE CURRENT SURGE FROM THE GROUND FAULT MAY BE OBSERVED ON UPSTREAM INDICATIONS. MALFUNCTION REMOVAL REMOVES THE BUS GROUND. THE BUS FEEDER INPUT BREAKERS MAY BE CLOSED TO RESTORE BUS POWER.

4. Date Tested: 02/06/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with bus D25 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of Power to D26 (ED14B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL GROUND FAULT ON BUS

   EFFECTS: THIS MALFUNCTION PUTS A GROUND ON CLASS 120 VAC BUS PNA-D26. THE BUS IS DE-ENERGIZED DUE TO AN OVERLOAD TRIP OF THE BUS FEEDER BREAKER 52-D26. ANNUNCIATOR 120VAC 1E PNL D26 INVERTOR A TROUBLE SOUNDS ON B01. THE CURRENT SURGE FROM THE GROUND FAULT MAY BE OBSERVED ON UPSTREAM INDICATIONS. MALFUNCTION REMOVAL REMOVES THE BUS GROUND. THE BUS FEEDER INPUT BREAKERS MAY BE CLOSED TO RESTORE BUS POWER.

4. Date Tested: 02/06/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with bus D26 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3151, 3152, & 3161

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of Power to D27 (ED14C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: FULL GROUND FAULT ON BUS

EFFECTS: THIS MALFUNCTION PUTS A GROUND ON CLASS 120 VAC BUS PNA-D27. THE BUS IS DE-ENERGIZED DUE TO AN OVERLOAD TRIP OF THE BUS FEEDER BREAKER 52-D27. ANNUNCIATOR 120VAC 1E PNL D27 INVERTOR A TROUBLE SOUNDS ON B01. THE CURRENT SURGE FROM THE GROUND FAULT MAY BE OBSERVED ON UPSTREAM INDICATIONS. MALFUNCTION REMOVAL REMOVES THE BUS GROUND. THE BUS FEEDER INPUT BREAKERS MAY BE CLOSED TO RESTORE BUS POWER.

4. Date Tested: 02/06/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with bus D27 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Loss of Power to D28 (ED14D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FULL GROUND FAULT ON BUS

   EFFECTS: THIS MALFUNCTION PUTS A GROUND ON CLASS 120 VAC BUS PNA-D28. THE BUS IS DE-ENERGIZED DUE TO AN OVERLOAD TRIP OF THE BUS FEEDER BREAKER 52-D28. ANNUNCIATOR 120VAC 1E PNL D28 INVERTOR A TROUBLE SOUNDS ON B01. THE CURRENT SURGE FROM THE GROUND FAULT MAY BE OBSERVED ON UPSTREAM INDICATIONS. MALFUNCTION REMOVAL REMOVES THE BUS GROUND. THE BUS FEEDER INPUT BREAKERS MAY BE CLOSED TO RESTORE BUS POWER.

4. Date Tested: 02/06/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with bus D28 de-energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3142, & 3167

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: DG Differential Trip (EG02A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DIFFERENTIAL PROTECTION RELAY FAILS IN TRIP POSITION

   EFFECTS: THE MALFUNCTION TRIPS DIFFERENTIAL RELAY 787. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. DIESEL GENERATOR A TRIPS. ANNUNCIATORS FOR DG A TRIP AND GENERATOR DIFFERENTIAL TRIP OCCUR ON B01. DG A VOLTAGE, AMPS AND WATTS INDICATIONS DROP TO ZERO ON B01 AND DG A COASTS TO A STOP. THE DIESEL GEN OUTPUT BREAKER PBA-S03B TRIPS OPEN.

4. Date Tested: 01/12/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, diesel trip, malfunction removed and diesel reset

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: DG Differential Trip (EG02B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DIFFERENTIAL PROTECTION RELAY FAILS IN TRIP POSITION

   EFFECTS: THE MALFUNCTION TRIPS DIFFERENTIAL RELAY 787. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. DIESEL GENERATOR'A TRIPS. ANNUNCIATORS FOR DG B TRIP AND GENERATOR DIFFERENTIAL TRIP OCCUR ON B01. DG B VOLTAGE, AMPS AND WATTS INDICATIONS DROP TO ZERO ON B01 AND DG B COASTS TO A STOP. THE DIESEL GEN OUTPUT BREAKER PBA-S04B TRIPS OPEN.

4. Date Tested: 01/12/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, diesel trip, malfunction removed and diesel reset

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Diesel Generator A Output Breaker Failure (EG06A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: B CONTACT FROM ALTERNATE SUPPLY BKR FAILS OPEN

   EFFECTS: ACTIVATION OF THIS MALFUNCTION DURING NORMAL POWER OPERATION WITH THE DG IN STANDBY IS PASSIVE. HOWEVER, DURING A SUBSEQUENT LOSS OF POWER ON PBA-S03, DIESEL GENERATOR A WILL START AND INCREASE TO NORMAL VOLTAGE AND FREQUENCY BUT DG OUTPUT BREAKER PBA-S03B DOES NOT CLOSE. THE BREAKER ALSO CANNOT BE CLOSED BY MANUAL OPERATION WHILE THE MALFUNCTION IS ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE 752B CONTACTS.

4. Date Tested: 01/18/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Malfunction removed, EDG A running and supplying PBA-S03.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Diesel Generator B Output Breaker Failure (EG06B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(3)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **B CONTACT FROM ALTERNATE SUPPLY BKR FAILS OPEN**

   EFFECTS: **ACTIVATION OF THIS MALFUNCTION DURING NORMAL POWER OPERATION WITH THE DG IN STANDBY IS PASSIVE. HOWEVER, DURING A SUBSEQUENT LOSS OF POWER ON PBB-S04, DIESEL GENERATOR B WILL START AND INCREASE TO NORMAL VOLTAGE AND FREQUENCY BUT DG OUTPUT BREAKER PBB-S04B DOES NOT CLOSE. THE BREAKER ALSO CANNOT BE CLOSED BY MANUAL OPERATION WHILE THE MALFUNCTION IS ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE 752B CONTACTS.**

4. Date Tested: **01/18/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Malfunction removed, EDG B running and supplying PBB-S04.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Generator Trip (EG08)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(16)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: PHASE TO PHASE SHORT IN GENERATOR STATOR

EFFECTS: THIS MALFUNCTION CAUSES A TRIP OF THE GENERATOR DIFFERENTIAL RELAY WHICH TRIPS GENERATOR LOCKOUT RELAY 186G-1. ANNUNCIATOR FOR MAIN GENERATOR UNIT DIFFERENTIAL TRIP OCCURS ON B06. THE MAIN TURBINE AND GENERATOR EXCITER TRIP. GENERATOR BREAKERS 915 AND 918 TRIP OPEN AND RECLOSURE IS BLOCKED. AUX TRANSFORMER BREAKERS NAN-S01A AND NAN-S01B TRIP AND TIE BREAKERS NAN-S03B AND S04B CLOSES TO MAINTAIN BUSES NAN-S01 AND S02 ENERGIZED FROM THE STARTUP TRANSFORMER. STATOR COOLING WATER PUMPS TRIP. With RPCS IN AUTO A REACTOR POWER CUTBACK IS INITIATED. SELECTED CEA SUBGROUPS ARE DROPPED. REACTOR POWER DECREASES. SBCS RESPONDS TO CONTROL STEAM GENERATOR PRESSURE AND RCS TEMPERATURE. MALFUNCTION REMOVAL REMOVES THE PHASE TO PHASE SHORT IN THE GENERATOR STATOR. THE TURBINE GENERATOR CAN RESYNCHRONIZED AFTER THE 186G-1 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/17/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Generator tripped, reactor power stable after power cutback, house loads supplied by offsite power.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Generator AC Regulator Failure (EG09)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(3)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: AC REGULATOR SETPOINT FAILS TO SELECTED VALUE

EFFECTS: THE MALFUNCTION FAILS THE SETPOINT OF THE MAIN GENERATOR AC VOLTAGE REGULATOR TO ANY VALUE WITHIN THE REGULATOR RANGE. HI SEVERITY CAUSES AN INCREASE IN FIELD CURRENT. GENERATOR VARS INCREASES (LESS NEGATIVE OR MORE POSITIVE) ON MAN-VR-005 ON B06. FIELD WINDING TEMPERATURES INCREASE. FIELD CURRENT MAY BE LIMITED BY THE EXCITER'S MAXIMUM EXCITATION LIMIT CIRCUITRY. LOW SEVERITY CAUSES A DECREASE IN FIELD CURRENT. GENERATORS VARS DECREASES ARMATURE TEMPERATURES INCREASE. WITH THE MALFUNCTION ACTIVE, TRANSFERRING THE VOLTAGE REGULATOR TO DC RESTORES VOLTAGE CONTROL CAPABILITY. MALFUNCTION REMOVAL RESTORES THE NORMAL AC REGULATOR SETPOINT.

4. Date Tested: 01/18/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Stable plant, malfunction removed and normal system operation restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **Turbine Trip by Reactor Trip Failure (EG10)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAILURE OF CEDMCS UVRX RELAY**

   EFFECTS: **THIS MALFUNCTION FAILS RELAY UVRX IN THE ENERGIZED POSITION. ACTIVATION OF THE MALFUNCTION DURING POWER OPERATION IS PASSIVE. DURING A REACTOR TRIP, THE UVRX RELAY FAILURE PREVENTS THE REACTOR TRIP SIGNAL FROM DIRECTLY TRIPPING THE TURBINE AND ALSO PREVENTS ENERGIZING THE 186M GENERATOR LOCKOUT RELAY. THE GENERATOR EXCITER TRIP, TRANSFER OF POWER TO NAN-S01/S02 AND TRIPPING OF 525KV BREAKERS 915/918 DOES NOT OCCUR DIRECTLY FROM THE REACTOR TRIP SIGNAL. THE TURBINE CONTINUES TO DRAW STEAM. STEAM GENERATOR PRESSURE AND RCS PRESSURE/TEMPERATURE DECREASE. STEAM GENERATORS EVENTUALLY ISOLATE DUE TO LOW PRESSURE (MSIS). ALL OTHER TURBINE TRIPS ARE FUNCTIONAL WHILE THIS MALFUNCTION IS ACTIVE. MALFUNCTION REMOVAL RESTORES OPERATION OF THE UVRX RELAY.**

4. Date Tested: **01/24/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Plant stable, turbine tripped by low condenser vacuum.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Motor Driven Aux Feedwater Pump Trip (FW01A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: FAULTY RELAY 750G TRIPS SELECTED PUMP

EFFECTS: THE MOTOR DRIVEN AUX FEED PUMP TRIPS DUE TO A FAILED OVERCURRENT RELAY WHICH TRIPS THE 786 LOCKOUT RELAY. NO OVERCURRENT INDICATION IS OBSERVED PRIOR TO THE TRIP. LOW DISCHARGE PRESSURE IS INDICATED ON B06. FEED FLOW TO THE STEAM GENERATORS (SG-FR-1113/1123) DROPS AND STEAM GENERATOR LEVELS DECREASE. THE PUMP CANNOT BE STARTED WHILE THE MALFUNCTION IS ACTIVE. MALFUNCTION REMOVAL RESTORES THE FAULTY RELAY TO NORMAL. THE 786 LOCKOUT RELAY CAN BE RESET AND THE PUMP STARTED.

4. Date Tested: 01/23/91

5. Test Initial Conditions: NOP, NOT, SGN-V097 and 98 closed.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with AFN-P01 tripped.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Motor Driven Aux Feed Pump B-P01 Trip (FW01B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAULTY RELAY 750G TRIPS SELECTED PUMP

   EFFECTS: MOTOR DRIVEN AUX FEED PUMP AFB-P01 TRIPS DUE TO A FAILED OVERCURRENT RELAY WHICH TRIPS THE 786 LOCKOUT RELAY. NO OVERCURRENT INDICATION IS OBSERVED PRIOR TO THE TRIP. LOW DISCHARGE PRESSURE IS INDICATED ON B06. FEED FLOW TO THE STEAM GENERATORS DROPS AND STEAM GENERATOR LEVELS DECREASE. THE PUMP CANNOT BE STARTED WHILE THE MALFUNCTION IS ACTIVE. MALFUNCTION REMOVAL RESTORES THE FAULTY RELAY TO NORMAL. THE 786 LOCKOUT RELAY CAN BE RESET AND THE PUMP STARTED.

4. Date Tested: 01/23/91

5. Test Initial Conditions: Mode 3, NOP, NOT

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, pump tripped.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: TDAFWP Speed Reference Control Failure (FW03)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(9)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: SPEED CONTROL SENSOR OUTPUT FAILS TO SELECTED VALUE

EFFECTS: THIS MALFUNCTION FAILS THE SPEED CONTROL SIGNAL TO TURBINE-DRIVEN AUX FW PUMP AFA-P01 TO A VALUE IN THE RANGE OF 0-6000 RPM. IF THE PUMP IS OPERATING, PUMP SPEED (AF-SI-52A ON B06) FOLLOWS THE MALFUNCTION VALUE. 0% SEVERITY DROPS PUMP SPEED TO MINIMUM. DISCHARGE PRESSURE DROPS (AF-PI-18A ON B06). IF AFA-P01 IS FEEDING STEAM GENERATORS, FLOW FROM THIS PUMP STOPS (AF-FI-40A/41A ON B06). HIGH MALFUNCTION SEVERITY CAUSES PUMP SPEED INCREASE. PUMP DISCHARGE PRESSURE AND FLOW INCREASE. IF SPEED IS INCREASED ABOVE 4058 RPM AN OVERSPEED TRIP OCCURS. TRIP VALVE AF-HV-54 CLOSES ON AN OVERSPEED TRIP. MALFUNCTION REMOVAL RESTORES NORMAL TURBINE SPEED CONTROL. IF OVERSPEED TRIP HAS OCCURRED, AFA-HV-54 CAN ONLY BE RE-OPENED AFTER THE OVERSPEED TRIP IS RESET BY REMOTE FUNCTION.

4. Date Tested: 01/23/91

5. Test Initial Conditions: Mode 3 NOP, NOT, TDAFW Pump operating

   a. Severity tested (if variable malfunction): 25-75%

6. Test Termination Conditions: Stable plant, TDAFW Pump tripped by overspeed.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: AFA-P01 Disch Line Break (FW11A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(10)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: LEAK DOWNSTREAM OF MANUAL DISCH ISOLATION VALVE

   EFFECTS: THIS MALFUNCTION LEAK RATE RANGES FROM 0-1300 GPM. LEAK IS DOWNSTREAM OF THE PUMP DISCHARGE CHECK VALVE AND MANUAL ISOLATION VALVE. LOW SEVERITY MAY RESULT IN LOW DISCHARGE PRESSURE (AF-PI-18A) AND OPERATION IN A RUNOUT CONDITION. 100% SEVERITY RESULTS IN COMPLETE LOSS OF PUMP DISCHARGE PRESSURE. PUMP AFA-P01 SPEED MAY INCREASE TO AN OVERSPEED TRIP. THE LEAK CAN CONTINUE FROM BOTH THE UPSTREAM SIDE (CST OR RMWT LEVEL DECREASING) AND DOWNSTREAM SIDE (IF AFW PUMP AFB-P01 IS OPERATING) UNTIL IT IS ISOLATED. LEAKAGE GOES TO THE TURBINE BLDG NON-RADIOACTIVE DRAIN SYSTEM. MALFUNCTION REMOVAL RESTORES PIPING INTEGRITY.

4. Date Tested: 01/24/91

5. Test Initial Conditions: NOP, NOT, AFA-P01 operating, AFB-P01 off.

   a. Severity tested (if variable malfunction): 100, 20, 40 & 50%

6. Test Termination Conditions: Malfunction removed and flow reestablished.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: CD A Pump Trip (FW17A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(9)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAULTY RELAY 450/451 TRIPS SUPPLY BREAKER

   EFFECTS: THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO THE CONDENSATE PUMP DUE TO A FAULTY OVERCURRENT RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. CD PUMP DISCHARGE PRESSURE AND FLOW DROPS TO 0. THE OVERCURRENT TRIP GIVES A COND SYS TRBL ANNUNCIATOR ON B06. FLOW THROUGH THE REMAINING CONDENSATE PUMPS INCREASES. CONDENSATE SYSTEM PRESSURES AND FW PUMP SUCTION PRESSURE DECREASES. THE FWCS ATTEMPTS TO MAINTAIN SG LEVEL BY OPENING OF ECONOMIZER FW VALVES AND INCREASING FWPT SPEED. FW PUMP LOW SUCTION PRESSURE ANNUNCIATOR (B06) SOUNDS AT 290 PSIG. IF FWP SUCTION PRESSURE DROPS TO 255 PSIG, THE FW PUMP TURBINES TRIP. MALFUNCTION REMOVAL RESTORES NORMAL OVERCURRENT RELAY OPERATION. THE 486 LOCKOUT RELAY MUST BE RESET TO RESTART THE PUMP.

4. Date Tested: 01/28/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Plant stable, malfunction removed and pump lockout reset.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **CD B Pump Trip (FW17B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(9)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **FAULTY RELAY 450/451 TRIPS SUPPLY BREAKER**

EFFECTS: **THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO THE CONDENSATE PUMP DUE TO A FAULTY OVERCURRENT RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. CD PUMP DISCHARGE PRESSURE AND FLOW DROPS TO 0. THE OVERCURRENT TRIP GIVES A COND SYS TRBL ANNUNCIATOR ON B06. FLOW THROUGH THE REMAINING CONDENSATE PUMPS INCREASES. CONDENSATE SYSTEM PRESSURES AND FW PUMP SUCTION PRESSURE DECREASES. THE FWCS ATTEMPTS TO MAINTAIN SG LEVEL BY OPENING OF ECONOMIZER FW VALVES AND INCREASING FWPT SPEED. FW PUMP LOW SUCTION PRESSURE ANNUNCIATOR (B06) SOUNDS AT 290 PSIG. IF FWP SUCTION PRESSURE DROPS TO 255 PSIG, THE FW PUMP TURBINES TRIP. MALFUNCTION REMOVAL RESTORES NORMAL OVERCURRENT RELAY OPERATION. THE 486 LOCKOUT RELAY MUST BE RESET TO RESTART THE PUMP.**

4. Date Tested: **01/28/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Plant stable, malfunction removed and pump lockout reset.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: CD C Pump Trip (FW17C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(9)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAULTY RELAY 450/451 TRIPS SUPPLY BREAKER

   EFFECTS: THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO THE CONDENSATE PUMP DUE TO A FAULTY OVERCURRENT RELAY. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. THE PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. CD PUMP DISCHARGE PRESSURE AND FLOW DROPS TO 0. THE OVERCURRENT TRIP GIVES A COND SYS TRBL ANNUNCIATOR ON B06. FLOW THROUGH THE REMAINING CONDENSATE PUMPS INCREASES. CONDENSATE SYSTEM PRESSURES AND FW PUMP SUCTION PRESSURE DECREASES. THE FWCS ATTEMPTS TO MAINTAIN SG LEVEL BY OPENING OF ECONOMIZER FW VALVES AND INCREASING FWPT SPEED. FW PUMP LOW SUCTION PRESSURE ANNUNCIATOR (B06) SOUNDS AT 290 PSIG. IF FWP SUCTION PRESSURE DROPS TO 255 PSIG, THE FW PUMP TURBINES TRIP. MALFUNCTION REMOVAL RESTORES NORMAL OVERCURRENT RELAY OPERATION. THE 486 LOCKOUT RELAY MUST BE RESET TO RESTART THE PUMP.

4. Date Tested: 01/28/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Plant stable, malfunction removed and pump lockout reset.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **Hotwell Makeup Controller Failure (FW19A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(5)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **CONTROLLER SETPOINT FAILURE**

   EFFECTS: **THIS MALFUNCTION FAILS THE SETPOINT FOR HOTWELL MAKEUP CONTROLLER LIC-81 (B05) TO ANY VALUE WITHIN THE CONTROLLER RANGE OF 37"-51". HIGH SEVERITY CAUSES LIC-81 TO OPEN MAKEUP VALVE LV-81. CST LEVEL DECREASES. ACTUAL LEVEL (CD-LR-83 ON B05) IN HOTWELL HALF 1 INCREASES BECAUSE MAKEUP CAPACITY IS GREATER THAN DRAWOFF CAPACITY. HOTWELL LEVEL 1C LEVEL HI ALARM AND HI-HI ALARM OCCURS ON B05. CONTINUED LEVEL INCREASE WILL COVER CONDENSER TUBES RESULTING IN MAIN CONDENSER VACUUM DECREASE. LOW SEVERITY CAUSES LIC-81 TO MAINTAIN MAKEUP VALVE LV-81 CLOSED. ANY LOSS OF WATER FROM THE CONDENSATE SYSTEM IS NOT MADE UP FOR IN HOTWELL 1C. ACTUAL LEVEL DECREASES (LR-83). HOTWELL 1C LOW LEVEL ALARMS AND LO-LO LEVEL ALARMS OCCUR. CONTINUED LEVEL DECREASE RESULTS IN A TRIP OF CONDENSATE PUMPS B AND C. MANUAL CONTROL OF CD-LIC-81 IS AVAILABLE WITH THIS MALF ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL CONTROLLER OPERATION.**

4. Date Tested: **01/29/91**

5. Test Initial Conditions: **Mode 3 NOP & NOT**

   a. Severity tested (if variable malfunction): **0-98%**

6. Test Termination Conditions: **Stable plant, malfunction removed, Condensate Pump C tripped.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Hotwell Makeup Controller Failure (FW19B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(5)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **CONTROLLER SETPOINT FAILURE**

   EFFECTS: **THIS MALFUNCTION FAILS THE SETPOINT FOR HOTWELL MAKEUP CONTROLLER LIC-82 (B05) TO ANY VALUE WITHIN THE CONTROLLER RANGE OF 37"-51". HIGH SEVERITY CAUSES LIC-82 TO OPEN MAKEUP VALVE LV-82. HOTWELL MAKEUP INITIATES FROM THE CST. CST LEVEL DECREASES. ACTUAL LEVEL (CD-LR-83 ON B05) IN HOTWELL HALF 2 INCREASES HOTWELL LEVEL HI ALARM (49") AND HI-HI ALARM (53") OCCURS ON B05. CONTINUED LEVEL INCREASE WILL COVER CONDENSER TUBES RESULTING IN MAIN CONDENSER VACUUM DECREASE. LOW SEVERITY CAUSES LIC-82 TO MAINTAIN MAKEUP VALVE LV-82 CLOSED. ANY LOSS OF WATER FROM THE CONDENSATE SYSTEM IS NOT MADE UP FOR IN HOTWELL. ACTUAL LEVEL DECREASES (LR-83). HOTWELL LOW LEVEL ALARMS AT 37" AND LO-LO LEVEL ALARMS AT 34". CONTINUED LEVEL DECREASE RESULTS IN A TRIP OF CONDENSATE PUMPS A AND B AT 30". MANUAL CONTROL OF CD-LIC-82 IS AVAILABLE WITH THIS MALF ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL CONTROLLER OPERATION.**

4. Date Tested: **01/29/91**

5. Test Initial Conditions: **Mode 3, NOP, NOT**

   a. Severity tested (if variable malfunction): **0-98 %**

6. Test Termination Conditions: **Stable plant, malfunction removed, Condensate Pump B tripped.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Condenser Shell A Air In-leakage (FW21A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(5)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **HOLE IN CONDENSER SHELL**

EFFECTS: **THIS MALFUNCTION IS A VARIABLE SIZE HOLE IN THE CONDENSER SHELL. THE LEAK CANNOT BE ISOLATED. THE AIR IN-LEAKAGE EXCEEDS THE CAPACITY OF THE AIR REMOVAL PUMPS AND VACUUM DECREASES. AS VACUUM IS DECREASING, LOW VACUUM IS ANNUNCIATED (B07). SHELL PRESSURE DECREASES ON B06 and B07. AIR REMOVAL PUMP D STARTS AND SUCTION VALVE TO THE AFFECTED SHELL OPENS. AT HIGH SEVERITY, THE ADDITIONAL AIR REMOVAL PUMP SLOWS THE VACUUM DECAY BUT DOES NOT STOP IT. FURTHER VACUUM LOSS CAUSES MAIN TURBINE TRIP (8.5 IN HGA), REACTOR FEED PUMP TRIP (13.5 IN HGA) AND CONDENSER UNAVAILABLE SIGNAL TO THE STEAM BYPASS CONTROL SYSTEM. MALFUNCTION REMOVAL REPAIRS THE HOLE IN THE CONDENSER.**

4. Date Tested: **01/31/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **25%**

6. Test Termination Conditions: **Stable plant, malfunction removed and vacuum recovering.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Condenser Shell B Air In-leakage (FW21B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(5)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **HOLE IN CONDENSER SHELL**

   EFFECTS: **THIS MALFUNCTION IS A VARIABLE SIZE HOLE IN THE CONDENSER SHELL. THE LEAK CANNOT BE ISOLATED. THE AIR IN-LEAKAGE EXCEEDS THE CAPACITY OF THE AIR REMOVAL PUMPS AND VACUUM DECREASES. AS VACUUM IS DECREASING, LOW VACUUM IS ANNUNCIATED (B07). SHELL PRESSURE DECREASES ON B06 and B07. AIR REMOVAL PUMP D STARTS AND SUCTION VALVE TO THE AFFECTED SHELL OPENS. AT HIGH SEVERITY, THE ADDITIONAL AIR REMOVAL PUMP SLOWS THE VACUUM DECAY BUT DOES NOT STOP IT. FURTHER VACUUM LOSS CAUSES MAIN TURBINE TRIP (8.5 IN HGA), REACTOR FEED PUMP TRIP (13.5 IN HGA) AND CONDENSER UNAVAILABLE SIGNAL TO THE STEAM BYPASS CONTROL SYSTEM. MALFUNCTION REMOVAL REPAIRS THE HOLE IN THE CONDENSER.**

4. Date Tested: **02/03/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **25%**

6. Test Termination Conditions: **Stable plant, malfunction removed and vacuum recovering.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Condenser Shell C Air In-leakage (FW21C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(5)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **HOLE IN CONDENSER SHELL**

   EFFECTS: **THIS MALFUNCTION IS A VARIABLE SIZE HOLE IN THE CONDENSER SHELL. THE LEAK CANNOT BE ISOLATED. THE AIR IN-LEAKAGE EXCEEDS THE CAPACITY OF THE AIR REMOVAL PUMPS AND VACUUM DECREASES. AS VACUUM IS DECREASING, LOW VACUUM IS ANNUNCIATED (B07). SHELL PRESSURE DECREASES ON B06 and B07. AIR REMOVAL PUMP D STARTS AND SUCTION VALVE TO THE AFFECTED SHELL OPENS. AT HIGH SEVERITY, THE ADDITIONAL AIR REMOVAL PUMP SLOWS THE VACUUM DECAY BUT DOES NOT STOP IT. FURTHER VACUUM LOSS CAUSES MAIN TURBINE TRIP (8.5 IN HGA), REACTOR FEED PUMP TRIP (13.5 IN HGA) AND CONDENSER UNAVAILABLE SIGNAL TO THE STEAM BYPASS CONTROL SYSTEM. MALFUNCTION REMOVAL REPAIRS THE HOLE IN THE CONDENSER.**

4. Date Tested: **02/03/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **25%**

6. Test Termination Conditions: **Stable plant, malfunction removed and vacuum recovering.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: LP Heater Level Switch Failure (FW42A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(9)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: LSHH OUTPUT FAILS HIGH

EFFECTS: THIS MALFUNCTION FAILS HEATER 4A HI-HI LEVEL SWITCH EDN-LSHH-425 OUTPUT HIGH. THIS CAUSES AN ISOLATION OF LOW PRESSURE HEATER TRAIN A. THE FOLLOWING ACTIONS OCCUR:
- EXTRACTION STM NRVS TO HEATERS 3A AND 4A (BTV-69,59,73) CLOSE AND EXTR STM DRAINS (UV-40,44) OPEN
- LP HEATER TRAIN A CONDENSATE INLET AND OUTLET VALVES (CDN-UV-214A,214B) CLOSE.
PLANT OPERATION CAN CONTINUE WITH DECREASED EFFICIENCY DUE TO THE REDUCTION IN FW HEATING. MALFUNCTION REMOVAL RESTORES LEVEL SWITCH OPERATION TO NORMAL.

4. Date Tested: 02/04/91

5. Test Initial Conditions: 50% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with LP Heater string isolated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3106

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **LP Heater Level Switch Failure (FW42B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(9)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **LSHH OUTPUT FAILS HIGH**

   EFFECTS: **THIS MALFUNCTION FAILS HEATER 4A HI-HI LEVEL SWITCH OUTPUT HIGH. THIS CAUSES AN ISOLATION OF LOW PRESSURE HEATER TRAIN B. THE FOLLOWING ACTIONS OCCUR:**
   - EXTRACTION STM NRVS TO HEATERS 3B AND 4B CLOSE AND EXTR STM DRAINS OPEN
   - LP HEATER TRAIN B CONDENSATE INLET AND OUTLET VALVES CLOSE.
   PLANT OPERATION CAN CONTINUE WITH DECREASED EFFICIENCY DUE TO THE REDUCTION IN FW HEATING. MALFUNCTION REMOVAL RESTORES LEVEL SWITCH OPERATION TO NORMAL.

4. Date Tested: **02/05/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with LP Heater string isolated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3106, & 3119**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Feedwater Header Rupture (FW53)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(20)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PIPE BREAK DOWNSTREAM OF HP FW HEATERS**

   EFFECTS: **THIS MALFUNCTION IS A PIPE BREAK IN THE COMBINED 32" FW HEADER DOWNSTREAM OF THE HP FW HEATERS. FW HEADER PRESSURE (FW-PI-121 ON B06) DROPS, THE MAGNITUDE DEPENDS ON MALF SEVERITY. SMALL LEAKS DO NOT CAUSE A PLANT TRIP. THE FWCS INCREASES FLOW DEMAND TO COMPENSATE FOR THE LEAK. THE LOSS OF MASS FROM THE CONDENSATE/FEEDWATER SYSTEMS IS MADE UP FROM THE CST VIA HOTWELL MAKEUP. HIGH SEVERITY CANNOT BE COMPENSATED FOR BY INCREASING FLOW DEMAND. STEAM GENERATOR LEVELS DECREASE TO THE LOW LEVEL TRIP. THE MALFUNCTION IS NON-RECOVERABLE.**

4. Date Tested: **02/06/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **1-37% & 100%.**

6. Test Termination Conditions: **Stable Plant, reactor tripped by Low SG Level.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: FWPT A Shaft Shear (FW57A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(9)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: PUMP-TURBINE SHAFT COMPLETE SHEAR

   EFFECTS: THE SHAFT SHEAR CAUSES LOSS OF THE FW PUMP MOTIVE FORCE. PUMP DISCHARGE PRESSURE (FW-PI-27 ON B06) AND FLOW COAST DOWN. FWPT A SPEED INCREASES TO THE OVERSPEED SETPOINT AND TRIPS. FWPT A TRIP IS ANNUNCIATED (B06). FWPT A STOP AND CONTROL VALVES CLOSE. STEAM GENERATOR LEVELS DECREASE. THE REMAINING FWPT TRIES TO ASSUME THE REQUIRED FLOW BUT CANNOT. A REACTOR POWER CUTBACK IS INITIATED DIRECTLY BY THE FWPT TRIP. MALFUNCTION REMOVAL RESTORES COUPLING BETWEEN THE TURBINE AND PUMP.

4. Date Tested: 01/28/91

5. Test Initial Conditions: 100% RTP, BOC, all control systems in automatic.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Malfunction removed, FWPT A reset, and pump tuning 500 RPM.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: FWPT B Shaft Shear (FW57B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(9)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: PUMP-TURBINE SHAFT COMPLETE SHEAR

   EFFECTS: THE SHAFT SHEAR CAUSES LOSS OF THE FW PUMP MOTIVE FORCE. PUMP DISCHARGE PRESSURE (FW-PI-27 ON B06) AND FLOW COAST DOWN. FWPT B SPEED INCREASES TO THE OVERSPEED SETPOINT AND TRIPS. FWPT B TRIP IS ANNUNCIATED (B06). FWPT B STOP AND CONTROL VALVES CLOSE. STEAM GENERATOR LEVELS DECREASE. THE REMAINING FWPT TRIES TO ASSUME THE REQUIRED FLOW BUT CANNOT. A REACTOR POWER CUTBACK IS INITIATED DIRECTLY BY THE FWPT TRIP. MALFUNCTION REMOVAL RESTORES COUPLING BETWEEN THE TURBINE AND PUMP.

4. Date Tested: 01/28/91

5. Test Initial Conditions: 100% RTP, BOC, all control systems in automatic.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Malfunction removed, FWPT B reset, and pump tuning 500 RPM.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **Feedwater Break Inside Containment (FW61A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(20)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PIPE RUPTURE INSIDE CONTAINMENT AFTER CV'S**

   EFFECTS: **THIS MALFUNCTION IS A VARIABLE SIZE LEAK ON STEAM GENERATOR 1 ECONOMIZER FEED LINE. THE LEAK IS INSIDE CONTAINMENT AFTER THE FW CHECK VALVE AND IS UNISOLABLE FROM THE STEAM GENERATOR. 100% SEVERITY DUMPS ALL ECONOMIZER LINE FEEDFLOW TO THE CONTAINMENT AND SG 1 BLOWS DOWN TO THE CONTAINMENT. CONTAINMENT PRESSURE INCREASES RAPIDLY. THE REACTOR TRIPS. MALFUNCTION IS NON-RECOVERABLE.**

4. Date Tested: **02/04/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Stable plant with reactor tripped, MSIS, CSAS**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3224**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Feedwater Break Inside Containment (FW61B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(20)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PIPE RUPTURE INSIDE CONTAINMENT AFTER CV'S**

   EFFECTS: **THIS MALFUNCTION IS A VARIABLE SIZE LEAK ON STEAM GENERATOR 2 ECONOMIZER FEED LINE. THE LEAK IS INSIDE CONTAINMENT AFTER THE FW CHECK VALVE AND IS UNISOLABLE FROM THE STEAM GENERATOR. 100% SEVERITY DUMPS ALL ECONOMIZER LINE FEEDFLOW TO THE CONTAINMENT AND SG 2 BLOWS DOWN TO THE CONTAINMENT. CONTAINMENT PRESSURE INCREASES RAPIDLY. THE REACTOR TRIPS. MALFUNCTION IS NON-RECOVERABLE.**

4. Date Tested: **02/04/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Stable plant with reactor tripped, MSIS, CSAS**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3224**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Downcomer FWIV UV-130 Fails Closed (FW73A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(9)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAILURE OF AIR SUPPLY SOLENOID

   EFFECTS: THIS MALFUNCTION FAILS THE DOWNCOMER FWIV TO THE CLOSED POSITION DUE TO AIR SUPPLY SOLENOID FAILURE. AT POWER OPERATION, THE MALFUNCTION ISOLATES DOWNCOMER FW FLOW. AT LESS THAN 15% POWER ALL FEED FLOW TO THE AFFECTED SG IS LOST AND STEAM GENERATOR LEVEL DECREASES. AT HIGH POWER OPERATION, THE LOSS OF DOWNCOMER FW LINE FLOW IS COMPENSATED FOR BY INCREASE IN FW PUMP SPEED AND ECONOMIZER VALVE POSITION. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION.

4. Date Tested: 01/25/91

5. Test Initial Conditions: 100% RTP, BOC.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and nominal FWCS system parameters restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Downcomer FWIV UV-172 Fails Closed (FW73B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(9)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **FAILURE OF AIR SUPPLY SOLENOID**

EFFECTS: **THIS MALFUNCTION FAILS THE DOWNCOMER FWIV TO THE CLOSED POSITION DUE TO AIR SUPPLY SOLENOID FAILURE. AT POWER OPERATION, THE MALFUNCTION ISOLATES DOWNCOMER FW FLOW. AT LESS THAN 15% POWER ALL FEED FLOW TO THE AFFECTED SG IS LOST AND STEAM GENERATOR LEVEL DECREASES. AT HIGH POWER OPERATION, THE LOSS OF DOWNCOMER FW LINE FLOW IS COMPENSATED FOR BY INCREASE IN FW PUMP SPEED AND ECONOMIZER VALVE POSITION. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION.**

4. Date Tested: **01/25/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, malfunction removed and nominal FWCS system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Downcomer FWIV UV-135 Fails Closed (FW73C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(9)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAILURE OF AIR SUPPLY SOLENOID**

   EFFECTS: **THIS MALFUNCTION FAILS THE DOWNCOMER FWIV TO THE CLOSED POSITION DUE TO AIR SUPPLY SOLENOID FAILURE. AT POWER OPERATION, THE MALFUNCTION ISOLATES DOWNCOMER FW FLOW. AT LESS THAN 15% POWER ALL FEED FLOW TO THE AFFECTED SG IS LOST AND STEAM GENERATOR LEVEL DECREASES. AT HIGH POWER OPERATION, THE LOSS OF DOWNCOMER FW LINE FLOW IS COMPENSATED FOR BY INCREASE IN FW PUMP SPEED AND ECONOMIZER VALVE POSITION. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION.**

4. Date Tested: **01/25/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, malfunction removed and nominal FWCS system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Downcomer FWIV UV-175 Fails Closed (FW73D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(9)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAILURE OF AIR SUPPLY SOLENOID**

   EFFECTS: **THIS MALFUNCTION FAILS THE DOWNCOMER FWIV TO THE CLOSED POSITION DUE TO AIR SUPPLY SOLENOID FAILURE. AT POWER OPERATION, THE MALFUNCTION ISOLATES DOWNCOMER FW FLOW. AT LESS THAN 15% POWER ALL FEED FLOW TO THE AFFECTED SG IS LOST AND STEAM GENERATOR LEVEL DECREASES. AT HIGH POWER OPERATION, THE LOSS OF DOWNCOMER FW LINE FLOW IS COMPENSATED FOR BY INCREASE IN FW PUMP SPEED AND ECONOMIZER VALVE POSITION. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION.**

4. Date Tested: **01/25/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, malfunction removed and nominal FWCS system parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: CR Ess. AHU Fan A Trips (HV06A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAULTY 50G RELAY TRIPS FAN

   EFFECTS: THE FAULTY 50G RELAY TRIPS CONTROL ROOM ESSENTIAL AHU FAN A BREAKER 86 LOCKOUT RELAY. THE LOCKOUT RELAY TRIPS THE BREAKER. THE BREAKER CANNOT BE RECLOSED WHILE THE MALFUNCTION IS ACTIVE. STATUS LIGHTS INDICATE THE BREAKER TRIP.

4. Date Tested: 01/24/91

5. Test Initial Conditions: 100% RTP, BOC, CR Ess. AHU Fan A running after manual start.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Malfunction removed, lockout reset, and fan restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **CR Ess. AHU Fan B Trips (HV06B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAULTY 50G RELAY TRIPS FAN**

   EFFECTS: **THE FAULTY 50G RELAY TRIPS CONTROL ROOM ESSENTIAL AHU FAN B BREAKER 86 LOCKOUT RELAY. THE LOCKOUT RELAY TRIPS THE BREAKER. THE BREAKER CANNOT BE RECLOSED WHILE THE MALFUNCTION IS ACTIVE. STATUS LIGHTS INDICATE THE BREAKER TRIP.**

4. Date Tested: **01/24/91**

5. Test Initial Conditions: **100% RTP, BOC, CR Ess. AHU Fan B running after manual start.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Malfunction removed, lockout reset, and fan restarted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **Instrument Air Compressor Trip (IA01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(2)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAULTY 50G RELAY TRIPS BREAKER**

   EFFECTS: **THE FAULTY 50G RELAY TRIPS THE 86 LOCKOUT RELAY ON AIR COMPRESSOR A WHICH TRIPS THE BREAKER. BREAKER STATUS LIGHTS ON B07 INDICATE THE BREAKER IS OPEN AND THE COMPRESSOR MOTOR AMMETER READS ZERO. INSTRUMENT AIR SYSTEM TROUBLE IS ANNUNCIATED ON B07. AIR RECEIVER AND INSTRUMENT AIR HEADER PRESSURE (IA-PI-32 ON B07) DECREASE SLOWLY DUE TO NORMAL AIR USAGE. A STANDBY AIR COMPRESSOR STARTS DUE TO LOW PRESSURE.**

4. Date Tested: **01/15/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Malfunction removed, lockout reset and compressor restarted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: IA Compressor Trip (IA01B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(2)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: FAULTY 50G RELAY TRIPS BREAKER

EFFECTS: THE FAULTY 50G RELAY TRIPS THE 86 LOCKOUT RELAY ON AIR COMPRESSOR B WHICH TRIPS THE BREAKER. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. BREAKER STATUS LIGHTS ON B07 INDICATE THE BREAKER IS OPEN AND THE COMPRESSOR MOTOR AMMETER READS ZERO. INSTRUMENT AIR SYSTEM TROUBLE IS ANNUNCIATED ON B07. AIR RECEIVER AND INSTRUMENT AIR HEADER PRESSURE (IA-PI-32 ON B07) DECREASE SLOWLY DUE TO NORMAL AIR USAGE. A STANDBY AIR COMPRESSOR STARTS DUE TO LOW PRESSURE AND MAINTAINS INSTRUMENT AIR PRESSURE. MALFUNCTION REMOVAL RESTORES THE 50G RELAY TO NORMAL. THE AIR COMPRESSOR CAN BE STARTED AFTER THE 86 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with the standby air compressor started.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: IA Compressor Trip (IA01C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(2)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: FAULTY 50G RELAY TRIPS BREAKER

EFFECTS: THE FAULTY 50G RELAY TRIPS THE 86 LOCKOUT RELAY ON AIR COMPRESSOR C WHICH TRIPS THE BREAKER. NO INDICATION OF A FAULT IS OBSERVED PRIOR TO THE TRIP. BREAKER STATUS LIGHTS ON B07 INDICATE THE BREAKER IS OPEN AND THE COMPRESSOR MOTOR AMMETER READS ZERO. INSTRUMENT AIR SYSTEM TROUBLE IS ANNUNCIATED ON B07. AIR RECEIVER AND INSTRUMENT AIR HEADER PRESSURE (IA-PI-32 ON B07) DECREASE SLOWLY DUE TO NORMAL AIR USAGE. A STANDBY AIR COMPRESSOR STARTS DUE TO LOW PRESSURE AND MAINTAINS INSTRUMENT AIR PRESSURE. MALFUNCTION REMOVAL RESTORES THE 50G RELAY TO NORMAL. THE AIR COMPRESSOR CAN BE STARTED AFTER THE 86 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with the standby air compressor started.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: IA Break Between V215 and V311 (IA04)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(2)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: PIPE BREAK

EFFECTS: THE MALFUNCTION IS A VARIABLE SIZE LEAK BETWEEN TURBINE BLDG IA LOOP ISOLATION VALVE V215 AND V311. AT 100% SEVERITY RECEIVER PRESSURE DECREASES FROM NORMAL OPERATING PRESSURE TO 50 PSIG IN 2 MINUTES WITH ALL IA COMPRESSORS FULLY LOADED. INSTRUMENT AIR RECEIVER AND AIR HEADER PRESSURE (IA-PI-32 ON B07) DROPS. STANDBY AIR COMPRESSORS START. IA LOW HEADER PRESSURE ANNUNCIATES AT 95 PSIG. INSTRUMENT AIR N2 BACKUP VALVE OPENS AT 85 PSIG (ANNUNCIATOR ON B07). IA PRESSURE CONTINUES TO DECREASE SLOWLY. THE LEAK CAN BE ISOLATED BY CLOSING IAN-V215 AND IAN-V311 VIA REMOTE FUNCTIONS. IF ISOLATED, PRESSURE BETWEEN V215 AND V311 DROPS RAPIDLY TO ZERO AND IA PRESSURE IN THE REMAINDER OF THE IA SYSTEM IS RESTORED. MALFUNCTION REMOVAL REPAIRS THE PIPE BREAK.

4. Date Tested: 02/08/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 5-100%

6. Test Termination Conditions: Instrument Air system completely depressurized

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Inst Air N2 Backup Valve Fails Closed (IA05)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(2)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **IAN-PV-52 MECHANICALLY BOUND IN CLOSED POSITION**

   EFFECTS: **THIS MALFUNCTION BINDS THE VALVE IN THE CLOSED POSITION. IF THE VALVE IS NOT CLOSED WHEN THE MALFUNCTION IS ACTIVATED, BINDING OCCURS ONLY AFTER THE VALVE REACHES FULL CLOSED BY NORMAL OPERATION. DURING NORMAL OPERATION, IAN-PV-52 IS CLOSED. ON DECREASING IA PRESSURE, THE BACKUP VALVE DOES NOT OPEN WHEN 85 PSIG IS REACHED. IAN-PV-52 CAN BE BYPASSED (REM FUNCTION) TO SUPPLEMENT THE IA SYSTEM WITH N2 WHILE THIS MALFUNCTION IS ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE VALVE.**

4. Date Tested: **01/15/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Malfunction removed, instrument air pressure recovering due to flow through the N2 backup valve.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: MSIV 170 Fails as Is (MS08A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING

   EFFECTS: THIS MALFUNCTION FAILS THE AFFECTED MSIV AT THE SELECTED SEVERITY POSITION WHEN THE VALVE IS AT THAT POSITION OR REACHES THAT POSITION DUE TO OPERATION OF THE VALVE. THE MALFUNCTION DOES NOT CAUSE VALVE MOVEMENT. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION. THE VALVE WILL STROKE IF MOVEMENT IS DEMANDED BY THE CONTROL LOGIC.

4. Date Tested: 01/27/91

5. Test Initial Conditions: 50% RTP, BOC

   a. Severity tested (if variable malfunction): 100 & 70 %

6. Test Termination Conditions: MSIS actuated, valve stuck approximately half open.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

[illegible]

MALFUNCTION TEST ABSTRACTS

1. Test Title: **MSIV 180 Fails as Is (MS08B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL BINDING**

   EFFECTS: **THIS MALFUNCTION FAILS THE AFFECTED MSIV AT THE SELECTED SEVERITY POSITION WHEN THE VALVE IS AT THAT POSITION OR REACHES THAT POSITION DUE TO OPERATION OF THE VALVE. THE MALFUNCTION DOES NOT CAUSE VALVE MOVEMENT. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION. THE VALVE WILL STROKE IF MOVEMENT IS DEMANDED BY THE CONTROL LOGIC.**

4. Date Tested: **01/27/91**

5. Test Initial Conditions: **50% RTP, BOC**

   a. Severity tested (if variable malfunction): **100 & 70 %**

6. Test Termination Conditions: **MSIS actuated, valve stuck approximately half open.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: MSIV 171 Fails as Is (MS08C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING

   EFFECTS: THIS MALFUNCTION FAILS THE AFFECTED MSIV AT THE SELECTED SEVERITY POSITION WHEN THE VALVE IS AT THAT POSITION OR REACHES THAT POSITION DUE TO OPERATION OF THE VALVE. THE MALFUNCTION DOES NOT CAUSE VALVE MOVEMENT. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION. THE VALVE WILL STROKE IF MOVEMENT IS DEMANDED BY THE CONTROL LOGIC.

4. Date Tested: 01/27/91

5. Test Initial Conditions: 50% RTP, BOC

   a. Severity tested (if variable malfunction): 100 & 70 %

6. Test Termination Conditions: MSIS actuated, valve stuck approximately half open.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: MSIV 181 Fails as Is (MS08D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING

   EFFECTS: THIS MALFUNCTION FAILS THE AFFECTED MSIV AT THE SELECTED SEVERITY POSITION WHEN THE VALVE IS AT THAT POSITION OR REACHES THAT POSITION DUE TO OPERATION OF THE VALVE. THE MALFUNCTION DOES NOT CAUSE VALVE MOVEMENT. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION. THE VALVE WILL STROKE IF MOVEMENT IS DEMANDED BY THE CONTROL LOGIC.

4. Date Tested: 01/27/91

5. Test Initial Conditions: 50% RTP, BOC

   a. Severity tested (if variable malfunction): 100 & 70 %

6. Test Termination Conditions: MSIS actuated, valve stuck approximately half open.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: ADV HV-184 Fails As Is (MS09A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(17)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING

   EFFECTS: THIS MALFUNCTION FAILS THE ADV IN ITS CURRENT POSITION WHEN THE MALFUNCTION BECOMES ACTIVE. THE MALFUNCTION OVERRIDES ALL MEANS OF VALVE OPERATION. MALFUNCTION REMOVAL RESTORES NORMAL ADV OPERATION. THE VALVE STROKES IF CONTROL LOGIC IS DEMANDING MOTION.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with the ADV manually isolated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ADV HV-178 Fails As Is (MS09B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(17)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING

   EFFECTS: THIS MALFUNCTION FAILS THE ADV IN ITS CURRENT POSITION WHEN THE MALFUNCTION BECOMES ACTIVE. THE MALFUNCTION OVERRIDES ALL MEANS OF VALVE OPERATION. MALFUNCTION REMOVAL RESTORES NORMAL ADV OPERATION. THE VALVE STROKES IF CONTROL LOGIC IS DEMANDING MOTION.

4. Date Tested: **01/15/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with the ADV manually isolated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

[illegible]

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ADV HV-185 Fails As Is (MS09C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(17)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL BINDING**

   EFFECTS: **THIS MALFUNCTION FAILS THE ADV IN ITS CURRENT POSITION WHEN THE MALFUNCTION BECOMES ACTIVE. THE MALFUNCTION OVERRIDES ALL MEANS OF VALVE OPERATION. MALFUNCTION REMOVAL RESTORES NORMAL ADV OPERATION. THE VALVE STROKES IF CONTROL LOGIC IS DEMANDING MOTION.**

4. Date Tested: **01/15/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with the ADV manually isolated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: ADV HV-179 Fails As Is (MS09D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(17)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING

   EFFECTS: THIS MALFUNCTION FAILS THE ADV IN ITS CURRENT POSITION WHEN THE MALFUNCTION BECOMES ACTIVE. THE MALFUNCTION OVERRIDES ALL MEANS OF VALVE OPERATION. MALFUNCTION REMOVAL RESTORES NORMAL ADV OPERATION. THE VALVE STROKES IF CONTROL LOGIC IS DEMANDING MOTION.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with the ADV manually isolated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Main Steam Safety Valve Fails Open (MS10A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(20)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **VALVE FAILS TO SELECTED POSITION**

EFFECTS: **THIS MALFUNCTION FAILS THE AFFECTED MAIN STEAM LINE RELIEF VALVE TO ANY POSITION. ACTIVATION AT 100% SEVERITY FAILS THE VALVE FULL OPEN. MAIN STEAM RELIEF VALVE ACTUATED ANNUNCIATES ON B06. INCREASED STEAM FLOW IS INDICATED ON B06. THE RESULTANT LEAKAGE CAUSES THE AFFECTED STEAM GENERATOR PRESSURE DECREASE AND LEVEL SWELL. THE INCREASED STEAM FLOW CAUSES A REDUCTION IN RCS AVERAGE TEMPERATURE LEADING TO A LOWER PZR LEVEL AND PRESSURE. REACTOR POWER INCREASES. MALFUNCTION REMOVAL RESTORES NORMAL RELIEF VALVE OPERATION.**

4. Date Tested: **01/18/91**

5. Test Initial Conditions: **50% RTP, BOC**

   a. Severity tested (if variable malfunction): **50% & 100%**

6. Test Termination Conditions: **Stable plant with increased reactor power.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **2641**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions:

    a. Justification for the exceptions:

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Main Steam Safety Valve Fails Open (MS10B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(20)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **VALVE FAILS TO SELECTED POSITION**

EFFECTS: **THIS MALFUNCTION FAILS THE AFFECTED MAIN STEAM LINE RELIEF VALVE TO ANY POSITION. ACTIVATION AT 100% SEVERITY FAILS THE VALVE FULL OPEN. MAIN STEAM RELIEF VALVE ACTUATED ANNUNCIATES ON B06. INCREASED STEAM FLOW IS INDICATED ON B06. THE RESULTANT LEAKAGE CAUSES THE AFFECTED STEAM GENERATOR PRESSURE DECREASE AND LEVEL SWELL. THE INCREASED STEAM FLOW CAUSES A REDUCTION IN RCS AVERAGE TEMPERATURE LEADING TO A LOWER PZR LEVEL AND PRESSURE. REACTOR POWER INCREASES. MALFUNCTION REMOVAL RESTORES NORMAL RELIEF VALVE OPERATION.**

4. Date Tested: **01/18/91**

5. Test Initial Conditions: **50% RTP, BOC**

   a. Severity tested (if variable malfunction): **50% & 100%**

6. Test Termination Conditions: **Stable plant with increased reactor power.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: SG 1 Line 1 MSLB Upstream of the MSIV (MS11A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(20)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: PIPE BREAK IN CONTAINMENT

EFFECTS: THIS MALFUNCTION IS A LEAK ON THE MAIN STEAM LINE INSIDE CONTAINMENT DOWNSTREAM OF THE SG OUTLET NOZZLE. 100% SEVERITY IS A LARGE RUPTURE. STEAM GENERATOR FLOW SPIKES UPSCALE ON B06. SG LEVEL INITIALLY SWELLS, THEN DECREASES. STEAM GENERATOR PRESSURE DECREASES. INITIAL DYNAMIC RESPONSE OF SG UNAFFECTED SG IS SIMILAR TO AFFECTED SG BUT SMALLER IN MAGNITUDE AND TERMINATES WITH MSIS. RCS TEMPERATURE AND PRESSURE DECREASE. CONTAINMENT TEMPERATURE AND PRESSURE INCREASE. THE HI AND HI-HI TRIP SETPOINTS ARE REACHED RAPIDLY. THE FOLLOWING ACTUATIONS OCCUR:

- THE REACTOR TRIPS
- THE STEAM GENERATORS ARE ISOLATED (MSIS).
- THE CONTAINMENT IS ISOLATED (CIAS)
- THE SAFETY INJECTION SYSTEMS START (SIAS).
- CONTAINMENT SPRAY IS INITIATED (CSAS).

THE STEAM GENERATOR ISOLATION DOES NOT ISOLATE THE LEAK. LEAK FLOWRATE DEGRADES BUT CONTINUES UNTIL AFFECTED SG IS BLOWN DRY. EMERGENCY FEEDWATER RESTORES LEVEL IN THE INTACT STEAM GENERATOR. COOLDOWN CAN COMMENCE USING ATMOSPHERIC DUMP VALVES FROM UNAFFECTED SG.

4. Date Tested: 02/09/91

5. Test Initial Conditions: 100% RTP, BOC
   a. Severity tested (if variable malfunction): 15 & 100 %

6. Test Termination Conditions: Stable plant, reactor tripped, MSIS, SIAS, CIAS actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None
    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **SG 1 Line 2 MSLB Upstream of the MSIV (MS11C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(20)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PIPE BREAK IN CONTAINMENT**

   EFFECTS: **THIS MALFUNCTION IS A LEAK ON THE MAIN STEAM LINE INSIDE CONTAINMENT DOWNSTREAM OF THE SG OUTLET NOZZLE. 100% SEVERITY IS A LARGE RUPTURE. STEAM GENERATOR FLOW SPIKES UPSCALE ON B06. SG LEVEL INITIALLY SWELLS, THEN DECREASES. STEAM GENERATOR PRESSURE DECREASES. INITIAL DYNAMIC RESPONSE OF SG UNAFFECTED SG IS SIMILAR TO AFFECTED SG BUT SMALLER IN MAGNITUDE AND TERMINATES WITH MSIS. RCS TEMPERATURE AND PRESSURE DECREASE. CONTAINMENT TEMPERATURE AND PRESSURE INCREASE. THE HI AND HI-HI TRIP SETPOINTS ARE REACHED RAPIDLY. THE FOLLOWING ACTUATIONS OCCUR:**

   - THE REACTOR TRIPS
   - THE STEAM GENERATORS ARE ISOLATED (MSIS).
   - THE CONTAINMENT IS ISOLATED (CIAS)
   - THE SAFETY INJECTION SYSTEMS START (SIAS).
   - CONTAINMENT SPRAY IS INITIATED (CSAS).

   THE STEAM GENERATOR ISOLATION DOES NOT ISOLATE THE LEAK. LEAK FLOWRATE DEGRADES BUT CONTINUES UNTIL AFFECTED SG IS BLOWN DRY. EMERGENCY FEEDWATER RESTORES LEVEL IN THE INTACT STEAM GENERATOR. COOLDOWN CAN COMMENCE USING ATMOSPHERIC DUMP VALVES FROM UNAFFECTED SG.

4. Date Tested: **02/09/91**

5. Test Initial Conditions: **100% RTP, BOC**
   a. Severity tested (if variable malfunction): **15 & 100 %**

6. Test Termination Conditions: **Stable plant, reactor tripped, MSIS, SIAS, CIAS actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None
    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **MSLB Downstream Upstream of the MSIV (MS12)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(20)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **BREAK ON STEAM CROSS AROUND HEADER IN TURBINE BLDG**

   EFFECTS: **100% SEVERITY IS A MAJOR MAIN STEAM PIPE RUPTURE IN THE TURBINE BUILDING. STEAM GENERATOR LEVELS SWELL AND PRESSURE DECREASES. STEAM FLOW INDICATION (SG-FR-1112 AND 1122) INCREASES UPSCALE. RCS TEMPERATURE AND PRESSURE DECREASE. REACTOR TRIPS ON LOW STEAM GENERATOR PRESSURE WHICH ALSO ISOLATES THE STEAM GENERATORS (MSIS). MSIV CLOSURE ISOLATES THE LEAK. STEAM GENERATOR LEVELS ARE RESTORED BY EMERGENCY FEEDWATER. CONTAINMENT ISOLATION (CIAS) AND SAFETY INJECTION (SIAS) SYSTEMS ARE INITIATED IF PZR PRESSURE REACHES THE LOW PRESSURE SETPOINT. COOLDOWN CAN COMMENCE USING ATMOSPHERIC DUMP VALVES. THE MALFUNCTION IS NON-RECOVERABLE.**

4. Date Tested: **01/28/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **10 & 100 %**

6. Test Termination Conditions: **Stable plant, reactor tripped, MSIS actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

[illegible]

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Startup NI Ch A PreAmp Failure (NI01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(21)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **NI PREAMPLIFIER OUTPUT FAILS AT SELECTED VALUE**

EFFECTS: **THIS MALFUNCTION FAILS THE OUTPUT SIGNAL FROM STARTUP CHANNEL A PRE-AMP TO ANY VALUE IN THE RANGE OF 0-10E5 CPS. THE MALFUNCTION VALUE IS INDICATED ON SEN-JI-005 AND SEN-JR-005 ON B04. A STARTUP CHANNEL HI CPS ANNUNCIATOR (SU AND CONT CH TRBL) ON B04 OCCURS ABOVE 2000 CPS. MALFUNCTION REMOVAL RESTORES THE PRE-AMP OUTPUT SIGNAL TO NORMAL.**

4. Date Tested: **01/26/91**

5. Test Initial Conditions: **Mode 3, NOP, NOT SEN-5A and SEN-HS-6A selected to Startup Channels.**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Malfunction removed and normal count rate indications restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

[illegible]

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Startup NI Ch B PreAmp Failure (NI01B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(21)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **NI PREAMPLIFIER OUTPUT FAILS AT SELECTED VALUE**

   EFFECTS: **THIS MALFUNCTION FAILS THE OUTPUT SIGNAL FROM STARTUP CHANNEL B PRE-AMP TO ANY VALUE IN THE RANGE OF 0-10E5 CPS. THE MALFUNCTION VALUE IS INDICATED ON SEN-JI-005 AND SEN-JR-005 ON B04. A STARTUP CHANNEL HI CPS ANNUNCIATOR (SU AND CONT CH TRBL) ON B04 OCCURS ABOVE 2000 CPS. MALFUNCTION REMOVAL RESTORES THE PRE-AMP OUTPUT SIGNAL TO NORMAL.**

4. Date Tested: **01/26/91**

5. Test Initial Conditions: **Mode 3, NOP, NOT SEN-5A and SEN-HS-6A selected to Startup Channels.**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Malfunction removed and normal count rate indications restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Control Channel NI A Detector Failure (NI02A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(21)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DETECTOR OUTPUT FAILS TO SELECTED VALUE

   EFFECTS: THIS MALFUNCTION FAILS THE SELECTED NI CONTROL CHANNEL SIGNAL TO A VALUE WITHIN THE RANGE OF 0-125% POWER. THE NI CONTROL CHANNEL SIGNAL IS USED AS FOLLOWS:

   - INDICATION SE-JI-007 ON B04
   - 15% POWER BISTABLE IN FWCS
   - REACTOR REG SYS FOR REACTIVITY CONTROL
   - SBCS FOR AMI GENERATION

   MALFUNCTION REMOVAL RESTORES NORMAL DETECTOR OUTPUT.

4. Date Tested: 01/30/91

5. Test Initial Conditions: 100% RTP, BOC, CEDMCS in Auto Sequential, SEN-HS-5A and 6A selected to Control Channels, Reactor Reg and FWCS flux inputs selected to Average.

   a. Severity tested (if variable malfunction): 0-80%

6. Test Termination Conditions: Malfunction removed and NI Control Channel indications restored to normal.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Control Channel NI B Detector Failure (NI02B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(21)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **DETECTOR OUTPUT FAILS TO SELECTED VALUE**

   EFFECTS: **THIS MALFUNCTION FAILS THE SELECTED NI CONTROL CHANNEL SIGNAL TO A VALUE WITHIN THE RANGE OF 0-125% POWER. THE NI CONTROL CHANNEL SIGNAL IS USED AS FOLLOWS:**

   - **INDICATION SE-JI-007 ON B04**
   - **15% POWER BISTABLE IN FWCS**
   - **REACTOR REG SYS FOR REACTIVITY CONTROL**
   - **SBCS FOR AMI GENERATION**

   MALFUNCTION REMOVAL RESTORES NORMAL DETECTOR OUTPUT.

4. Date Tested: **01/31/91**

5. Test Initial Conditions: **100% RTP, BOC, CEDMCS in Auto Sequential, SEN-HS-5A and 6A selected to Control Channels, Reactor Reg and FWCS flux inputs selected to Average.**

   a. Severity tested (if variable malfunction): **0-80%**

6. Test Termination Conditions: **Malfunction removed and NI Control Channel indications restored to normal.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

[illegible]

MALFUNCTION TEST ABSTRACTS

1. Test Title: Control Channel NI C Detector Failure (NI02C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(21)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: DETECTOR OUTPUT FAILS TO SELECTED VALUE

EFFECTS: THIS MALFUNCTION FAILS THE SELECTED NI CONTROL CHANNEL SIGNAL TO A VALUE WITHIN THE RANGE OF 0-125% POWER. THE NI CONTROL CHANNEL SIGNAL IS USED AS FOLLOWS:

- INDICATION SE-JI-007 ON B04
- 15% POWER BISTABLE IN FWCS
- REACTOR REG SYS FOR REACTIVITY CONTROL
- SBCS FOR AMI GENERATION

MALFUNCTION REMOVAL RESTORES NORMAL DETECTOR OUTPUT.

4. Date Tested: 01/30/91

5. Test Initial Conditions: 100% RTP, BOC, CEDMCS in Auto Sequential, SEN-HS-5A and 6A selected to Control Channels, Reactor Reg and FWCS flux inputs selected to Average.

   a. Severity tested (if variable malfunction): 0-80%

6. Test Termination Conditions: Malfunction removed and NI Control Channel indications restored to normal.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Control Channel NI D Detector Failure (NI02D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(21)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **DETECTOR OUTPUT FAILS TO SELECTED VALUE**

   EFFECTS: **THIS MALFUNCTION FAILS THE SELECTED NI CONTROL CHANNEL SIGNAL TO A VALUE WITHIN THE RANGE OF 0-125% POWER. THE NI CONTROL CHANNEL SIGNAL IS USED AS FOLLOWS:**

   - **INDICATION SE-JI-007 ON B04**
   - **15% POWER BISTABLE IN FWCS**
   - **REACTOR REG SYS FOR REACTIVITY CONTROL**
   - **SBCS FOR AMI GENERATION**

   MALFUNCTION REMOVAL RESTORES NORMAL DETECTOR OUTPUT.

4. Date Tested: **01/31/91**

5. Test Initial Conditions: **100% RTP, BOC, CEDMCS in Auto Sequential, SEN-HS-5A and 6A selected to Control Channels, Reactor Reg and FWCS flux inputs selected to Average.**

   a. Severity tested (if variable malfunction): **0-80%**

6. Test Termination Conditions: **Malfunction removed and NI Control Channel indications restored to normal.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Safety Channel NI Middle Detector Failure (NI04B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: DETECTOR OUTPUT FAILS TO SELECTED VALUE

EFFECTS: THIS MALFUNCTION FAILS NI SAFETY CHANNEL B MIDDLE DETECTOR OUTPUT TO ANY VALUE IN THE RANGE OF 0-200% POWER. THE DETECTOR SIGNAL IS PROCESSED BY A LINEAR AMPLIFIER AND USED BY CPC FOR LPD AND DNBR CALCULATIONS AND, BY PPS FOR OVERPOWER PROTECTION. THE DETECTOR OUTPUT IS ALSO PROCESSED BY A LOG PRE-AMP AND USED IN THE LOGARITHMIC SAFETY CHANNEL MALFUNCTION REMOVAL RESTORES NORMAL DETECTOR OUTPUT.

4. Date Tested: 02/13/91

5. Test Initial Conditions: 75 & 100 % RTP, BOC

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Stable plant, malfunction removed, normal system operation restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Safety Channel NI Middle Detector Failure (NI04D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: DETECTOR OUTPUT FAILS TO SELECTED VALUE

EFFECTS: THIS MALFUNCTION FAILS NI SAFETY CHANNEL D MIDDLE DETECTOR OUTPUT TO ANY VALUE IN THE RANGE OF 0-200% POWER. THE DETECTOR SIGNAL IS PROCESSED BY A LINEAR AMPLIFIER AND USED BY CPC FOR LPD AND DNBR CALCULATIONS AND, BY PPS FOR OVERPOWER PROTECTION. THE DETECTOR OUTPUT IS ALSO PROCESSED BY A LOG PRE-AMP .AND USED IN THE LOGARITHMIC SAFETY CHANNEL MALFUNCTION REMOVAL RESTORES NORMAL DETECTOR OUTPUT.

4. Date Tested: 02/13/91

5. Test Initial Conditions: 75 & 100 % RTP, BOC

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Stable plant, malfunction removed, normal system operation restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3259, 3260

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Safety Channel NI Lower Detector Failure (NI05B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **DETECTOR OUTPUT FAILS TO SELECTED VALUE**

   EFFECTS: **THIS MALFUNCTION FAILS NI SAFETY CHANNEL B LOWER DETECTOR OUTPUT TO ANY VALUE IN THE RANGE OF 0-200% POWER. THE DETECTOR SIGNAL IS PROCESSED BY A LINEAR AMPLIFIER AND USED BY CPC FOR LPD AND DNBR CALCULATIONS AND, BY PPS FOR OVERPOWER PROTECTION. THE DETECTOR OUTPUT IS ALSO PROCESSED BY A LOG PRE-AMP AND USED IN THE LOGARITHMIC SAFETY CHANNEL MALFUNCTION REMOVAL RESTORES NORMAL DETECTOR OUTPUT.**

4. Date Tested: **02/03/91**

5. Test Initial Conditions: **75 & 100 % RTP, BOC**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Stable plant, malfunction removed, normal system operation restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3587**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

[illegible]

1. Test Title: Safety Channel NI Lower Detector Failure (NI05D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DETECTOR OUTPUT FAILS TO SELECTED VALUE

   EFFECTS: THIS MALFUNCTION FAILS NI SAFETY CHANNEL D LOWER DETECTOR OUTPUT TO ANY VALUE IN THE RANGE OF 0-200% POWER. THE DETECTOR SIGNAL IS PROCESSED BY A LINEAR AMPLIFIER AND USED BY CPC FOR LPD AND DNBR CALCULATIONS AND, BY PPS FOR OVERPOWER PROTECTION. THE DETECTOR OUTPUT IS ALSO PROCESSED BY A LOG PRE-AMP AND USED IN THE LOGARITHMIC SAFETY CHANNEL MALFUNCTION REMOVAL RESTORES NORMAL DETECTOR OUTPUT.

4. Date Tested: 02/03/91

5. Test Initial Conditions: 75 & 100 % RTP, BOC

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Stable plant, malfunction removed, normal system operation restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3587

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **Pressurizer Safety Valve 200 Failure (RC01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(1)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **VALVE FAILS TO SELECTED POSITION**

EFFECTS: **AT 100% MALFUNCTION SEVERITY, THE AFFECTED PRESSURIZER SAFETY VALVE FAILS TO THE FULL OPEN POSITION. STEAM FLOW FROM THE PRESSURIZER GOES TO THE REACTOR DRAIN TANK. REACTOR DRAIN TANK PRESSURE AND LEVEL AND TEMPERATURE ON B03 INCREASE. HIGH ANNUNCIATORS FOR THESE PARAMETERS OCCUR ON B03. A DEPRESSURIZATION OCCURS WITH SUBSEQUENT LOW PRESSURE REACTOR TRIP AND ESFAS ACTUATION OF CONTAINMENT ISOLATION (CIAS) AND SAFETY INJECTION (SIAS). PRESSURIZER PRESSURE AND LEVEL DECREASE CAUSES THEIR CONTROL SYSTEMS TO RESPOND IN AN ATTEMPT TO RETURN THESE PARAMETERS TO THEIR NORMAL SETPOINTS. PRESSURIZER RELIEF LINE TEMPERATURE INCREASES FROM THE VALVE OPENING ON B04 AND PZR TRBL ANNUNCIATOR OCCURS ON B04. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE RELIEF VALVE.**

4. Date Tested: **02/10/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **10 & 100 %**

6. Test Termination Conditions: **Stable plant with reactor tripped and SIAS actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3231, 3234, 3237**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **Pressurizer Safety Valve 201 Failure (RC01B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(1)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **VALVE FAILS TO SELECTED POSITION**

   EFFECTS: **AT 100% MALFUNCTION SEVERITY, THE AFFECTED PRESSURIZER SAFETY VALVE FAILS TO THE FULL OPEN POSITION. STEAM FLOW FROM THE PRESSURIZER GOES TO THE REACTOR DRAIN TANK. REACTOR DRAIN TANK PRESSURE AND LEVEL AND TEMPERATURE ON B03 INCREASE. HIGH ANNUNCIATORS FOR THESE PARAMETERS OCCUR ON B03. A DEPRESSURIZATION OCCURS WITH SUBSEQUENT LOW PRESSURE REACTOR TRIP AND ESFAS ACTUATION OF CONTAINMENT ISOLATION (CIAS) AND SAFETY INJECTION (SIAS). PRESSURIZER PRESSURE AND LEVEL DECREASE CAUSES THEIR CONTROL SYSTEMS TO RESPOND IN AN ATTEMPT TO RETURN THESE PARAMETERS TO THEIR NORMAL SETPOINTS. PRESSURIZER RELIEF LINE TEMPERATURE INCREASES FROM THE VALVE OPENING ON B04 AND PZR TRBL ANNUNCIATOR OCCURS ON B04. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE RELIEF VALVE.**

4. Date Tested: **02/10/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **10 & 100 %**

6. Test Termination Conditions: **Stable plant with reactor tripped and SIAS actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3231, 3234, 3237**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

[illegible]

1. Test Title: PZR Spray Valve Fails (RC02A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: E/P CONVERTER FAILS TO SEVERITY POSITION

   EFFECTS: AT 100% SEVERITY, THIS MALFUNCTION FAILS THE AFFECTED PRESSURIZER SPRAY VALVE FULLY OPEN. THE PRESSURIZER IS SPRAYED FROM THE COLD LEG. AS PZR PRESSURE DECREASES, THE BACKUP HEATERS ENERGIZE AND PZR LO PRESSURE ANNUNCIATES ON B04. ENERGY INPUT FROM THE BACKUP HEATERS REDUCES THE DEPRESSURIZATION RATE BUT PRESSURE CONTINUES TO DROP. EFFECTS OF THIS MALFUNCTION CAN BE MITIGATED BY CLOSING THE PRESSURIZER SPRAY VALVE ISOLATION VALVE VIA REMOTE FUNCTION. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE PZR SPRAY VALVE.

4. Date Tested: 01/20/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 0 & 100%

6. Test Termination Conditions: Stable Plant, Reactor tripped. Stable plant, malfunction removed and normal spray restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: PZR Spray Valve Fails (RC02B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: E/P CONVERTER FAILS TO SEVERITY POSITION

   EFFECTS: AT 100% SEVERITY, THIS MALFUNCTION FAILS THE AFFECTED PRESSURIZER SPRAY VALVE FULLY OPEN. THE PRESSURIZER IS SPRAYED FROM THE COLD LEG. AS PZR PRESSURE DECREASES, THE BACKUP HEATERS ENERGIZE AND PZR LO PRESSURE ANNUNCIATES ON B04. ENERGY INPUT FROM THE BACKUP HEATERS REDUCES THE DEPRESSURIZATION RATE BUT PRESSURE CONTINUES TO DROP. EFFECTS OF THIS MALFUNCTION CAN BE MITIGATED BY CLOSING THE PRESSURIZER SPRAY VALVE ISOLATION VALVE VIA REMOTE FUNCTION. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE PZR SPRAY VALVE.

4. Date Tested: 01/20/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 0 & 100%

6. Test Termination Conditions: Stable Plant, Reactor tripped. Stable plant, malfunction removed and normal spray restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RCP 1A Locked Rotor (RC05A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(4)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SHAFT SEIZURE

   EFFECTS: THE AFFECTED RCP SHAFT INSTANTANEOUSLY SEIZES. MOTOR CURRENT INCREASES RAPIDLY, THE PUMP BREAKER IS TRIPPED AND LOCKED OUT FROM OVERCURRENT. THE OVERCURRENT TRIP IS ANNUNCIATED ON B04. LOOP FLOW COASTDOWN IS RAPID. RCP DIFFERENTIAL PRESSURE ON B04 AND SG DP ON B05 DECREASE RAPIDLY. REACTOR TRIPS ON LOW SG 1 RCS FLOW WITH ANNUNCIATION OF THE TRIP ON B05. PLANT RESPONDS AS EXPECTED TO THE REACTOR AND TURBINE TRIP. MALFUNCTION REMOVAL REMOVES THE CAUSE OF THE SHAFT SEIZURE. THE RCP CAN BE RESTARTED AFTER THE 286 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/20/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, reactor tripped, malfunction removed and pump reset.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 2726

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

[illegible]

[illegible]

[illegible]

1. Test Title: RCP 2A Locked Rotor (RC05C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(4)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SHAFT SEIZURE

   EFFECTS: THE AFFECTED RCP SHAFT INSTANTANEOUSLY SEIZES. MOTOR CURRENT INCREASES RAPIDLY, THE PUMP BREAKER IS TRIPPED AND LOCKED OUT FROM OVERCURRENT. THE OVERCURRENT TRIP IS ANNUNCIATED ON B04. LOOP FLOW COASTDOWN IS RAPID. RCP DIFFERENTIAL PRESSURE ON B04 AND SG DP ON B05 DECREASE RAPIDLY. REACTOR TRIPS ON LOW SG 1 RCS FLOW WITH ANNUNCIATION OF THE TRIP ON B05. PLANT RESPONDS AS EXPECTED TO THE REACTOR AND TURBINE TRIP. MALFUNCTION REMOVAL REMOVES THE CAUSE OF THE SHAFT SEIZURE. THE RCP CAN BE RESTARTED AFTER THE 286 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/20/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, reactor tripped, malfunction removed and pump reset.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 2726

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Dropped CEA 60 (RD01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: GROUND ON CEDM UPPER HOLD COIL

   EFFECTS: THIS MALFUNCTION CAUSES A DROP OR SLIP OF THE AFFECTED CEA. THE MALFUNCTION IS DESIGNED SO THAT THE CEA POSITION CHANGES BY 1.5 " FOR EVERY 1% MALFUNCTION SEVERITY. AT 100% SEVERITY, THE CEA DROPS TO THE BOTTOM OF THE CORE. ALL INDICATIONS OF INDIVIDUAL CEA POSITION SHOW CEA 60 AT CORE BOTTOM. ANNUNCIATORS FOR CEA TECH SPEC VIOLATION AND CWP (CEA WITHDRAWAL PROHIBIT) ON B04 AND A CEA DEVIATION ALARM (CPC/CEAC TRBL) ON B05 MAY OCCUR. MALFUNCTION REMOVAL REMOVES THE CEDM FAILURE. THE SELECTED CEDM CAN BE OPERATED.

4. Date Tested: **02/09/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Stable plant with reactor tripped.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Dropped CEA 19 (RD01B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: GROUND ON CEDM UPPER HOLD COIL

   EFFECTS: THIS MALFUNCTION CAUSES A DROP OR SLIP OF THE AFFECTED CEA. THE MALFUNCTION IS DESIGNED SO THAT THE CEA POSITION CHANGES BY 1.5 " FOR EVERY 1% MALFUNCTION SEVERITY. AT 100% SEVERITY, THE CEA DROPS TO THE BOTTOM OF THE CORE. ALL INDICATIONS OF INDIVIDUAL CEA POSITION SHOW THE AFFECTED CEA AT CORE BOTTOM. ANNUNCIATORS FOR CEA TECH SPEC VIOLATION AND CWP (CEA WITHDRAWAL PROHIBIT) ON B04 AND A CEA DEVIATION ALARM (CPC/CEAC TRBL) ON B05 MAY OCCUR. MALFUNCTION REMOVAL REMOVES THE CEDM FAILURE. THE SELECTED CEDM CAN BE OPERATED.

4. Date Tested: 02/09/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 100%

6. Test Termination Conditions: Stable plant with reactor not tripped.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Stuck CEA 04 (RD02A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING OF CEA

   EFFECTS: THIS MALFUNCTION MECHANICALLY BINDS THE SELECTED CEA AT IT'S PRESENT POSITION IN THE CORE. THE ROD CANNOT BE MOVED BY THE CONTROL ELEMENT DRIVE SYSTEM AND DOES NOT INSERT ON A TRIP SIGNAL. ROD POSITION INDICATION FOR THE STUCK ROD DOES NOT CHANGE WHEN ITS SUBGROUP IS MOVED. THIS LEADS TO DEVIATION ALARMS ON B04. IF THE OTHER CEA'S IN THE GROUP ARE MOVED. FAILURE OF THE ROD TO MOVE MAY ALSO BE OBSERVED ON THE NUCLEAR INSTRUMENTATION INDICATION. MALFUNCTION REMOVAL ALLOWS THE ROD TO BE REPOSITIONED BY CEDMCS OR REACTOR TRIP.

4. Date Tested: 01/28/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, reactor tripped, malfunction removed and rod inserted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Stuck CEA 87 (RD02B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING OF CEA

   EFFECTS: THIS MALFUNCTION MECHANICALLY BINDS THE SELECTED CEA AT IT'S PRESENT POSITION IN THE CORE. THE ROD CANNOT BE MOVED BY THE CONTROL ELEMENT DRIVE SYSTEM AND DOES NOT INSERT ON A TRIP SIGNAL. ROD POSITION INDICATION FOR THE STUCK ROD DOES NOT CHANGE WHEN ITS SUBGROUP IS MOVED. THIS LEADS TO DEVIATION ALARMS ON B04 AND B05 IF THE OTHER CEA'S IN THE GROUP ARE MOVED. FAILURE OF THE ROD TO MOVE MAY ALSO BE OBSERVED ON THE NUCLEAR INSTRUMENTATION INDICATION. MALFUNCTION REMOVAL ALLOWS THE ROD TO BE REPOSITIONED BY CEDMCS OR REACTOR TRIP.

4. Date Tested: 01/28/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Malfunction removed after reactor tripped and rod insertion verified.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

[illegible]

MALFUNCTION TEST ABSTRACTS

1. Test Title: Stuck CEA 21 (RD02C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: MECHANICAL BINDING OF CEA

   EFFECTS: THIS MALFUNCTION MECHANICALLY BINDS THE SELECTED CEA AT IT'S PRESENT POSITION IN THE CORE. THE ROD CANNOT BE MOVED BY THE CONTROL ELEMENT DRIVE SYSTEM AND DOES NOT INSERT ON A TRIP SIGNAL. ROD POSITION INDICATION FOR THE STUCK ROD DOES NOT CHANGE WHEN ITS SUBGROUP IS MOVED. THIS LEADS TO DEVIATION ALARMS ON B04 AND B05 IF THE OTHER CEA'S IN THE GROUP ARE MOVED. FAILURE OF THE ROD TO MOVE MAY ALSO BE OBSERVED ON THE NUCLEAR INSTRUMENTATION INDICATION. MALFUNCTION REMOVAL ALLOWS THE ROD TO BE REPOSITIONED BY CEDMCS OR REACTOR TRIP.

4. Date Tested: 01/28/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Malfunction removed after reactor tripped and rod insertion verified.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Stuck CEA 02 (RD02D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL BINDING OF CEA**

   EFFECTS: **THIS MALFUNCTION MECHANICALLY BINDS THE SELECTED CEA AT IT'S PRESENT POSITION IN THE CORE. THE ROD CANNOT BE MOVED BY THE CONTROL ELEMENT DRIVE SYSTEM AND DOES NOT INSERT ON A TRIP SIGNAL. ROD POSITION INDICATION FOR THE STUCK ROD DOES NOT CHANGE WHEN ITS SUBGROUP IS MOVED. THIS LEADS TO DEVIATION ALARMS ON B04. IF THE OTHER CEA'S IN THE GROUP ARE MOVED. FAILURE OF THE ROD TO MOVE MAY ALSO BE OBSERVED ON THE NUCLEAR INSTRUMENTATION INDICATION. MALFUNCTION REMOVAL ALLOWS THE ROD TO BE REPOSITIONED BY CEDMCS OR REACTOR TRIP.**

4. Date Tested: **01/28/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant, reactor tripped, malfunction removed and rod inserted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: CEA Pu;se Counter Program Failure (RD03)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: PULSE COUNTER ALGORITHM FAILS AS IS

   EFFECTS: THIS MALFUNCTION FAILS THE CEA PULSE COUNTING PROGRAM AS IS. CEA POSITION VALUES FROM THIS PROGRAM REMAIN AT WHAT THEY WERE WHEN THE MALFUNCTION WAS ACTIVATED. AS CEA'S ARE MOVED, PULSE COUNTS ARE NOT UPDATED. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE CEA PULSE COUNTER PROGRAM.

4. Date Tested: 03/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Malfunction removed and pulse counter program restored.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3702

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Inoperable Shutdown Group A CEA (RD06A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUP SEQUENCER FAILS**

   EFFECTS: **THIS MALFUNCTION DISABLES GROUP MOVEMENT OF THE AFFECTED GROUPS RODS VIA THE CEDMCS. BOTH WITHDRAW AND INSERT CAPABILITY IS DISABLED. ALL RODS IN THIS GROUP FAIL AS IS. WHEN MOVEMENT IS DEMANDED, NO CHANGE IN GROUP OR INDIVIDUAL CEA POSITION INDICATION IS OBSERVED. INDIVIDUAL MANUAL CONTROL OF RODS IN THIS GROUP IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE SELECTED GROUP OF RODS.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, reactor tripped, all rods inserted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Inoperable Shutdown Group B CEA (RD06B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUP SEQUENCER FAILS**

   EFFECTS: **THIS MALFUNCTION DISABLES GROUP MOVEMENT OF THE AFFECTED GROUPS RODS VIA THE CEDMCS. BOTH WITHDRAW AND INSERT CAPABILITY IS DISABLED. ALL RODS IN THIS CONTROL GROUP FAIL AS IS. WHEN MOVEMENT IS DEMANDED, NO CHANGE IN GROUP OR INDIVIDUAL CEA POSITION INDICATION IS OBSERVED. INDIVIDUAL MANUAL CONTROL OF RODS IN THIS GROUP IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE SELECTED GROUP OF RODS.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, reactor tripped, all rods inserted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Inoperable Reg Group 1 CEA (RD06C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: GROUP SEQUENCER FAILS

   EFFECTS: THIS MALFUNCTION DISABLES GROUP MOVEMENT OF THE AFFECTED GROUPS RODS VIA THE CEDMCS. BOTH WITHDRAW AND INSERT CAPABILITY IS DISABLED. ALL RODS IN THIS CONTROL GROUP FAIL AS IS. WHEN MOVEMENT IS DEMANDED, NO CHANGE IN GROUP OR INDIVIDUAL CEA POSITION INDICATION IS OBSERVED. INDIVIDUAL MANUAL CONTROL OF RODS IN THIS GROUP IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE SELECTED GROUP OF RODS.

4. Date Tested: 02/12/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, reactor tripped, all rods inserted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **Inoperable Reg Group 2 CEA (RD06D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUP SEQUENCER FAILS**

   EFFECTS: **THIS MALFUNCTION DISABLES GROUP MOVEMENT OF THE AFFECTED GROUPS RODS VIA THE CEDMCS. BOTH WITHDRAW AND INSERT CAPABILITY IS DISABLED. ALL RODS IN THIS CONTROL GROUP FAIL AS IS. WHEN MOVEMENT IS DEMANDED, NO CHANGE IN GROUP OR INDIVIDUAL CEA POSITION INDICATION IS OBSERVED. INDIVIDUAL MANUAL CONTROL OF RODS IN THIS GROUP IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE SELECTED GROUP OF RODS.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, reactor tripped, all rods inserted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Inoperable Reg Group 3 CEA (RD06E)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUP SEQUENCER FAILS**

   EFFECTS: **THIS MALFUNCTION DISABLES GROUP MOVEMENT OF THE AFFECTED GROUPS RODS VIA THE CEDMCS. BOTH WITHDRAW AND INSERT CAPABILITY IS DISABLED. ALL RODS IN THIS CONTROL GROUP FAIL AS IS. WHEN MOVEMENT IS DEMANDED, NO CHANGE IN GROUP OR INDIVIDUAL CEA POSITION INDICATION IS OBSERVED. INDIVIDUAL MANUAL CONTROL OF RODS IN THIS GROUP IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE SELECTED GROUP OF RODS.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, reactor tripped, all rods inserted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Inoperable Reg Group 4 CEA (RD06F)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUP SEQUENCER FAILS**

   EFFECTS: **THIS MALFUNCTION DISABLES GROUP MOVEMENT OF THE AFFECTED GROUPS RODS VIA THE CEDMCS. BOTH WITHDRAW AND INSERT CAPABILITY IS DISABLED. ALL RODS IN THIS CONTROL GROUP FAIL AS IS. WHEN MOVEMENT IS DEMANDED, NO CHANGE IN GROUP OR INDIVIDUAL CEA POSITION INDICATION IS OBSERVED. INDIVIDUAL MANUAL CONTROL OF RODS IN THIS GROUP IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE SELECTED GROUP OF RODS.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: **Stable plant, reactor tripped, all rods inserted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Inoperable Reg Group 5 CEA (RD06G)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUP SEQUENCER FAILS**

   EFFECTS: **THIS MALFUNCTION DISABLES GROUP MOVEMENT OF THE AFFECTED GROUPS RODS VIA THE CEDMCS. BOTH WITHDRAW AND INSERT CAPABILITY IS DISABLED. ALL RODS IN THIS CONTROL GROUP FAIL AS IS. WHEN MOVEMENT IS DEMANDED, NO CHANGE IN GROUP OR INDIVIDUAL CEA POSITION INDICATION IS OBSERVED. INDIVIDUAL MANUAL CONTROL OF RODS IN THIS GROUP IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE SELECTED GROUP OF RODS.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, reactor tripped, all rods inserted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Inoperable Part Length CEA Group (RD06H)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **GROUP SEQUENCER FAILS**

   EFFECTS: **THIS MALFUNCTION DISABLES GROUP MOVEMENT OF THE AFFECTED GROUPS RODS VIA THE CEDMCS. BOTH WITHDRAW AND INSERT CAPABILITY IS DISABLED. ALL RODS IN THIS CONTROL GROUP FAIL AS IS. WHEN MOVEMENT IS DEMANDED, NO CHANGE IN GROUP OR INDIVIDUAL CEA POSITION INDICATION IS OBSERVED. INDIVIDUAL MANUAL CONTROL OF RODS IN THIS GROUP IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE SELECTED GROUP OF RODS.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, reactor tripped, all rods inserted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Uncoupled CEA Spider CEA 62 (RD07A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(12)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: CEA SPIDER UNCOUPLES FROM DRIVE SHAFT

EFFECTS: THIS MALFUNCTION UNCOUPLES THE AFFECTED CEA FROM IT'S DRIVE MECHANISM. THE ROD DROPS INTO THE CORE. THE ROD POSITION INDICATION SYSTEM CONTINUES TO SHOW DRIVE MECHANISM POSITION. ANNUNCIATORS ASSOCIATED WITH A DROPPED ROD OR ROD DEVIATION DO NOT OCCUR. THE NEGATIVE REACTIVITY FROM THE DROPPED ROD WILL CAUSE POWER AND T-AVE TO DECREASE. THE COOLDOWN CAUSES PZR LEVEL AND PRESSURE TO DECREASE. NUCLEAR INSTRUMENTATION MAY SHOW THE FLUX TILT IN THE CORE. MAGNITUDE OF THE EFFECTS DEPENDS ON INITIAL ROD POSITION AND ROD WORTH. MALFUNCTION REMOVAL ALLOWS ROD RECOUPLING. THE ROD IS ONLY RECOUPLED WHEN THE DRIVE MECHANISM IS AT, OR IS MOVED TO, THE FULL INSERTED POSITION.

4. Date Tested: 02/07/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, reactor tripped.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Uncoupled CEA Spider CEA 68 (RD07B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **CEA SPIDER UNCOUPLES FROM DRIVE SHAFT**

EFFECTS: **THIS MALFUNCTION UNCOUPLES THE AFFECTED CEA FROM IT'S DRIVE MECHANISM. THE ROD DROPS INTO THE CORE. THE ROD POSITION INDICATION SYSTEM CONTINUES TO SHOW DRIVE MECHANISM POSITION. ANNUNCIATORS ASSOCIATED WITH A DROPPED ROD OR ROD DEVIATION DO NOT OCCUR. THE NEGATIVE REACTIVITY FROM THE DROPPED ROD WILL CAUSE POWER AND T-AVE TO DECREASE. THE COOLDOWN CAUSES PZR LEVEL AND PRESSURE TO DECREASE. NUCLEAR INSTRUMENTATION MAY SHOW THE FLUX TILT IN THE CORE. MAGNITUDE OF THE EFFECTS DEPENDS ON INITIAL ROD POSITION AND ROD WORTH. MALFUNCTION REMOVAL ALLOWS ROD RECOUPLING. THE ROD IS ONLY RECOUPLED WHEN THE DRIVE MECHANISM IS AT, OR IS MOVED TO, THE FULL INSERTED POSITION.**

4. Date Tested: **02/07/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, reactor tripped.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Uncontrolled Reg Group Withdrawal (RD12A-B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **WITHDRAWAL RELAY FAILS IN MOTION DEMAND POSITION WITH THE AUTO SEQUENTIAL MODE SELECTED (RD12A) AND MANUAL SEQUENTIAL MODE (RD12B).**

EFFECTS: **ACTIVATION OF MALFUNCTION RD12A INITIATES CONTINUOUS WITHDRAWAL OF ROD GROUPS SELECTED BY THE COMPUTER AT THE RATE SELECTED BY THE REACTOR REGULATING SYSTEM. OUTWARD MOTION OF THE RODS IS INDICATED BY ROD POSITION INDICATION SYSTEMS. DURING THE ROD WITHDRAWAL, REACTOR POWER AND RCS TEMPERATURES ARE INCREASING. ANNUNCIATORS ON B04 FOR CONTINUOUS CEA MOTION (CEDMCS TRBL) AND TAVG-TREF HI AND AWP (AUTOMATIC WITHDRAW PROHIBIT) OCCUR. CONTINUED WITHDRAWAL MAY RESULT IN AN OVER-POWER REACTOR TRIP. THIS MALFUNCTION CAUSES CONTINUOUS ROD WITHDRAWAL WHILE MANUAL SEQUENTIAL MODE IS SELECTED. EFFECTS ARE SIMILAR TO RD12A. ROD WITHDRAWAL CAN BE STOPPED BY SELECTING A MODE OTHER THAN MANUAL SEQUENTIAL. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF CEDMCS.**

4. Date Tested: **02/04/91**

5. Test Initial Conditions: **50% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, malfunction inserted and rod motion stopped by operator action.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Uncontrolled Rod Insertion (RD13A-B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(12)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **INSERTION RELAY FAILS IN MOTION DEMAND POSITION (RD13A) AND INSERTION RELAY FAILS IN MOTION DEMAND POSITION**

   EFFECTS: **ACTIVATION OF MALFUNCTION RD13A OR RD13B INITIATES CONTINUOUS INSERTION OF ROD GROUPS SELECTED BY THE COMPUTER AT THE RATE SELECTED BY THE REACTOR REGULATING SYSTEM. INWARD MOTION OF THE RODS IS INDICATED BY ROD POSITION INDICATION SYSTEMS. DURING THE ROD INSERTION, REACTOR POWER AND RCS TEMPERATURES DECREASE. ANNUNCIATORS ON B04 FOR CONTINUOUS CEA MOTION (CEDMCS TRBL) AND TAVG-TREF LO ALARM. WITHDRAW DEMAND SIGNALS ARE GENERATED BUT INSERTION CONTINUES AS LONG AS THE MALFUNCTION IS ACTIVE. THE ROD INSERTION MAY BE STOPPED BY SELECTING A MODE OTHER THAN AUTO SEQUENTIAL FOR RD13A OR MANUAL SEQUENTIAL FOR RD13B ON THE CEDMCS OPERATOR MODULE ON B04. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF CEDMCS.**

4. Date Tested: **01/30/91**

5. Test Initial Conditions: **100% RTP, BOC, CEDMCS in Standby, no Tavg-Tref deviation.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **CEA motion arrested by placing CEDMCS in Standby.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Containment Spray Pump A Trip (RH05A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAULTY 750G RELAY TRIPS PUMP BREAKER

   EFFECTS: THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO CS PUMP DUE TO A FAILED GROUND FAULT OVERCURRENT RELAY. AN ACTUAL FAULT DOES NOT OCCUR. PUMP DISCHARGE PRESSURE INDICATION ON B02 DROPS. IF SPRAYING THE CONTAINMENT, FLOW INDICATION ON B02 ALSO DECREASES. PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. THE MALFUNCTION IS PASSIVE WHEN INSERTED WITH THE PUMP NOT RUNNING. THE PUMP WILL NOT START WHEN DEMANDED. MALFUNCTION REMOVAL REMOVES THE BREAKER TRIP SIGNAL. THE BREAKER CAN BE CLOSED AFTER THE 786 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC, CS Pump A running after manual SIAS.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, malfunction removed, pump reset and restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Containment Spray Pump B Trip (RH05B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **FAULTY 750G RELAY TRIPS PUMP BREAKER**

EFFECTS: **THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO CS PUMP DUE TO A FAILED GROUND FAULT OVERCURRENT RELAY. AN ACTUAL FAULT DOES NOT OCCUR. PUMP DISCHARGE PRESSURE INDICATION ON B02 DROPS. IF SPRAYING THE CONTAINMENT, FLOW INDICATION ON B02 ALSO DECREASES. PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. THE MALFUNCTION IS PASSIVE WHEN INSERTED WITH THE PUMP NOT RUNNING. THE PUMP WILL NOT START WHEN DEMANDED. MALFUNCTION REMOVAL REMOVES THE BREAKER TRIP SIGNAL. THE BREAKER CAN BE CLOSED AFTER THE 786 LOCKOUT RELAY IS RESET.**

4. Date Tested: **01/15/91**

5. Test Initial Conditions: **100% RTP, BOC, CS Pump B running after manual SIAS.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant, malfunction removed, pump reset and restarted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: LPSI Pump A Trip (RH06A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAULTY 750G RELAY TRIPS PUMP BREAKER

   EFFECTS: THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO THE LPSI PUMP DUE TO A FAILED GROUND FAULT OVERCURRENT RELAY. AN ACTUAL FAULT DOES NOT OCCUR. PUMP DISCHARGE PRESSURE INDICATION ON B02 DROPS. IF INJECTING TO THE RC SYSTEM FOR LOW PRESSURE SAFETY INJECTION OR SHUTDOWN COOLING, FLOW TO RC LOOPS IS TERMINATED. THE PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. THE MALFUNCTION IS PASSIVE WHEN INSERTED WITH THE PUMP NOT RUNNING. THE PUMP WILL NOT START WHEN DEMANDED. MALFUNCTION REMOVAL REMOVES THE BREAKER TRIP SIGNAL. THE BREAKER CAN BE CLOSED AFTER THE 786 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/20/91

5. Test Initial Conditions: 100% RTP, BOC, LPSI Pump running after manual SIAS.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and LPSI pump stopped by RAS.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: LPSI Pump B Trip (RH06B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: FAULTY 750G RELAY TRIPS PUMP BREAKER

EFFECTS: THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO THE LPSI PUMP DUE TO A FAILED GROUND FAULT OVERCURRENT RELAY. AN ACTUAL FAULT DOES NOT OCCUR. PUMP DISCHARGE PRESSURE INDICATION ON B02 DROPS. IF INJECTING TO THE RC SYSTEM FOR LOW PRESSURE SAFETY INJECTION OR SHUTDOWN COOLING, FLOW TO RC LOOPS IS TERMINATED. THE PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. THE MALFUNCTION IS PASSIVE WHEN INSERTED WITH THE PUMP NOT RUNNING. THE PUMP WILL NOT START WHEN DEMANDED. MALFUNCTION REMOVAL REMOVES THE BREAKER TRIP SIGNAL. THE BREAKER CAN BE CLOSED AFTER THE 786 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/20/91

5. Test Initial Conditions: 100% RTP, BOC, LPSI Pump running after manual SIAS.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and LPSI pump stopped by RAS.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: PMS Computer Failure (RJ02A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: PMS LARGE CORE STORE FAILURE

   EFFECTS: THIS MALFUNCTION FAILS THE PLANT COMPUTER (PC). ALL PC POINTS GO BAD. ALL PC OUTPUT IS LOST OR IS INVALID. THE CORE MONITORING COMPUTER (CMC) IS NOT AFFECTED BY THIS MALFUNCTION AND REMAINS FUNCTIONAL. MALFUNCTION REMOVAL RESTORES AVAILABILITY OF THE PLANT COMPUTER.

4. Date Tested: 03/08/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with the malfunction removed and the PMS restored to operable status.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3658, 3659

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: PMS Computer Failure (RJ02B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: PMS LARGE CORE STORE FAILURE

   EFFECTS: THIS MALFUNCTION FAILS THE PLANT COMPUTER (PC). ALL PC POINTS GO BAD. ALL PC OUTPUT IS LOST OR IS INVALID. THE CORE MONITORING COMPUTER (CMC) IS NOT AFFECTED BY THIS MALFUNCTION AND REMAINS FUNCTIONAL. MALFUNCTION REMOVAL RESTORES AVAILABILITY OF THE PLANT COMPUTER.

4. Date Tested: 03/08/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with the malfunction removed and the PMS restored to operable status.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3658, 3659

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RU-29 Output Fails High (RM01A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DETECTOR OUTPUT FAILS HIGH

   EFFECTS: THIS MALFUNCTION FAILS THE OUTPUT SIGNAL FROM THE DETECTOR HIGH. RADIATION UNIT RU-29 MONITORS THE CONTROL BUILDING OUTSIDE AIR INTAKE PLENUM. ACTIVATION OF THE MALFUNCTION INITIATES A CONTROL ROOM ESSENTIAL FILTRATION ACTUATION (CREFAS). CREFAS ANNUNCIATOR OCCURS ON B05. ALL SIMULATED INDICATIONS FROM THE MALFUNCTIONED DETECTOR GO UPSCALE.

4. Date Tested: 03/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with CREFAS actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RU-30 Output Fails High (RM01B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DETECTOR OUTPUT FAILS HIGH

   EFFECTS: THIS MALFUNCTION FAILS THE OUTPUT SIGNAL FROM THE DETECTOR HIGH. RADIATION UNIT RU-30 MONITORS THE CONTROL BUILDING OUTSIDE AIR INTAKE PLENUM. ACTIVATION OF THE MALFUNCTION INITIATES A CONTROL ROOM ESSENTIAL FILTRATION ACTUATION (CREFAS). CREFAS ANNUNCIATOR OCCURS ON B05. ALL SIMULATED INDICATIONS FROM THE MALFUNCTIONED DETECTOR GO UPSCALE.

4. Date Tested: 03/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with CREFAS actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RU-31 Fails High (RM01C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **DETECTOR OUTPUT FAILS HIGH**

   EFFECTS: **RU-31 MONITORS THE SPENT FUEL POOL AREA IN THE FUEL BUILDING. ACTIVATION OF THIS MALFUNCTION INITIATES A FUEL BUILDING ESSENTIAL FILTRATION ACTUATION (FBEVAS) WHICH IN TURN ACTUATES A CONTROL ROOM ESSENTIAL FILTRATION ACTUATION (CREFAS). FBEVAS AND CREFAS ANNUNCIATORS OCCUR ON B05. INDICATED SPENT FUEL POOL AREA RADIATION INCREASES UPSCALE.**

4. Date Tested: **03/03/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant, FBIAS and CREFAS actuated**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: RU-145 Fails High (RM01D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DETECTOR OUTPUT FAILS HIGH

   EFFECT: RU-145 MONITORS THE SPENT FUEL POOL AREA IN THE FUEL BUILDING. ACTIVATION OF THIS MALFUNCTION INITIATES A FUEL BUILDING ESSENTIAL FILTRATION ACTUATION (FBEVAS) WHICH IN TURN ACTUATES A CONTROL ROOM ESSENTIAL FILTRATION ACTUATION (CREFAS). FBEVAS AND CREFAS ANNUNCIATORS OCCUR ON B05. INDICATED SPENT FUEL POOL AREA RADIATION INCREASES UPSCALE.

4. Date Tested: 03/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, FBIAS and CREFAS actuated

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RU-37 Fails High (RM01E)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DETECTOR OUTPUT FAILS HIGH

   EFFECT: RU-37 MONITORS THE CONTAINMENT PURGE EXHAUST FLOW. ACTIVATION OF THE MALFUNCTION INITIATES A CONTAINMENT PURGE ISOLATION ACTUATION (CPIAS) WHICH IN TURN INITIATES A CONTROL ROOM ESSENTIAL FILTRATION ACTUATION (CREFAS). CPIAS AND CREFAS ANNUNCIATORS OCCUR ON B05. ALL SIMULATED INDICATIONS FROM THE MALFUNCTIONED DETECTOR GO UPSCALE.

4. Date Tested: 03/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, CPIAS and CREFAS actuated

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

[illegible]

MALFUNCTION TEST ABSTRACTS

1. Test Title: RU-38 Fails High (RM01F)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: DETECTOR OUTPUT FAILS HIGH

   EFFECT: RU-38 MONITORS THE CONTAINMENT PURGE EXHAUST FLOW. ACTIVATION OF THE MALFUNCTION INITIATES A CONTAINMENT PURGE ISOLATION ACTUATION (CPIAS) WHICH IN TURN INITIATES A CONTROL ROOM ESSENTIAL FILTRATION ACTUATION (CREFAS). CPIAS AND CREFAS ANNUNCIATORS OCCUR ON B05. ALL SIMULATED INDICATIONS FROM THE MALFUNCTIONED DETECTOR GO UPSCALE.

4. Date Tested: 03/04/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, CPIAS and CREFAS actuated

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RU-1 Output Fails High (RM01G)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **DETECTOR OUTPUT FAILS HIGH**

   EFFECTS: **THIS MALFUNCTION FAILS THE OUTPUT SIGNAL FROM THE DETECTOR HIGH. RADIATION UNIT RU-1 MONITORS CONTAINMENT BUILDING ATMOSPHERE. THIS MALFUNCTION CAUSES CONTAINMENT BUILDING ACTIVITY INDICATION TO GO FULL UPSCALE. NO AUTOMATIC ACTIONS ARE CAUSED BY THIS RADIATION UNIT.**

4. Date Tested: **03/04/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant with indications of high containment activity.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3591**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ESFAS Actuation Circuit Fuse Failure (RP01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FUSE IN THE MSIS TRAIN A LEG 1-3 ACTUATION CIRCUIT BLOWS**

   EFFECTS: **THIS MALFUNCTION CAUSES MSIS TRAIN A LEG 1-3 ACTUATION RELAYS TO TRIP. MSIS TRAIN A LEG 1-3 TRIP IS ANNUNCIATED ON B05. ALL MSIS TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.**

4. Date Tested: **01/26/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with MSIS Train A Leg 1-3 components actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ESFAS Actuation Circuit Fuse Failure (RP01B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FUSE IN THE MSIS TRAIN A LEG 2-4 ACTUATION CIRCUIT BLOWS**

   EFFECTS: **THIS MALFUNCTION CAUSES MSIS TRAIN A LEG 2-4 ACTUATION RELAYS TO TRIP. MSIS TRAIN A LEG 2-4 TRIP IS ANNUNCIATED ON B05. ALL MSIS TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.**

4. Date Tested: **01/26/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with MSIS Train A Leg 2-4 components actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ESFAS Actuation Circuit Fuse Failure (RP01E)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FUSE IN THE SIAS TRAIN A LEG 1-3 ACTUATION CIRCUIT BLOWS**

   EFFECTS: **THIS MALFUNCTION CAUSES SIAS TRAIN A LEG 1-3 ACTUATION RELAYS TO TRIP. SIAS TRAIN A LEG 1-3 TRIP IS ANNUNCIATED ON B05. ALL SIAS TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.**

4. Date Tested: **02/09/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with SIAS Train A Leg 1-3 components actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ESFAS Actuation Circuit Fuse Failure (RP01F)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FUSE IN THE SIAS TRAIN A LEG 2-4 ACTUATION CIRCUIT BLOWS**

   EFFECTS: **THIS MALFUNCTION CAUSES SIAS TRAIN A LEG 2-4 ACTUATION RELAYS TO TRIP. SIAS TRAIN A LEG 2-4 TRIP IS ANNUNCIATED ON B05. ALL SIAS TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with SIAS Train A Leg 2-4 components actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: ESFAS Actuation Circuit Fuse Failure (RP01K)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FUSE IN THE CIAS TRAIN B LEG 1-3 ACTUATION CIRCUIT BLOWS

   EFFECTS: THIS MALFUNCTION CAUSES CIAS TRAIN B LEG 1-3 ACTUATION RELAYS TO TRIP. CIAS TRAIN B LEG 1-3 TRIP IS ANNUNCIATED ON B05. ALL CIAS TRAIN B EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.

4. Date Tested: 02/04/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant conditions with CIAS Train B Leg 1-3 components actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3046, 3096, 3097

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions:

    a. Justification for the exceptions:

MALFUNCTION TEST ABSTRACTS

1. Test Title: ESFAS Actuation Circuit Fuse Failure (RP01L)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FUSE IN THE CIAS TRAIN B LEG 2-4 ACTUATION CIRCUIT BLOWS

   EFFECTS: THIS MALFUNCTION CAUSES CIAS TRAIN B LEG 2-4 ACTUATION RELAYS TO TRIP. CIAS TRAIN B LEG 2-4 TRIP IS ANNUNCIATED ON B05. ALL CIAS TRAIN B EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.

4. Date Tested: 02/06/91

5. Test Initial Conditions: 100% RTP, BOC, Containment Vent Isol valves open.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant with CIAS Train B equipment actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ESFAS Actuation Circuit Fuse Failure (RP01M)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FUSE IN THE CSAS TRAIN A LEG 1-3 ACTUATION CIRCUIT BLOWS**

   EFFECTS: **THIS MALFUNCTION CAUSES CSAS TRAIN A LEG 1-3 ACTUATION RELAYS TO TRIP. CSAS TRAIN A LEG 1-3 TRIP IS ANNUNCIATED ON B05. ALL CSAS TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.**

4. Date Tested: **02/18/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with CSAS Train A Leg 1-3 components actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ESFAS Actuation Circuit Fuse Failure (RP01N)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FUSE IN THE CSAS TRAIN A LEG 2-4 ACTUATION CIRCUIT BLOWS**

   EFFECTS: **THIS MALFUNCTION CAUSES CSAS TRAIN A LEG 2-4 ACTUATION RELAYS TO TRIP. CSAS TRAIN A LEG 2-4 TRIP IS ANNUNCIATED ON B05. ALL CSAS TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.**

4. Date Tested: **02/12/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with CSAS Train A Leg 2-4 components actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: ESFAS Actuation Circuit Fuse Failure (RP01S)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FUSE IN THE RAS TRAIN B LEG 1-3 ACTUATION CIRCUIT BLOWS

   EFFECTS: THIS MALFUNCTION CAUSES RAS TRAIN B LEG 1-3 ACTUATION RELAYS TO TRIP. RAS TRAIN B LEG 1-3 TRIP IS ANNUNCIATED ON B05. ALL RAS TRAIN B EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.

4. Date Tested: 02/06/91

5. Test Initial Conditions: 100% RTP, BOC.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant conditions with RAS Train B Leg 1-3 components actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: ESFAS Actuation Circuit Fuse Failure (RP01T)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FUSE IN THE RAS TRAIN B LEG 2-4 ACTUATION CIRCUIT BLOWS

   EFFECTS: THIS MALFUNCTION CAUSES RAS TRAIN B LEG 2-4 ACTUATION RELAYS TO TRIP. RAS TRAIN B LEG 2-4 TRIP IS ANNUNCIATED ON B05. ALL RAS TRAIN B EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.

4. Date Tested: 02/11/91

5. Test Initial Conditions: 100% RTP, BOC.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant conditions with RAS Train B Leg 2-4 components actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **ESFAS Actuation Circuit Fuse Failure (RP01W)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FUSE IN THE AFAS-1 TRAIN B LEG 1-3 ACTUATION CIRCUIT BLOWS**

   EFFECTS: **THIS MALFUNCTION CAUSES AFAS-1 TRAIN B LEG 1-3 ACTUATION RELAYS TO TRIP. AFAS TRAIN B LEG 1-3 TRIP IS ANNUNCIATED ON B05. ALL AFAS TRAIN B EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.**

4. Date Tested: **02/16/91**

5. Test Initial Conditions: **100% RTP, BOC, EDG's A and B running parallel to offsite sources and loaded to 1 MWe each.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with AFAS-1 Train B Leg 1-3 components actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: ESFAS Actuation Circuit Fuse Failure (RP01X)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FUSE IN THE AFAS-1 TRAIN A LEG 2-4 ACTUATION CIRCUIT BLOWS

   EFFECTS: THIS MALFUNCTION CAUSES AFAS-1 TRAIN A LEG 2-4 ACTUATION RELAYS TO TRIP. AFAS-1 TRAIN A LEG 2-4 TRIP IS ANNUNCIATED ON B05. ALL AFAS-1 TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.

4. Date Tested: 02/20/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant conditions with AFAS-1 Train A Leg 2-4 components actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: ESFAS Actuation Circuit Fuse Failure (RP01Y)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: FUSE IN THE AFAS-2 TRAIN A LEG 1-3 ACTUATION CIRCUIT BLOWS

EFFECTS: THIS MALFUNCTION CAUSES AFAS-2 TRAIN A LEG 1-3 ACTUATION RELAYS TO TRIP. AFAS-2 TRAIN A LEG 1-3 TRIP IS ANNUNCIATED ON B05. ALL AFAS-2 TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.

4. Date Tested: 02/21/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant conditions with AFAS-2 Train A Leg 1-3 components actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **ESFAS Actuation Circuit Fuse Failure (RP01Z)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FUSE IN THE AFAS-2 TRAIN A LEG 2-4 ACTUATION CIRCUIT BLOWS**

   EFFECTS: **THIS MALFUNCTION CAUSES AFAS-2 TRAIN A LEG 2-4 ACTUATION RELAYS TO TRIP. AFAS-2 TRAIN A LEG 2-4 TRIP IS ANNUNCIATED ON B05. ALL AFAS-2 TRAIN A EQUIPMENT ACTUATES. MALFUNCTION REMOVAL RESTORES THE BLOWN FUSE AND NORMAL ESFAS ACTUATION FUNCTION.**

4. Date Tested: **02/21/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant conditions with AFAS-2 Train A Leg 2-4 components actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Low SG Level Setpoint Failure (RP03A-H)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(11)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SETPOINT FAILS TO THE SELECTED VALUE

   EFFECTS: THIS MALFUNCTION ALLOWS THE REACTOR TRIP SETPOINT FOR THE AFFECTED PARAMETER AND CHANNEL TO BE CHANGED TO ANY VALUE WITHIN THE GIVEN RANGE. ONLY THE TRIP SETPOINT FOR THE SELECTED CHANNEL IS AFFECTED. INITIATING LOGIC (2 OUT OF 4 CHANNELS) AND ACTUATION LOGIC REMAINS THE SAME. MALFUNCTION REMOVAL RESTORES THE NORMAL SETPOINT.

4. Date Tested: 02/09/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Stable plant, malfunction removed and reactor trip setpoint restored to appropriate value.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: BOP ESFAS Sequencer Failure (RP05A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SEQUENCER MICROPROCESSOR ABORTS THE PROGRAM

   EFFECTS: ALL ESFAS COMPONENTS SEQUENCED IN RESPONSE TO ESFAS ACTUATION CIRCUITS FAILS TO ACTUATE.

4. Date Tested: 02/27/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, Diesel Generator closed on S03 and partially loaded, SIAS actuated and not all components sequenced.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3668

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: BOP ESFAS Sequencer Failure (RP05B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SEQUENCER MICROPROCESSOR ABORTS THE PROGRAM

   EFFECTS: ALL ESFAS COMPONENTS SEQUENCED IN RESPONSE TO ESFAS ACTUATION CIRCUITS FAILS TO ACTUATE.

4. Date Tested: 02/27/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, Diesel Generator closed on S03 and partially loaded, SIAS actuated and not all components sequenced.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Low RCS Flow Setpoint Failure (RP26A-II)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(11)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **SETPOINT FAILS TO THE SELECTED VALUE**

   EFFECTS: **THIS MALFUNCTION ALLOWS THE REACTOR TRIP SETPOINT FOR THE AFFECTED PARAMETER AND CHANNEL TO BE CHANGED TO ANY VALUE WITHIN THE GIVEN RANGE. ONLY THE TRIP SETPOINT FOR THE SELECTED CHANNEL IS AFFECTED. INITIATING LOGIC (2 OUT OF 4 CHANNELS) AND ACTUATION LOGIC REMAINS THE SAME. MALFUNCTION REMOVAL RESTORES THE NORMAL SETPOINT.**

4. Date Tested: **02/09/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Stable plant, malfunction removed and reactor trip setpoint restored to appropriate value.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: RTSG TCB-1 Fails As Is (RP34A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(24)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: BREAKER BINDS MECHANICALLY

   EFFECTS: THIS MALFUNCTION FAILS THE AFFECTED REACTOR TRIP SWITCHGEAR BREAKER IN ITS CURRENT POSITION. THE MALFUNCTION IS PASSIVE WHEN FIRST ACTIVATED. ON A SUBSEQUENT REACTOR TRIP SIGNAL, THE BREAKER REMAINS CLOSED. IF THE REMAINING RTSG BREAKERS ARE NOT AFFECTED, THEY WILL OPEN AND A REACTOR TRIP OCCUR. MALFUNCTION REMOVAL RESTORES NORMAL BREAKER OPERATION. THE BREAKER OPERATES TO THE POSITION CALLED FOR BY THE CONTROL LOGIC WHEN THE MALFUNCTION IS REMOVED.

4. Date Tested: 01/19/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and reactor manually tripped.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RTSG TCB-2 Fails As Is (RP34B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(24)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: BREAKER BINDS MECHANICALLY

   EFFECTS: THIS MALFUNCTION FAILS THE AFFECTED REACTOR TRIP SWITCHGEAR BREAKER IN ITS CURRENT POSITION. THE MALFUNCTION IS PASSIVE WHEN FIRST ACTIVATED. ON A SUBSEQUENT REACTOR TRIP SIGNAL, THE BREAKER REMAINS CLOSED. IF THE REMAINING RTSG BREAKERS ARE NOT AFFECTED, THEY WILL OPEN AND A REACTOR TRIP OCCUR. MALFUNCTION REMOVAL RESTORES NORMAL BREAKER OPERATION. THE BREAKER OPERATES TO THE POSITION CALLED FOR BY THE CONTROL LOGIC WHEN THE MALFUNCTION IS REMOVED.

4. Date Tested: 01/19/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and reactor manually tripped.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: RTSG TCB-3 Fails As Is (RP34C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(24)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: BREAKER BINDS MECHANICALLY

   EFFECTS: THIS MALFUNCTION FAILS THE AFFECTED REACTOR TRIP SWITCHGEAR BREAKER IN ITS CURRENT POSITION. THE MALFUNCTION IS PASSIVE WHEN FIRST ACTIVATED. ON A SUBSEQUENT REACTOR TRIP SIGNAL, THE BREAKER REMAINS CLOSED. IF THE REMAINING RTSG BREAKERS ARE NOT AFFECTED, THEY WILL OPEN AND A REACTOR TRIP OCCUR. MALFUNCTION REMOVAL RESTORES NORMAL BREAKER OPERATION. THE BREAKER OPERATES TO THE POSITION CALLED FOR BY THE CONTROL LOGIC WHEN THE MALFUNCTION IS REMOVED.

4. Date Tested: 01/19/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and TCB manually cycled.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RTSG TCB-4 Fails As Is (RP34D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(24)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: BREAKER BINDS MECHANICALLY

   EFFECTS: THIS MALFUNCTION FAILS THE AFFECTED REACTOR TRIP SWITCHGEAR BREAKER IN ITS CURRENT POSITION. THE MALFUNCTION IS PASSIVE WHEN FIRST ACTIVATED. ON A SUBSEQUENT REACTOR TRIP SIGNAL, THE BREAKER REMAINS CLOSED. IF THE REMAINING RTSG BREAKERS ARE NOT AFFECTED, THEY WILL OPEN AND A REACTOR TRIP OCCUR. MALFUNCTION REMOVAL RESTORES NORMAL BREAKER OPERATION. THE BREAKER OPERATES TO THE POSITION CALLED FOR BY THE CONTROL LOGIC WHEN THE MALFUNCTION IS REMOVED.

4. Date Tested: 01/19/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and TCB manually cycled.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RTSG TCB-1 Trips (RP35A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(19)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAILED UV COIL IN BREAKER CONTROL CIRCUIT

   EFFECTS: THIS MALFUNCTION FAILS THE UV COIL IN RTSG BREAKER WHICH CAUSES THE BREAKER TO TRIP OPEN. ANNUNCIATOR REAC SWGR CKT BKR OPEN ALARMS ON B04. IF THE OTHER RTSG BREAKERS ARE CLOSED, NO REACTOR TRIP OCCURS. MALFUNCTION REMOVAL RESTORES NORMAL BREAKER OPERATION.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and breaker reclosed.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RTSG TCB-2 Trips (RP35B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(19)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAILED UV COIL IN BREAKER CONTROL CIRCUIT

   EFFECTS: THIS MALFUNCTION FAILS THE UV COIL IN RTSG BREAKER WHICH CAUSES THE BREAKER TO TRIP OPEN. ANNUNCIATOR REAC SWGR CKT BKR OPEN ALARMS ON B04. IF THE OTHER RTSG BREAKERS ARE CLOSED, NO REACTOR TRIP OCCURS. MALFUNCTION REMOVAL RESTORES NORMAL BREAKER OPERATION.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and breaker reclosed.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RTSG TCB-3 Trips (RP35C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(19)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAILED UV COIL IN BREAKER CONTROL CIRCUIT

   EFFECTS: THIS MALFUNCTION FAILS THE UV COIL IN RTSG BREAKER WHICH CAUSES THE BREAKER TO TRIP OPEN. ANNUNCIATOR REAC SWGR CKT BKR OPEN ALARMS ON B04. IF THE OTHER RTSG BREAKERS ARE CLOSED, NO REACTOR TRIP OCCURS. MALFUNCTION REMOVAL RESTORES NORMAL BREAKER OPERATION.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and breaker reclosed.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RTSG TCB-4 Trips (RP35D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(19)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAILED UV COIL IN BREAKER CONTROL CIRCUIT

   EFFECTS: THIS MALFUNCTION FAILS THE UV COIL IN RTSG BREAKER WHICH CAUSES THE BREAKER TO TRIP OPEN. ANNUNCIATOR REAC SWGR CKT BKR OPEN ALARMS ON B04. IF THE OTHER RTSG BREAKERS ARE CLOSED, NO REACTOR TRIP OCCURS. MALFUNCTION REMOVAL RESTORES NORMAL BREAKER OPERATION.

4. Date Tested: 01/15/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed and breaker reclosed.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Failure of RPCB to Actuate (RX01)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **1 OF 2 RPCB DROP RELAYS FAIL**

   EFFECTS: **THIS MALFUNCTION PREVENTS 1 OF THE 2 RPCB DROP RELAYS FROM SHIFTING TO THE DE-ENERGIZED POSITION ON RPCB AUTOMATIC INITIATION SIGNAL. BOTH RELAYS MUST DE-ENERGIZE TO INITIATE THE REQUIRED ACTION. DURING A LOAD REJECTION OR LOSS OF ONE FEED PUMP THE SELECTED CEA SUBGROUPS ARE NOT DROPPED, AND THE TURBINE RUNBACK AND TURBINE SETBACK ARE NOT INITIATED. LOSS OF ONE FEED PUMP RESULTS IN A LOW SG LEVEL REACTOR TRIP AND LOAD REJECTION CAUSES A LARGE INCREASE IN SG AND PRIMARY SYSTEM PRESSURES AND A SUBSEQUENT PLANT TRIP. MALFUNCTION REMOVAL RESTORES NORMAL OPERATION OF THE RPCS.**

4. Date Tested: **01/24/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant after reactor tripped by Hi PZR Press.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RRS T-avg Failure (RX03)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: T-AVE FUNCTION GENERATOR OUTPUT FAILS

EFFECTS: THIS MALFUNCTION FAILS THE T-AVE SIGNAL IN THE REACTOR REGULATING SYSTEM (RRS) TO ANY VALUE WITHIN THE RANGE OF INDICATION (500-650 F). THE FAULTY T-AVE SIGNAL IS DISPLAYED ON RC-TR-100 (B04). LOGIC AND EFFECTS ARE BASED ON MALFUNCTION SEVERITY AND THE PLANT CONDITIONS. THE T-AVE SIGNAL IS USED BY THE FOLLOWING:

1) RRS TO COMPARE AGAINST REFERENCE TEMP (BASED ON TURBINE LOAD) AND REACTOR POWER TO DEVELOP CEA MOTION DEMAND SIGNALS TO CEDMCS
2) PZR LEVEL CONTROL SYSTEM TO CALCULATE THE PROGRAMMED LEVEL SETPOINT INPUT TO THE PLCS MASTER CONTROLLER
FWCS FOR PRODUCING THE SG REFILL DEMAND SIGNAL FOLLOWING A REACTOR TRIP
3) SBCS TO GENERATE A QUICK OPEN BLOCK IF T-AVE IS LOW AND THE REACTOR IS TRIPPED
4) SBCS TO CONTROL TURBINE RUNBACK DURING RPCB
T AVG-T REF HI-LO ANNUNCIATOR (B04) AND AUTOMATIC WITHDRAW PROHIBIT SIGNAL (AWP) TO CEDMCS
5) MALFUNCTION REMOVAL RESTORES THE NORMAL T-AVE SIGNAL.

4. Date Tested: **01/20/91**

5. Test Initial Conditions: **100% RTP, BOC**
   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Stable plant, reactor tripped, malfunction removed and normal control system response restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None
    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RRS Turbine 1st Stage Pressure Fails (RX04)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **TRANSMITTER FAILURE**

   EFFECTS: **TURBINE FIRST STAGE PRESSURE TRANSMITTER OUTPUT SIGNAL FAILS TO THE MALFUNCTION SEVERITY. THIS SIGNAL PROVIDES A TURBINE LOAD INDEX (TLI) SIGNAL TO THE REACTOR REGULATING SYSTEM (RRS). THE TLI SIGNAL IS USED BY THE FOLLOWING - RRS TO DEVELOP A REFERENCE TEMPERATURE FOR COMPARISON WITH T-AVE AND REACTOR POWER TO DEVELOP CEA MOTION DEMAND SIGNALS TO CEDMCS - SBCS TO DEVELOP THE AUTOMATIC MOTION INHIBIT (AMI) SIGNAL TO CEDMCS - SBCS FOR TURBINE RUNBACK DEMAND DURING RPCB ACTUATION - RRS INPUT CHANNEL DEVIATION ALARM - REACTOR COOLANT REFERENCE TEMP INDICATION ON B04. MALFUNCTION REMOVAL RESTORES THE TRANSMITTER TO NORMAL.**

4. Date Tested: **02/03/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Stable plant, alternate transmitter selected for control functions.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results:

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **RRS Cold Leg Transmitter Failure (RX06A-B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: TRANSMITTER FAILURE

EFFECTS: RX06A: TRANSMITTER RCN-TT-111Y OUTPUT SIGNAL FAILS TO THE MALFUNCTION SEVERITY. THIS IS A NARROW RANGE TT (500-650 F) ON LOOP 1A COLD LEG. THE FAULTY SIGNAL IS DISPLAYED ON RC-TI-111Y (B04) AND IS ONLY USED BY THE REACTOR REGULATING SYSTEM (RRS) TO CALCULATE T-AVE. RX06B: TRANSMITTER RCN-TT-121Y FAILS. THIS TT IS ON LOOP 2B COLD LEG. EFFECTS ARE SIMILAR TO RX06A. MALFUNCTION REMOVAL RESTORES THE TRANSMITTER TO NORMAL.

4. Date Tested: **01/18/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Stable plant, malfunction removed and nominal system operating parameters restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **2687**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Spurious Turbine Runback (RX07)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SBCS RUNBACK BISTABLE FAILS TO THE RUNBACK POSITION

   EFFECTS: WITH THE MALFUNCTION ACTIVE THE SBCS PROVIDES A CONTINUOUS RUNBACK DEMAND SIGNAL TO THE REACTOR POWER CUTBACK SYSTEM (RPCS). WHEN A REACTOR POWER CUTBACK IS INITIATED (LOSS OF FEED PUMP OR RAPID LOAD CHANGE), A CONTINUOUS TURBINE RUNBACK OCCURS DUE THE FAILED BISTABLE OUTPUT. MALFUNCTION REMOVAL RESTORES THE SBCS RUNBACK CIRCUIT TO NORMAL OPERATION.

4. Date Tested: 01/18/91

5. Test Initial Conditions: 100% RTP, BOC, all control systems in automatic.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed turbine runback circuitry restored to normal function.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **SBCS Quick Open Circuit Failure (RX08)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **NOR GATE 201-4 OUTPUT FAILS TO 1 (QUICK OPEN BLOCK)**

   EFFECTS: **THIS MALFUNCTION SIMULATES A CONTINUOUS QUICK OPEN BLOCK SIGNAL. MALFUNCTION ACTIVATION DURING POWER OPERATION IS INITIALLY PASSIVE. WHEN A QUICK OPEN DEMAND IS INITIATED BY A RAPID TURBINE LOAD DECREASE, THE TURBINE BYPASS VALVES WILL NOT QUICK OPEN. AUTOMATIC MODULATION AS WELL AS MANUAL CONTROL OF THE STEAM BYPASS VALVES FROM THEIR INDIVIDUAL CONTROLLERS REMAINS AVAILABLE, HOWEVER, VALVE OPENING RATE MAY NOT BE QUICK ENOUGH TO PREVENT A LARGE STEAM PRESSURE INCREASE. MALFUNCTION REMOVAL RESTORES THE AVAILABILITY OF THE QUICK OPEN FEATURE.**

4. Date Tested: **01/18/91**

5. Test Initial Conditions: **100% RTP, BOC.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, with heat removal via SBCV's in modulation mode, malfunction removed, quick open circuit restored to functionality.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Steam Header Pressure Fails (RX09A-B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **TRANSMITTER FAILURE**

EFFECTS: **RX09A: SGN-PT-1024 OUTPUT SIGNAL FAILS TO ANY VALUE WITHIN THE INDICATED RANGE (900-1300 PSIA). INDICATION IS ON SGN-PI-1024 (B06). THE FAULTY TRANSMITTER SIGNAL IS ALSO USED BY SBCS TO DEVELOP THE STEAM BYPASS VALVE MODULATION DEMAND AND MODULATION PERMISSIVE SIGNALS BY COMPARING THIS SIGNAL AGAINST A PRESSURE SETPOINT. RX09B: SGN-PT-1027 FAILS. INDICATION IS ON SGN-PI-1027 (B06). EFFECTS ARE SIMILAR TO GENERIC A. MALFUNCTION REMOVAL RESTORES THE TRANSMITTER TO NORMAL.**

4. Date Tested: **01/30/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction):

6. Test Termination Conditions: **Stable plant, malfunction removed and nominal system operation restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results:

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **SBCS Master Controller Failure (RX10)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **CONTROLLER SETPOINT FAILS TO SELECTED VALUE**

   EFFECTS: **THIS MALFUNCTION FAILS THE SBCS MASTER CONTROLLER (SGN-PIC-1010) SETPOINT TO ANY VALUE IN THE INDICATED RANGE (900-1300 PSIA). THE SETPOINT CALCULATED BY SBCS IS OVERRIDDEN. MANUAL CONTROL OF THE SBCS NEGATES THE EFFECTS OF THIS MALFUNCTION. MALFUNCTION REMOVAL RESTORES THE NORMAL, CALCULATED SETPOINT.**

4. Date Tested: **01/20/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **50%**

6. Test Termination Conditions: **Stable plant, malfunction removed, SBCS functionality restored.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: FWCS SG Level Transmitter Failure (RX13-A-D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: TRANSMITTER FAILURE

EFFECTS: LT OUTPUT FAILS TO THE MALF SEVERITY. THIS IS A NARROW RANGE LT (0-100% INDICATED) FOR SG. THE FAULTY SIGNAL IS DISPLAYED ON B06 AND IS SUPPLIED TO THE FWCS. GREATER THAN 5% DEVIATION FROM LT GIVES A CHANNEL DEVIATION ANNUNCIATOR. THE FWCS RESPONSE TO THE FAULTY SIGNAL DEPENDS ON WHICH LEVEL CHANNEL IS SELECTED FOR CONTROL AND ON THE MALF SEVERITY. WITH LOW MALF SEVERITY FWCS RESPONDS WITH AN INCREASE IN THE FW FLOW DEMAND. BOTH FEEDPUMP SPEEDS INCREASE AND SG ECONOMIZER VALVE OPENS. ACTUAL LEVEL IN BOTH SG's INCREASES. UNAFFECTED SG ECONOMIZER VALVE CLOSES DOWN IN RESPONSE TO INCREASING LEVEL TO CONTROL UNAFFECTED SG LEVEL. AFFECTED SG LEVEL INCREASES TO THE HIGH LEVEL ALARM AT 86%. A HIGH LEVEL OVERRIDE SIGNAL IS NOT ACTUATED. AFFECTED SG LEVEL ACTIVATES A RX TRIP AND MSIS ACTUATION AT 91%. WITH MALF SEVERITY >88%, FWCS 2 HIGH LEVEL OVERRIDE SIGNAL (HLO) IS GENERATED. FLOW DEMAND IS SET TO 0. AFFECTED SG LEVEL DECREASES TO THE RX TRIP SETPOINT OF 44.2%. THE RX TRIPS. WITH A HIGH MALF SEVERITY (BUT LESS THAN 88%), AFFECTED FWC SYSTEM RESPONDS WITH AN DECREASE IN THE FW FLOW DEMAND. FW PUMPS SPEEDS REMAIN UNDER CONTROL OF THE HIGHER FLOW DEMAND FROM UNAFFECTED FWC SYSTEM. AFFECTED SG ECONOMIZER VALVE POSITION DEMAND DECREASES, CLOSING THE VALVE. ACTUAL AFFECTED SG LEVEL DECREASES TO THE LO LEVEL RX TRIP. THE EFFECTS OF THE MALF CAN BE NEGATED BY SELECTION OF THE NON-MALFUNCTIONED LT AS INPUT TO FWCS.

4. Date Tested: 01-20-91

5. Test Initial Conditions: 100% RTP BOC, All control systems in Auto, FWCS 1 & 2 selected to higher level.

   a. Severity tested (if variable malfunction): 0-100% Ramp

6. Test Termination Conditions: MSIS & Rx Trip

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None
   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: N/A

10. ANS 3.5-1985 exceptions: NONE

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **FWCS Steam Flow Transmitter Failure (RX14A-D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(22)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **TRANSMITTER FAILURE**

EFFECTS: **STEAM FLOW TRANSMITTER SIGNAL FAILS TO THE MALFUNCTION SEVERITY. RANGE IS 0 - 10 MLBM/HR. THE FAULTY SIGNAL IS DISPLAYED ON B06 AND IS INPUT TO THE FWCS. FOR A LOW SEVERITY FWCS RESPONDS BY LOWERING THE FEED FLOW DEMAND. STEAM GENERATOR LEVEL WILL ATTEMPT TO STABILIZE AT A LOWER LEVEL, COMPENSATING FOR THE STEAM/FEED MISMATCH. STEAM GENERATOR LEVEL MAY REACH THE LOW LEVEL REACTOR TRIP SETPOINT (44.2%) BEFORE IT CAN STABILIZE. FOR A HIGH SEVERITY FWCS RESPONDS BY INCREASING FLOW DEMAND. BOTH FEEDPUMPS INCREASE SPEED. THE AFFECTED SG ECONOMIZER VALVE CLOSES TO RESTORE NORMAL LEVEL. THE UNAFFECTED SG LEVEL INCREASES AND WILL ATTEMPT TO STABILIZE AT A HIGHER LEVEL COMPENSATING FOR THE STEAM/FEED MISMATCH . LEVEL MAY REACH THE HI LEVEL ALARM (86%), HLO (88%) AND REACTOR TRIP SETPOINT AND MSIS ACTUATION (91%). THE MALFUNCTION CAN BE OVERRIDDEN BY MANUAL OPERATION. MALFUNCTION REMOVAL RESTORES THE TRANSMITTER TO NORMAL.**

4. Date Tested: **01/20/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **0%**

6. Test Termination Conditions: **Stable Plant with SBCS quick open circuit actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: FWCS Master Controller Failure (RX17)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SETPOINT FAILS AT SELECTED VALUE

   EFFECTS: THE SETPOINT OF THE FWCS MASTER CONTROLLER FAILS TO THE SELECTED MALFUNCTION SEVERITY (0-100%). WITH THE CONTROLLER IN AUTOMATIC, THE FWCS RESPONDS TO THE MALFUNCTION SETPOINT THE SAME AS A RESPONSE TO A NORMAL SETPOINT CHANGE. MANUAL OPERATION OF THE CONTROLLER IS AVAILABLE WITH THIS MALFUNCTION ACTIVE. MALFUNCTION REMOVAL RESTORES THE NORMAL CONTROLLER SETPOINT VALUE.

4. Date Tested: 01/21/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 0 & 65%

6. Test Termination Conditions: Stable plant with FWCS controlled in manual.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: FWCS Refill Demand Controller Failure (RX18A-B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: OUTPUT SIGNAL FAILS TO THE SELECTED VALUE

   EFFECTS: THIS MALFUNCTION FAILS FWCS 1 REFILL DEMAND CONTROLLER OUTPUT TO THE MALFUNCTION SEVERITY. RANGE IS 0-24% FLOW DEMAND. AT HIGH SEVERITY, FEED FLOW IS EXCESSIVE FOR T-AVE. T-AVE DECREASES BELOW THE PROGRAMMED VALUE OF 564 F. WHEN SG LEVEL INCREASES TO 52 INCHES, LEVEL CONTROL TRANSFERS TO THE NORMAL LOW POWER MODE OF CONTROL AND TAKES CONTROL AWAY FROM THE REFILL DEMAND CONTROLLER. AT LOW SEVERITY, FEED FLOW IS INSUFFICIENT. T-AVE WILL BE HIGHER THAN THE PROGRAMMED VALUE AND SG LEVEL MAY NOT RECOVER. MALFUNCTION REMOVAL RESTORES THE CONTROLLER TO NORMAL.

4. Date Tested: 01/31/91

5. Test Initial Conditions: Mode 3, NOP, NOT, SBCS master in local at 1190 psia, HS-1142 and HS-1144 taken closed, SG levels manually maintained at 30% NR level, FWCS controllers 1111 and 1121 in auto at 40%.

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Stable Plant, malfunction removed and SG level restored by manual operation.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Pressurizer Level Transmitter Fails (RX23A-C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(18)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: TRANSMITTER FAILURE

   EFFECTS: THIS MALFUNCTION FAILS PZR LEVEL TRANSMITTER RCE-LT-110Y & X TO ANY VALUE WITHIN THE TRANSMITTER RANGE (0-100% INDICATED). THE FAULTY OUTPUT SIGNAL IS DISPLAYED ON RC-LI-110 (B04) AND ON RC-LR-110 (B04) IF CHANNEL IS SELECTED. THE SIGNAL IS USED BY THE PZR PRESS CONTROL AND PZR LEVEL CONTROL SYSTEMS.
   ASSUMING CHANNEL IS SELECTED FOR PZR LEVEL CONTROL, A HIGH SEVERITY (HIGH LEVEL SIGNAL) CAUSES A PZR HIGH LEVEL ALARM. THE HIGH LEVEL INPUT TO MASTER CONTROLLER RC-LIC-110 REDUCES THE CONTROLLER OUTPUT CLOSING DOWN THE LETDOWN CONTROL VALVES (CH-110P/Q). ACTUAL PZR LEVEL INCREASES. A HIGH LEVEL DEVIATION (DEPENDING ON MAGNITUDE) CAUSES THE FOLLOWING:
   - ALL BACKUP PZR HEATERS ENERGIZE (+3%)
   - A NORMALLY RUNNING CHARGING PUMP TRIPS (+8.2%)
   - HIGH LEVEL ERROR ALARM (8.5%)
   A LOW SEVERITY (LOW LEVEL SIGNAL) CAUSES TRIP OF ALL PZR HEATERS. THE LOW LEVEL INPUT TO MASTER CONTROLLER RC-LIC-110 INCREASES THE CONTROLLER OUTPUT OPENING THE LETDOWN CONTROL VALVES. ACTUAL PZR LEVEL DECREASES. A LOW LEVEL DEVIATION (DEPENDING ON MAGNITUDE) CAUSES THE FOLLOWING:
   - LOW LEVEL ERROR ALARM (-3.5%)
   - STANDBY CHARGING PUMP STARTS (-23%)
   THIS MALFUNCTION (C) ALSO FAILS RCN-LT-0103 TO ANY VALUE. RCN-LT-0103 HAS NO CONTROL FUNCTION.

4. Date Tested: **01/21/91**

5. Test Initial Conditions: **100% RTP BOC, PZR Level Control AUTO**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **PZR level controlling in AUTO at normal setpoint.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: NONE

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: PZR Level Master Setpoint Failure (RX24)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: CONTROLLER SETPOINT FAILURE

   EFFECTS: THIS MALFUNCTION FAILS THE SETPOINT OF THE PLCS MASTER CONTROLLER RC-LIC-110 (B04) TO ANY VALUE WITHIN THE SETPOINT RANGE (0-100%). THE LEVEL SETPOINT VALUE IS DISPLAYED ON RC-LR-110 (B04) AND SUPPLIED TO THE LEVEL ERROR DEVIATION PROGRAM ALONG WITH ACTUAL LEVEL. THE MASTER CONTROLLER OUTPUT CONTROLS THE LETDOWN VALVES (CH-110P AND CH-110Q). MALFUNCTION REMOVAL RESTORES THE NORMAL SETPOINT TO THE CONTROLLER. LOW SEVERITY (SETPOINT BELOW ACTUAL LEVEL) CLOSES DOWN ON THE LETDOWN CONTROL VALVES CAUSING AN ACTUAL PZR LEVEL INCREASE. THE HIGH LEVEL DEVIATION MAY ENERGIZE BACKUP HEATERS, TRIP THE NORMALLY RUNNING CHARGING PUMP AND PRODUCE A HIGH LEVEL ERROR ALARM. A HIGH SEVERITY (SETPOINT ABOVE ACTUAL LEVEL) OPENS THE LETDOWN CONTROL VALVES CAUSING AN ACTUAL PZR LEVEL DECREASE. THE LOW LEVEL DEVIATION MAY START THE STANDBY CHARGING PUMP AND PRODUCE A LOW LEVEL ALARM.

4. Date Tested: 01/22/91

5. Test Initial Conditions: 100% RTP, BOC, PLCS in Remote Auto, PZR backup heaters in Auto-After-Stop.

   a. Severity tested (if variable malfunction): 0-100 %

6. Test Termination Conditions: Malfunction removed, PZR level setpoint tracking M/A station input.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: PZR Pressure Transmitter Failure (RX26A-B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: TRANSMITTER FAILURE

   EFFECTS: THIS MALFUNCTION FAILS THE OUTPUT SIGNAL FROM PRESSURIZER PRESSURE TRANSMITTER TO ANY VALUE IN THE RANGE OF 1500-2500 PSIA. A HIGH SEVERITY CAUSES PRESSURE DEVIATION ALARMS TO SOUND ON B04. IF CHANNEL Y IS SELECTED FOR PRESSURE CONTROL, ALL HEATERS DE-ENERGIZE AND SPRAY VALVES OPEN TO REDUCE PRESSURE. PRESSURE MAY DROP TO THE LOW PRESSURE REACTOR TRIP SETPOINT. LOW SEVERITY CAUSES LOW PRESSURE AND DEVIATION ALARMS ON B04. IF CHANNEL Y IS SELECTED, ALL HEATERS ENERGIZE. ACTUAL PRESSURE INCREASES AND SPRAY VALVES REMAIN CLOSED. ACTUAL PRESSURE MAY INCREASE TO THE HIGH PRESSURE REACTOR TRIP SETPOINT. MANUAL CONTROL OF HEATERS AND SPRAY VALVES, OR SELECTION OF CHANNEL X PRESSURE INPUT OVERRIDES THE MALFUNCTION EFFECTS. MALFUNCTION REMOVAL RESTORES THE TRANSMITTER TO NORMAL.

4. Date Tested: 01/22/91

5. Test Initial Conditions: 100% RTP, BOC, RCN-HS-100 selected to Channel Y

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Plant stable with all PZR heaters energized.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: RCS T-hot Transmitter Failure (RX34A-H)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: TRANSMITTER FAILURE

   EFFECTS: OUTPUT OF THE AFFECTED TRANSMITTER FAILS TO THE MALFUNCTION SEVERITY SPECIFIED. THE FAULTY TRANSMITTER OUTPUT IS INDICATED ON B05 AND USED BY CORE PROTECTION CALCULATOR TO CALCULATE DNBR AND LOCAL POWER DENSITY. AT HIGH SEVERITIES THIS MALFUNCTION WILL PRODUCE HI LPD AND LO DNBR CHANNEL TRIPS. MALFUNCTION REMOVAL RESTORES THE TRANSMITTER TO NORMAL.

4. Date Tested: 02/03/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Stable Plant after reactor trip by Lo DNBR.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: PZR NR Pressure Transmitter Failure (RX37A-D)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(18)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: TRANSMITTER FAILURE

   EFFECTS: TRANSMITTER OUTPUT FAILS TO THE MALFUNCTION SEVERITY. THIS IS A NARROW RANGE PRESSURIZER PT (1500-2500 PSIA). THE FAULTY TRANSMITTER OUTPUT IS DISPLAYED ON (B05). THE SIGNAL IS ALSO USED BY THE CORE PROTECTION CALCULATOR AND THE PLANT PROTECTION SYSTEM (PPS) IN A 2 OUT OF 4 LOGIC FOR HI PZR PRESSURE REACTOR TRIP (1837 PSIA). THE LOGIC AND EFFECTS ARE BASED ON THE MALFUNCTION SEVERITY.

4. Date Tested: 02/06/91

5. Test Initial Conditions: 100% RTP BOC

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Rx Trip

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: NONE

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **SG Pressure Transmitter Failure (RX40A-H)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(9)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **TRANSMITTER FAILURE**

   EFFECTS: **THE AFFECTED TRANSMITTER OUTPUT FAILS TO THE MALFUNCTION SEVERITY. THE FAULTY OUTPUT SIGNAL IS INDICATED ON B05 AND B02. THE SIGNAL IS USED BY THE PLANT PROTECTION SYSTEM (PPS) IN A 2 OUT OF 4 LOGIC FOR A LOW SG PRESSURE REACTOR TRIP AND ACTUATION OF MSIS. MALFUNCTION REMOVAL RESTORES THE TRANSMITTER TO NORMAL.**

4. Date Tested: **01/21/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **0-100%**

6. Test Termination Conditions: **Stable plant, reactor tripped and MSIS actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: SG NR Level Transmitter Failure (RX41A-H)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: TRANSMITTER FAILURE

   EFFECTS: SG NR LEVEL OUTPUT SIGNAL FAILS TO THE MALFUNCTION SEVERITY. THE FAULTY OUTPUT SIGNAL IS DISPLAYED ON B05 AND IS USED BY THE PLANT PROTECTION SYSTEM (PPS) IN A 2 OUT OF 4 REACTOR TRIP LOGIC AND MSIS ACTUATION. THE LOGIC AND EFFECTS ARE BASED ON THE MALFUNCTION SEVERITY. MALFUNCTION REMOVAL RESTORES THE TRANSMITTER TO NORMAL.

4. Date Tested: 01/21/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 0-100%

6. Test Termination Conditions: Stable plant with malfunction removed and SG levels returning to normal.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: CPC A Failure (SB01A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(11)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: CPC AUX CHANNEL TRIPS DUE TO CPU FAILURE

   EFFECTS: CPU FAILURE CAUSES AN AUXILIARY TRIP OF AFFECTED CHANNEL CORE PROTECTION CALCULATOR. CPC/CEAC TRBL ANNUNCIATOR (B05) AND CPC FAILURE ALARM ON REMOTE OPERATOR MODULE (B05) OCCURS. LOW DNBR AND HIGH LPD TRIPS OCCUR IN SAME PPS CHANNEL, ALONG WITH THE ASSOCIATED ANNUNCIATORS ON B05. WITH THE MALFUNCTION ACTIVE, ATTEMPTS TO RESTART THE AFFECTED CPC WILL BE UNSUCCESSFUL. MALFUNCTION REMOVAL REMOVES THE CPC FAILURE. THE AFFECTED CPC CAN BE RESTARTED.

4. Date Tested: 02/11/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, malfunction removed and CPC restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: CPC B Failure (SB01B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(11)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: CPC AUX CHANNEL TRIPS DUE TO CPU FAILURE

   EFFECTS: CPU FAILURE CAUSES AN AUXILIARY TRIP OF AFFECTED CHANNEL CORE PROTECTION CALCULATOR. CPC/CEAC TRBL ANNUNCIATOR (B05) AND CPC FAILURE ALARM ON REMOTE OPERATOR MODULE (B05) OCCURS. LOW DNBR AND HIGH LPD TRIPS OCCUR IN SAME PPS CHANNEL, ALONG WITH THE ASSOCIATED ANNUNCIATORS ON B05. WITH THE MALFUNCTION ACTIVE, ATTEMPTS TO RESTART THE AFFECTED CPC WILL BE UNSUCCESSFUL. MALFUNCTION REMOVAL REMOVES THE CPC FAILURE. THE AFFECTED CPC CAN BE RESTARTED.

4. Date Tested: 02/11/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, malfunction removed and CPC restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: CPC C Failure (SB01C)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(11)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: CPC AUX CHANNEL TRIPS DUE TO CPU FAILURE

   EFFECTS: CPU FAILURE CAUSES AN AUXILIARY TRIP OF AFFECTED CHANNEL CORE PROTECTION CALCULATOR. CPC/CEAC TRBL ANNUNCIATOR (B05) AND CPC FAILURE ALARM ON REMOTE OPERATOR MODULE (B05) OCCURS. LOW DNBR AND HIGH LPD TRIPS OCCUR IN SAME PPS CHANNEL, ALONG WITH THE ASSOCIATED ANNUNCIATORS ON B05. WITH THE MALFUNCTION ACTIVE, ATTEMPTS TO RESTART THE AFFECTED CPC WILL BE UNSUCCESSFUL. MALFUNCTION REMOVAL REMOVES THE CPC FAILURE. THE AFFECTED CPC CAN BE RESTARTED.

4. Date Tested: 02/11/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, malfunction removed and CPC restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **CPC D Failure (SB01D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(11)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **CPC AUX CHANNEL TRIPS DUE TO CPU FAILURE**

   EFFECTS: **CPU FAILURE CAUSES AN AUXILIARY TRIP OF AFFECTED CHANNEL CORE PROTECTION CALCULATOR. CPC/CEAC TRBL ANNUNCIATOR (B05) AND CPC FAILURE ALARM ON REMOTE OPERATOR MODULE (B05) OCCURS. LOW DNBR AND HIGH LPD TRIPS OCCUR IN SAME PPS CHANNEL, ALONG WITH THE ASSOCIATED ANNUNCIATORS ON B05. WITH THE MALFUNCTION ACTIVE, ATTEMPTS TO RESTART THE AFFECTED CPC WILL BE UNSUCCESSFUL. MALFUNCTION REMOVAL REMOVES THE CPC FAILURE. THE AFFECTED CPC CAN BE RESTARTED.**

4. Date Tested: **02/11/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant, malfunction removed and CPC restarted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: CEAC FAILURE (SB02A-B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(22)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: CEAC FAILURE DUE TO CPU FAILURE

EFFECTS: CPU FAILURE CAUSES FAILURE OF CEAC CHANNEL. CPC/CEAC TRBL ANNUNCIATOR (B05) AND CEAC FAILURE ALARM ON REMOTE OPERATOR MODULE (B05) OCCURS. ROD POSITION INFORMATION FROM CEAC CH IS LOST. CEAC DEFAULT PENALTY FACTORS ARE USED IN DNBR AND LPD CALCULATIONS IN ALL FOUR CORE PROTECTION CALCULATORS. DNBR AND LPD MARGINS ARE REDUCED. DEPENDING ON PLANT CONDITIONS, LO DNBR AND HI LPD PRE-TRIP AND TRIPS MAY OCCURS ALONG WITH THE APPROPRIATE B05 ANNUNCIATORS. WITH THE MALFUNCTION ACTIVE, ATTEMPTS TO RESTART THE AFFECTED CEAC WILL BE UNSUCCESSFUL.

4. Date Tested: 02/11/91

5. Test Initial Conditions: 100% RTP BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Malfunction removed & system returned to normal.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: NONE

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: HPSI Pump A Trip (SI02A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SUPPLY BREAKER TRIP DUE TO FAULTY 750G RELAY

   EFFECTS: THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO THE HPSI PUMP DUE TO A FAILED GROUND FAULT OVERCURRENT RELAY WHICH TRIPS THE 786 LOCKOUT RELAY. AN ACTUAL FAULT DOES NOT OCCUR. PUMP DISCHARGE PRESSURE INDICATION ON B02 DROPS. IF INJECTING TO THE RCS HIGH PRESSURE SAFETY INJECTION FLOW DROPS TO APPROXIMATELY HALF. THE PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. THE MALFUNCTION IS PASSIVE WHEN INSERTED WITH THE PUMP NOT RUNNING. THE PUMP WILL NOT START WHEN DEMANDED. MALFUNCTION REMOVAL REMOVES THE BREAKER TRIP SIGNAL. THE BREAKER CAN BE CLOSED AFTER THE 786 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/22/91

5. Test Initial Conditions: 100% RTP, BOC, HPSI Pump started by manual SIAS.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed, lockout reset and pump restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: HPSI Pump B Trip (SI02B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: SUPPLY BREAKER TRIP DUE TO FAULTY 750G RELAY

   EFFECTS: THIS MALFUNCTION TRIPS THE SUPPLY BREAKER TO THE HPSI PUMP DUE TO A FAILED GROUND FAULT OVERCURRENT RELAY WHICH TRIPS THE 786 LOCKOUT RELAY. AN ACTUAL FAULT DOES NOT OCCUR. PUMP DISCHARGE PRESSURE INDICATION ON B02 DROPS. IF INJECTING TO THE RCS HIGH PRESSURE SAFETY INJECTION FLOW DROPS TO APPROXIMATELY HALF. THE PUMP CANNOT BE RESTARTED WHILE THE MALFUNCTION IS ACTIVE. THE MALFUNCTION IS PASSIVE WHEN INSERTED WITH THE PUMP NOT RUNNING. THE PUMP WILL NOT START WHEN DEMANDED. MALFUNCTION REMOVAL REMOVES THE BREAKER TRIP SIGNAL. THE BREAKER CAN BE CLOSED AFTER THE 786 LOCKOUT RELAY IS RESET.

4. Date Tested: 01/22/91

5. Test Initial Conditions: 100% RTP, BOC, HPSI Pump started by manual SIAS.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable plant, malfunction removed, lockout reset and pump restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: SIT 1A Water Leak (SI04A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: OUTLET CHECK VALVE BONNET LEAK TO CONTAINMENT

   EFFECTS: THIS MALFUNCTION SIMULATES A WATER LEAK FROM THE AFFECTED SAFETY INJECTION TANK TO THE CONTAINMENT. TANK LEVEL INDICATION DECREASES ON B02. SIT LOW LEVEL LO-LO LEVEL ANNUNCIATES ON B02. TANK LOW AND LO-LO PRESSURE ALARMS ALSO OCCUR. MAKEUP TO THE TANK CAN EXCEED THE LEAK RATE. MALFUNCTION REMOVAL STOPS THE WATER LEAK.

4. Date Tested: 01/23/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 10 & 100 %

6. Test Termination Conditions: Stable plant with makeup from HPSI refilling the SIT.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: SIT 1B Water Leak (SI04B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: OUTLET CHECK VALVE BONNET LEAK TO CONTAINMENT

   EFFECTS: THIS MALFUNCTION SIMULATES A WATER LEAK FROM THE AFFECTED SAFETY INJECTION TANK TO THE CONTAINMENT. TANK LEVEL INDICATION DECREASES ON B02. SIT LOW LEVEL LO-LO LEVEL ANNUNCIATES ON B02. TANK LOW AND LO-LO PRESSURE ALARMS ALSO OCCUR. MAKEUP TO THE TANK CAN EXCEED THE LEAK RATE. MALFUNCTION REMOVAL STOPS THE WATER LEAK.

4. Date Tested: 01/23/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 10 & 100 %

6. Test Termination Conditions: Stable plant with makeup from HPSI refilling the SIT.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **SIT 1C Water Leak (SI04C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **OUTLET CHECK VALVE BONNET LEAK TO CONTAINMENT**

   EFFECTS: **THIS MALFUNCTION SIMULATES A WATER LEAK FROM THE AFFECTED SAFETY INJECTION TANK TO THE CONTAINMENT. TANK LEVEL INDICATION DECREASES ON B02. SIT LOW LEVEL LO-LO LEVEL ANNUNCIATES ON B02. TANK LOW AND LO-LO PRESSURE ALARMS ALSO OCCUR. MAKEUP TO THE TANK CAN EXCEED THE LEAK RATE. MALFUNCTION REMOVAL STOPS THE WATER LEAK.**

4. Date Tested: **01/24/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **10 & 100 %**

6. Test Termination Conditions: **Stable plant with makeup from HPSI refilling the SIT.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **SIT 1D Water Leak (SI04D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **OUTLET CHECK VALVE BONNET LEAK TO CONTAINMENT**

   EFFECTS: **THIS MALFUNCTION SIMULATES A WATER LEAK FROM THE AFFECTED SAFETY INJECTION TANK TO THE CONTAINMENT. TANK LEVEL INDICATION DECREASES ON B02. SIT LOW LEVEL LO-LO LEVEL ANNUNCIATES ON B02. TANK LOW AND LO-LO PRESSURE ALARMS ALSO OCCUR. MAKEUP TO THE TANK CAN EXCEED THE LEAK RATE. MALFUNCTION REMOVAL STOPS THE WATER LEAK.**

4. Date Tested: **01/24/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **10 & 100 %**

6. Test Termination Conditions: **Stable plant with makeup from HPSI refilling the SIT.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **HPSI Pump A Degraded Performance (SI05A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PUMP IMPELLER FAILURE**

   EFFECTS: **THIS MALFUNCTION PROVIDES A VARIABLE REDUCTION IN HPSI PUMP PERFORMANCE. FOR A GIVEN SPEED, PUMP DISCHARGE PRESSURE AND FLOW RATE ARE BELOW THE NORMAL PUMP OPERATING CHARACTERISTICS. AT 100% SEVERITY, NO PUMP HEAD IS DEVELOPED. MALFUNCTION REMOVAL RESTORES NORMAL PUMP OPERATING CHARACTERISTICS.**

4. Date Tested: **01/22/91**

5. Test Initial Conditions: **100% RTP, BOC, HPSI pump operating.**

   a. Severity tested (if variable malfunction): **100, 50 & 20%.**

6. Test Termination Conditions: **Stable plant with RCS pressure above HPSI shutoff head.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: HPSI Pump B Degraded Performance (SI05B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(23)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: PUMP IMPELLER FAILURE

   EFFECTS: THIS MALFUNCTION PROVIDES A VARIABLE REDUCTION IN HPSI PUMP PERFORMANCE. FOR A GIVEN SPEED, PUMP DISCHARGE PRESSURE AND FLOW RATE ARE BELOW THE NORMAL PUMP OPERATING CHARACTERISTICS. AT 100% SEVERITY, NO PUMP HEAD IS DEVELOPED. MALFUNCTION REMOVAL RESTORES NORMAL PUMP OPERATING CHARACTERISTICS.

4. Date Tested: 01/22/91

5. Test Initial Conditions: 100% RTP, BOC, HPSI pump operating.

   a. Severity tested (if variable malfunction): 100, 50 & 20%.

6. Test Termination Conditions: Stable plant with RCS pressure above HPSI shutoff head.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Plant Cooling Water Pump A Trip (SW01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(6)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **FAULTY 450G RELAY TRIPS PUMP BREAKER**

   EFFECTS: **THE FAULTY 450G RELAY TRIPS THE 486 LOCKOUT RELAY WHICH TRIPS THE PW PUMP BREAKER. THE PCW SYS TRBL ANNUNCIATOR (B07) SOUNDS DUE TO THE PUMP TRIP. PW PUMP DISCHARGE HEADER PRESSURE ON B07 DROPS. PCW DISCHARGE PRESSURE LOW ANNUNCIATES AND THE PCW STANDBY PUMP AUTO STARTS AT 40 PSIG. THE STANDBY PUMP RESTORES SYSTEM PRESSURE AND FLOW. MALFUNCTION REMOVAL REMOVES THE PUMP TRIP SIGNAL. THE PUMP CAN BE RESTARTED AFTER THE 486 RELAY IS RESET.**

4. Date Tested: **01/19/91**

5. Test Initial Conditions: **100% RTP, BOC, PWN-P01A running and PWN-P01B in standby.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Plant stable, malfunction removed, lockout reset and pump restarted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Plant Cooling Water Pump B Trip (SW01B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(6)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **FAULTY 450G RELAY TRIPS PUMP BREAKER**

EFFECTS: **THE FAULTY 450G RELAY TRIPS THE 486 LOCKOUT RELAY WHICH TRIPS THE PW PUMP BREAKER. THE PCW SYS TRBL ANNUNCIATOR (B07) SOUNDS DUE TO THE PUMP TRIP. PW PUMP DISCHARGE HEADER PRESSURE ON B07 DROPS. PCW DISCHARGE PRESSURE LOW ANNUNCIATES AND THE PCW STANDBY PUMP AUTO STARTS AT 40 PSIG. THE STANDBY PUMP RESTORES SYSTEM PRESSURE AND FLOW. MALFUNCTION REMOVAL REMOVES THE PUMP TRIP SIGNAL. THE PUMP CAN BE RESTARTED AFTER THE 486 RELAY IS RESET.**

4. Date Tested: **01/19/91**

5. Test Initial Conditions: **100% RTP, BOC, PWN-P01B running and PWN-P01A in standby.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Plant stable, malfunction removed, lockout reset and pump restarted.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: PW Header Break (SW03)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(6)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: PIPE BREAK

EFFECTS: THIS MALFUNCTION IS A VARIABLE SIZE PIPE BREAK IN THE PCW SYSTEM AT THE FIRST FLANGE DOWNSTREAM OF PWN-HCV-12 (PCW PUMP B DISCHARGE VALVE). 100% SEVERITY LEAK RATE IS APPROXIMATELY HALF THE CAPACITY OF ONE PCW PUMP. DISCHARGE HEADER PRESSURE DROPS ON PW-PI-13 (B07). PCW DISCHARGE PRESSURE LOW ANNUNCIATES (B07) AND THE STANDBY PCW PUMP STARTS AT 40 PSIG. TWO PUMP OPERATION RESTORES PARTIAL PRESSURE AND SYSTEM FLOW. SYSTEM PRESSURE REMAINS BELOW NORMAL. REDUCED PCW FLOW TO NCW AND TCW HEAT EXCHANGERS, AND AR PUMP SEAL COOLERS CAUSES A CORRESPONDING TEMPERATURE INCREASE IN THESE SYSTEM. LEAK ISOLATION CAN ONLY BE ACCOMPLISHED BY ISOLATION OF THE PCW SYSTEM. THIS MALFUNCTION IS NON-RECOVERABLE.

4. Date Tested: 01/24/91

5. Test Initial Conditions: 100% RTP, BOC, PWN-P01B running and PWN-P01A in standby.

   a. Severity tested (if variable malfunction): 100%

6. Test Termination Conditions: Stable Plant with elevated operating temperatures evidenced in affected components.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

1. Test Title: **Turbine Trip (TC12)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(15)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL OVERSPEED TRIP DEVICE SPRING BREAKS**

   EFFECTS: **THE MECHANICAL OVERSPEED TRIP DEVICE FAILS CAUSING A TRIP OF THE MAIN TURBINE. MECHANICAL OVERSPEED TRIP (MN TURB TRIP) IS ANNUNCIATED ON B06. TURBINE SPEED INDICATIONS SHOW THAT TURBINE SPEED REMAINED AT RATED PRIOR TO THE TRIP AND DECREASES AFTER THE TURBINE TRIPS. THE FOLLOWING ACTIONS ARE INITIATED BY THE TURBINE TRIP: GENERATOR TRIPS, 525KV BREAKERS 915 AND 918 TRIP AND ARE LOCKED OUT, AUX TRANSFORMER BREAKERS TO NAN-S01 AND NAN-S02 TRIP, TIE BREAKERS BETWEEN NAN-S01 AND S03, AND BETWEEN NAN-S04 AND S02 AUTO-CLOSE, REACTOR POWER CUTBACK IS INITIATED, REACTOR POWER DECREASES, THE SBCS SYSTEM OPENS TURBINE BYPASS VALVES TO CONTROL STEAM PRESSURE. THE FWCS RECOVERS STEAM GENERATOR LEVELS. MALFUNCTION REMOVAL REPAIRS THE MECHANICAL OVERSPEED TRIP DEVICE.**

4. Date Tested: **01/24/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable Plant with reduced reactor power, heat removal via the SBCS, and the turbine offline.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **Turbine Control Valve CV-4 Fails (TC15A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **CV POSITIONER CONTROLLER SUMMING AMPLIFIER OUTPUT FAILS TO SELECTED VALUE**

   EFFECTS: **THIS MALFUNCTION FAILS THE POSITION DEMAND TO THE AFFECTED MAIN TURBINE CONTROL VALVE. WHEN THE MALFUNCTION IS ACTIVATED AT 0% SEVERITY THE CONTROL VALVE STROKES CLOSED. CONTROL VALVE SERVO VALVE CURRENT METER RESPONDS TO THE CHANGE IN POSITION DEMAND. VALVE POSITION INDICATION (EHC PANEL) SHOWS THE VALVE CLOSING. GENERATOR LOAD DECREASES. STEAM PRESSURE AND RCS TEMPERATURE / PRESSURE INCREASE. WHEN THE MALFUNCTION IS INSERTED AT 100% THE AFFECTED CONTROL VALVE STROKES FULL OPEN. GENERATOR LOAD INCREASES. THIS MALFUNCTION OVERRIDES ALL MODES OF OPERATING THE CV. THE VALVE WILL STILL TRIP CLOSED ON A TURBINE TRIP. MALFUNCTION REMOVAL RESTORES THE NORMAL VALVE OPERATION. THE VALVE STROKES TO THE POSITION CALLED FOR BY THE VALVE OPERATING LOGIC.**

4. Date Tested: **01/24/91**

5. Test Initial Conditions: **50% RTP, BOC**

   a. Severity tested (if variable malfunction): **0 & 100%**

6. Test Termination Conditions: **Stable plant with control valve closed and SBCS controlling steam pressure.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Turbine Control Valve CV-2 Fails (TC15C)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE: **CV POSITIONER CONTROLLER SUMMING AMPLIFIER OUTPUT FAILS TO SELECTED VALUE**

EFFECTS: **THIS MALFUNCTION FAILS THE POSITION DEMAND TO THE AFFECTED MAIN TURBINE CONTROL VALVE. WHEN THE MALFUNCTION IS ACTIVATED AT 0% SEVERITY THE CONTROL VALVE STROKES CLOSED. CONTROL VALVE SERVO VALVE CURRENT METER RESPONDS TO THE CHANGE IN POSITION DEMAND. VALVE POSITION INDICATION (EHC PANEL) SHOWS THE VALVE CLOSING. GENERATOR LOAD DECREASES. STEAM PRESSURE AND RCS TEMPERATURE / PRESSURE INCREASE. WHEN THE MALFUNCTION IS INSERTED AT 100% THE AFFECTED CONTROL VALVE STROKES FULL OPEN. GENERATOR LOAD INCREASES. THIS MALFUNCTION OVERRIDES ALL MODES OF OPERATING THE CV. THE VALVE WILL STILL TRIP CLOSED ON A TURBINE TRIP. MALFUNCTION REMOVAL RESTORES THE NORMAL VALVE OPERATION. THE VALVE STROKES TO THE POSITION CALLED FOR BY THE VALVE OPERATING LOGIC.**

4. Date Tested: **01/24/91**

5. Test Initial Conditions: **50% RTP, BOC**

   a. Severity tested (if variable malfunction): **0 & 100%**

6. Test Termination Conditions: **Stable plant with control valve closed and SBCS controlling steam pressure.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Turbine Stop Valve #2 Failure (TC15E)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(17)**

3. Description of Test (Cause and Effects if malfunction):

CAUSE:	CV POSITIONER CONTROLLER SUMMING AMPLIFIER OUTPUT
EFFECTS:	THIS MALFUNCTION FAILS THE POSITION DEMAND TO MAIN TURBINE CONTROL VALVE CV-2. THE VALVE WILL STROKE TO THE SEVERITY POSITION. ASSUME FULL LOAD OPERATION AND THE MALFUNCTION ACTIVATED AT 0% SEVERITY. CV-2 STROKES CLOSED. CV-2 SERVO VALVE CURRENT METER RESPONDS TO THE CHANGE IN POSITION DEMAND. VALVE POSITION INDICATION SHOWS THE VALVE CLOSING. MALFUNCTION REMOVAL RESTORES THE NORMAL OUTPUT VALUE FROM THE CV POSITION CONTROLLER SUMMING AMPLIFIER. THE VALVE STROKES TO THE POSITION CALLED FOR BY THE VALVE OPERATING LOGIC.

4. Date Tested: **01/25/91**

5. Test Initial Conditions: **Mode 3 with shell warming in progress.**

   a. Severity tested (if variable malfunction): **5 & 100%**

6. Test Termination Conditions: **Stable plant with turbine pressures and temperatures decreasing.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Control Oil Rupture (TC19)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(17)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: PIPE BREAK

EFFECTS: THIS MALFUNCTION IS A VARIABLE SIZE PIPE BREAK IN THE EH CONTROL OIL COMBINED DISCHARGE HEADER DOWNSTREAM OF CON-V208 (PUMP A DISCHARGE CHECK VALVE). AT HIGH SEVERITY, CONTROL OIL HEADER PRESSURE DECREASES RAPIDLY (CON-PI-3 ON B06). THE STANDBY EH PUMP AUTO STARTS AND EH FLUID PRESSURE LOW IS ANNUNCIATED ON B06. THE MAIN TURBINE IS TRIPPED ON EHC LOW PRESSURE (SETPOINT 1100 PSIG). THE PLANT RESPONDS TO THE MAIN TURBINE TRIP AS EXPECTED. THE HYDRAULIC FLUID RESERVOIR IS PUMPED DOWN BY THE EH FLUID PUMPS. TANK LOW LEVEL IS ANNUNCIATED (EHC FLUID SYS TRBL) ON B06.

4. Date Tested: 01/29/91

5. Test Initial Conditions: 100% RTP BOC, CON-P01A running, B in standby

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Main Turbine Tripped

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3319

   a. Schedule DR correction:

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **LOCA - Cold Leg (TH01A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(01)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: BREAK ON PUMP DISCHARGE PIPE

   EFFECTS: **THIS MALFUNCTION CAUSES A RAPID LOSS OF MASS INVENTORY FROM RC LOOP 1A COLD LEG. PRESSURIZER PRESSURE AND LEVEL DECREASE RAPIDLY. CONTAINMENT SUMP LEVELS, RADIATION, TEMPERATURE, PRESSURE AND HUMIDITY INCREASE.**

   CONTAINMENT PRESSURE INCREASES TO THE HI TRIP SETPOINT OF 3 PSIG. THE REACTOR TRIPS AND ESFAS INITIATES MSIS, CIAS, AND SIAS. AT THE HI-HI CONTAINMENT PRESSURE SETPOINT OF 8.5 PSIG, CONTAINMENT SPRAY (CSAS) INITIATES TO AID IN CONTAINMENT DEPRESSURIZATION.

   AS RCS PRESSURE DECREASES, HPSI AND LPSI PUMPS DUMP BORATED WATER INTO THE RCS LOOPS. THE SAFETY INJECTION TANKS ALSO DUMP AS A PASSIVE SOURCE TO AID IN RE-FLOODING AND COOLING THE REACTOR CORE.

4. Date Tested: **02-14-91**

5. Test Initial Conditions: **100% RTP BOC**

   a. Severity tested (if variable malfunction): **0-10%, & 100%**

6. Test Termination Conditions: **Stable Post-LOCA condition**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3669**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: LOCA - Hot Leg (TH02B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(01)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: BREAK ON HOT LEG

   EFFECTS: RCS HOT LEG 2 RUPTURES. EFFECTS ARE SIMILAR TO MALFUNCTION TH01 EXCEPT THAT THE MASS RELEASE RATE IS HIGHER DUE TO LARGER PIPE SIZE ON THE HOT LEG.

4. Date Tested: 03/05/91

5. Test Initial Conditions: 100% RTP BOC

   a. Severity tested (if variable malfunction): 0-10%, & 100%

6. Test Termination Conditions: Stable Post-LOCA conditions.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3664, 3665

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Steam Generator 1 Tube Rupture (TH03A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(1)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: RUPTURE OF ONE STEAM GENERATOR TUBE

EFFECTS: THIS MALFUNCTION IS A VARIABLE SIZE TUBE LEAK IN STEAM GENERATOR 1 RESULTING IN A PRIMARY TO SECONDARY LEAK. AT LOW SEVERITY, PRESSURIZER LEVEL AND PRESSURE START TO DECREASE. LETDOWN VALVES CLOSE DOWN AND CHARGING MAINTAINS PZR LEVEL OR AT LEAST REDUCES THE RATE OF DECREASE. VCT LEVEL DECREASES. BACKUP HEATERS ENERGIZE TO ATTEMPT TO MAINTAIN PRESSURE. STEAM GENERATOR 1 LEVEL INCREASES SLIGHTLY. STEAM GENERATOR BLOWDOWN RADIATION AND MAIN STEAM RADIATION INCREASE. ACTIVITY TRANSPORT TO THE CONDENSER CAUSES INCREASED CONDENSER OFF GAS RADIATION. THE AIR REMOVAL SYSTEM SHIFTS TO THE FILTER MODE. HIGH SEVERITY EXCEEDS THE CHARGING PUMPS MAKEUP CAPACITY. PRESSURIZER LEVEL AND PRESSURE DECREASE. LOW PZR PRESSURE CAUSES A REACTOR AND MAIN TURBINE TRIP AND ESFAS ACTUATION OF CIAS AND SIAS. LEAK RATE DECREASES AS PRIMARY PRESSURE DECREASES. HIGH PRESSURE SAFETY INJECTION RESTORES PRESSURIZER LEVEL. STEAM GENERATOR 1 LEVEL INCREASES DUE TO THE LEAK AND EVENTUALLY ISOLATES ON HIGH LEVEL (MSIS). RADIATION TRANSPORT IN THE STEAM CONTINUES UNTIL STEAM GENERATOR 1 IS ISOLATED.

4. Date Tested: 02/10/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 5 & 100%

6. Test Termination Conditions: Stable plant, reactor tripped, SIAS actuated.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3243 & 3244

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

   a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Steam Generator 2 Tube Rupture (TH03B)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(1)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **RUPTURE OF ONE STEAM GENERATOR TUBE**

   EFFECTS: **THIS MALFUNCTION IS A VARIABLE SIZE TUBE LEAK IN STEAM GENERATOR 2 RESULTING IN A PRIMARY TO SECONDARY LEAK. AT LOW SEVERITY, PRESSURIZER LEVEL AND PRESSURE START TO DECREASE. LETDOWN VALVES CLOSE DOWN AND CHARGING MAINTAINS PZR LEVEL OR AT LEAST REDUCES THE RATE OF DECREASE. VCT LEVEL DECREASES. BACKUP HEATERS ENERGIZE TO ATTEMPT TO MAINTAIN PRESSURE. STEAM GENERATOR 2 LEVEL INCREASES SLIGHTLY. STEAM GENERATOR BLOWDOWN RADIATION AND MAIN STEAM RADIATION INCREASE. ACTIVITY TRANSPORT TO THE CONDENSER CAUSES INCREASED CONDENSER OFF GAS RADIATION. THE AIR REMOVAL SYSTEM SHIFTS TO THE FILTER MODE. HIGH SEVERITY EXCEEDS THE CHARGING PUMPS MAKEUP CAPACITY. PRESSURIZER LEVEL AND PRESSURE DECREASE. LOW PZR PRESSURE CAUSES A REACTOR AND MAIN TURBINE TRIP AND ESFAS ACTUATION OF CIAS AND SIAS. LEAK RATE DECREASES AS PRIMARY PRESSURE DECREASES. HIGH PRESSURE SAFETY INJECTION RESTORES PRESSURIZER LEVEL. STEAM GENERATOR 2 LEVEL INCREASES DUE TO THE LEAK AND EVENTUALLY ISOLATES ON HIGH LEVEL (MSIS). RADIATION TRANSPORT IN THE STEAM CONTINUES UNTIL STEAM GENERATOR 2 IS ISOLATED.**

4. Date Tested: **02/10/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **5 & 100%**

6. Test Termination Conditions: **Stable plant, reactor tripped, SIAS actuated.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **3243 & 3244**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: Fuel Rod Defect (TH09)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(14)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FUEL ROD CLADDING FAILURE

   EFFECTS: AT 100% SEVERITY, RADIATION RELEASE TO THE RCS IS THE EQUIVALENT OF THE TOTAL GASEOUS RADIATION IN ONE FUEL ROD. THE MAJOR INDICATION OF THE FUEL DEFECT IS THE LETDOWN SYSTEM RADIATION MONITOR WHICH INDICATES THE ACTIVITY INCREASE ON CHN-RR-204 (B03) AND MAY GIVE A HI RADIATION ANNUNCIATOR ON B03. AREA MONITORS IN THE VICINITY OF THE LETDOWN LINES AND IN THE CONTAINMENT SHOW INCREASED RADIATION. THE INCREASE IN RCS ACTIVITY CAUSES HIGHER ACTIVITY LEVELS TRANSMISSION TO INTERFACING SYSTEMS WHEN RCS LEAKAGE IS INVOLVED. THE MALFUNCTION IS NON-RECOVERABLE.

4. Date Tested: 03/09/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): 100%

6. Test Termination Conditions: Stable plant

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3684, 3688, 3685, 3683, & 3686

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions:

    a. Justification for the exceptions:

MALFUNCTION TEST ABSTRACTS

1. Test Title: Stator Cooling Pump A Trip (TP01A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(8)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: FAULTY MOTOR WINDING TEMPERATURE SWITCH

EFFECTS: CE PUMP MOTOR WINDING TEMP SWITCH FAILS WHICH TRIPS THE BREAKER 86 LOCKOUT RELAY. THE PUMP BREAKER TRIPS AND CANNOT BE CLOSED WHILE THE MALF REMAINS ACTIVE. THE AMBER PUMP TRIP LIGHT ENERGIZES. MOTOR HIGH TEMPERATURE AND THE PUMP TRIP ARE ANNUNCIATED (GENERATOR STATOR CLG WTR SYS TRBL) ON B06. STATOR COOLING SYSTEM FLOW AND PRESSURE DECREASE. SYSTEM LOW PRESSURE ANNUNCIATORS (B06) SOUND. LOW COMBINED PUMP DISCHARGE PRESSURE CAUSES AUTO-START OF THE STANDBY CE PUMP. CE SYSTEM PRESSURE AND FLOW IS RESTORED BY THE STANDBY PUMP. MALFUNCTION REMOVAL RESTORES NORMAL TEMPERATURE SWITCH OPERATION. THE PUMP BREAKER CAN BE CLOSED AFTER THE 86 LOCKOUT IS RESET.

4. Date Tested: 01/24/91

5. Test Initial Conditions: 100% RTP, BOC CE Pump A operating, pump B in standby.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, malfunction removed and pump restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: Stator Cooling Pump B Trip (TP01B)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(8)

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: FAULTY MOTOR WINDING TEMPERATURE SWITCH

   EFFECTS: CE PUMP MOTOR WINDING TEMP SWITCH FAILS WHICH TRIPS THE BREAKER 86 LOCKOUT RELAY. THE PUMP BREAKER TRIPS AND CANNOT BE CLOSED WHILE THE MALF REMAINS ACTIVE. THE AMBER PUMP TRIP LIGHT ENERGIZES. MOTOR HIGH TEMPERATURE AND THE PUMP TRIP ARE ANNUNCIATED (GENERATOR STATOR CLG WTR SYS TRBL) ON B06. STATOR COOLING SYSTEM FLOW AND PRESSURE DECREASE. SYSTEM LOW PRESSURE ANNUNCIATORS (B06) SOUND. LOW COMBINED PUMP DISCHARGE PRESSURE CAUSES AUTO-START OF THE STANDBY CE PUMP. CE SYSTEM PRESSURE AND FLOW IS RESTORED BY THE STANDBY PUMP. MALFUNCTION REMOVAL RESTORES NORMAL TEMPERATURE SWITCH OPERATION. THE PUMP BREAKER CAN BE CLOSED AFTER THE 86 LOCKOUT IS RESET.

4. Date Tested: 01/24/91

5. Test Initial Conditions: 100% RTP, BOC CE Pump B operating, pump A in standby.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Stable Plant, malfunction removed and pump restarted.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Hydrogen Leak From Main Generator Casing (TP03)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(08)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: H2 LEAK FROM MAIN GENERATOR CASING FLANGE

   EFFECTS: **THIS MALFUNCTION IS A H2 LEAK IN THE GENERATOR CASING. LEAK RATE EXCEEDS THE H2 MAKEUP CAPACITY. MAIN GENERATOR H2 PRESSURE DECREASES (GHN-PI-17 ON B06) AT THE SELECTED RATE. H2 LOW PRESSURE (GEN H2 AND SEAL OIL SYS TRBL) IS ANNUNCIATED AT 73 PSIG ON B06. EXPLOSION EFFECTS FROM THE H2 LEAK ARE NOT MODELED. H2 PURITY IS NOT AFFECTED. MAIN GENERATOR HOT GAS TEMPERATURE INCREASES AS H2 PRESSURE DECREASES. LOAD REDUCTION REDUCES THE TEMPERATURE INCREASING EFFECT.**
   MALFUNCTION REMOVAL STOPS THE GAS LEAK. GENERATOR PRESSURE CAN BE RESTORED BY THE NORMAL H2 SUPPLY.

4. Date Tested: **01/26/91**

5. Test Initial Conditions: **100% RTP BOC**

   a. Severity tested (if variable malfunction): **100%**

6. Test Termination Conditions: **Malfunction removed, system recovered to nominal parameters.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **2842**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: **Turbine Cooling Water Break (TP08)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(6)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **PIPE BREAK DOWNSTREAM OF PUMP DISCH VALVES**

   EFFECTS: **THIS MALFUNCTION IS A PIPE BREAK ON THE COMBINED TCW PUMP DISCHARGE HEADER. LEAKAGE EXCEEDS THE DW MAKEUP CAPACITY TO THE TCW SURGE TANK. AT HIGH SEVERITY, DISCHARGE HEADER LOW PRESSURE ALARM SOUNDS (B07). THE STANDBY TCW PUMP STARTS. SURGE TANK LEVEL DROPS RAPIDLY TO THE LOW LEVEL ALARM (TCW SYS TRBL ON B07). TCW PUMPS CAVITATE. THE MALFUNCTION IS NON-RECOVERABLE.**

4. Date Tested: **01/31/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **10 & 100%**

6. Test Termination Conditions: **Stable plant, turbine tripped, air compressors tripped.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

MALFUNCTION TEST ABSTRACTS

1. Test Title: GR Decay Tank Rupture (WD01)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: TANK RUPTURE DUE TO TANK WELD FAILURE

   EFFECTS: A FULL GASEOUS RADWASTE DECAY TANK RUPTURES, RELEASING ALL THE CONTAINED GASEOUS ACTIVITY. DECAY TANK PRESSURE DROPS RAPIDLY. THE ACTIVITY RELEASE CAUSES RADWASTE BUILDING VENTILATION ACTIVITY AND AREA RADIATION TO INCREASE. EFFECT ON BUILDING RADIATION DEPENDS ON INITIAL TANK ACTIVITY.
   THE MALFUNCTION IS NON-RECOVERABLE.

4. Date Tested: 03/09/91

5. Test Initial Conditions: 100% RTP BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Radiation levels stabilized & beginning to decrease.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: 3687

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: SG 1 Blowdown Line Break Inside Contmt (WD04A)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(20)

3. Description of Test (Cause and Effects if malfunction):

CAUSE: BLOWDOWN HEADER RUPTURE

EFFECTS: THIS MALFUNCTION IS A VARIABLE SIZE PIPE RUPTURE OF STEAM GENERATOR 1 BLOWDOWN LINE BETWEEN SG-HV-43 AND SG-UV-500P INSIDE THE CONTAINMENT. AT HIGH SEVERITY, STEAM GENERATOR 1 LEVEL DECREASES RAPIDLY. SG 1 PRESSURE ALSO DECREASES (MORE SIGNIFICANT IF HOT LEG BLOWDOWN IS LINED UP). RCS TEMPERATURE AND PRESSURE DECREASE. CONTAINMENT TEMPERATURE AND PRESSURE INCREASE. THE REACTOR TRIPS AND ESFAS ACTUATES MSIS, CIAS AND SIAS. THE STEAM GENERATOR BLOWDOWN ISOLATION WILL NOT ISOLATE THE LEAK. LEAK FLOW RATE CONTINUES UNTIL SG 1 IS BLOWN DRY. THE LEAK CAN BE ISOLATED IF OPERATORS CLOSE SG-UV-43 AND UV-41 WITH CONTROL SWITCHES ON B07. THE MALFUNCTION IS NON-RECOVERABLE.

4. Date Tested: 02/11/91

5. Test Initial Conditions: 50% RTP, BOC, CEDMCS in Auto Sequential, SG Blowdown valves 41 and 43 closed.

   a. Severity tested (if variable malfunction): 10% & 100%

6. Test Termination Conditions:

   (1) Plant stable with increases in secondary makeup, contmt temp, contmt press and contmt humidity. Contmt radwaste sump pumps operating.
   (2) Reactor tripped, AFAS, CIAS, MSIS and SIAS actuated, SG blowdown terminated by SG dry-out.

7. Reference Data: Specific plant design documentation as listed on the Test cover sheet.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **SGBD Isolation Valve 500R Fails As Is (WD05A)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL BINDING**

   EFFECTS: **THIS MALFUNCTION FAILS A STEAM GENERATOR BLOWDOWN ISOLATION VALVE AT ITS CURRENT POSITION WHEN THE MALFUNCTION BECOMES ACTIVE. WITH THE VALVE OPEN (NORMAL BLOWDOWN OPERATION), ACTIVATION OF THE MALFUNCTION IS INITIALLY PASSIVE. HOWEVER, ON ANY SUBSEQUENT CLOSE DEMAND (CONTROL SWITCH, AFAS, SIAS OR MSIS) THE VALVE DOES NOT MOVE. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION.**

4. Date Tested: **01/26/91**

5. Test Initial Conditions: **100% RTP, BOC, SGBD normal to the BFT.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, malfunction removed and valve cycled.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

MALFUNCTION TEST ABSTRACTS

1. Test Title: **SGBD Isolation Valve 500Q Fails As Is (WD05D)**

2. ANS 3.5-1985 Section Requiring Test: **3.1.2(23)**

3. Description of Test (Cause and Effects if malfunction):

   CAUSE: **MECHANICAL BINDING**

   EFFECTS: **THIS MALFUNCTION FAILS A STEAM GENERATOR BLOWDOWN ISOLATION VALVE AT ITS CURRENT POSITION WHEN THE MALFUNCTION BECOMES ACTIVE. WITH THE VALVE OPEN (NORMAL BLOWDOWN OPERATION), ACTIVATION OF THE MALFUNCTION IS INITIALLY PASSIVE. HOWEVER, ON ANY SUBSEQUENT CLOSE DEMAND (CONTROL SWITCH, AFAS, SIAS OR MSIS) THE VALVE DOES NOT MOVE. MALFUNCTION REMOVAL RESTORES NORMAL VALVE OPERATION.**

4. Date Tested: **02/08/91**

5. Test Initial Conditions: **100% RTP, BOC, SGBD normal to the BFT.**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Stable plant, malfunction removed and valve cycled.**

7. Reference Data: **Specific plant design documentation as listed on the Test cover sheet.**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

[illegible]

TRANSIENT TEST ABSTRACTS

1. Test Title: Manual Reactor Trip (TTP001)

2. ANS 3.5-1985 Section Requiring Test: Appendix B.2.2(1)

3. Description of Test (Cause and Effects if malfunction):

   A MANUAL REACTOR TRIP FROM 100% RATED THERMAL POWER WAS PERFORMED BY OPERATOR ACTUATION OF THE REACTOR TRIP SWITCHGEAR PUSHBUTTONS ON PANEL B05.

4. Date Tested: 03/21/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: Plant Trip Review Report 1-86-010

8. Deficiencies identified by the test: 3831, & 3832

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

TRANSIENT TEST ABSTRACTS

1. Test Title: Simultaneous Trip of Main Feed Pumps (TTP002)

2. ANS 3.5-1985 Section Requiring Test: Appendix B.2.2(2)

3. Description of Test (Cause and Effects if malfunction):

   A SIMULTANEOUS TRIP OF BOTH MAIN FEED PUMPS WAS PERFORMED CONCURRENT WITH THE OPENING OF THE CONDENSER VACUUM BREAKERS AND INSERTION OF MALFUNCTIONS TO SIMULATE CONDENSER AIR IN-LEAKAGE. THE COMBINATION OF EVENTS WAS CHOSEN TO MIMIC THE SCENARIO OUTLINED BY PVNGS UFSAR CHAPTER 15.2.

4. Date Tested: 3/21/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: PVNGS UFSAR Chapter 15.2

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

TRANSIENT TEST ABSTRACTS

1. Test Title: **Simultaneous Closure of All MSIV's (TTP003)**

2. ANS 3.5-1985 Section Requiring Test: **Appendix B.2.2(3)**

3. Description of Test (Cause and Effects if malfunction):

   THE SIMULTANEOUS CLOSURE OF ALL MSIV'S WAS PERFORMED BY SIMULATING THE OPENING THE DC POWER DISCONNECTS TO MSIV CONTROL CIRCUITS.

4. Date Tested: **03/21/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **A stable, safe, and steady state which could be continued to Cold Shutdown conditions.**

7. Reference Data: **APS Nuclear Fuels Analysis SA-ALL-NCR-90-29-00**

8. Deficiencies identified by the test: **3834**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

TRANSIENT TEST ABSTRACTS

1. Test Title: **Simultaneous Trip of All RCP's (TTP004)**

2. ANS 3.5-1985 Section Requiring Test: **Appendix B.2.2(4)**

3. Description of Test (Cause and Effects if malfunction):

   THE SIMULTANEOUS TRIP OF ALL RCP'S WAS ACCOMPLISHED BY INSERTION OF MALFUNCTIONS TO DE-ENERGIZE THE 13.8 KV SWITCHGEAR. ADDITIONAL MALFUNCTIONS WERE INSERTED TO ENSURE THAT THESE BUSES DID NOT TRANSFER TO OFFSITE POWER SOURCES.

4. Date Tested: **03/21/91**

5. Test Initial Conditions: **100% RTP, MOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **A stable, safe, and steady state which could be continued to Cold Shutdown conditions.**

7. Reference Data: **Actual plant data**

8. Deficiencies identified by the test: **3830, & 3837**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

TRANSIENT TEST ABSTRACTS

1. Test Title: **Trip of Two RCP's (TTP005)**

2. ANS 3.5-1985 Section Requiring Test: **Appendix B.2.2(5)**

3. Description of Test (Cause and Effects if malfunction):

   THE SIMULTANEOUS TRIP OF TWO RCP'S, IN OPPOSITE LOOPS, WAS PERFORMED BY INSERTION OF MALFUNCTIONS TO SIMULATE THE DE-ENERGIZATION OF ONE 13.8 KV BUS. TWO PUMPS WERE TRIPPED BECAUSE ACTUAL PLANT DATA IS AVAILABLE FOR SUCH A TRANSIENT. THE DYNAMIC RESULTS OF SUCH A TRANSIENT ARE NOT SIGNIFICANTLY DIFFERENT FROM THOSE OF A SINGLE RCP TRIP.

4. Date Tested: **03/21/91**

5. Test Initial Conditions: **100% RTP, MOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **A stable, safe, and steady state which could be continued to Cold Shutdown conditions.**

7. Reference Data: **Actual plant data.**

8. Deficiencies identified by the test: **3838**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

TRANSIENT TEST ABSTRACTS

1. Test Title: Large Load Rejection Reactor Power Cutback (TTP006)

2. ANS 3.5-1985 Section Requiring Test: Appendix B.2.2(6)

3. Description of Test (Cause and Effects if malfunction):

   A 100% LOAD REJECTION TEST WAS PERFORMED BY MANUALLY OPENING THE MAIN GENERATOR OUTPUT BREAKERS FROM B06.

4. Date Tested: 03/21/91

5. Test Initial Conditions: 100% RTP, MOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: Unit Load Rejection Test 73PA-1MA-01, 1/7/86

8. Deficiencies identified by the test: 3839, & 3794

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

TRANSIENT TEST ABSTRACTS

1. Test Title: Maximum Rate Power Ramp (TTP007)

2. ANS 3.5-1985 Section Requiring Test: Appendix B.2.2(7)

3. Description of Test (Cause and Effects if malfunction):

   A POWER RAMP SIMILAR TO THAT PERFORMED FOR THE STARTUP TEST WAS CONDUCTED BY MANUAL OPERATOR CONTROL OF TURBINE LOAD SETTING, RCS BORON CONCENTRATION, AND ROD POSITION.

4. Date Tested: 03/22/91

5. Test Initial Conditions: 95% RTP, MOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: Best estimate data

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

TRANSIENT TEST ABSTRACTS

1. Test Title: Maximum LOCA with Loss of Offsite Power (TTP008)

2. ANS 3.5-1985 Section Requiring Test: Appendix B.2.2(8)

3. Description of Test (Cause and Effects if malfunction):

   A LARGE LOCA COINCIDENT WITH A LOSS OF OFFSITE POWER WAS SIMULATED BY THE INSERTION OF SIMULTANEOUS MALFUNCTIONS TO BREAK A RCS COLD LEG AND TRIP ALL STARTUP TRANSFORMERS.

4. Date Tested: 03/22/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: Palo Verde UFSAR Chapters 6.2 and 6.3

8. Deficiencies identified by the test: 3835, & 3836

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

TRANSIENT TEST ABSTRACTS

1. Test Title: **Maximum Unisolable Steam Line Rupture (TTP009)**

2. ANS 3.5-1985 Section Requiring Test: **Appendix B.2.2(9)**

3. Description of Test (Cause and Effects if malfunction):

   THE LARGEST UNISOLABLE STEAM LINE RUPTURE WAS SIMULATED BY INSERTION OF A MALFUNCTION TO BREAK THE STEAM LINE UPSTREAM OF THE MSIV, INSIDE CONTAINMENT.

4. Date Tested: **03/22/91**

5. Test Initial Conditions: **100% RTP, MOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **A stable, safe, and steady state which could be continued to Cold Shutdown conditions.**

7. Reference Data: **Palo Verde UFSAR Chapter 15.1**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

1. Test Title: **Primary System Depressurization to Saturation Conditions Using a Pressurizer Safety Valve with HPSI Disabled (TTP010)**

2. ANS 3.5-1985 Section Requiring Test: **Appendix B.2.2(10)**

3. Description of Test (Cause and Effects if malfunction):

   THE RCS DEPRESSURIZATION WAS PERFORMED BY INSERTION OF A MALFUNCTION WHICH FAILED A PRESSURIZER SAFETY VALVE FULL OPEN. CONCURRENT MALFUNCTIONS WERE INSERTED TO PREVENT THE HPSI PUMP BREAKERS FROM CLOSING.

4. Date Tested: **03/22/91**

5. Test Initial Conditions: **100% RTP, BOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **A stable, safe, and steady state which could be continued to Cold Shutdown conditions.**

7. Reference Data: **APS Nuclear Fuels Analysis SA-ALL-NCR-90-29-00**

8. Deficiencies identified by the test: **3822, & 3833**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

TRANSIENT TEST ABSTRACTS

1. Test Title: Reactor Trip From 67% Power (TTP011)

2. ANS 3.5-1985 Section Requiring Test: N/A

3. Description of Test (Cause and Effects if malfunction):

   A REACTOR TRIP FROM 67% WAS SIMULATED BY MANUAL OPERATION OF THE REACTOR TRIP SWITCHGEAR FROM B05.

4. Date Tested: 03/22/91

5. Test Initial Conditions: 100% RTP, MOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: Incident Investigation Report 2-2-89-002

8. Deficiencies identified by the test: 3794

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

TRANSIENT TEST ABSTRACTS

1. Test Title: Loss of Normal and Emergency Feedwater (TTP012)

2. ANS 3.5-1985 Section Requiring Test: 3.1.2(10)

3. Description of Test (Cause and Effects if malfunction):

   THE LOSS OF NORMAL AND EMERGENCY FEEDWATER WAS SIMULATED BY THE SIMULTANEOUS INSERTION OF MALFUNCTION TO TRIP EACH PUMP.

4. Date Tested: 03/22/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: CEPAC run dated 03/12/91

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: N/A

    a. Justification for the exceptions: N/A

TRANSIENT TEST ABSTRACTS

1. Test Title: **Simultaneous Steam Flow Transmitter Failures (TTP013)**

2. ANS 3.5-1985 Section Requiring Test: **N/A**

3. Description of Test (Cause and Effects if malfunction):

   THE SIMULTANEOUS FAILURE OF STEAM FLOW TRANSMITTERS WAS SIMULATED BY THE INSERTION OF MALFUNCTIONS TO FAIL EACH MAIN STEAM LINE'S FLOW TRANSMITTER HIGH.

4. Date Tested: **03/21/91**

5. Test Initial Conditions: **100% RTP, MOC**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **A stable, safe, and steady state which could be continued to Cold Shutdown conditions.**

7. Reference Data: **Plant Trip Review Report 1-86-012**

8. Deficiencies identified by the test: **3828, & 3829**

   a. Schedule DR correction: **The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

TRANSIENT TEST ABSTRACTS

1. Test Title: Spurious Opening of SBCV's (TTP014)

2. ANS 3.5-1985 Section Requiring Test: N/A

3. Description of Test (Cause and Effects if malfunction):

   THE SPURIOUS OPENING OF SBCV'S WAS SIMULATED BY INSERTING A MALFUNCTION TO PREVENT THE RPCB FORM INITIATING A CUTBACK, A MALFUNCTION TO PREVENT THE SBCV'S FROM QUICK OPENING, AND ADDITIONAL MALFUNCTIONS TO FAIL MAIN STEAM HEADER PRESSURES HIGH.

4. Date Tested: 03/21/91

5. Test Initial Conditions: 100% RTP, MOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: Incident Investigation Report 2-3-90-002

8. Deficiencies identified by the test: 3794, & 3827

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

TRANSIENT TEST ABSTRACTS

1. Test Title: SGFP Trip RPCB (TTP015)

2. ANS 3.5-1985 Section Requiring Test: N/A

3. Description of Test (Cause and Effects if malfunction):

   A REACTOR POWER CUTBACK WAS INITIATED BY MANUALLY TRIPPING A STEAM GENERATOR FEED PUMP TURBINE FROM 100% RATED THERMAL POWER.

4. Date Tested: 03/21/91

5. Test Initial Conditions: 100% RTP, BOC

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: A stable, safe, and steady state which could be continued to Cold Shutdown conditions.

7. Reference Data: PVNGS Startup Test Archive 114, 73PA-1SF10

8. Deficiencies identified by the test: 3794, & 3826

   a. Schedule DR correction: The schedule for deficiency correction is presented in the section which identifies all outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

STEADY STATE TEST ABSTRACTS

1. Test Title: Computed Value Accuracy (SST001)

2. ANS 3.5-1985 Section Requiring Test: 4.1 and Appendix B2.1

3. Description of Test (Cause and Effects if malfunction):

   THE STEADY STATE COMPUTED VALUES OF THE PARAMETERS SPECIFIED IN APPENDIX B2.1 WERE COMPARED TO REFERENCE-PLANT VALUES AT 100% RTP, 60% RTP, AND 23% RTP. THE ACCURACY OF THE COMPUTED VALUES WAS SHOWN TO BE WITHIN +/- 2% OF THE ACTUAL PLANT PARAMETERS UNDER THE SAME CONDITIONS.

4. Date Tested: 03/18/91

5. Test Initial Conditions: Steady state, 100% RTP, 60% RTP, and 23% RTP.

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: Steady State

7. Reference Data: Actual plant data, and where plant data was unavailable PEPSE engineering code results.

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

STEADY STATE TEST ABSTRACTS

1. Test Title: **Mass and Energy Balance & Simulator Stability (SST002)**

2. ANS 3.5-1985 Section Requiring Test: **4.1 and Appendix B2.1**

3. Description of Test (Cause and Effects if malfunction):

   THE SIMULATOR COMPUTED VALUES OF CRITICAL PARAMETERS AT STEADY STATE FULL POWER OPERATION WITH THE REFERENCE-PLANT CONFIGURATION WERE EVALUATED OVER A SIXTY MINUTE PERIOD. ALL PARAMETERS WERE FOUND TO BE STABLE AND NOT VARY MORE THAN +/- 2% OF THEIR INITIAL VALUES OVER THE SIXTY MINUTE PERIOD. SATISFACTION OF THE MASS AND ENERGY BALANCES IS DEMONSTRATED BY THE STABILITY OF THE MONITORED PARAMETERS FOR THE SIXTY MINUTE PERIOD.

4. Date Tested: **3/18/91**

5. Test Initial Conditions: **Steady state**

   a. Severity tested (if variable malfunction): **N/A**

6. Test Termination Conditions: **Steady State**

7. Reference Data: **Actual plant data**

8. Deficiencies identified by the test: **None**

   a. Schedule DR correction: **N/A**

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: **None**

10. ANS 3.5-1985 exceptions: **None**

    a. Justification for the exceptions: **N/A**

STEADY STATE TEST ABSTRACTS

1. Test Title: Instrument Accuracy (SST003)

2. ANS 3.5-1985 Section Requiring Test: 4.1

3. Description of Test (Cause and Effects if malfunction):

   THE PURPOSE OF THIS ABSTRACT IS TO DOCUMENT THE SIMULATOR'S COMPLIANCE WITH THE REQUIREMENT OF SECTION 4.1 OF ANSI/ANS 3.5-1985 RELATIVE TO INSTRUMENT ACCURACY. THE SIMULATOR USES PANEL INSTRUMENTATION OF COMPARABLE ACCURACY TO THAT CONTAINED IN THE REFERENCE-PLANT WITH THE EXCEPTION OF THE PPS BACK PANEL DIGITAL VOLT METERS.

4. Date Tested: 3/18/91

5. Test Initial Conditions: N/A

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: N/A

7. Reference Data: Palo Verde Unit 1 panel instrument photographs.

8. Deficiencies identified by the test: 2375

   a. Schedule DR correction: The schedule for correction of Deficiency Reports is presented in the section devoted to Outstanding Deficiency Reports.

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

OTHER TEST ABSTRACTS

1. Test Title: Instructor Station Test (MTI001)

2. ANS 3.5-1985 Section Requiring Test: 3.4

3. Description of Test (Cause and Effects if malfunction):
THE INSTRUCTOR INTERFACE WAS TESTED TO VERIFY THE FOLLOWING CONTROL FUNCTIONS:

   REMOTE FUNCTIONS: THE ABILITY TO ACT IN THE CAPACITY OF SUPPORT PERSONNEL REMOTE FROM THE CONTROL ROOM.

   MALFUNCTIONS: THE ABILITY TO SIMULTANEOUSLY AND/OR SEQUENTIALLY INSERT MALFUNCTIONS

   INITIAL CONDITIONS: THE ABILITY TO STORE AT LEAST TEN INITIAL CONDITION SETS

   SNAPSHOT: THE ABILITY TO TAKE A SNAPSHOT OF CURRENT SIMULATOR CONDITIONS AND RESET TO THOSE CONDITIONS.

   BACKTRACK: THE ABILITY TO BACKTRACK TO A PREVIOUS POINT IN THE PROGRESS OF DYNAMIC SIMULATION AND BEGIN DYNAMIC SIMULATION AGAIN.

   FREEZE & RUN: THE ABILITY TO START AND STOP THE PROGRESS OF DYNAMIC SIMULATION.

   TIME: THE ABILITY TO CONTROL THE PROGRESS OF DYNAMIC SIMULATION IN MULTIPLES OR FRACTIONS OF REAL TIME.

4. Date Tested: 3/18/91

5. Test Initial Conditions: N/A

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: N/A

7. Reference Data: Instructor Station ATP

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

OTHER TEST ABSTRACTS

1. Test Title: Computer Real Time Test (MTI002)

2. ANS 3.5-1985 Section Requiring Test: 3.1.1 & 3.1.2

3. Description of Test (Cause and Effects if malfunction):

   THE SIMULATOR'S ABILITY TO SIMULATE, IN REAL TIME, THE NORMAL EVOLUTIONS AND MALFUNCTIONS OF THE REFERENCE-PLANT ARE VERIFIED BY SATISFACTORY COMPLETION OF THE NORMAL EVOLUTION TESTS, MALFUNCTION TESTS, TRANSIENT TESTS, AND STEADY STATE TESTS WITHOUT A FRAME OVERTIME OR MODULE STALL. TIMING STUDIES ARE PERIODICALLY PERFORMED TO VERIFY ALL CODE IS CYCLED WITH SPARE TIME REMAINING IN THE COMPUTER PROCESSORS.

4. Date Tested: 3/18/91

5. Test Initial Conditions: N/A

   a. Severity tested (if variable malfunction): N/A

6. Test Termination Conditions: N/A

7. Reference Data: N/A

8. Deficiencies identified by the test: None

   a. Schedule DR correction: N/A

9. Differences among the opinions of Subject Matter Experts evaluations of the test results: None

10. ANS 3.5-1985 exceptions: None

    a. Justification for the exceptions: N/A

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SECTION 8

PERIODIC TEST SCHEDULE

PERIODIC TEST SCHEDULE

NRC Form 474 requires that a Performance Test Schedule be attached. Regulatory Guide 1.149 requires certain tests including, approximately 25% of the malfunction tests, be run each year. Section 8 lists the 4 year testing schedule for the Simulator.

1. On an annual basis starting from the date of Certification Submittal, all Transient and Normal Evolution Tests will be performed.

2. On an annual basis starting from the date of Certification Submittal, approximately 25% of the Malfunction Tests shall be performed with all Malfunction Tests being performed before the four (4) year anniversary of Certification Submittal.

3. Specific Malfunction Test Schedule is as follows:

MARCH 1991 THROUGH MARCH 1992 PERFORM:

CC02	NUCLEAR COOLING WATER PUMP TRIPS (PUMP "A" & "B")
CC06	ESSENTIAL COOLING WATER PUMP TRIP (PUMP "A" & "B")
CC16	NCW LEAK INSIDE CONTAINMENT ON COMMON RETURN HEADER IMMEDIATELY UPSTREAM OF NCN-UV-403 (DISCRETE)
CV16	RCP SEAL #1 FAILURE (ALL 4 RCP's)
CV17	RCP SEAL #2 FAILURE (ALL 4 RCP's)
CV18	RCP SEAL #3 FAILURE (ALL 4 RCP's)
CV23	LOCA ON LETDOWN LINE DOWNSTREAM OF RHX OUTLET ISOLATION VALVE, CH-UV-523. (DISCRETE)
ED03	STARTUP TRANSFORMER TRIPS ON TRANSFORMER FAULT (ALL 3 TRANSFORMERS)
ED09	LOSS OF POWER TO NON-CLASS 125 VDC BUS (NKN-M45 & M46)
ED12	LOSS OF POWER TO CLASS 125 VDC BUS (PK M41, M42, M43 & M44)
FW01	MOTOR DRIVEN AUX FEED PUMP TRIP (AFN & AFB-P01)
FW03	AFA-P01 SPEED CONTROL FAILURE (DISCRETE)
FW57	FW PUMP-TURBINE SHAFT SHEAR (BOTH PUMPS)
IA04	IA HEADER RUPTURE BETWEEN IAN-V215 AND IAN-V311 (DISCRETE)
MS11	STEAM LINE RUPTURE UPSTREAM OF MSIV (SG1 LINE 1 & SG2 LINE 1)
RC01	PRESSURIZER SAFETY VALVE FAILS (RCE-PSV-200 & 201)
RD01	DROP/SLIP OF CEA (CEA's 60, 19)
RH06	LPSI PUMP TRIP (BOTH PUMPS)
RP34	RTSG FAILS AS IS (ALL 4 BREAKERS)
RX01	FAILURE TO INITIATE RPCB (DISCRETE)
RX07	SBCS TURBINE RUNBACK CIRCUIT FAILS (PRODUCES RUNBACK) (DISCRETE)
RX09	STEAM HEADER PRESSURE TRANSMITTER FAILS (BOTH DETECTORS)
RX13	FWCS S/G LEVEL TRANSMITTER FAILS (ALL 4 DETECTORS)
RX14	FWCS STEAM FLOW TRANSMITTER FAILS (ALL 4 DETECTORS)
SW01	PLANT COOLING WATER PUMP TRIP (BOTH PUMPS)
TH01	LOCA - COLD LEG (LOOP 1A)
TH03	STEAM GENERATOR TUBE RUPTURE (BOTH SG's)
TP08	TC HEADER RUPTURE (DISCRETE)

PERIODIC TEST SCHEDULE

MARCH 1992 THROUGH MARCH 1993 PERFORM:

CC12	SPRAY POND PUMP BREAKER FAILS TO CLOSE (PUMP "A" & "B")
CV02	LETDOWN TEMPERATURE CONTROLLER FAILURE (DISCRETE)
CW01	CW PUMP TRIP (ALL 4 PUMPS)
ED01	FAST BUS TRANSFER RELAY FAILS TO ACTUATE (BOTH BUSSES)
ED05	13.8KV INTERMEDIATE BUS TRIP (NAN-S05 & S06)
ED10	LOSS OF POWER TO NON-CLASS 120 VAC BUS (NNN-D11, D12, D15 & D16)
EG06	DG BREAKER FAILS TO CLOSE (BOTH DG's)
EG08	LOSS OF LOAD DUE TO GENERATOR TRIP (DISCRETE)
FW11	CLASS AUX FW PUMP DISCHARGE LINE LEAK (AFA-P01)
FW21	CONDENSER AIR IN LEAKAGE (ALL 3 SHELLS)
FW61	ECONOMIZER FW RUPTURE INSIDE CONTAINMENT DOWNSTREAM OF CHECK VALVE (BOTH SG's)
HV06	CR ESSENTIAL AFU FAN TRIPS (BOTH FANS)
IA01	IA COMPRESSOR TRIP (ALL 3 COMPRESSORS)
MS08	MSIV FAILS AS-IS (ALL 4 MSIV's)
MS12	STEAM LINE RUPTURE DOWNSTREAM OF MSIV (DISCRETE)
NI02	CONTROL CHANNEL NI DETECTOR FAILURE (BOTH CHANNELS, BOTH DETECTORS)
RC02	PRESSURIZER SPRAY VALVE FAILS (BOTH VALVES)
RD02	STUCK CEA (CEA's 04, 87, 21 & 02)
RD07	UNCOUPLED CEA SPIDER (CEA's 62 & 68)
RH05	CONTAINMENT SPRAY PUMP TRIP (BOTH PUMPS)
RP01	ESFAS ACTUATION CIRCUIT FUSE FAILURE (MSIA TRAIN A LEG 1-3, MSIS-A-2-4, SIAS-A-1-3, SIAS-A-2-4, CIAS-B-1-3, CIAS-B-2-4, CSAS-A-1-3, CSAS-A-2-4, RAS-B-1-3, RAS-B-2-4, AFAS1-B-1-3, AFAS1-B-2-4, AFAS2-A-1-3, AFAS2-A-2-4
RP26	PPS REACTOR PROTECTION SETPOINT FAILURE FOR LOW RCS FLOW (ALL 8 DETECTORS)
RX03	RRS T_{AVE} FAILURE (DISCRETE)
RX24	PLCS MASTER CONTROLLER SETPOINT FAILS (DISCRETE)
SB01	CPC FAILURES (ALL 4 CPC's)
TC12	TURBINE TRIP (DISCRETE)
TH02	LOCA - HOT LEG (LOOP 2)
WD05	S/G BLOWDOWN ISOLATION VALVE FAILS AS-IS (SG-UV-500R & Q)

PERIODIC TEST SCHEDULE

MARCH 1993 THROUGH MARCH 1994 PERFORM:

CH04	CEDM NORMAL ACU FAN MOTOR TRIPS (ALL 4 FANS)
CV10	CHARGING PUMP TRIP (ALL 3 PUMPS)
CV15	LD CONTROL VALVE FAILURE (BOTH VALVES)
CW02	CONDENSER TUBE RUPTURE (SECTION 1A & 1C)
ED02	UNIT AUXILIARY TRANSFORMER TRIP ON TRANSFORMER FAULT (DISCRETE)
ED04	13.8 KV BUS UNDERVOLTAGE PROTECTION (NAN-S01 & S02)
ED11	CLASS 4160 VOLT BUS TRIP (PBA-S03 & PBB-S04; NORM & ALT SUPPLY BKRS)
ED14	LOSS OF POWER TO CLASS 120 VAC BUS (PN D25, D26, D27 & D28)
EG02	DG DIFFERENTIAL RELAY TRIP (BOTH DG's)
EG09	MAIN GENERATOR AC REGULATOR SETPOINT FAILURE (DISCRETE)
EG10	TURBINE FAILS TO TRIP (DISCRETE)
FW17	CD PUMP TRIP (ALL 3 PUMPS)
FW19	HOTWELL MAKEUP CONTROLLER FAILURE (BOTH)
FW42	FW LP HEATER LEVEL SWITCH FAILURE (EDN-LSHH-425 & 426)
FW53	FW HEADER RUPTURE (DISCRETE)
FW73	DOWNCOMER FWIV FAILS CLOSED (ALL 4 VALVES)
IA05	IA N_2 BACKUP CONTROL VALVE STICKS CLOSED (DISCRETE)
MS09	ADV FAILS AS-IS (ALL 4 ADV's)
MS10	STEAM LINE SAFETY VALVE FAILS OPEN (SG-PSV-556, 557, 558, 559, 574, 575, 576, 577, 691, 692, 694 & 695)
NI01	STARTUP NI PRE-AMP FAILURE (BOTH CHANNELS)
NI04	SAFETY CHANNEL NI MIDDLE DETECTOR FAILURE (CH's "B" & "D")
NI05	SAFETY CHANNEL NI LOWER DETECTOR FAILURE (CH's "B" & "D")
RC05	LOCKED ROTOR ON REACTOR COOLANT PUMP (RCP "1A" & "2A")
RD03	CEA PULSE COUNTER PROGRAM FAILS (DISCRETE)
RD06	INOPERABLE CEA GROUP (ALL GROUPS)
RD12	UNCONTROLLED REG GROUP MOTION (WITHDRAWAL) (AS & MS)
RD13	UNCONTROLLED REG GROUP MOTION (INSERTION) (AS & MS)
RJ02	PLANT (PMS) COMPUTER FAILURE (BOTH COMPUTERS)

PERIODIC TEST SCHEDULE

MARCH 1994 THROUGH MARCH 1995 PERFORM:

RM01	RADIATION MONITOR OUTPUT IS HIGH (RU-29, 30, 31, 145, 37, 38 & 1)
RP03	PPS REACTOR PROTECTION SETPOINT FAILURE FOR LOW STEAM GENERATOR LEVEL (ALL 8 DETECTORS)
RP05	BOP ESFAS SEQUENCER FAILURE (BOTH TRAINS)
RP35	RTSG TRIP (ALL 4 BREAKERS)
RX04	RRS TURBINE FIRST STAGE PRESSURE INPUT FAILS (BOTH DETECTORS)
RX06	RRS COLD LEG TEMPERATURE INPUT FAILS (BOTH DETECTORS)
RX08	SBCS QUICK OPEN CIRCUITS FAILS (DISCRETE)
RX10	SBCS MASTER CONTROLLER FAILS (DISCRETE)
RX17	FWCS MASTER CONTROLLER FAILS (BOTH CONTROLLERS)
RX18	FWCS REFILL DEMAND CONTROLLER FAILS (BOTH CONTROLLERS)
RX23	PRESSURIZER LEVEL TRANSMITTER FAILS (ALL 3 TRANSMITTERS)
RX26	PRESSURIZER PRESSURE TRANSMITTER FAILS (RCN-PT-100Y & X)
RX34	RCS T-HOT TRANSMITTER FAILURE (RC-TT-112HA & HD, 122HB & HC)
RX37	PZR NR PRESSURE TRANSMITTER FAILURE (RC-PT-101A, B, C & D)
RX40	S/G PRESSURE TRANSMITTER FAILURE (SG-PT-1013A, D & 1023B)
RX41	S/G NR LEVEL TRANSMITTER FAILURE (ALL 8 TRANSMITTERS)
SB02	CEAC FAILURE (DEFAULT PF SENT TO CPC) (BOTH CEAC's)
SI02	HPSI PUMP TRIP (BOTH PUMPS)
SI04	SIT WATER LEAK (ALL 4 SIT's)
SI05	HPSI PUMP DEGRADED PERFORMANCE (BOTH PUMPS)
SW03	PW HEADER RUPTURE (DISCRETE)
TC15	TURBINE CONTROL VALVE/ NO. 2 STOP-VALVE FAILURE (CV2 & 4 AND SV-2)
TC19	CONTROL OIL RUPTURE (DISCRETE)
TH09	FUEL ROD DEFECT (DISCRETE)
TP01	STATOR COOLING PUMP TRIP (BOTH PUMPS)
TP03	HYDROGEN LEAK FROM MAIN GENERATOR CASING (DISCRETE)
WD01	GR DECAY TANK RUPTURE (DISCRETE)
WD04	S/G BLOWDOWN LINE RUPTURE INSIDE CONTAINMENT (SG1)

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SECTION 9

DISCREPANCY REPORTS

DISCREPANCY REPORTS

Simulator Discrepancy Reports (DR) document current deficiencies in the Certified load. There are no outstanding DR's in the Certified load which would cause an exception to the requirements of ANSI/ANS-3.5-1985 as endorsed by Reg. Guide 1.149.

The schedule for resolving outstanding DR's is as follows:

1. All DR's listed in this Report will be resolved within one year of Certification Submittal.

2. DR's issued on malfunctions will be resolved prior to training on that malfunction.

3. DR's on tests will be resolved prior to the scheduled re-run of that test.

A listing of outstanding DR's follows.

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I0204	AN	ANNUNCIATOR
I0450	FW	RF FUNCTION
I0563	OPER	MSR 2ND STG HI LD VLVS CLOSE PRIOR TO 860 MW'S
I0841	MANU	CONTROLLERS AT RSDP "A" AND "B" HAVE THE WRONG DESIGNATIONS
I0998	HW	5 POS SWITCH DIS
I1011	OPER	MF-CV15: CHN-201 RESPONSE
I1019	YP	SWITCH CHECK AFW DISCONNECT SWITCHES
I1049	CH	UNIFORM CNMT TEMPS
I1183	OPER	LOCAL ANNUN RESET RF
I1221	OPER	MF-DG04: MF NEEDS RE-WRITE
I1234	TH	MF-RC01: NO VARIABLE
I1235	OPER	SAFETY VLV TAIL PIPE TEMP EXPECTED
I1342	OPER	MF RD13: CEA'S SHOULD INSERT AT THE FAST RATE
I1409	OPER	WRONG DAMPERS SHUT
I1438	HW	PHONES HAVE AN INDICATION AND RINGS ON LOSS OF D-12
I1509	YP	FLASH NEEDED FOR SGN-HIC-1010(B04)
I1556	AN	ALARMS ON LOP
I1571	OPER	COMPUTER PT NEEDED
I1573	AN	PROVIDE CORRECT INTERFACING & CYCLING
I1626	OPER	RF-EDR103/NO RESET FOR PBA-S03M
I1628	OPER	ED146/NO RESET LOCKOUT ON PGA-L35C4
I1635	YP	"B" TRAIN BOP ESFAS SWTCH DOES NOT CK
I1651	EG	DG BKR RACK OUT INCORRECT
I1654	OPER	86 LOCKOUT WOULD NOT RESET ON PBB-S04M
I1657	OPER	86 LOCKOUT ON PGB-L34C3 WOULD NOT RESET
I1710	OPER	DELETE TESTING
I1737	YP	MAJORITY OF HW COULD NOT BE FOUND AT INIT STA
I1745	XX	REPLAY FEATURE DOES NOT FUNCTION
I1755	OPER	SHOULD RECEIVE SEIS ALRM
I1756	OPER	SEIS SHLD ALRM 5 SEC TIME DELAY
I1757	OPER	SHLD RECEIVE SEIS ALRM

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I1758	OPER	SHLD ALRM WITH 5 SEC TIME DELAY
I1812	BAD	MISSING DR
I1861	OPER	WINDOWS CAME IN AND WERE NOT EXPECT
I1892	HW	DVM READ NEG VALUES-SHLD BE POS
I1935	OPER	PROVIDE RF FOR RESET
I1957	HW	CORRECT SERVO VLVS
I1966	OPER	RFSCHR16
I1967	OPER	PROVIDE SEPARATE RF FOR FUEL POOL LOCAL ANNUNC
I1985	RX	CORRECT MODULE LOCKUP
I2003	NI	ERROR IN MF-NI08A SHLD BECOME LESS
I2006	BAD	MISSING DR
I2007	OPER	NO RF TO DE-ENERG EDN-UV-31 & 32
I2015	BAD	MISSING DR
I2061	YP	NI BACK PANELS NOT IN SWTCHCK
I2072	FW	TEMP DECREASED/SHLD REMAIN SAME
I2073	RX	FLOW SHLD GO SLIGHTLY NEG
I2081	MANU	FIX PROB AT RSDP "B" SAME AT RSDP "A"
I2094	TH	RF DOES NOT WORK
I2131	MANU	CORRECT INDICATOR
I2144	FW	FWT109 AND 110 DID NOT DECREASE
I2145	FW	FWP 18 AND 17 DID NOT INCREASE IN PRESS
I2146	OPER	SHLD BE BOXES
I2151	OPER	CORRECT ALARM FUNCTION ON BOX DISPLAYS
I2167	OPER	ADD DISPLAY BORDER TO TOP AND BOTTOM
I2183	HW	CHG PMP CTRL PNL HANDSWTCHES NOT FUNCT CORRECTLY
I2195	OPER	STROKE TIMES TOO LONG
I2197	AN	NO BELL ALRMS SHLD COME IN
I2226	OPER	SHLD BE LEAKAGE TO ALLOW PRESS TO DECAY AWAY
I2231	OPER	CLD NOT OPN BREAKER FOR EMERGENCY OIL PMP
I2240	MANU	NUMERIC & FUNCT KEYPADS DO NOT WORK
I2245	OPER	ONE VLV SHLD BE CLSD AT ALL TIMES-FIX RF

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I2273	OPER	NO RF'S TO CYCLE BKRS
I2280	MS	PRESS SHLD DROP
I2286	OPER	RCP DIFFERENTIAL LOW
I2291	OPER	410P-16H01 DOES NOT WORK AS WRITTEN
I2318	OPER	MAX NUMBER OF GRP DISPLAYS IS GREATER THAN 22
I2347	NI	COUNT AUDIBLE SHLD NOT BE HEARD WHEN S/U CHANNELS ARE DE-ENERG
I2375	HW	LINEAR PWR
I2393	OPER	LPSI A&B PMP CURRENTS INCORRECT
I2430	PE	OUT OF SCOPE
I2477	PMS	COMPLETE LOSS OF AC & DC
I2487	WD	VLV SHLD INDICATE ACTUAL POSITION & BE OPERABLE
I2506	OPER	STROKE TIMES EXCESS
I2512	AN	CORRECT TEST FEATURE OF 5C 1-7
I2555	ALL	CORRECT PMP AMPS TO DISCHG PRESS RELATIONSHIP
I2558	OPER	SHOULD BE ABLE TO PASS FLOW THRU IDLE CHARGING PMP
I2559	SI	CORRECT SIT HEAD LVL CALC & PRESS HEAD RELATIONSHIPS
I2560	OPER	CORRECT INPUTS TO CHEST DISPLAY
I2570	YP	SHLD BE CONSIST IN METHOD USED FOR INITIAL TGIS
I2574	HW	CORRECT WESTRONICS CHART RECORD ALRM ACK TO CLEAR RK WINDOW
I2579	CH	CORRECT RDT RUPTURE DISC OVERFLOW
I2618	YP	TPR DOES NOT FUNCTION IAW ATP
I2622	HW	SHOULD BE A 2 POSITION SWITCH
I2628	AN	PT ID'S DO NOT CHANGE STATUS WHEN MF-ED03 IS ACTIVATED
I2632	OPER	MF-CV16
I2678	PE	MILLIVOLTS NEVER CHANGE
I2683	OPER	CANNOT BE DISPLAYED ON ERFDADS CRT
I2687	HW	MAX SETPT SHOULD BE 52%
I2692	PE	MILLIVOLT SIGNAL NOT WORK ON COMPUTER PTS
I2705	PE	PMS NOT WORKING

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I2743	COLSS	DIGITAL PWR MARGIN METER NOT BLANKED
I2744	COLSS	COLLS OUTPUT GOOD AFTER MF REMOVED
I2745	COLSS	COLLS ALARM MESSAGES NOT MARKED
I2799	OPER	PRESSURE DROPPED TO MUCH
I2816	AN	PMS PTS DID NOT CHANGE
I2819	OPER	MALF TC15E EFFECTS
I2820	AN	PTS DO NOT CHANGE STATE
I2825	WD	ALARMS AND WINDOW WERE NOT RECEIVED
I2829	TH	CORRECT H5TC UNHEATED INPUTS
I2842	TP	PMS PTS DO NOT ALARM
I2845	WD	PTS NEVER CHANGE STATE
I2862	RM	CORRECT COMPONENT OPERATION
I2890	OPER	MANUAL INDIVIDUAL DOES NOT WORK
I2894	PMS	PMS PT DOES NOT CHANGE STATE
I2909	HW	ROD CONTROL SWITCH HAS TO MANY POSITIONS
I2921	MANU	METERS NEED REPAIRING
I2927	OPER	NO RUNBACK
I2934	CR	NO EFFECT ON ASI
I2939	BAD	HOLDING
I2951	PMS	CORRECT CONTACT CUTOUT
I2953	YP	NO CRYWOLF CAPABILITY
I2959	AN	ANNUNCIATOR WINDOWS SHOULD BE DEENERGIZED
I2972	MANU	BACKPANEL IS NOT DEENERGIZED
I2974	MANU	BACKPANEL IS NOT DEENERGIZED/SHOULD BE
I2993	XX	CORRECT ANN/PROBLEM/FRAME SLIPPAGE
I3000	HW	UNABLE TO USE PHONES
I3007	ATP	ANNUNCIATOR WINDOWS DO NOT ALARM
I3010	PE	PMS PTS DO NOT FAIL
I3015	RM	RADIATION MONITOR DID NOT DEENERGIZE
I3016	EG	AUTO FUNCTION DOES NOT WORK
I3017	PE	PMS ANALOG PTS DO NOT FAIL

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3019	ATP	PTS SHOULD ALARM
I3024	HW	CORRECT INGRAVING
I3027	HW	CORRECT WITH CORRECT SWITCH
I3028	HW	SHIM SWITCH BOOT MISSING
I3030	OPER	CORRECT DISPLAYS
I3032	HW	CORRECT HARDWARE
I3033	HW	PAINT BOUNDARY AROUND QSPDS INCORRECT
I3046	PE	PMS DID NOT GIVE INDICATION OF "BAD"
I3047	PMS	PMS RESPONSE INCORRECT
I3068	AN	ALARM ACKNOWLEDGE PUSH BUTTON DOES NOT WORK
I3078	RP	FANS DO NOT START
I3079	AN	DIG PTS DO NOT GO TO ALARM
I3094	ERF	ERFDADS DISPLAY DOES NOT GIVE INDICATIONS CORRESPONDING TO REMOTE
I3096	OPER	POINTS NON-VALID TO BE
I3098	HW	DVM CHANNEL TEST VOLTS SHOULD BE WITHIN ACCEPTABLE TOLERANCE
I3106	FW	NO TEMP DECREASE OCCURS
I3111	SI	FLOW COULD NOT BE ACHIEVED
I3113	OPER	NEED TO ADD REMOTE FUNCTION
I3114	AN	COMPONENT WINDOW N19 DOES NOT LAMP
I3119	FW	INCORRECT READINGS
I3121	WD	BFT FLOW OSCILLATION EXCESSIVE IN ABNORMAL BLOWDOWN
I3131	BAD	MISSING
I3132	OPER	SEAL LEAKAGE INCORRECT
I3133	ATP	SUMP RESPONSE INCORRECT
I3142	PE	PTS SHOULD BE IN ALARM
I3151	CPC	CEAC #1 DISPLAY ON BO4 DOES NOT FAIL
I3152	RMS	RMS MONITORS ARE NOT FULLY DEENERGIZED
I3161	PE	PMS PID'S DO NOT ALARM
I3200	TC	SERVO CURRENTS FOR TURBINE VALVES INCORRECT

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3202	OPER	PROVIDE REMOTE OPERATOR ACTION REQUIREMENTS
I3203	MANU	SG PRESSURE INDICATOR BACKWARDS
I3231	SI	HPSI FLOW OSCILLATIONS OCCURRED WHEN SIZE OF VALVE WAS REDUCED
I3234	CH	CORRECT RESPONSE OF RADIATION MONITORS
I3243	TH	S/G LEVEL #1 DID NOT RECOVER
I3244	WD	CONDENSER AIR REMOVAL FILTER UNIT DID NOT SWITCH THRU-FILTER
I3281	HW	NI DRAWER WENT TO 100% / SHOULD HAVE GONE TO 200%
I3284	CPC	CORRECT CPC PROGRAM
I3288	YP	CONDENSER VACUUM FAST TIME DOES NOT WORK
I3293	AN	CORRECT LOGIC/ANNUNCIATOR INPUT
I3300	TH	CORRECT MS/SG RESPONSE
I3305	OPER	PUMP AMPS SHOULD NOT DROP TO 45 AMPS AND THEN INCREASE
I3312	TH	VESSELS HEAD COOLDOWN IS TOO SLOW
I3314	TP	GENERATOR PRESSURE DOES NOT DECREASE
I3319	OPER	HEADER PRESSURE DECREASES TOO SLOWLY
I3333	PE	PMS PTS HAVE '0' INDICATED FOR MILLIVOLTS
I3335	YP	ALL SIM DIAGS REQ
I3336	YP	SIM DIAGS DO NOT HAVE ABILITY TO SELECT OVERRIDES
I3345	RP	CORRECT HARDWARE/SOFTWARE
I3346	OPER	CW CONDENSER OUTLET VALVES CANNOT BE OPENED
I3350	TH	PRESSURE SHOULD HAVE REACHED 5 PSIG FOR STEADY STATE LEVEL
I3354	HW	PHYSICAL HARDWARE FOR CPC NOT CORRECT
I3357	OPER	NO REMOTE FUNCTIONS TO FILL THE CW SYSTEM
I3358	YP	SPECIAL FUNCTIONS DO NOT SHOW UP AS OVERRIDES
I3370	RD	REMOTE FUNCTIONS INCORRECTLY ASSIGNED
I3371	RD	PULSE COUNTERS DO NOT UPDATE
I3372	RD	ALL SUBGROUPS CANNOT BE ON THE HOLD BUS AT THE SAME TIME
I3380	RD	CEDMCS TRB ALARM COMES IN TOO SOON

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3381	TP	TPR09 VENT REMOTE FUNCTION DOES NOT WORK
I3383	AN	PROVIDE CORRECT LOGIC FOR RR
I3388	HW	DEMAND TO ALARM DOES NOT WORK
I3403	PMS	PT PRINT AND OPER LOGS CANCEL FUNCTION DOES NOT WORK
I3414	TC	CV SERVO'S NEVER WENT POSITIVE
I3415	OPER	NEED REMOTE FUNCTIONS TO CLOSE MSR DRAIN TANK
I3418	PE	NO REMOTE FUNCTIONS FOR 17 & 19
I3424	OPER	NEED RF FOR TRNG TO ADJUST #2 PRESSURE IN VCT
I3425	AN	ALARM PTS IN ALARM FOR NO REASON
I3432	PMS	NOT GETTING ENTIRE REPORT WHEN PRINTING PC & CMC "COLSS REPORT"
I3444	RP	PMS SPTS RECEIVING INCORRECT INPUTS
I3445	TU	TURNING GEAR TAKES TOO LONG TO SLOW DOWN AND RETURN
I3446	AN	RK SYS RINGS ONCE TO INDICATE ALARM IS CLEAR/SHOULD NOT HAPPEN
I3452	TH	CEDM DID NOT COOL RX VESSEL HEAD AT
I3453	OPER	LOCAL FIRE ALARMS DO NOT ALARM
I3454	OPER	REMOTE FUNCTION WAS NOT ADDED
I3461	PE	RESTORE PERIPHERAL
I3464	XX	CMC "LAMP TEST" BACKLIGHT IS ON AT ALL TIMES
I3468	FW	CORRECT INDIVIDUAL DEMIN VESSEL DP
I3479	RD	ALARM PTS INCORRECT
I3483	OPER	PMS ANNUNCIATOR PAGE DISPLAYS ARE MISSING SOME DATA
I3494	HW	CORRECTERFDADS RESPONSE
I3497	TC	STOP VALVE CONTACTS TO UNIT OCCILLIGRAPH ARE BACKWARDS
I3502	HW	ALARM FOR RODS OFF BOTTOM DOES NOT COME IN
I3507	QSPDS	SATURATION MARGIN SHOULD CHANGE
I3519	TU	ECCENTRICITY SHOULD OSCILLATE AT TURBINE TURNING SPEED
I3527	NI	SWITCH TOGGLES BETWEEN FLUX & SETPOINT/SHOULD TOGGLE TO NEXT POSIT
I3532	NI	PULSE LIGHTS FOR SUBGROUP SHOULD REPEAT

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3534	XX	97BSCOMPUTER SNAPLOAD DOES NOT SNAP THE CONSTANTS CHANGED VIA ISD
I3545	WD	CHECK PZR SURGE AND PZR STEAM SPACE FOR PROBLEM
I3554	CW	ON PVTGIS RF CW15 RANGE IS 0 TO 100/SHOULD BE 0 TO 360 DEGREES
I3559	TP	H2 COOLER TEMP ARE NOT CORRECT
I3560	COLSS	ALARM WINDOWS SHOULD LOCKIN
I3564	ATP	PT 5 READING SHOULD BE CONSISTENT WITH PT 9
I3567	TC	LARGE TIME DELAY BEFORE IV-1 VALVE STARTS TO SHUT
I3573	CH	CORRECT FAN FLOWS
I3587	CPC	DO NOT RECEIVE AUX TRIP ON ASI OUT OF RANGE
I3589	FW	SWAP OVER SHOULD OCCUR QUICKLY WITH NO NOTICEABLE SPEED CHANGE
I3591	RM	STEP CANNOT BE VERIFIED WHEN CHANNELS ARE ALREADY IN ALARM
I3593	NI	DVM SHOULD CHANGE
I3594	MS	DECAY RATE ON TUBE PRESSURE IS TOO FAST AFTER SECURING STEAM
I3595	YP	TGIS SHOULD NOT EXIT WHEN "MOUSING" AROUND ON MPS
I3596	YP	OVERRIDES HAVE LISTED PROBLEMS
I3598	YP	NEED OVERRIDE CAPABILITY
I3609	MANU	MAX STOP SHOULD BE 10.0
I3616	OPER	SECOND STAGE STEAM FLOWS ARE MUCH HIGHER THAN UNIT DATA
I3629	YP	DESCRIPTIONS FOR MALFUNCTIONS ARE REVERSED
I3641	AN	PC AND CMC RETURN TO NORMAL
I3646	FW	FEEDWATER REMOTE FUNCTION FW59 WILL NOT CAUSE FLOW IN LP HEATER
I3648	FW	ERFDADS PT NOT RECEIVING ANY INPUT
I3649	CH	ERFDADS PT NOT RECEIVING INPUT
I3651	ED	VOLTAGE METER IMPROPERLY CONNECTED
I3653	PMS	PMS SEQUENCE OF EVENTS LOGS DO NOT WORK

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3654	PMS	POST TRIP LOG FUNCTION DOES NOT WORK
I3656	YP	CONTROL BOARD DOES NOT FLASH IN SWITCH CHECK
I3658	HW	LARGE CORE STORE (LCS) FAILURE ALARM LAMP SHOULD LIGHT
I3659	COLSS	POINTS SHOULD GO INTO ALARM STATUS
I3663	OPER	RU-33 IS SHOWN ON RMS/SHOULD BE DELETED FROM SIMULATOR
I3665	TH	LEVEL IN OUTLET PLEMUM TOOK TOO LONG TO GO AWAY
I3668	RP	DURING MALF TEST LIGHTS WERE ON @ STEP 73
I3669	RP	LIGHTS SHOULD NOT BE EFFECTED
I3670	MS	EDLS830 & 810 SHOULD NOT HAVE COME IN ALARM
I3671	YP	DISK ERROR SIGNALS SLOW THE REBOOTING OF THE INSTRUCTOR STATION
I3675	OPER	NEED REMOTE FUNCTIONS
I3677	PE	CONTAINMENT SPRAY PUMP SPRAYING TO CONTAINMENT 1SIL704
I3678	PE	ERFDADS PT NOT CHANGING AS PUMP RUNS
I3679	YP	OVERRIDE INSTRUCTION ED SYSTEM IS NOT SHOWN
I3680	YP	PZR PRESSURE CONTROLLER DOES NOT FLASH IN SWITCH CHECK
I3681	RM	RU-4 & RU-5 DO NOT RECEIVE LOW FLOW ALARMS
I3683	RM	ANNUNCIATORS ON B03 DO NOT ENERGIZE WHEN ALARMS OCCUR
I3685	RM	LETDOWN RAD MONITOR RESPONDS ALMOST INSTANTLY WHEN MALF INSERTED
I3687	RM	RU-143-144 DO NOT INCREASE ENOUGH
I3688	OPER	ERFDADS PTS ARE NOT IN DATABASE
I3692	COLSS	CORRECT ALARM CALCULATIONS
I3694	RMS	VARIOUS RU UNITS ARE IN ALARM
I3698	RD	ERFDADS PT DID NOT CHANGE
I3699	RP	CORRECT VSP TRIP IN PPS
I3702	PMS	CEA POSITION PT ON PMS DOES NOT WORK PROPERLY
I3709	OPER	ERFDADS PTS NOT RECEIVING INPUTS
I3711	QSPDS	ERFDADS PTS NOT RECEIVING INPUTS
I3713	OPER	SIMULATOR HEAT BALANCE OFF AT ALL PWR LEVELS
I3714	HW	STANDBY PUMP SHOULD GO OFF BLACK & WHITE SETPOINT

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3717	PMS	CMC SHOULD BE READING THE SAME AS PC
I3719	WD	ERFDADS PTS BACKWARDS
I3720	WD	ERFDADS PTS BACKWARDS
I3721	QSPDS	ERFDADS PTS ARE RECEIVING NO VALUE
I3723	CC	REMOTE FUNCTION SHOULD NOT RESET BACKCUTS
I3727	PMS	OPERATOR LOG #1 WILL PRINT NO MATTER WHAT LOG HAS BEEN REQUESTED
I3728	CV	BORON DECREASES
I3735	YP	NO RESPONSE AT THE INSTRUCTOR STATION
I3736	MANU	HARDWARE SIMULATION FAULT ALARM DOES NOT FUNCTION
I3739	XX	QSPDS A/B LOCKUP & WILL NOT UPDATE/CHANGE DISPLAY
I3740	TH	RCA PT 190A NOT TAPPED FROM CORRECT RCP
I3742	QSPDS	ERFDADS PTS NOT RECEIVING INPUTS
I3744	TC	MAIN TURBINE SHOULD MECHANICALLY OVERSPEED BETWEEN 1980 & 1998
I3745	TC	TURBINE IS DRAWING TOO MUCH STEAM
I3746	TH	PRESSURIZER PRESSURE RESPONSE SEEMS TO DRASTIC
I3749	HW	SWITCH IS INCORRECT
I3753	COLSS	COLSS INDICATORS DO NOT FAIL LOW
I3754	RMS	MONITOR WAS NOT ALARMING
I3755	BAD	RAD MONITOR SHOWS REACHABLE AFTER ITS TAKEN OFF LINE
I3761	RMS	T. YCREX ABORTED ON MF01
I3762	HW	SIT PRESS & NCW FLOW TO RCP ANNC BUTTONS ARE WRONG
I3764	BAD	ERFDADS PT INCORRECT
I3765	RX	PROPORTIONAL HEATER TRIP OFF
I3766	TH	RADIATION LEVELS SHOULD NOT INCREASE IN TH
I3767	TH	INCREASE IN RAD LEVEL IS NOT CORRECT
I3769	XX	RXLG2 ABORTED ON MF01
I3770	OPER	PMS PTS READ VERY HIGH
I3771	COLSS	POINTS ON PC AND CMC INCORRECT
I3772	RX	CORRECT STEAM FLOW RATE OF CHA

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3774	QSPDS	ERFDADS PTS NOT RECEIVING INPUTS
I3775	RX	S/G #2 NR WAS AT 60%/SHOULD BE AT 50% NR
I3776	MS	FLUCTUATIONS SHOULD NOT OCCUR
I3778	TH	HI ALERT CAME IN WHEN #1 S/G WAS TAKEN TO ABNORMAL RATE BLOWDOWN
I3779	TH	SPEED SHOULD DECREASE TO 0 RPM
I3782	OPER	EXCESSIVE NOISE OCCURS ON SECONDARY PARAMETERS
I3783	WD	WINDOW 7B6A ALARM DID NOT COME N
I3784	TC	PMS PT MTYS76 IS IN ALARM STATE FOR NO REASON
I3785	AN	PMS PTS ARE IN ALARM FOR NO REASON
I3786	HW	LOCK ARE INCORRECTLY LOCATED
I3787	CV	BORONOMETER READING IS INCORRECT
I3788	RX	RPCB & CWP GO IN & OUT OF ALARM
I3789	TH	LETDOWN RADIATION MONITOR PEGS HIGH WHILE RUNNING THIS
I3790	HW	KNOB MALFUNCTION & "TENS" INDICATOR DOES NOT UPDATE
I3793	EG	MAIN GENERATOR TRIPPED ON BACKUP VOLTS/H2
I3794	MS	MAIN STEAM PRESSURE IS VERY ERRATIC
I3795	RM	THERE IS AN UNINTERRUPTABLE PWR SUPPLY ON EQUIPMENT
I3796	RX	SBCS VALVES FAIL IN OPEN POSITIONS
I3797	FW	ISOLATION VALVES DID NOT FAST CLOSE / APPEARED TO SLOW CLOSE
I3798	CPC	TRIP SHOULD BE ON DNBR ON THIS EVENT
I3799	PMS	UNITS DISPLAYED ON TGIS ARE "GPM"PARAMETER SUMMARY ARE 'GPM'
I3800	CPC	EX-CORE PWR ONLY GOES UP TO 102% PWR
I3801	HW	RCN-TT-186 INDICATOR IS FAILED LOW
I3802	CPC	CEAC CRT TEST PATTERN IS INCORRECT
I3803	PMS	AFFECTED CALCULATOR SHOULD NOT BE ADDRESSABLE
I3804	CPC	CPC & CEAC FAILED SENSOR STATUS PT ID DO NOT OPERATE CORRECTLY
I3805	PMS	PMS PTS DISPLAY INCORRECT VALUES
I3806	PMS	PMS PTS FOR PPS SETPOINTS INDICATE STRANGE & UNUSUAL VALUES

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3807	TH	S/G LEVEL DOES NOT DECREASE
I3808	EG	LOAD LIMIT FLASHED ON/OFF REPEATEDLY & LOAD SET SLOWLY STEPPED DOW
I3809	SW	CHILLER CONDENSER HIGH PRESS TRIP CONSTANT IS SET TOO HIGH
I3810	COLSS	COLSS PC & COLSS CMC CONTINUOUSLY ALARMING WHEN UNSCHEDULED
I3811	ED	ANALOG ALARMS ARE DISPLAYING L****** DEG C
I3812	COLSS	ANNUNCIATOR CONTINUALLY ALARMS ST FLASH
I3813	NI	BACK PANEL NI SWITCHES DO NOT SHOW ON SUMMARY
I3814	TH	HCT42B READING IS INCONSISTENT FOR CONDITIONS
I3815	EG	AC VOLTAGE CONTROL WOULD NOT WORK
I3816	RM	RAD MONITORS WENT OFF DURING TH03 AT 100%
I3817	CR	XE OSCILLATION AT EOC SHOULD BE DIVERGENT. NOT CON
I3818	XX	INSTRUCTORS NEED INDICATION WHEN SIMULATOR IS NOT IN RUN MODE
I3819	XX	COMPUTER "RUN" INDICATION CANNOT BE IN SIMULATOR CONTROL ROOM AREA
I3820	RM	RMS MONITOR RU-142 CHANNEL 4 HAS AN ALERT LEVEL ALARM DURING LOCA
I3821	CH	CANNOT RESET 86-1 AFTER CV10 MALF
I3822	RC	POST TRIP PZR LEVEL/PRESSURE DOES NOT INITIALLY RESPOND
I3823		PZR & TEMP DECREASE WHEN THEY SHOULD INCREASE
I3824		REACTOR TRIPS ON HIGH PZR PRESSURE/NOT EXPECTED
I3825	TC	MAIN TURBINE LAMP IS ENERGIZED AFTER LARGE LOAD REJECT
I3826	SG	TURBINE BYPASS DEMAND NOT RECEIVED AFTER RX PWR CUTBACK
I3827	RC	NEVER RECEIVED ALARM "RC LOOPS TEMP HI" W WINDOW 4A06A
I3828		Tave - Tref ALARM SHOULD BE AT 4 SEC. WAS AT 36 SEC.
I3829		RX NEVER TRIPPED ON LOW S/G PRESS
I3830		DID NOT RECEIVE ALARMS WHEN MALF INSERTED
I3831		LIGHT SHOULD BE ON AFTER TURBINE TRIP
I3832		LD PROCESS MON TRBL NEVER ALARMED DURING TTP-001

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3833		CNTMT SUMP HIGH WATER TEMP ALARM SHOULD BE RECEIVED IN 2 MIN.
I3834		NO VOPT TRIP AFTER ALL 4 MSIV's CLOSING
I3835		BREAKERS DID NOT OPEN
I3836		DID NOT RECEIVE VAR OVERPOWER TRIP ON TRANSIENT
I3837		RX TRIP SHOULD HAVE BEEN LO DNBR / NOT HI LPD
I3838		LO DNBR CHANNEL TRIP ALARM WAS NOT RECEIVED
I3839		PLUB LIGHT DID NOT ENERGIZE
I3840		LRG LOAD REJECT W/13.8KV BUSES SUPPLIED/RESULTS IN MAIN TURBINE TRIP
I3841	RM	RM MONITOR SETPOINTS NO SET IN ACCORDANCE WITH PLANT DOCUMENTATION
I3842		SBCS IN REMOTE/AUTO OPERATION, S/G PZR & RCS TEMPS TOO HIGH
I3843	RM	LOW FLOW ALARMS OCCUR ON RU-9 & RU-10 ON LOSS OF LOADCENTER NGN-L16
I3844	RM	RU-144 LOW FLOW ALARMS OCCUR ON LOSS OF NGN-L06
I3845	RM	RU-146 CHANNELS 1-5 GO OFF-LINE ON LOSS OF PHB-M36
I3846	RM	MONITORS/CHANNELS GO OFF-LINE ON LOSS OF POWER
I3847	RM	RU-146 CHANNEL 5 DOES NOT RECEIVE LOW FLOW ALARM
I3848	RM	SWAPOVER FUNCTIONS DO NOT FUNCTION CORRECTLY
I3849	RM	RU-158 DOES NOT RESPOND TO ANY MALFUNCTIONS
I3850	RM	IODINE CHANNELS DO NOT RESPOND
I3851	WD	LEAK RATE ON MF WD02 IS TOO SMALL / RMS RESPONSE TOO SMALL
I3852	CV	RU-145 RESPONSE IS EXCESSIVE WITH GAS STRIPPER IN SERVICE
I3853	RM	100% PWR READINGS ON RU-151/150 ARE TOO HIGH
I3854	RM	MSSS AREA MONITORS DO NOT RESPOND TO LOCA
I3855	RM	RU-150/151 ARE NOT INTERFACED TO CONTAINMENT AREA RADIATION LEVELS
I3856	RM	RU-37/RU-38 DO NOT RESPOND CORRECTLY, TO HIGH CNTMNT RADIATION LEVEL
I3857	RM	MONITORS DO NOT HAVE LOWER RANGE THRESHOLD VALUES

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3858	RM	RU-2 READING GOES TO 4X10-36 WHEN MF RH11A IS INSERTED
I3859	RM	READINGS ON MONITORS RU-139 & 140 GO TO HIGH
I3860	RM	RMS MONITORS RU-141/142 DO NOT RESPOND TO MF TH03 A/B
I3861	RH	LPSI/CS PUMPS DO NOT ACTIVATE WHEN SDC IS IN SERVICE
I3862	RMS	RU-4 BAR CHART DISPLAYS ARE WHITE ON "RLT" W/NORMAL CONDITIONS
I3863	RM	100% PWR READING ON LISTED MONITOR ARE INCORRECT
I3864	RM	RMS MONITOR RU-149 VALUES READ INCORRECTLY
I3865	RM	RMS MONITOR RU-148 VALUES READ INCORRECTLY
I3866		ECH SYSTEM LOAD LIMIT POT ON B06 IS WORN-OUT, NEEDS TO BE REPLACED
I3867	RM	CONTAINMENT RADIATION LEVELS DO NOT INCREASE
I3868	RM	CONTAINMENT AREA RADIATION LEVELS DO NOT RESPOND
I3869	RM	RU-204 RESPONSE TO MF TH09 AT 100% IS TOO SMALL
I3870	RM	RU-1 GAS CHANNEL DOES NOT RESPOND
I3871		REMOTE FUNCTION FOR CHN-VG55 IS OPEN/VALVE CWN-HV-11 NOT OPEN IN AUTO
I3872	CC	NC SYSTEM MASS IS VERY LARGE & LEAK IS SMALL
I3873	RM	INITIAL VALUE SHOULD BE RETAINED/DISPLAYED AFTER LOW FLOW
I3874	RP	CIAS SETPOINTS FOR HI CNTMT PRESSURE ON CHANNELS B,C,D ARE WRONG
I3875	RP	CSAS SETPOINTS ON CHANNELS B&D ARE SET TOO HIGH
I3876	RM	CNTMT RU MONITORS DO NOT RESPOND CORRECTLY
I3877	RM	EFFLUENT MONITOR SAMPLE FLOW ADJUSTMENTS NOT MODELED CORRECTLY
I3878	RM	AREA MONITORS LOCATED OUTSIDE CNTMT RESPOND EXCESSIVELY TO LOCA
I3879		VARIABLES ON PAGE PC-5 OF THE PMS NEED TO BE CORRECTED
I3880		IC2 IS INITIALIZED WITH RCS ACTIVITY TOO HIGH
I3881	WD	S/G LEVELS DECREASE AND NEVER STABILIZE
I3882		NUMEROUS DISCREPANCIES FOUND DURING PHOTO SURVEY REVIEW

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3883		BACKLIGHT CONTROLLER ON SPDS TERMINAL IS NOT FUNCTIONAL
I3884	SF	CORRECT TRACK AND DECAY OPERATION
I3885	SF	RRS MODULE R 324 GOES NEGATIVE ON OUTPUT, SHOULD GO TO ZERO
I3886	SF	MANUALLY INSERTING A LARGE LOAD REJECT CUTBACK CAUSES LOSS OF FEEDPUMP
I3887	SH	REMOTE FUNCTION FOR TRAIN A PIO1 SHOULD BE ENERGIZED
I3888	SH	NUMBER 1 NEEDS MOVED TO H16 LOCATION
I3889	MA	INSERTED MF EG07 186G14 TRIPPED BUT NO FAST BUS XFR OCCURRED
I3890	SB	RX TRIPS ON LPD/DNBR
I3891	SQ	NO LOW FLOW ON RU MONITORS
I3892	SA	PMS POINTS DO NOT INDICATE ACTUATED RELAYS DEENERGIZE
I3893	PMS	TGIS WILL NOT ACCEPT COMMANDS TO INSERT MALFUNCTIONS
I3894	RJ	PMS DOES NOT CALCULATE CEA GROUP POSITION CORRECTLY
I3895	RF	PMS GROUP POSITION DOES NOT BLANK OUT
I3896		AFW PUMP A CNTRL POTENTIOMETER ON REMOTE SHUTDOWN FAILS TO PASS CHECK
I3897	RD	DEVIATION IN CEA POSITIONS BETWEEN PULSE COUNT & RSPT CAN OCCUR
I3898		MESSAGE "INVALID ENTRY" WAS RECEIVED
I3899		PMS COMPUTER POINTS APPEAR TO ADD H2 TEMP TO CURRENT VALUE EACH UPDATE
I3900		WHEN ED12D IS ACTIVATED AT 100% PWR A REACTOR TRIP OCCURS
I3901		RMS RESPONSE TO MF TH03 A/B IS POOR
I3902	RM	RMS RESPONSE TO MF TH03 A/B IS POOR
I3903	RM	RMS RESPONSE TO MF TH03 A/B IS POOR
I3904	PMS	REACTOR PWR CUTBACK SYS COMMANDS DO NOT FUNCTION PROPERLY
I3905	PMS	PMS DATA QUALITY CODE DOES NOT WORK PROPERLY
I3906	SE	AUDIBLE COUNT RATE COMES ON WHEN YOU TAKE CR S/U METER SWITCHES TO S/U

SIMULATOR OPEN DISCREPANCY REPORT LISTING

DR NUMBER	SYSTEM	DESCRIPTION
I3907	RJ	TREND PEN NOT PERFORMING PROPERLY
I3908	RJ	CMC INTERMITTENTLY STOPS FUNCTIONING
I3909	CH	CHBUV523 DOES NOT CLOSE ON LOW NC FLOW (FIX SW & ATP)
I3910		NO RU-6 ALARM WAS RECEIVED

PVNGS SIMULATOR
1991
CERTIFICATION SUBMITTAL

SECTION 10

SIMULATOR TO UNIT DIFFERENCES

Hardware Differences

Environmental Differences

Design Differences

Procedure Differences

Technical Specification Differences

Operational Characteristic Differences

HARDWARE DIFFERENCES

The "Hardware Differences" between the Simulator and Unit 1, Unit 1 and Unit 2, and Unit 1 and Unit 3 have been evaluated using extensive photo surveys of the Unit 1, 2 and 3 Control Rooms. The Simulator to Unit 1 differences are listed first. These differences are not anticipated to be corrected due to the type of difference, and the negligible training impact. All other hardware differences are to be corrected, and a Discrepancy Report has been issued for tracking of the Corrections.

The Simulator to Unit 1 hardware differences are listed by Control Board, Photograph number, and grid location.

The photographs used in the comparison have been organized in sequence working from left to right from the top of the panel down. Each photograph has a number placed near the top right corner of the picture. The number consists of the following three parts:

1. Panel designation - B01 - B07, BACK (back panels), ANN (annunciators), and MISC (miscellaneous)

2. Row - V1 - V3 (V for vertical boards), and B1 - B2 (B for bench board)

3. Sequence number in the row (generally 01 - 15)

For example, B03-V1-05 would be panel three, vertical board row 1, the 5th frame from the left.

Following the Simulator to Unit 1 differences is the analysis of the Unit 1 to Unit 2, and the Unit 1 to Unit 3 Hardware differences. There is a page preceding that sub-section describing the evaluation process, and the cataloging method used.

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B01

DESCRIPTION	PHOTO REFERENCE
MINOR ESCUTCHEON/LABEL FONTS AND SPACING DIFFERENCES ARE NOT INDIVIDUALLY NOTED	ALL
MIMICS "LINE DISCONNECT" INDICATORS ARE DIFFERENT	ALL (REF:B01-V2-07;C9)
BAY 0 SWITCH CAPS; UNIT=BLACK BORDER, SIM=NO BLACK BORDER	B01-2;L/N/Q12
BAY 1 & 2 SWITCH CAP; UNIT=NONE, SIM=CAP	B01-2;K20,L16
SEVERAL SMALL .125" HOLES IN PANEL; UNIT=NONE	B01-4
BAY 8 & 10 SWITCH CAPS; UNIT=BLACK BORDER,SIM=NO BLACK BORDER	B01-4;N6,P/S8,M/O/R19
BAY 9 SWITCH CAP; UNIT=NONE, SIM=CAP	B01-4;M11
SCALE ON MAN-EI-002I, DIFFERENT GRADIENTS; UNIT=0,30,60,90,120,150, SIM=0,60,90,120,150	B01-V1-02
SCALE ON MAN-EI-002R, DIFFERENT GRADIENTS; UNIT=0,30,60,90,120,150, SIM=0,60,90,120,150	B01-V1-02
SCALE ON MAN-SI-002I, DIFFERENT GRADIENTS; UNIT=55,58,60,62,65,SIM=55,57,59,61,63,65	B01-V1-05
SCALE ON MAN-SI-002R, DIFFERENT GRADIENTS; UNIT=55,58,60,62,65,SIM=55,57,59,61,63,65	B01-V1-05
VENDOR TAG DIFFERENT;UNIT="HONEYWELL", SIM="CONRAC"	B01-V1-06;I19
HORIZONTAL GRID MIMIC 1/2" HIGH IN SIMULATOR	B01-V2-07;Z6

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B01

DESCRIPTION	PHOTO REFERENCE
NAMEPLATE; UNIT="WEST WING", SIM="WESTWING	B01-V2-08,09;H18,G15
"SMALL .125" HOLE IN PANEL; UNIT=NONE	B01-V2-08,10;W1/7
GENERATOR TO TRANSFORMER MIMIC .5" RIGHT IN SIM	B01-V3-03;C4-T4,C20-T20
LOAD GROUP MIMICS APPROX .25" LOW IN SIM	B01-B2-03;C6,L9

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B02

DESCRIPTION	PHOTO REFERENCE
MINOR ESCUTCHEON/LABEL FONTS AND SPACING DIFFERENCES ARE NOT INDIVIDUALLY NOTED	ALL
WINDOW E-13; UNIT="SG2", SIM="SG 2"	B02-V1-03,K11
WINDOW F-13; UNIT="SG1", SIM="SG 1"	B02-V1-03,M11
WINDOW K-12; UNIT="PUMP", SIM="PMP"	B02-V1-03,T/10
WINDOW I-16; UNIT="PUMP", SIM="PMP"	B02-V1-03,Q/17
WINDOW J-6; UNIT="ELECT", SIM="ELEC"	B02-V1-05,Q/17
WINDOW H-10; UNIT="INLT", SIM="INLET"	B02-V1-06,P/8
WINDOW I-16; UNIT="DSCH", SIM="DISCH"	B02-V1-06,Q/19
WINDOW M-19; UNIT="BLEEDOFF", SIM="BLEED OFF"	B02-V1-07,W/13
WINDOW D-18; COLOR BLOCK FOR "AUXILIARY FEEDWATER" SMALLER IN SIM	B02-V1-07,I/11
SCALE ON RCA-PI-103, MORE GRADIENTS IN SIM	B02-V1-09
SCALE ON RCA-PI-104, MORE GRADIENTS IN SIM	B02-V1-09
SCALE ON RCA-PI-105, MORE GRADIENTS IN SIM	B02-V1-09
SCALE ON RCA-PI-106, MORE GRADIENTS IN SIM	B02-V1-09
RJN-UI-2 LABEL; UNIT="HONEYWELL", SIM= "CONRAC"	B02-V1-11,E/17
H2 MONITOR PNL (CHN A & B); UNIT=LABELS MOUNTED WITH SCREWS, SIM=NO SCREWS	B02-V2-01 & 04
H2 MONITOR PNL (CHN A & B), "OFF-STBY-ANALG" LABEL; UNIT=ONE LABEL, SIM=SEPARATE LABELS	B02-V2-01,R-W/9

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B02

DESCRIPTION	PHOTO REFERENCE
H2 MONITOR PNL (CHN A & B), PUSH BUTTON; UNIT=YELLOW, SIM=RED	B02-V2-01,J/11
H2 MONITOR PNL (CHN A & B), PNL MOUNTING SCREWS: UNIT=SLOTTED, SIM=PHILLIPS	B02-V2-01,X/6,10,14
SIM MISSING YELLOW ARROWS ON RCA-PR-102A	B02-V2-08,G&H/17
SCALES DIFFERENT ON RCA-LR-110X; UNIT="90", SIM="%"	B02-V2-09,C/4
"PLENUM LEVEL" & "REACTOR HEAD" LABELS MISSING FROM SIM	B02-V2-10,J/3
SCALE DIFFERENT ON RCN-LI-752B; UNIT=NO UNITS SIM=IN	B02-V2-10
SIM MISSING DASH ON SIN-PI-332	BO2-V2-13,I/9
SIM MISSING DASH ON SIN-PI-333	B02-V2-13,G/19
PT-311 & 321 LABELS MISSING DASH IN SIM	B02-V2-14,J/19
SCALE ON SPN-LI-27, MORE GRADIENTS IN SIM	B02-V3-06
SCALE ON SPN-LI-28, MORE GRADIENTS IN SIM	B02-V3-08
PATCH PLATE UNDER FI-311 & 338 IN SIM	B02-V3-09&10
MIMICS FROM HS-691 IN SIM, NOT IN UNIT (NOW INSTALLED IN UNIT)	B02-V3-11,G/12
PNL PATCH UNDER FI-331-1, 311, 348 IN SIM	B02-V3-13
MIMICS FROM HS-690 IN SIM, NOT IN UNIT (NOW INSTALLED IN UNIT)	B02-V3-14,G/19

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B02

DESCRIPTION	PHOTO REFERENCE
KEYSWITCH HS-696; UNIT=BLACK COLLAR, SIM=SILVER COLLAR	B02-V3-14,Z/11
LENS COLORED IN UNIT, COLORED BULBS IN SIM	BO2-V3-16,J/3,14,19
HS-5 LABEL DIFFERENT; UNIT="PMP A", SIM="PMP"	B02-B1-08,G/14
B02 KEYSWITCH COLLARS SHORTER THAN UNIT	B02-B1-10
HS-94 LABEL DIFFERENT; UNIT="DMPR", SIM="DMPRS"	B02-B1-01,R/14
LABELS ABOVE KEYSWITCHES MOUNTED DIFFERENT; UNIT=3/16" ABOVE ESCUTCHEON, SIM=TOUCHES ESCUTCHEON	B02
EWA-HS-1 LABEL DIFFERENT; UNIT="WATER", SIM="WTR"	B02-B2-06,N/9
EWB-HS-2 LABEL DIFFERENT; UNIT="WATER", SIM="WTR"	B02-B2-08,M/6
SIB-HS-6 LABEL DIFFERENT; UNIT="PUMP", SIM="PMP"	B02-B2-14,H/5

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B03

DESCRIPTION	PHOTO REFERENCE
MINOR ESCUTCHEON/LABEL FONTS AND SPACING DIFFERENCES ARE NOT INDIVIDUALLY NOTED	ALL
MIMIC FONT ARROWS ARE DIFFERENT	B03-V1-03
BROWN MIMIC INSTALLED DIFFERENT IN SIM; VERTICALLY OFF BY 1/4"	B03-V2-03,L/9
PRESSURIZER MIMIC DIFFERENT; SIM NO ROUND TOP & BOTTOM	B03-V1-09,I/13
BORONOMETER METER DIFFERENT; SIM MISSING MANUFACTURERS LABEL & HORIZONTAL BLUE LINES	B03-V1-09
LIGHTS FOR CH-201-P,Q MOUNTED DIFFERENT; SIM=1" SPACE BETWEEN LIGHTS UNIT=NO SPACE BETWEEN LIGHTS	B03-V1-10,O/12 & 13
SELECTOR SWITCH CHN-HS-201 DIFFERENT IN SIM; SIM=ROUND RING,UNIT=HEX RING	B03-V1-10,S/13
LIGHTS CH-110-P,Q DIFFERENT; SIM=COLORED LIGHTS, UNIT=COLORED LENS	B03-V1-10,O/12&13
UNIT DOES NOT HAVE PANEL PATCH	B03-V1-10
HANDSWITCH ENGRAVED DIFFERENT; "ION X" 1/4" TO THE RIGHT IN SIM	B03-V2-02,R/13
MIMIC UNDER GAS STRIPPER DIFFERENT; SIM=MIMIC TOUCHES, UNIT=MIMIC DOES NOT TOUCH	B03-V2-01,G/21
MIMIC UNDER HUT DIFFERENT; SIM=MIMIC TOUCHES, UNIT=MIMIC DOES NOT TOUCH	B03-V2-01,W/21
RD FILTER INDICATOR DIFFERENT; SIM HAS "DATE"	B03-V2-02,C/14

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B03

DESCRIPTION	PHOTO REFERENCE
MIMIC DIFFERENT BY CHN-HS-256; SIM VERTICAL MIMIC RIGHT BY 1/4"	B03-V2-03,L/9
REACTOR DRAIN TANK MIMIC DIFFERENT; SIM 1/2" LARGER IN WIDTH	B03-V2-04
MIMIC UNDER RCN-HS-430,31,32,33 DIFFERENT; SIM HORZ DOWN BY 1/2"	B03-V2-04,A-P/18
MIMIC FROM CHA-HS-507 TO PI 215 DIFFERENT; SIM HORZ UP BY 3/4"	B03-V2-04,S-U/18
CHN-AR-203 SCALES REVERSED	B03-V2-05
$1X10^2$ - $1X10^6$ ENGRAVINGS DIFFERENT; FONTS DIFFERENT IN SIM	B03-V2-05,H/9-15
CHN-RR-204 SCALE DIFFERENT; SIM="VPM" ON LEFT SCALE, UNIT=NO UNITS ON SCALE	B03-V2-05,L/11
HANDSWITCH CHN-HS-521 ENGRAVED DIFFERENT; SIM="BORON & P.RAD" AND "BY PASS", UNIT="BORON P. RAD" AND "BY-PASS"	B03-V2-05,D/17
MIMIC DIFFERENT AT RIGHT SIDE OF CHN-HS-521; SIM=1/4" PIECE OF MIMIC,UNIT=NO 1/4" PIECE OF MIMIC	BO3-V2-05,B/17
MIMIC DIFFERENT UNDER CHN-RR-204; SIM=HAS 3/8" VERTICAL MIMIC, UNIT=NO VERTICAL PIECE	B03-V2-05,L/20
NO N2 TANK AND LABEL IN SIM	B03-V2-06,X/20
MIMIC DIFFERENT ABOVE CHN-HS-567; SIM HAS 1/2" EXTRA VERTICAL MIMIC	B03-V3-01,O/6

HARDWARE DIFFERENCES
<u>SIMULATOR TO UNIT 1</u>

CONTROL BOARD B03

DESCRIPTION	PHOTO REFERENCE
LABEL AT TOP OF CHART RECORDER; MISSING IN SIM	B03-V3-01,Q/16
WORDING ON CHN-FQ-210XIS MISSING IN SIM	B03-V3-02,M/9
WORDING ON CHART RECORDERS MISSING	B03-V3-02,C/15
WORDING ON CHN-FW-210Y IS MISSING IN SIM	B03-V3-03,Z/9
VOLUME CONTROL TANK MIMIC DIFFERENT; 1/2" WIDER IN SIM	B03-V3-04
MIMIC INSTALLED ON RIGHT SIDE OF VCT DIFFERENT; SIM=1" LOWER	B03-V3-04,G/12&14
MIMIC BETWEEN CHA-HS-506,505 DIFFERENT; SIM HAS EXTRA 1/2" VERTICAL PIECE	B03-V3-05,K/14
LET DOWN HX MIMIC DIFFERENT; SIM LINES DO NOT LINE UP WITH HX	B03-V3-06,P/18
NCN-FI-208 SCALE DIFFERENT; SIM="GPM", UNIT="1800"	B03-V3-06
MIMIC DIFFERENT UNDER CHN-FIC-241 THROUGH 244; SIM HAS EXTRA 1/4" VERTICAL MIMIC	B03-V3-07,H-U/18
MIMIC ABOVE CHN-HS-501 DIFFERENT; MISSING ARROW IN SIM	B03-V3-10,E/12
MIMIC DIFFERENT AT LEFT UPPER RMWT; SIM VERTICAL MIMIC 1/2" TO THE RIGHT	B03-B1-01,Z/6
MIMIC DIFFERENT SI PUMPS B; SIM HAS EXTRA HORZ PIECE	B03-B1-03

HARDWARE DIFFERENCES
<u>SIMULATOR TO UNIT 1</u>

CONTROL BOARD B03

DESCRIPTION	PHOTO REFERENCE
SI PUMP B LABEL MOUNTED DIFFERENT IN SIM; SIM LABEL 1/2" TO THE RIGHT AND 1/2" DOWN	B03-B1-03
CHARGING PUMP SUCTION MIMIC DIFFERENT; SIM IS STRAIGHT, UNIT JOGS LEFT	B03-B1-04,M/7
LABEL CHN-SH-514 ENGRAVED DIFFERENT; SIM MISSING DASH (MAKE-UP)	B03-B1-04,V/13
CHECK VLV MIMIC DIFFERENT; SIM IS SMALLER	B03-B1-07,V/20
LABEL MOUNTED DIFFERENT CHN-HS-11; SIM MOUNTED ON TOP,UNIT MOUNTED ON SIDE	B03-B2-01,S/14
FILTER PLATE ENGRAVED DIFFERENT (ALL); SIM HAS "DATE"	B03-B2-01,B/8

HARDWARE DIFFERENCES
<u>SIMULATOR TO UNIT 1</u>

CONTROL BOARD B04

DESCRIPTION	PHOTO REFERENCE
MINOR ESCUTCHEON/LABEL FONTS AND SPACING DIFFERENCES ARE NOT INDIVIDUALLY NOTED	ALL
ALARM MONITOR RJN-UI-4A; LEFT OF CENTER BY 2" IN SIM	B04-1,D/11
RECORDER RCN-TR-115 MOUNTED 2" TO THE LEFT IN SIM	B04-2,Q/10
QSPDS PAGE CONTROL CHANNEL B (SHB-UC-002); INSTALLED 2" TO LEFT IN SIM	B04-2,R/8
UNIT 1 DOESN'T HAVE A PANEL PATCH TO THE LEFT OF CONTROLLER RCN-LIC-110	B04-1,U/3
UNIT 1 DOESN'T HAVE PANEL PATCH PLATE UNDER PRV INDICATORS	B04-1,N/10
UNIT 1 DOESN'T HAVE PATCH PLATE UNDER 1E ANNUNCIATOR ACKNOWLEDGE CONTROLS	B04-1,M/9-13
UNIT 1 DOESN'T HAVE PATCH PLATE UNDER INSTR./CNTRL GROUP ABOVE PHONE STATION	B04-2,U/11
BEZEL MISSING FROM CEAC DISPLAY SFN-ZI-2 IN SIM	B04-2
DEMARCATION FOR QSPDS B KEYPAD IS NARROWER BY 1" IN SIM	B04-2
UNIT 1 DOESN'T HAVE PATCH PLATE BY AUDIO CONTROLS	B04-V1-01
ALARM MONITOR RJN-UI-4A MODEL # AND VENDOR TAG DIFFERENT; UNIT="HONEYWELL", SIM="CONRAC"	B04-V1-01

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B04

DESCRIPTION	PHOTO REFERENCE
QSPDS DISPLAY MOUNTING SCREWS DIFFERENT; UNIT=ROUND HEAD, SIM=BEVELED HEAD	B04-V1-02,03
QSPDS DISPLAY HAS BEZEL MOUNTING HOLES IN SIM, UNIT 1 DOESN'T	B04-V1-02,03
UTILITY MONITOR RJN-UI-4B VENDOR TAG DIFFERENT UNIT="HONEYWELL", SIM="CONRAC"	B04-V1-05
BLUE OPERATOR AID LABEL 1/2" TOO HIGH IN SIM	B04-V2-02,O/12
BLACK VERTICAL SPACERS MISSING FROM RESET SW IN SIM	B04-V2-03,04Q/12G/11
PRZR RELIEF VALVE INDICATOR ARE DIFFERENT; UNIT=3/4" LOWER W/EXPOSED SCREWS, SIM=3/4" HIGHER WITH NO MOUNTING SCREWS	B04-V2-07,G/12
INDICATORS FOR RCN-HS-100-10 ARE RED/GREEN LENS IN UNIT, SIM=RED/GREEN BULBS	B04-V3-02,S/15
VPI FOR RCA-HS-100-4 DIFFERENT; SIM="AMPS" ON TOP OF SCALE, UNIT="AMPS" BELOW SCALE	B04-B1-02,V/10
REACTOR PWR CUTBACK DOES NOT HAVE A METAL TRIM IN SIM	B04-B1-10,B/3
VPI FOR RCB-HS-100-5 DIFFERENT; SIM="AMPS" ON TOP OF SCALE, UNIT="AMPS" BELOW SCALE	B04-B2-01,J/7
KEYLOCK SWITCHES RCN-HS-446,447,448,450,451,& 452; SIM=SHORT SILVER COLLAR; UNIT=BLACK, TALL NUT COLLAR	B04-B2-03,03A,&04
KEYLOCK SWITCHES FOR RCN-HS-449&453; SIM=SHORT SILVER COLLAR; UNIT=BLACK, TALL NUT COLLAR	B04-B2-05,T&AA/8

HARDWARE DIFFERENCES
<u>SIMULATOR TO UNIT 1</u>

CONTROL BOARD B04

DESCRIPTION	PHOTO REFERENCE
CEDMC PANEL 'LAMP TEST' SWITCH COLLAR DIFFERENT; UNIT=POLISHED ROUND, SIM=HEX NUT	B04-B2-06,E/11

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B05

DESCRIPTION	PHOTO REFERENCE
MINOR ESCUTCHEON/LABEL FONTS AND SPACING DIFFERENCES ARE NOT INDIVIDUALLY NOTED	ALL
RCA-PI-102A SCALE DIFFERENT; SIM=DUAL, UNIT=SINGLE	BO5-V1-01
METER BOTTOM COVER MISSING RCA-PI-199A IN SIM	B05-V1-01,P/11
UPPER HORIZONTAL DIVIDER AND CHAN NAMEPLATES INSTALLED 3/4" TOO HIGH IN SIM	B05-V1-1,2,3,4,T/3
LABEL "RKN-UA-5C" INSTALLED DIFFERENTLY; SIM=ABOVE ANNUNCIATOR, UNIT=BELOW	B05-V1-03,K/1
SED-J1-1D SCALE DIFFERENT (CHN A,B,C,D); SIM HAS ADDITIONAL MINOR GRADUATES	B05-V2-04,H/6
CPC OPERATORS MODULE DIFFERENT IN SIM; UNIT=BLACK BEZEL AROUND DIGITAL READ OUTS, SIM=NONE; SIM=GREY KEYPAD, UNIT=BLACK KEYPAD	B05-V3-01,2,3,4)
LABEL "FOR MANUAL ESFAS ACTUATION ACTIVATE" ALL CHANNELS IN SIM 2" LARGER	B05-V3-01,O/10
CDN-PDIC-195 SCALE DIFFERENT; SIM=SINGLE, UNIT=DUAL	BO5-V3-11
PPS OPERATORS MODULE HARDWARE; NUTS MISSING IN SIM	B05-B1-2
SG1,2 LO FLOW ENGRAVED DIFFERENT IN SIM; (CHN A,B,C,D); SIM="LO" 2ND LINE, UNIT="LO" 1ST LINE	B05-B1-03,G/10&12
"P", "T", "BYPASS" NOT ENGRAVED ON UNUSED INDICATORS IN SIM (SAME FOR CHAN A,B,C,D)	B05-B1-03,H/13,Q/15&17

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B05

DESCRIPTION	PHOTO REFERENCE
EXCORE LINEAR POWER CAL POT DIFFERENT IN SIM; (CHN A,B,C,D) UNIT=SILVER, UNIT=BLACK	B05-B1-03,J/18
"HH CONT PRESS" ENGRAVED DIFFERENT IN SIM (CHN A,B,C,D); SIM="CONT", UNIT="CNT"	B05-B1-03,P/4
"INITIATION RELAY" ENGRAVED DIFFERENT; (CHN A,B,C,D); SHOULD BE SAME SIZE AS "ENG. SAFETY FEATURES" IN SIM	B05-B1-03,S/10
LO PZR PRESS BYPASS LAMPS DIFFERENT (ALL CHN); UNIT=DEFUSED LENS, SIM=COLORED BOOTS	B05-B1-05,K/3
HI LOG POWER BYPASS LAMPS DIFFERENT (ALL CHN); UNIT=DEFUSED LENS, SIM=COLORED BOOTS	B05-B1-05,K/3
CDN-HS-29,30,31,32,33 METER SCALE DIFFERENT; UNIT=NON LINEAR,SIM=LINEAR	B05-B1-07,H/9
MOTOR CONTROL ENGRAVING MISSING ON CDN-HS-11,12,13 ESCUTCHEONS IN SIM	B05-B1-08,H,P,W/7

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B06

DESCRIPTION	PHOTO REFERENCE
MINOR ESCUTCHEON/LABEL FONTS AND SPACING DIFFERENCES ARE NOT INDIVIDUALLY NOTED	ALL
MAIN STEAM RELIEF LABEL DIFFERENT; SIM DOWN 1"	B06-V1-01,O/8
"TEC MODEL 164 ALARM" MANUFACTURERS LABEL MISSING IN SIM	B06-V1-01,H-V/12
TEC 164 ALARM UNIT MOUNTING SCREWS MISSING IN SIM	B06-V1-01,H-V/12&17
TEC 164 ALARM UNIT MOUNTED ON A PNL INSERT IN SIM, UNIT HAS NO PANEL INSERT	B06-V1-01
CRT/VIDEO MANUFACTURER'S LABEL; UNIT="HONEYWELL",SIM="CONRAC" (SAME FOR ALL THREE UNITS ON B06)	B06-V1-03,4,5,J/20
GHN-A1-21B LABEL DIFFERENT; UNIT="H_2", SIM="H2"	B06-V1-07,M/18
GHN-PI-17 LABEL DIFFERENT; UNIT="H_2", SIM="H2"	B06-V1-07,R/18
SGB-HIC-178A & 184A SCALES DIFFERENT; UNIT= SINGLE SCALE, SIM=DUAL SCALE	B06-V2-01
SGB-HIC-185 & SGB-HIC-179 SCALES DIFFERENT; UNIT=SINGLE W/"%", SIM=DUAL W/"90"	B06-V2-01,G,M/12
"STM GEN 1" LABEL DIFFERENT; SIM 1/2" LARGER	B06-V2-04
HS 1142 & 1143 MOUNTED ON A PNL PATCH IN SIM	B06-V2-04
SGN HS 1142 LABEL MISSING "DASH"; UNIT="NHN M71", SIM="NHN-M71"	B06-V2-04,B/5

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B06

DESCRIPTION	PHOTO REFERENCE
SGN-HS-1143 LABEL MISSING "DASH"; UNIT="HV 1143", SIM="HV-1143"	B06-V2-04,D/13
SGN-TR-7 SCALE DIFFERENT; UNIT=RIGHT DUAL SCALE MARKED 0-500, SIM=BOTH DUAL SCALES MARKED 0-500	B06-V2-05
PANEL PATCH PLATE IN SIM	B06-V2-07
RJN-UJR-168 SCALE DIFFERENT; UNIT="%", SIM="90"	B06-V2-12
LABEL "EXTERNAL STEAM SUPPLY" MOUNTED 1" TO THE RIGHT IN SIM	B06-V2-14
SGN-FIK-1113 SCALE DIFFERENT; UNIT= DUAL W/"%", SIM=SINGLE E/"90"	B06-V3-03,E/17
SGN-FIK-1122 SCALE DIFFERENT; UNIT= DUAL W/"%", SIM=SINGLE E/"90"	B06-V3-03,E/17
SGN-FIK-1123 SCALE DIFFERENT; UNIT= DUAL W/"%", SIM=SINGLE E/"90"	B06-V3-03,E/17
SGN-HS-46 MOUNTED 1/2" TO RIGHT IN SIM	B06-V3-05,D/16
FWIV CONTROL LABEL 1/2" LONGER, 1/8" NARROWER IN SIM	B06-V3-06,Q/7
SGN-PIK-1001,2,3 SCALES DIFFERENT; UNIT= DUAL 0-100, SIM=SINGLE 0-100	B06-V3-09
ENGRAVINGS ON MTN-A-002 DIFFERENT; SIM HAS A LINE BEFORE & AFTER "INTERCEPT VALUES" & "COMBINED INTERMEDIATE VALUES"	B06-V3-10
GE LOGO MISSING ON ALL VALVE POSITION/AMP METERS ON MTN-A-002 PANEL IN SIM	B06-V3-10

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B06

DESCRIPTION	PHOTO REFERENCE
LAMP TEST PUSH BUTTON INSTALLED 1" LOWER IN SIM	B06-V3-11,Q/8
KNOB MISSING ON THRUST BEARING METER IN SIM	B06-V3-11,J/4
"TEST MALF" INDICATOR ENGRAVED DIFFERENT; UNIT="TEST MALF", SIM="TEST MALFUNCTION"	B06-V3-11,E/16
LED # INSTALLED 1/8" OFF IN SIM	B06-V3-12
GENERIX MIMIC MISSING "GE" INSIGNIA IN SIM	B06-V3-12,F/6
EDN-HS-24A & 14A ENGRAVED DIFFERENT; UNIT="OPEN AUTO", SIM="OPEN (AUTO)"	B06-V3-14,J/6&17
SGN-PIK-1005,6,7,8 SCALES DIFFERENT; UNIT= DUAL 0-100, SIM=SINGLE 0-100	B06-B1-07
EDN-HS-36 METER SCALE HAS DIFFERENT; UNIT=NON LINEAR, SIM=LINEAR	B06-B1-11
AFA-HS-11 INSTALLED 1" TO THE LEFT IN SIM	B06-B2-04
ACCELERATION METER SCALE DOES NOT HAVE "+" & "-" INDICATION IN SIM	B06-B2-14
STBY LOAD SET POT DIFFERENT; UNIT=SILVER PERIMETER,. SIM=BLACK PERIMETER	B06-B2-14

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B07

DESCRIPTION	PHOTO REFERENCE
MINOR ESCUTCHEON/LABEL FONTS AND SPACING DIFFERENCES ARE NOT INDIVIDUALLY NOTED	ALL
WESTRONICS RECORDERS ARE INSTALLED 2" TOO CLOSE	B07-2
RJN-UJR-17 SCALE DIFFERENT; UNIT="%", SIM="90"	B07-V2-03
1JMTNUR302 LABEL INSTALLED DIFFERENT; UNIT=UNDER RECORDER, SIM=ABOVE RECORDER	B07-V2-04
1JMTNTR303 LABEL INSTALLED DIFFERENT; UNIT=UNDER RECORDER, SIM=ABOVE RECORDER	B07-V2-05
1JRMNTJR1 LABEL INSTALLED DIFFERENT; UNIT=UNDER RECORDER, SIM=ABOVE RECORDER	B07-V2-06
COOLING WATER INSERT IS MOUNTED WITH DIFFERENT SCREWS; UNIT=SLOTTED W/WASHERS, SIM=PHILLIPS W/O WASHERS	B07-V3-01
NORMAL CHILL WATER CONTROLS MOUNTED ON PATCH PLATE IN SIM	B07-V3-04
LABEL WCA-HS-1A DIFFERENT; UNIT="CIRC A", SIM="CIRC PMP A"	B07-V3-06
LABEL WCN-HS-4A DIFFERENT; UNIT="WCN-HS 4A", SIM="WCN-HS-4A"	B07-V3-06
PNL PATCH PLATES UNDER CPB-HS-5 IN SIM	B07-V3-09
PNL PATCH PLATES UNDER CPB-HS-3 IN SIM	B07-V3-09
COND DEMIN "IN STANDBY" ENGRAVING DIFFERENT FOR HS-211A,212A,213A,214A,215A,216A; UNIT="STANDBY", SIM="STAND BY"	B07-V3-11

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

CONTROL BOARD B07

DESCRIPTION	PHOTO REFERENCE
SGU-HS-41 LABEL DIFFERENT; UNIT="VLV-HV-41", SIM="VLV HV-41"	B07-V3-13
SGU-HS-43 LABEL DIFFERENT; UNIT="VLV-HV-43", SIM="VLV HV-43"	B07-V3-13
SGU-HS-43,42 STEEL MOUNTING PLATE IS 1/8" SMALLER IN WIDTH THAN IN THE UNIT	B07-V3-13
"PASS" LABEL 1" SHORTER THAN UNIT	B07-V3-15
PUSHBUTTONS CWN-HS-16, DIFFERENT ENGRAVING; UNIT="PERM O'RIDE", SIM PERM OVER-RIDE"	B07-B1-01
CWN-HS7 LABEL DIFFERENT; UNIT="NHNM16"' SIM="NHN-M16"	B07-B1-01
"POWER ACCESS" LABEL MOUNTED 1/4" TOO HIGH IN SIM	B07-B1-07,S/4
"REFUELING PURGE MODE" LABEL MOUNTED 1/4" TOO HIGH IN SIM	B07-B1-07,M/4
"CONTAINMENT SUMPS" LABEL 3/4" SMALLER IN SIM	B07-B1-09
"RDN-LI-10" SCALE DIFFERENT; UNIT="50", SIM="LB/HR"	B07-B1-09
METER SGA-PI-229, AND -230 INSTALLED 1.25" TOO HIGH IN SIM	B07-B1-11
CEDM-HS-49,AND -50 INSTALLED 1" TO RIGHT IN SIM	B07-B2-07
LABEL RDN-HS-11 DIFFERENT; UNIT="RON-HS-11", SIM="RDN-HS-11"	B07-B2-09

HARDWARE DIFFERENCES
SIMULATOR TO UNIT 1

BACKPANELS

DESCRIPTION	PHOTO REFERENCE
ALL PANEL INSERTS HAVE PHILLIPS HEAD SCREWS, UNIT HAS THUMB SCREWS	BACK01;C6
MIMIC ARROWS ARE SOLID IN SIMULATOR, HOLLOW IN UNIT	BACK01;D12
LABEL PHASE/CURRENT HAS NO SPACE BETWEEN THEM IN SIM	BACK01;W14
ALL MATRIX LABELS NOT CENTERED ABOVE LIGHTS IN SIM	BACK08-13-18
MISSING ALL LABELS AND INDICATIONS FOR BOTTOM PART OF CABINET IN SIM	BACK08-13-18
ALL INITIATION RESET SWITCHES MOUNTED LOW IN SIM	BACK14
MISSING ALL POWER SYSTEMS LABELS AND LOGOS IN SIM	BACK05-10-15;D7
ALL PANEL PLATE SCREWS ARE BRIGHT IN SIMULATOR, UNIT HAS BLACK. ALL SUB PANELS HAVE PHILLIPS SCREWS IN SIM; UNIT HAS SLOTTED SCREWS	BACK-19 BACK-24
UNIT SUB PANELS HAVE MANUFACTURER LOGO AND NAME (GENERAL ATOMICS) PAINTED ON, SIM DOES NOT	BACK-20;A-AA
PHASE SYMBOL IS SMALLER IN SIM (ALL PLACES USED)	BACK27;AA15-16 BACK28;Z14
SWITCH BANK HAS EXTRA ROW OF BUTTONS (RIGHT SIDE) IN SIM	BACK-27;E17-21

HARDWARE DIFFERENCES

The description of the differences between Unit 1, the other Units and the Simulator include three parts:

1. A verbal description of what the difference is.

2. A component number of some other uniquely identifying characteristic of the associated object.

3. The photograph number.

An attempt was made to describe the differences as clearly as possible. One exception to this was a convenience for writing meter scales. These are written by giving the range first, and then the lettered divisions, major division markings, and minor division markings. For example, a meter with a range from 0 to 100, graduation numbers of 0, 20, 40, 60, 80, and 100, major markings by tens, and minor markings by fives would be written:

0-100 20/10/5

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROL ROOM LAYOUT

OPERATOR CONSOLE

ALARM PRINTER

1. Different types of alarm printers are used in Unit 1 and Unit 2.

   Photo: MISC-07

FIRE PROTECTION CONSOLE

1. The three fire pump switches are not in Unit 2.

   Photo: MISC-13

COMMUNICATIONS CONSOLE

1. The red NRC phone is a wall phone in Unit 1 and a desk phone in Unit 2.

   Photo: MISC-14

ENVIRONMENT

1. The incandescent lights over panels B03 and B05 are over each end of the panels in Unit 2. They are over the center and the back-end of the panels in Unit 1.

   Photo: MISC-17, MISC-18

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROL BOARD B01

LABELING

1. Unit 2 labels for the following are different as shown:

Component	Difference	Photo
NAN-JIW-01Z1	1 "NAN-JIW-01Z1" 2 "A-E-NAN-JIW-01Z2"	B01-V1-02
NAN-JIV-01Z1	1 "NAN-JIV-01Z1" 2 "A-E-NAN-JIV-01Z2"	B01-V1-02
MAN-SI-002	1 "MAN-SI-002" 2 "SYNCHROSCOPE MAN-SI-002"	B01-V1-03
NAN-JIW-02Y1	1 "NAN-JIW-02Y1" 2 "A-E-NAN-JIW-02Y2"	B01-V1-04
NAN-JIV-02Y1	1 "NAN-JIV-02Y1" 2 "A-E-NAN-JIV-02Y2"	B01-V1-04
NAN-JIW-02Z1	1 "NAN-JIW-02Z1" 2 "A-E-NAN-JIW-02Z2"	B01-V1-04
NAN-JIV-02Z1	1 "NAN-JIV-02Z1" 2 "A-E-NAN-JIV-02Z2"	B01-V1-04
NAN-JIW-03Y1	1 "NAN-JIW-03Y1" 2 "A-E-NAN-JIW-03Y2"	B01-V1-04
NAN-JIV-03Y1	1 "NAN-JIV-03Y1" 2 "A-E-NAN-JIV-03Y2"	B01-V1-04
MAN-EI-001	1 "MAN-EI-001" 2 "A-E-MAN-EI-001A"	B01-V2-07
MAN-EI-002	1 "MAN-EI-002" 2 "A-E-MAN-EI-002A"	B01-V2-07
NAN-II-02Y1	1 "NAN-II-02Y1" 2 "A-E-NAN-II-02Y2"	B01-V2-09
NAN-II-02Z1	1 "NAN-II-02Z1" 2 "A-E-NAN-II-02Z2"	B01-V2-10
NAN-II-03Y1	1 "NAN-II-03Y1" 2 "A-E-NAN-II-03Y2"	B01-V2-12
NAN-HS-M4502	1 "125 BATTERY E" 2 "125 BATTERY E BKR"	B01-V2-14
NKN-EI-M4505	1 "BACKUP BATTERY ..." 2 "BATTERY ..."	B01-V2-15
NKN-II-M4505	1 "BACKUP BATTERY ..." 2 "BATTERY ..."	B01-V2-15
1-E-MAN-G01	1 "UNIT 1 GENERATOR 1-E-MAN-G01" 2 "Unit 2 GENERATOR 2-E-MAN-G01"	B01-V3-02
NAN-HK-S03B	1 "... TRANSFER ..." 2 "... XFR MANUAL-AUTO ..."	B01-V3-04

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

NBN-HK-S01C	1 "... TRANSFER ..." 2 "... XFR MANUAL-AUTO ..."	B01-B1-04
NAN-EI-SO5B1	1 "NAN-EI-SO5B1" 2 "NAN-EI-SO5B2"	B01-V3-09
NAN-II-SO5B1	1 "NAN-II-SO5B1" 2 "NAN-II-SO5B2"	B01-V3-09
NAN-HS-SO5B1	1 "NAN-HS-SO5B1" 2 "NAN-HS-SO5B2"	B01-V3-09
NAN-SS-SO5B1	1 "NAN-SS-SO5B1" 2 "NAN-SS-SO5B2"	B01-V3-09
NAN-EI-SO51	1 "NAN-EI-SO51" 2 "NAN-EI-SO52"	B01-V3-09
NAN-EI-SO5D1	1 "NAN-EI-SO5D1" 2 "NAN-EI-SO5D2"	B01-V3-09
NAN-II-SO5D1	1 "NAN-II-SO5D1" 2 "NAN-II-SO5D2"	B01-V3-09
NAN-HS-SO5D1	1 "NAN-HS-SO5D1" 2 "NAN-HS-SO5D2"	B01-V3-09
NAN-SS-SO5D1	1 "NAN-SS-SO5D1" 2 "NAN-SS-SO5D2"	B01-V3-09
NAN-EI-SO6B1	1 "NAN-EI-SO6B1" 2 "NAN-EI-SO6B2"	B01-V3-10
NAN-II-SO6B1	1 "NAN-II-SO6B1" 2 "NAN-II-SO6B2"	B01-V3-10
NAN-HS-SO6B1	1 "NAN-HS-SO6B1" 2 "NAN-HS-SO6B2"	B01-V3-10
NAN-SS-SO6B1	1 "NAN-SS-SO6B1" 2 "NAN-SS-SO6B2"	B01-V3-10
NAN-EI-SO61	1 "NAN-EI-SO61" 2 "NAN-EI-SO62"	B01-V3-10
NAN-EI-SO6D1	1 "NAN-EI-SO6D1" 2 "NAN-EI-SO6D2"	B01-V3-10
NAN-II-SO6D1	1 "NAN-II-SO6D1" 2 "NAN-II-SO6D2"	B01-V3-10
NAN-HS-SO6D1	1 "NAN-HS-SO6D1" 2 "NAN-HS-SO6D2"	B01-V3-10
NAN-SS-SO6D1	1 "NAN-SS-SO6D1" 2 "NAN-SS-SO6D2"	B01-V3-10
NAN-HS-S04B	1 " ... " 2 "... NAN-II-SO4B"	B01-V3-12
NAN-II-S04	1 "NAN-II-SO4" 2 "NAN-II-SO4A"	B01-V3-12
PEA-SC-G01	1 "PEA-SC-G01 ..." 2 "PEA-SC-G01 ADJUST ..."	B01-B1-01
PEA-EC-G01	1 "PEA-EC-G01 ..." 2 "PEA-EC-G01 ADJUST ..."	B01-B1-01

PEA-EK-G01	1 "PEA-EK-G01 ..." 2 "PEA-EK-G01 MNL AUTO ..."	B01-B1-01
PEA-SC-G02	1 "PEA-SC-G02 ..." 2 "PEA-SC-G02 ADJUST ..."	B01-B1-13
PEA-EC-G02	1 "PEA-EC-G02 ..." 2 "PEA-EC-G02 ADJUST ..."	B01-B1-13
PEA-EK-G02	1 "PEA-EK-G02 ..." 2 "PEA-EK-G01 MNL AUTO ..."	B01-B1-13
MIMIC LABEL	1 "DIESEL GENERATOR B" 2 "DIESEL GENERATOR"	B01-B2-13

2. The following labels are missing in Unit 2:

Label	Photo
EOF AND TSC BLDGS SUPPLY BREAKER A-E-NAN-II-S08J	B01-V3-07
Unit 2 BUSES	B01-V3-09
Unit 2 BUSES	B01-V3-11

3. The following labels are in Unit 2 under the "CHARGER AC OUTPUT" lights but not Unit 1:

Label	Photo
CAUTION: ENSURE COMPLIANCE OF T.S. 3.8.1.1 PRIOR TO CLOSURE (Associated with NAN-SS-S06A)	B01-V3-11
CAUTION: ENSURE COMPLIANCE OF T.S. 3.8.1.1 PRIOR TO CLOSURE (Associated with NAN-SS-S05B1)	B01-V3-09
CAUTION: ENSURE COMPLIANCE OF T.S. 3.8.1.1 PRIOR TO CLOSURE (Associated with PBA-SS-S03R)	B01-B1-03
CAUTION: ENSURE COMPLIANCE OF T.S. 3.8.1.1 PRIOR TO CLOSURE (Associated with NBN-SS-S01C)	B01-B1-04
CAUTION: ENSURE COMPLIANCE OF T.S. 3.8.1.1 PRIOR TO CLOSURE (Associated with PBB-SS-S04L)	B01-B1-10

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CAUTION: ENSURE COMPLIANCE OF T.S. 3.8.1.1 PRIOR TO CLOSURE (Associated with NAN-SS-S05B1) B01-V3-09

4. The following labels are in Unit 2 under the "CHARGER AC OUTPUT" lights but not Unit 1:

Label	Photo
BACKUP BATTERY CHARGER AC THROWOVER SW CH A STATUS	B01-V2-01
BACKUP BATTERY CHARGER AC THROWOVER SW CH C STATUS	B01-V2-02
BACKUP BATTERY CHARGER AC THROWOVER SW CH B STATUS	B01-V2-04
BACKUP BATTERY CHARGER AC THROWOVER SW CH D STATUS	B01-V2-05
BATTERY CHARGER CF THROWOVER SW STATUS	B01-V2-15

5. The labels for the following components are below the component in Unit 1 and above it in Unit 2:

Component	Photo
NAN-II-01Z1	B01-V2-08
NAN-II-02Y1	B01-V2-09
NAN-II-03Y1	B01-V2-12
NBN-E1-S02	B01-B1-09

6. The labels for the following components are below the component in Unit 1 and above it in Unit 2:

Component	Photo
MAN-EI-001	B01-V2-07

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

7. The following components have incomplete meter numbers (e.g., II-S03A, rather than NBN-II-S03A) in Unit 2 and complete numbers in Unit 1:

Component	Photo
NBN-HS-S03A	B01-V3-04
NBN-HS-S03B	B01-V3-05
NAN-HS-S01A	B01-V3-05
NBN-HS-S01N	B01-V3-06
NGN-HS-L19B2	B01-B1-06
NGN-HS-L21B2	B01-B1-06
NGN-HS-L23B2	B01-B1-07
NGN-HS-L20B2	B01-B1-07
NGN-HS-L22B2	B01-B1-07
NGN-HS-L24B2	B01-B1-07
NGN-HS-L26B2	B01-B1-08
NGN-HS-L28B2	B01-B1-08
NGN-HS-L30B2	B01-B1-08

MIMICS AND BACKGROUND SHADING

1. Mimic between MAN-HS-910 and MAN-EI-002 goes to label "TO UNIT 1 MAIN XFMR 1-E-X01A/B/C" in Unit 2.

   Photo: B01-V2-07

2. "START-UP TRANSFORMER NAN-X01" is to the left of the mimic in Unit 2 and to the right in Unit 1.

   Photo: B01-V2-10

3. "TO UNIT 2 MAIN XFMR 2-E-MAN-X01A/B/C" is not in Unit 2 and the mimic goes to the brown generator mimic.

   Photo: B01-V2-09

4. Mimic between MAN-HS-975 and MAN-HS-978 goes to label "FUTURE" in Unit 2.

   Photo: B01-V2-07

5. Orange mimic with white line goes to Unit 2 NAN-SO6 BUS in Unit 2 rather than to NAN-HS-S06K.

   Photo: B01-V3-10

6. White mimic with green line going to PEB-HS-S04B in Unit 1 is missing in Unit 2.

   Photo: B01-B1-12

7. There is no background shading for Unit 2 (beige) and Unit 3 (gray) buses.

   Photo: B01-4

CONTROLS

1. The following switches are not in Unit 2:

Number	Photo
MAN-HS-912	B01-V2-07
MAN-HS-910	B01-V2-07
MAN-SS-922	B01-V2-08
MAN-SS-925	B01-V2-08
MAN-SS-928	B01-V2-08
MAN-HS-932A	B01-V2-09
MAN-SS-932A	B01-V2-09
MAN-SS-942A	B01-V2-10
MAN-SS-942	B01-V2-10
MAN-SS-945	B01-V2-10
MAN-SS-948	B01-V2-10
MAN-HS-972	B01-V2-11
MAN-HS-975	B01-V2-11
MAN-HS-978	B01-V2-11
MAN-SS-982	B01-V2-12
MAN-HS-992	B01-V2-13
MAN-HS-995	B01-V2-13
MAN-HS-998	B01-V2-13
NAN-HS-S05A	B01-V3-04
NAN-SS-S05A	B01-V3-04
NAN-SS-S05D	B01-V3-06
NAN-SS-S05B	B01-V3-06
NAN-SS-S06F	B01-V3-08
NAN-SS-S06H	B01-V3-08
NAN-SS-S06K	B01-V3-08
NAN-HS-S06K	B01-V3-08
NAN-SS-S05A1	B01-V3-12
NAN-SS-S05C1	B01-V3-12
NAN-SS-S05D1	B01-V3-11
NAN-SS-S05B1	B01-V3-11

2. The following switches are in Unit 2 but not Unit 1:

Number	Photo
MAN-HS-930	B01-V2-09

3. The following switches have a switch position that are different in Unit 1 and Unit 2:

Number	Unit	Position	Photo
NBN-SS-S01C	1	S01 XFR	B01-B1-04
	2	S01 XFR PERMITS TRANSFER TO X02	
	1	S02 XFR	
	2	S02 XFR PERMITS TRANSFER TO X01	

4. NAN-SS-S06C1 key switch has different switch plates in Unit 1 and Unit 2.

Photo: B01-V3-10

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

DISPLAYS

LIGHTS

1. "525KV GENERATOR BKR 552-918" and "915" have legends which read "TRIP COIL A TRIP COIL 2" in Unit 1 and are blank in Unit 2.

   Photo: B01-V2-07

2. The following breakers with meters in Unit 1 are now indicating lights only in Unit 2:

Number	Photo
MAN-HS-912	B01-V2-07
MAN-HS-922A	B01-V2-08
MAN-HS-925	B01-V2-08
MAN-HS-928	B01-V2-08
MAN-HS-920	B01-V2-08
MAN-HS-942	B01-V2-10
MAN-HS-940	B01-V2-10
MAN-HS-945	B01-V2-10
MAN-HS-948	B01-V2-10
MAN-HS-972	B01-V2-11
MAN-HS-975	B01-V2-11
MAN-HS-978	B01-V2-11
MAN-HS-982	B01-V2-12
MAN-HS-992A	B01-V2-13
MAN-HS-995	B01-V2-13
MAN-HS-998	B01-V2-13
MAN-HS-990	B01-V2-13
NAN-HS-S05F	B01-V3-05
NAN-HS-S05J	B01-V3-05
NAN-HS-S05K	B01-V3-05
NAN-HS-S05D	B01-V3-05
NAN-HS-S05B	B01-V3-06
NAN-HS-S06B	B01-V3-07
NAN-HS-S06H	B01-V3-08
NAN-HS-S05J	B01-V3-07
NAN-HS-S05C	B01-V3-07
NAN-HS-S05D	B01-V3-07

NAN-HS-S05F	B01-V3-07
NAN-HS-L43B2	B01-V3-08
NAN-HS-L44B2	B01-V3-08

METERS

1. The following meters associated with the listed breakers are kilovolts or kiloamps numbered by ones in Unit 1, but are volts and amps numbered by thousands in Unit 2:

Breaker Number	Photo
MAN-E1-001	B01-V2-07

2. The following meters have different ranges or divisions in Unit 1 and Unit 2:

Number	P/S	Range	Divisions (number/major/minor)	Photo
NAN-JIV-02Z1	1	100-0-100	50/25/5	B01-V1-04
	2	100-0-100	40/20/4	
NAN-JIV-03Y1	1	100-0-100	50/25/5	B01-V1-04
	2	100-0-100	40/20/4	
NAN-JIV-03Z1	1	100-0-100	50/25/5	B01-V1-04
	2	100-0-100	40/20/4	
NAN-II-S03B	1	0-4	1/.2	B01-V3-06
	2	0-4	1/.5/.1	
NAN-EI-S05B1	1	0-18	4/2/1	B01-V3-09
	2	0-18	5/1/.5	

3. The following meters have setpoints in Unit 1 that are not in Unit 2:

Number	Setpoint	Photo
PEN-EI-G02	yellow 3700	B01-V3-13
PEN-SI-G02	yellow 58.8	B01-V3-13

4. The following meters are not in Unit 2:

Number	Photo
NAN-JIW-01Y1	B01-V1-02
NAN-JIV-01Y1	B01-V1-02
NAN-JIW-03Z1	B01-V1-04
NAN-JIV-03Z1	B01-V1-04
NAN-II-01Y1	B01-V1-07
NAN-II-03Z1	B01-V1-13

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

NAN-II-S05A	B01-V3-04
NAN-II-S05G	B01-V3-04
NAN-EI-S06	B01-V3-07
NAN-EI-S06	B01-V3-11
NAN-EI-S051	B01-V3-11

ANNUNCIATORS

1. The following annunciators are in Unit 1 and not Unit 2:

Box	Window	Photo
1	A15	A1-1-2
2	A3	A1-2-1
2	A5	A1-2-1
3	A5	A1-3-1
3	A6	A1-3-1
3	B5	A1-3-1
3	B4	A1-3-1
3	C5	A1-3-1
3	B16	A1-3-2
3	C17	A1-3-2
3	C11	A1-3-2
3	C10	A1-3-2
3	C09	A1-3-2

2. The following annunciators have different text as indicated:

Box	Window	Unit	Text	Photo
1	B15	1	"... UNIT 1 ..."	A-1-1-2
		2	"... Unit 2 ..."	
1	B17	1	"... UNIT 1 ..."	A-1-1-2
		2	"... Unit 2 ..."	
1	C15	1	"... UNIT 1 ..."	A-1-1-2
		2	"... Unit 2 ..."	
2	B06	1	"... UNIT 1 ..."	A-1-2-1
		2	"... Unit 2 ..."	
2	C06	1	"... UNIT 1 ..."	A-1-2-1
		2	"... Unit 2 ..."	
3	C18	1	"... UNIT 1 ..."	A-1-3-2
		2	"... Unit 2 ..."	
3	C10	1	"... SPLY BKR ..."	A-1-3-2
		2	"... SWGR S04 ..."	

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROL BOARD B02

GENERAL

1. There is a black demarcation line between LPSI A and HPSI B in Unit 1 and not in Unit 2.

   Photo: B02-4

LABELING

1. SESS CONTROL TRAINS A and B have their component number labels on the boxes in Unit 1 and below the boxes in Unit 2.

   Photo: B02-B2-07, B02-B2-09

2. "HPSI B" and "A" label below "TO LOOP 1B" and "A" in Unit 1 and to the right in Unit 2.

   Photo: B02-V3-12, BO2-V3-08

3. RJN-UJR-12 label above recorder in Unit 1 and below in Unit 2.

   Photo: B02-V2-5

4. ESA-UA-2E and ESB-UA-2F labels are on the upper left corner of the boxes in Unit 1 and centered below the boxes in Unit 2.

   Photo: BO2-V1-02, B02-V1-05

5. ESA-UA-2E and ESB-UA-2F row matrix labels are on the right in Unit 1 and the left in Unit 2.

   Photo: BO2-V1-02, B02-V1-05, BO2-V1-04, B02-V1-07

6. The labels for the ANALYZER CONTROLS A and B are red and green respectively in Unit 2 and black in Unit 1.

   Photo: B02-V2-01, B02-V2-04

7. The component labels for the ANALYZER CONTROLS A and B begin with 1 in Unit 1 and 2 in Unit 2.

   Photo: B02-V2-01, B02-V2-04

8. ESA-UA-2C and ESB-UA-2D labels are on the lower right corner of the boxes in Unit 1 and centered below the boxes in Unit 2.

Photo: BO2-B2-07, B02-B2-09

9. Unit 2 has the following labels which are not in Unit 1:

Label	Photo
LPSI PMP B DSCH TT-352X SD HX TO LOOPS TT-352Y SIB-TR-352 (this is an extra label on the recorder)	B02-V2-11
CONTROL BLDG HVAC (major label)	B02-V3-01

10. Unit 1 has the following labels which are not in Unit 2:

Label	Photo
CONSULT ODG #47 AFTER OPERATION (associated with SIA-HS-604)	B02-B1-07
CONSULT ODG #47 AFTER OPERATION (associated with SIB-HS-694)	B02-B1-10

11. SIB-HS-18A has the label above it in Unit 1 and below in Unit 2.

Photo: B02-B1-13

MIMICS AND BACKGROUND SHADING

CONTROLS

1. The following switches are in Unit 1 and not Unit 2:

Component Number	Photo
RCN-HS-752	B02-V2-09
RCN-HS-752-1	B02-V2-09

DISPLAYS

LIGHTS

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

1. The following lights are improperly labeled in Unit 2:

Component	Row	Col	P/S	Verbage	Photo
ESA-UA-2E	E	20	1	AUX FW PMP RERC TEST VLV V-027	B02-V1-04
			2	blank	
ESB-UA-2F	E	20	1	AUX FW PMP RERC TEST VLV V-027	B02-V1-07
			2	blank	
SIA-HS-60	1	1	1	blank	B02-B2-11
			2	LEVEL TRIP OVERRIDE	
SIB-HS-61	1	1	1	blank	B02-B2-15
			2	LEVEL TRIP OVERRIDE	
SIA-HS-603	upper		1	blank	B02-B1-08
			2	LEVEL TRIP OVERRIDE	
SIA-HS-681	upper		1	blank	B02-B1-09
			2	LEVEL TRIP OVERRIDE	
SIA-HS-3	upper		1	blank	B02-B1-09
			2	RAS OVERRIDE	
SIB-HS-602	upper		1	blank	B02-B1-011
			2	LEVEL TRIP OVERRIDE	
SIB-HS-680	upper		1	blank	B02-B1-11
			2	LEVEL TRIP OVERRIDE	
SIA-HS-4	upper		1	blank	B02-B1-11
			2	RAS OVERRIDE	

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

METERS

1. The following meters/recorders are in Unit 1 and not Unit 2:

Component Number	Photo
RCN-LI-752B	B02-V2-10
RCN-LI-752A	B02-V2-9
RCN-LR-752	B02-V1-08

2. The following meters have different setpoints in Unit 1 and Unit 2:

Number	Unit	Setpoint	Photo
RCA-TR-112	1	-	B02-V2-08
	2	yellow 600	
RCA-TR-122	1	-	B02-V2-08
	2	yellow 600 470 blue 550	
RCA-LR-110X	1	blue 28 58	B02-V2-09
	2	-	

ANNUNCIATORS

1. The axis labels for the annunciator boxes ESD-UA-2A & B are not in Unit 2.

   Photo: A2-1, A2-2

2. The following annunciators are in Unit 1 and not in Unit 2:

Box	Window	Photo
2	A10	A2-4
2	B10	A2-4

3. The labels for RKA-UA-2C and RKV-UA-2D are not in Unit 2.

   Photo: A2-5

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROL BOARD B03

LABELING

1. The following labels are missing in Unit 2:

Label	Photo
EDT	B03-V1-03
RDT	B03-V1-07
HUT	B03-V2-01
NITROGEN GAS TANK (mimic also missing)	B03-V2-06
VCT	B03-V3-04
RMWT	B03-B1-01
RWT	B03-B1-02

2. The following meters have "R)" and "L)" in front of the point numbers in Unit 2, but not in the plant:

Component	Photo
CHN-PI-268	B03-V1-07
CHN-PI-255	B03-V2-03
CHN-PI-208	B03-B2-01
CHN-PI-206	B03-B2-03

3. The following labels are in different locations or orientations relative to the component in Unit 1 and Unit 2:

Component	Unit	Orientation/Location	Photo
CHN-A1-203	1	below	B03-V1-09
	2	above	
BORONOMETER RANGE	1	left, above "LOW RANGE" light	B03-V1-09
	2	below "LOW RANGE" light	
CHN-AR-203	1	left side	B03-V2-05
	2	below	
CHN-RR-204	1	left side	B03-V2-05
	2	below	
BORIC ACID CONCENTRATOR CONDENSATE 10X	1	sideways on mimic	B03-V3-08

	2	normal, to left	
CONSULT LABEL	1	below left	B03-V3-11
	2	above	
REACTOR MAKE-UP WATER TANK	1	sideways on mimic	B03-B1-01
	2	normal, to left	
REFUELING WATER TANK	1	on vertical panel	B03-B1-02
	2	on bench	
CHN-HS-11	1	diagonal, upper right	B03-B2-01
	2	normal, lower right	

MIMICS AND BACKGROUND SHADING

1. The LETDOWN HEAT EXCHANGER label is on the heat exchanger mimic in Unit 2.

   Photo: B)#-V3-06

2. The heat exchanger mimics are reversed in Unit 2.

   Photo: B03-V3-06, B03-B1-07, B03-B2-05

3. There are orange and white "BORATION FLOW PATH" labels in the following locations in Unit 2:

Location	Photo
right of CHN-HS-536	B03-B1-03
left of CHN-HS-S14	B03-B1-04
between CHA-HS-216 CHA-HS-218A	B03-B1-04
below left of CHA-HS-205	B03-B1-06
next to arrow	B03-B1-07
right of CHN-HS-532	B03-B2-02
below left CHN-HS-206	B03-B2-02
below left CHN-HS-207	B03-B2-02
above CHB-HS-218 lights	B03-B2-04
below CHB-HS-217	B03-B2-04
right of CHN-TI-229	B03-B2-05A

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROLS

1. CHN-PDIC-240 has "A" and "M" on the lights in Unit 2 and "AUTO" and "MAN" in Unit 1.

   Photo: B03-B2-06

DISPLAYS

LIGHTS

NONE

METERS

1. The scales on CHN-AR-203 are reversed in Unit 2.

   Photo: B03-V2-05

2. The numbers on the scale for CHN-RR-265 are on the right in Unit 1 and the left in Unit 2.

   Photo: B03-V3-08

3. The following setpoints are on Unit 2 but not Unit 1:

Number	Setpoint	Photo
CHB-LI-201	blue	B03-B1-02
CHN-LI-200	blue, yellow	B03-B1-02

ANNUNCIATORS

NONE

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROL BOARD B04

LABELING

1. RJN-UJR-14 has its label on the recorder in Unit 1 and below it in Unit 2.

   Photo: B04-V2-03

2. The labels for the following recorders have "R)" and "L)" before the points in Unit 2 and not Unit 1:

Component	Photo
RCN-TI-101	B04-V2-07
RCN-TI-106	B04-V2-07
RCN-TI-107	B04-V2-07

3. The labels for the following components are below the component in Unit 1 and above in Unit 2:

Component	Photo
"DEGAUSE"	B04-V1-01
RCN-LR-110	B04-V3-01

MIMICS AND BACKGROUND SHADING

CONTROLS

1. The monitor in Unit 2 has a white square button to the right of power, a "TEST" button, and a "EXT SYNC" button that are not in Unit 1. Unit 2 monitor is made by CONRAC while Unit 1's is made by Honeywell.

   Photo: B04-V1-01

2. The following controls have pistol grips in Unit 2 and round knobs in Unit 1:

Component	Photo
RCA-HS-100-4	B04-B1-01
RCB-HS-100-5	B04-B2-01
RCB-HS-100-6	B04-B2-02
RCB-HS-100-6	B04-B2-02
RCB-HS-100-7	B04-B2-02
RCB-HS-100-8	B04-B2-02
RCB-HS-100-9	B04-B2-02

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

DISPLAYS

LIGHTS

NONE

METERS

NONE

ANNUNCIATORS

NONE

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROL BOARD B05

LABELING

1. The following components have the labels below them in Unit 1 and above them in Unit 2:

Component	Photo
RCA-PI-199A	B05-V1-01
RCA-PI-199B	B05-V1-02
RCA-PI-199C	B05-V1-03
RCA-PI-199D	B05-V1-04
CDN-LR-83	B05-V2-05

MIMICS AND BACKGROUND SHADING

CONTROLS

1. The following pushbuttons are silver in Unit 1 and red in Unit 2:

Number	Photo
SBA-HS-1	B05-B1-01
SBA-HS-2	B05-B1-01
SBA-HS-3	B05-B1-01
SBA-HS-4	B05-B1-01

DISPLAYS

LIGHTS

NONE

METERS

NONE

ANNUNCIATORS

NONE

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROL BOARD B06

LABELING

1. Unit 2 labels for the following are different as shown:

Component	Difference	Photo
WHITE INFO LABEL	1 "AUX FW PUMP A (TURBINE DRIVEN)" (black on white) 2 "ESS STM DRIVEN AUX FEED PUMP AFA-P01" (white on red)	B06-V3-02
WHITE INFO LABEL	1 "AUX FW PUMP B (MOTOR DRIVEN)" (black on white) 2 "ESS ELECTRIC AUX FEED PUMP AFB-P01" (white on green)	B06-V3-07
WHITE INFO LABEL	1 "AUX FW PUMP N (MOTOR DRIVEN)" (black on white) 2 "START UP AUX FEED PUMP AFN-P01" (white on black)	B06-B1-03
SGA-LI-1132A	additional "WIDE RANGE" label above	B06-V3-03
SGB-LI-1113BA	additional "WIDE RANGE" label above	B06-V3-07
MAN-HS-918	1 "MAN-HS-918" 2 "MAN-HS-938"	B06-V3-13
MAN-HS-918	1 "MAN-HS-918A" 2 "MAN-HS-938A"	B06-V3-13
MAN-HS-918	1 "MAN-HS-915" 2 "MAN-HS-935"	B06-V3-13
MAN-HS-918	1 "MAN-HS-915A" 2 "MAN-HS-935A"	B06-V3-13
MAN-HS-918	1 "MAN-SS-918" 2 "MAN-SS-938"	B06-V3-13
MAN-HS-918	1 "MAN-SS-915" 2 "MAN-SS-935"	B06-V3-13

2. RJN-UJR-16B has the label below the recorder in Unit 1 and above in Unit 2.

Photo: B06-V2-12

3. The following components have labels above in Unit 1 and below in Unit 2:

Component	Photo
AFN-HS-95	B06-B2-04
CTA-LI-35A	B06-V2-07

4. "28V ONLY" label is below and to the left of HS-52A TEST button in Unit 1 and between HS-51A and HS-52A in Unit 2.

   Photo: B06-B2-15

MIMICS AND BACKGROUND SHADING

1. SGN-HS-1142 and 43 have gray backgrounds in Unit 1 and a beige one in Unit 2.

   Photo: B06-V2-04

CONTROLS

NONE

DISPLAYS

NONE

LIGHTS

1. The following lights are improperly labeled in Unit 2:

Component	Row	Col	P/S	Verbage	Photo
SGA-HS-134A	1	1	1	UV-134A	B06-B1-02
			2	blank	
SGA-HS-134A	1	2	1	UV-134A	B06-B1-02
			2	blank	
SGA-HS-138A	1	1	1	UV-138A	B06-B1-02
			2	blank	
SGA-HS-138A	1	2	1	UV-138A	B06-B1-02
			2	blank	
RJN-UIC-18	2	4	1	blank	B06-V2-10
			2	BOTTLED SHUTDOWN	

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

METERS

1. The following meters have different ranges or divisions in Unit 1 and Unit 2:

Number	P/S	Range	Divisions (number/major/minor)	Photo
SGN-HS-1145	1	0-100	25/5	B06-V2-07
	2	0-100	20/10/5	
FTN-ZI-69	1	0-100	25/5	B06-B1-02
	2	0-100	20/10/5	
SGN-FR-1122	1	0-10	.5/.1	B06-V2-06
	2	0-100	5/1	
FWN-HS-103	1	0-100	20/5	B06-V3-05
	2	0-100	25/5	
EDN-HS-30	1	0-100	25/5	B06-V3-14
	2	0-100	20/10/5	

2. The following meters and controllers have one scale in Unit 1 and two in Unit 2:

Component Number	Photo
SGA-HIC-184A	B06-V2-01
SGN-TR-7	B06-V2-05
CDN-PR-49	B06-V2-08
SGN-FIK-1112	B06-V3-03

3. The following meters and controllers have one scale in Unit 2 and two in Unit 1:

Component Number	Photo
SGN-PIC-1010	B06-V2-08

ANNUNCIATORS

NONE

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

CONTROL BOARD B07

LABELING

1. The following labels are missing in Unit 2:

Label	Photo
VENT VLV PV-47 CPN-ZS NHN-M26 (lower)	B07-B1-07

2. J-SCN-UR-21 is missing the "J" in Unit 2.

   Photo: B07-V3-12

3. RJN-UJR-17 has the label on the top in Unit 1 and the bottom in Unit 2.

   Photo: B07-V2-03

4. The labels for the following recorders are between the recorders in Unit 1 and above their respective recorder in Unit 2:

Number	Photo
1JMTNUR302	B07-V2-04, B07-V1-03
1JMTNUR301	B07-V2-04
1JMTNTR303	B07-V2-05, B07-V1-04
1JMTNTR305	B07-V2-05
1JMNTJR1	B07-V2-06, B07-V1-05
1JMNTJR2	B07-V2-06

5. The labels for the following recorders begin with 1J in Unit 1 and 2J in Unit 2 and have a dash after the N in Unit 2:

Number	Photo
1JMTNUR302	B07-V2-04, B07-V1-03
1JMTNUR301	B07-V2-04
1JMTNTR303	B07-V2-05, B07-V1-04
1JMTNTR305	B07-V2-05
1JMNTJR1	B07-V2-06, B07-V1-05
1JMNTJR2	B07-V2-06

6. 1AN-HS-213A has "COMPR." in the label in Unit 1 and "COMP." in Unit 2.

   Photo: B07-B1-08

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

MIMICS AND BACKGROUND SHADING

CONTROLS

1. The following controls are not in Unit 2:

Number	Photo
ASN-HS-126	B07-B2-10
ASN-HS-127	B07-B2-10
ASN-HS-138	B07-B2-10

DISPLAYS

LIGHTS

NONE

METERS

1. The following meters are not in Unit 2:

Number	Photo
ASN-FI-114C	B07-B1-10

2. The following meters have different ranges or divisions in Unit 1 and Unit 2:

Number	P/S	Range	Divisions (number/major/minor)	Photo
CWN-HS-8	1	0-100	20/4	B07-B1-01
	2	0-100	25/5	
CWN-HS-7	1	0-100	20/4	B07-B1-01
	2	0-100	25/5	
CWN-HS-6	1	0-100	20/4	B07-B1-01
	2	0-100	25/5	
CWN-HS-5	1	0-100	20/4	B07-B1-01
	2	0-100	25/5	

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

ANNUNCIATORS

1. The following annunciators are in Unit 1 and not in Unit 2:

Box	Window	Photo
1	B6	A7-1-1
1	B9	A7-1-1
1	A14	A7-1-2
1	A16	A7-1-2

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 2

BACKPANELS

PLANT PROTECTION

1. "EXCORE SAFTEY CHANNEL" labels are not on Unit 2.

   Photo: BACK-05, BACK-10, BACK-15

BOP ESFAS PANELS

1. The black instruction labels are not on Unit 2.

   Photo: BACK-25

2. The top right hand light has "ESS CHILL" in Unit 1 and "ESS CHILL NORM CHILL" in Unit 2.

   Photo: BACK-23

FEEDWATER CONTROL PANELS 1 AND 2

NONE

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

CONTROL ROOM LAYOUT

GENERAL

1 The annunciator boxes have the column numbers on the bottom in Unit 1 and on the top in Unit 3.

OPERATOR CONSOLE

ALARM PRINTER

1. Different types of alarm printers are used in Unit 1 and Unit 3.

   Photo: MISC-07

FIRE PROTECTION CONSOLE

1. The three fire pump switches are not in Unit 3.

   Photo: MISC-13

COMMUNICATIONS CONSOLE

1. The red NRC phone is a wall phone in Unit 1 and a desk phone in Unit 3.

   Photo: MISC-14

ENVIRONMENT

1. The incandescent lights over panels B03 and B05 are over each end of the panels in Unit 3. They are over the center and the back-end of the panels in Unit 1.

   Photo: MISC-17, MISC-18

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

CONTROL BOARD B01

GENERAL

1. The orange mimics are very different for Unit 3 and Unit 1.

   Photo: B01-4, B01-5, B01-6, B01-7

LABELING

1. Unit 3 labels for the following are different as shown:

Component	Difference	Photo
NAN-JIW-01Y1	1 "NAN-JIW-01Y1" 3 "A-E-NAN-JIW-01Y3"	B01-V1-02
NAN-JIV-01Y1	1 "NAN-JIV-01Y1" 3 "A-E-NAN-JIV-01Y3"	B01-V1-02
NAN-JIW-02Z1	1 "NAN-JIW-02Z1" 3 "A-E-NAN-JIW-02Z3"	B01-V1-04
NAN-JIV-02Z1	1 "NAN-JIV-02Z1" 3 "A-E-NAN-JIV-02Z3"	B01-V1-04
NAN-JIW-03Y1	1 "NAN-JIW-03Y1" 3 "A-E-NAN-JIW-03Y3"	B01-V1-04
NAN-JIV-03Y1	1 "NAN-JIV-03Y1" 3 "A-E-NAN-JIV-03Y3"	B01-V1-04
MAN-EI-001	1 "MAN-EI-001" 3 "A-E-MAN-EI-001B"	B01-V2-07
MAN-EI-002	1 "MAN-EI-002" 3 "A-E-MAN-EI-002B"	B01-V2-07
NAN-II-03Y1	1 "NAN-II-03Y1" 3 "A-E-NAN-II-03Y3"	B01-V2-13
NAN-II-03Z1	1 "NAN-II-023Z1" 3 "A-E-NAN-II-03Z3"	B01-V2-13
NKN-EI-M4505	1 "BACKUP BATTERY ..." 3 "BATTERY ..."	B01-V2-15
NAN-HK-S03B	1 "... TRANSFER ..." 3 "... XFR MANUAL-AUTO ..."	B01-V3-04
PEA-SC-G01	1 "PEA-SC-G01 ..." 3 "PEA-SC-G01 ADJUST ..."	B01-B1-01
PEA-EC-G01	1 "PEA-EC-G01 ..." 3 "PEA-EC-G01 ADJUST ..."	B01-B1-01
PEA-EK-G01	1 "PEA-EK-G01 ..." 3 "PEA-EK-G01 MNL AUTO ..."	B01-B1-01
PEA-SC-G02	1 "PEA-SC-G02 ..." 3 "PEA-SC-G02 ADJUST ..."	B01-B1-13

PEA-EC-G02	1 "PEA-EC-G02 ..." 3 "PEA-EC-G02 ADJUST ..."	B01-B1-13
PEA-EK-G02	1 "PEA-EK-G02 ..." 3 "PEA-EK-G01 MNL AUTO ..."	B01-B1-13
MAN-S1-002	1 "..." 3 "SYNCHROSCOPE ..."	B01-V1-03
1-E-MAN-G01	1 "UNIT 1 ... 1-..." 1 "UNIT 3 ... 3-..."	B01-V3-03

2. The following labels are missing in Unit 3:

Label	Photo
EOF AND TSC BLDGS SUPPLY BREAKER A-E-NAN-II-S06J	B01-V3-07

3. The label "CAUTION - ENSURE ONLY ONE SYNC SWITCH IS ON AT A TIME" is in Unit 3 and not Unit 1 next to the following switches:

Number	Photo
NAN-SS-S05B3	B01-V3-11
NAN-SS-S05D3	B01-V3-11
NAN-SS-S02A	B01-V3-11
NAN-SS-S04B	B01-V3-11
NAN-SS-S06A3	B01-V3-12
NAN-SS-S06C3	B01-V3-12
NBN-SS-S01A	B01-B1-03
NBN-SS-S01C	B01-B1-04
NBN-SS-S02A	B01-B1-10
PEA-SS-S03B	B01-B1-02
PBA-SS-S03K	B01-B1-03
PBA-SS-S03L	B01-B1-03
PBB-SS-S04K	B01-B1-11
PBB-SS-S04L	B01-B1-10
PEB-SS-S04B	B01-B1-12

4. The following labels are in Unit 3 under the "CHARGER AC OUTPUT" lights and not Unit 1:

Label	Photo
BACKUP BATTERY CHARGER AC THROWOVER SW CH C STATUS	B01-V2-02

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

BACKUP BATTERY CHARGER AC THROWOVER SW CH D STATUS	B01-V2-05
BATTERY CHARGER EF THROWOVER SW STATUS	B01-V2-15

5. The following components have incomplete meter numbers (e.g., II-S03A, rather than NBN-II-S03A) in Unit 3 and complete numbers in Unit 1:

Component	Photo
NBN-HS-S03A	B01-V3-04
NBN-HS-S03B	B01-V3-05
NAN-HS-S01A	B01-V3-05
NBN-HS-S01N	B01-V3-06
NGN-EI-25	B01-B1-06
NGN-EI-19	B01-B1-06
NGN-EI-21	B01-B1-06
NGN-EI-23	B01-B1-07
NGN-EI-20	B01-B1-07
NGN-EI-22	B01-B1-07
NGN-EI-24	B01-B1-07
NGN-EI-26	B01-B1-08
NGN-EI-28	B01-B1-08
NGN-EI-30	B01-B1-08

6. The following components have the labels above in Unit 1 and below in Unit 3:

Number	Photo
MAN-EI-001	B01-V2-07
MAN-EI-002	B01-V2-07

7. The following components have the labels below in Unit 1 and above in Unit 3:

Number	Photo
NBN-EI-S02	B01-B1-06

MIMICS AND BACKGROUND SHADING

1. Mimic between MAN-HS-910 and MAN-EI-002 goes to label "TO UNIT 1 MAIN XFMR 1-E-X01A/B/C" in Unit 3.

   Photo: B01-V2-07

2. The mimic that normally goes to the generator mimic goes to the label "TO UNIT 3 ...."

   Photo: B01-V2-12

3. There is no background shading for Unit 2 (beige) and Unit 3 (gray) buses.

   Photo: B01-4

CONTROLS

1. The following switches are not in Unit 3:

Number	Photo
MAN-SS-912	B01-V2-07
MAN-HS-910	B01-V2-07
MAN-SS-922	B01-V2-08
MAN-SS-925	B01-V2-08
MAN-SS-928	B01-V2-08
MAN-SS-932	B01-V2-09
MAN-HS-942A	B01-V2-10
MAN-SS-942	B01-V2-10
MAN-SS-945	B01-V2-10
MAN-SS-948	B01-V2-10
MAN-HS-972	B01-V2-11
MAN-HS-975	B01-V2-11
MAN-HS-978	B01-V2-11
MAN-SS-982	B01-V2-12
MAN-HS-992	B01-V2-13
MAN-HS-995	B01-V2-13
MAN-HS-998	B01-V2-13
NAN-HS-S05A	B01-V3-04
NAN-SS-S05A	B01-V3-04
NAN-SS-S05D	B01-V3-06
NAN-SS-S05B	B01-V3-06
NAN-SS-S06F	B01-V3-08
NAN-SS-S06H	B01-V3-08
NAN-SS-S06K	B01-V3-08
NAN-HS-S06K	B01-V3-08
NAN-SS-S06A1	B01-V3-10
NAN-SS-S06C1	B01-V3-10
NAN-SS-S05D1	B01-V3-09
NAN-SS-S05B1	B01-V3-09

2. MAN-HS-980 is in Unit 3 and not Unit 1.

Photo: B01-V2-12

DISPLAYS

LIGHTS

1. "525KV GENERATOR BKR 552-918" and "915" have legends which read "TRIP COIL A TRIP COIL 2" in Unit 1 and are blank in Unit 3.

   Photo: B01-V2-07

2. The following breakers with meters in Unit 1 are now indicating lights only in Unit 3:

Number	Photo
MAN-HS-912	B01-V2-07
MAN-HS-922A	B01-V2-08
MAN-HS-925	B01-V2-08
MAN-HS-928	B01-V2-08
MAN-HS-920	B01-V2-08
MAN-HS-932	B01-V2-09
MAN-HS-942	B01-V2-10
MAN-HS-940	B01-V2-10
MAN-HS-945	B01-V2-10
MAN-HS-948	B01-V2-10
MAN-HS-972	B01-V2-11
MAN-HS-975	B01-V2-11
MAN-HS-978	B01-V2-11
MAN-HS-982A	B01-V2-12
MAN-HS-992	B01-V2-13
MAN-HS-995	B01-V2-13
MAN-HS-998	B01-V2-13
MAN-HS-990	B01-V2-13
NAN-HS-S05F	B01-V3-05
NAN-HS-S05J	B01-V3-05
NAN-HS-S05K	B01-V3-05
NAN-HS-S05D	B01-V3-05
NAN-HS-S05B	B01-V3-06
NAN-HS-S06B	B01-V3-07
NAN-HS-S06H	B01-V3-08
NAN-HS-S06J	B01-V3-07
NAN-HS-S06C	B01-V3-07
NAN-HS-S06D	B01-V3-07
NAN-HS-S06F	B01-V3-07
NAN-HS-L43B2	B01-V3-08
NAN-HS-L44B2	B01-V3-08

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

METERS

1. The following meters have different ranges or divisions in Unit 1 and Unit 3:

Number	Unit	Range	Divisions (number/major/minor)	Photo
PEN-JIW-G01	1	0-8	2/1/.2	B01-V3-03
		0-8	2/1/.5/.1	

2. The following meters are not in Unit 3

Number	Photo
NAN-JIW-01Z1	B01-V1-02
NAN-JIV-01Z1	B01-V1-02
NAN-JIW-02K1	B01-V1-04
NAN-JIV-02K1	B01-V1-04
NAN-JIW-01Y1	B01-V1-02
NAN-JIV-01Y1	B01-V1-02
NAN-JIW-03Z1	B01-V1-04
NAN-JIV-03Z1	B01-V1-04
NAN-II-01Y1	B01-V1-07
NAN-II-01Z1	B01-V1-08
NAN-II-02Z1	B01-V1-08
NAN-II-03Z1	B01-V1-13
NAN-II-S05A	B01-V3-04
NAN-II-S05G	B01-V3-04
NAN-EI-S06	B01-V3-07
NAN-EI-S06	B01-V3-11
NAN-EI-S051	B01-V3-11

ANNUNCIATORS

1. The following annunciators are in Unit 1 and not Unit 3:

Box	Window	Photo
1	A15	A1-1-2
2	A6	A1-2-1
2	A5	A1-2-1
2	A12	A1-2-2
2	B4	A1-2-1
2	B5	A1-2-1
2	B15	A1-2-2
2	C5	A1-2-1

[illegible]

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

2	C8	A1-2-1
2	C9	A1-2-1
2	C10	A1-2-1
2	A11	A1-2-2
2	A17	A1-2-2
3	A1	A1-3-1

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

CONTROL BOARD B02

GENERAL

1. There is a black demarcation line between LPSI "A" and HPSI "B" in Unit 1 and not in Unit 3.

   Photo: B02-4

LABELING

1. SESS CONTROL TRAINS "A" and "B" have their component number labels on the boxes in Unit 1 and below the boxes in Unit 3.

   Photo: B02-B2-07, B02-B2-09

2. "HPSI B" and "A" label below "TO LOOP 1B" and "A" in Unit 1 and to the right in Unit 3.

   Photo: B02-V3-12, BO2-V3-08

3. RJN-UJR-12 label above recorder in Unit 1 and below in Unit 3.

   Photo: B02-V2-5

4. ESA-UA-2E and ESB-UA-2F labels are on the upper left corner of the boxes in Unit 1 and centered below the boxes in Unit 3.

   Photo: BO2-V1-02, B02-V1-05

5. ESA-UA-2E and ESB-UA-2F row matrix labels are on the right in Unit 1 and the left in Unit 3.

   Photo: BO2-V1-02, B02-V1-05, BO2-V1-04, B02-V1-07

6. The component labels for the ANALYZER CONTROLS "A" and "B" begin with 1 in Unit 1 and 2 in Unit 3.

   Photo: B02-V2-01, B02-V2-04

7. ESA-UA-2C and ESB-UA-2D labels are on the lower right corner of the boxes in Unit 1 and centered below the boxes in Unit 3.

   Photo: BO2-B2-07, B02-B2-09

8. Unit 1 has the following labels which read differently in Unit 3:

Unit	Label	Photo
1	CONSULT ODG #47 AFTER OPERATION	B02-B1-07
3	CONSULT ODG 40DP-90P07 AFTER OPERATION	
1	CONSULT ODG #47 AFTER OPERATION	B02-B1-10
3	CONSULT ODG 40DP-90P07 AFTER OPERATION	

9. Unit 1 has the following labels which are not in Unit 3:

Label	Photo
CONSULT ODG #47 AFTER OPERATION (associated with SIA-HS-604)	B02-B1-07
CONSULT ODG #47 AFTER OPERATION (associated with SIB-HS-694)	B02-B1-10

10. The following components have the labels in different locations in Unit 1 and Unit 3:

Number	Unit	Location	Photo
SIB-HS-18A	1	above	B02-B1-13
	3	below	
"CONSULT.."	1	above	B02-V3-10
	3	side	
"CONSULT.."	1	above	B02-V3-11
	3	side	
"CONSULT.."	1	above	B02-V3-14
	3	side	
UV-634	1	above	B02-V3-17
	3	below	
UV-644	1	above	B02-V3-18
	3	below	
UV-614	1	above	B02-V3-18
	3	below	
UV-624	1	above	B02-V3-18
	3	below	

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

MIMICS AND BACKGROUND SHADING

CONTROLS

NONE

DISPLAYS

LIGHTS

1. The following lights are improperly labeled in Unit 3:

Component	Row	Col	Unit	Verbage	Photo
SIA-HS-603	upper		1	blank	B02-B1-08
			3	LEVEL TRIP OVERRIDE	
SIA-HS-681	upper		1	blank	B02-B1-09
			3	LEVEL TRIP OVERRIDE	
SIA-HS-3	upper		1	blank	B02-B1-09
			3	RAS OVERRIDE	
SIB-HS-602	upper		1	blank	B02-B1-011
			3	LEVEL TRIP OVERRIDE	
SIB-HS-680	upper		1	blank	B02-B1-11
			3	LEVEL TRIP OVERRIDE	
SIA-HS-4	upper		1	blank	B02-B1-11
			3	RAS OVERRIDE	
ESA-UA-2C	3	5	1	blank	B02-B2-07
			3	BOPESFAS	
	3	6	1	blank	
			3	NSSS ESFAS	
ESB-UA-2D	3	5	1	blank	B02-B2-09
			3	BOPESFAS	
	3	6	1	blank	
			3	NSSS ESFAS	

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

METERS

1. RCN-LI-752B has the "L)" and "R)" indications on the label switched in Unit 3.

   Photo: B02-V2-10

2. The following meters have different setpoints in Unit 1 and Unit 3:

Number	Unit	Setpoint	Photo
RCA-TR-112	1	-	B02-V2-08
	3	yellow 570, 580 blue 550	
RCA-TR-122	1	-	B02-V2-08
	3	yellow 610 470 blue 560	
RCA-LR-110K	1	blue 28 57	B02-V2-09
	3	-	
STA-LR-35	1	blue 80	B02-V2-11
	3	-	
HLA-PR-355A	1	yellow 5, 10	B02-V2-11

ANNUNCIATORS

1. The axis labels for the annunciator boxes ESD-UA-2A & B are not in Unit 3.

   Photo: A2-1, A2-2

2. The following annunciators are in Unit 1 and not in Unit 3:

Box	Window	Photo
2	A10	A2-4
2	B10	A2-4

3. The labels for RKA-UA-2C and RKV-UA-2D are not in Unit 3.

   Photo: A2-5

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

CONTROL BOARD B03

LABELING

1. The following labels are missing in Unit 3:

Label	Photo
EDT	B03-V1-03
RDT	B03-V1-07
HUT	B03-V2-01
NITROGEN GAS TANK (mimic also missing)	B03-V2-06
VCT	B03-V3-04
RMWT	B03-B1-01
RWT	B03-B1-02

2. The following meters have "R)" and "L)" in front of the point numbers in Unit 3, but not in the plant:

Component	Photo
CHN-PI-255	B03-V2-03
CHN-PI-208	B03-B2-01
CHN-PI-206	B03-B2-03

3. The following labels are in different locations or orientations relative to the component in Unit 1 and Unit 3:

Component	Unit	Orientation/location	Photo
CHN-AR-203	1	left side	B03-V2-05
	3	below	
CHN-RR-204	1	left side	B03-V2-05
	3	below	
BORIC ACID CONCENTRATOR CONDENSATE 10X	1	sideways on mimic	B03-V3-08
	3	normal, to left	
CHN-RR-265	1	side	B03-V3-08
	3	below	
CONSULT LABEL	1	below left	B03-V3-11
	3	above	

REACTOR MAKE-UP WATER TANK	1	sideways on mimic	B03-B1-01
	3	normal, to left	
CHN-HS-527	1	angled	B03-V3-10
	3	normal above	
CHN-HS-11	1	angled	B03-B3-01
	3	normal above right	

4. Unit 3 labels for the following are different as shown:

Component	Difference	Photo
CHN-HS-501	1 "..." (white on black) 3 "... POWER FROM PHA-M35" (white on red)	B03-V3-10
CHN-HS-536	1 "..." (white on black) 3 "... POWER FROM PHA-M35" (white on red)	B03-V3-10

5. "POWER BREAKER M3620 PRIOR TO OPERATING" is below CHA-HS-524 in Unit 1 but not Unit 2.

   Photo: B03-B2-05

6. There are white note labels next to CHB-HS-217 and 218 in Unit 3 that are not in Unit 1.

   Photo: B03-B2-04

MIMICS AND BACKGROUND SHADING

1. The LETDOWN HEAT EXCHANGER label is on the heat exchanger mimic in Unit 3.

   Photo: B03-V3-06

2. The heat exchanger mimics are reversed in Unit 3.

   Photo: B03-V3-06, B03-B1-07, B03-B2-05

3. There are orange and white "BORATION FLOW PATH" labels in the following locations in Unit 3:

Location	Photo
right of CHN-HS-536	B03-B1-03
left of CHN-HS-S14	B03-B1-04

between CHA-HS-218 CHA-HS-217	B03-B1-04
next to arrow	B03-B1-07
right of CHN-HS-532	B03-B2-02
below left CHN-HS-218	B03-B2-03
below left CHN-HS-217	B03-B2-03
above CHB-HS-218 lights	B03-B2-04
right of CHN-TI-229	B03-B2-05A

CONTROLS

NONE

DISPLAYS

LIGHTS

NONE

METERS

1. The scales on CHN-AR-203 are reversed in Unit 3.

   Photo: B03-V2-05

2. The following meters have different ranges or divisions in Unit 1 and Unit 3:

Number	Unit	Range	Divisions (number/major/minor)	Photo
RCN-FI-156	1	0-9.5	1/.5/.1	B03-V1-08
	3	0-16	2/1/.2	
RCN-FI-166	1	0-9.5	1/.5/.1	B03-V1-08
	3	0-16	2/1/.2	
RCN-FI-176	1	0-9.5	1/.5/.1	B03-V1-08
	3	0-16	2/1/.2	
RCN-FI-186	1	0-9.5	1/.5/.1	B03-V1-08
	3	0-16	2/1/.2	

3. CHN-LI-200 has a double scale on Unit 3 and a single scale on Unit 1.

   Photo: B03-B1-02

ANNUNCIATORS

NONE

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

CONTROL BOARD B04

LABELING

1. RJN-UJR-14 has its label on the recorder in Unit 1 and below it in Unit 3.

   Photo: B04-V2-03

2. The labels for the following components are below the component in Unit 1 and above in Unit 3:

Component	Photo
"DEGAUSE"	B04-V1-01
RCN-LR-110	B04-V3-01
RCN-PR-100	B04-V3-02
RCN-TR-115	B04-V3-05
1J-RCN-TR-100	B04-V3-06
RCN-PIK-100	B04-B1-02
SGN-HIC-1010	B04-B1-10

3. The matrix labels for RKN-UA-4B and C below the matrix in Unit 1 and above in Unit 3

   Photo: B04-V2-03, B04-V2-04

4. "1J-RCN-TR-100" is "RCN-TR-100" on Unit 3.

   Photo: B04-V3-06

MIMICS AND BACKGROUND SHADING

1. The background for the monitor is tan in Unit 1 and black in Unit 3.

   Photo: B04-V1-03

CONTROLS

1. The monitor in Unit 3 has a white square button to the right of power, a "TEST" button, and a "EXT SYNC" button that are not in Unit 1. Unit 3 monitor is made by CONRAC while Unit 1's is made by Honeywell.

   Photo: B04-V1-01

2. The following controls have pistol grips in Unit 3 and round knobs in Unit 1:

Component	Photo
RCA-HS-100-4	B04-B1-01
RCB-HS-100-5	B04-B2-01
RCB-HS-100-6	B04-B2-02
RCB-HS-100-7	B04-B2-02
RCB-HS-100-8	B04-B2-02
RCB-HS-100-9	B04-B2-02

3. RCN-LIC-110 has "A" and "M" rather than "AUTO" and "MAN" on the pushbuttons for Unit 3.

   Photo: B04-B1-01

DISPLAYS

LIGHTS

NONE

METERS

1. The following meters have different setpoints in Unit 1 and Unit 3:

Number	Unit	Setpoint	Photo
RCN-TR-115	1	yellow 470	B04-V3-05
	3	-	
RCN-TI-177	1	red 175	B04-V3-09
	3	-	
RCN-TI-192	1	red 175	B04-V3-09
	3	-	
RCN-TI-138	1	red 175	B04-V3-09
	3	-	
RCN-TI-170	1	red 250	B04-B1-05
	3	-	
RCN-TI-171	1	red 175	B04-B1-10
	3	-	
RCN-TI-176	1	red 250	B04-B2-04
	3	-	

ANNUNCIATORS

NONE

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

CONTROL BOARD B05

LABELING

1. The following components have the labels below them in Unit 1 and above them in Unit 3:

Component	Photo
CDN-LI-96	B05-V3-12
CDN-LI-98	B05-V3-12

2. The following meters have WIDE RANGE or NARROW RANGE above the labels in Unit 1 and below in Unit 3:

Number	Photo
SGA-LI-1113A	B05-V2-01
SGA-LI-1114A	B05-V2-01
SGB-LI-1113B	B05-V2-02
SGB-LI-1114B	B05-V2-02
SGC-LI-1113C	B05-V2-03
SGC-LI-1114C	B05-V2-03
SGD-LI-1113D	B05-V2-04
SGD-LI-1114D	B05-V2-04

3. The blue and white "CEAC INACTIVE" label is not in Unit 3.

   Photo: B05-V3-09

MIMICS AND BACKGROUND SHADING

CONTROLS

1. The following pushbuttons are silver in Unit 1 and red in Unit 3:

Number	Photo
SBA-HS-1	B05-B1-01
SBA-HS-2	B05-B1-01
SBA-HS-3	B05-B1-01
SBA-HS-4	B05-B1-01

DISPLAYS

LIGHTS

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

1. The INITIATION RELAY lights are blue in Unit 3 and red in Unit 1.

   Photo: B05-B1-02, B05-B1-05

METERS

1. The following recorders have a double scale in one unit and a single in the other:

Number	Single	Double	Photo
RCA-PI-102A	U1	U3	B05-V1-01
CDN-PPIC-P15	U3	U1	B05-V3-11

2. The following meters have different setpoints in Unit 1 and Unit 3:

Number	Unit	Setpoint	Photo
RCA-PI-102A	1	-	B05-V1-01
	3	yellow 1.8, 2.4	
HCA-PI-351A	1	-	B05-V1-01
	3	blue 0, 2.5 yellow 3, 8.5	
HCA-PI-352A	1	yellow 8	B05-V1-01
	3	-	
RCB-PI-102B	1	-	B05-V1-02
	3	yellow 1.8, 2.4	
HCB-PI-351B	1	-	B05-V1-02
	3	blue 0, 2.5 yellow 3, 8.5	
HCB-PI-352B	1	yellow 8	B05-V1-02
	3	-	
RCB-PI-102B	1	-	B05-V1-03
	3	yellow 1.8, 2.4	
HCC-PI-351C	1	-	B05-V1-03
	3	blue 0, 2.5 yellow 3, 8.5	
HCC-PI-352C	1	yellow 8	B05-V1-03
	3	-	
RCC-PI-102C	1	-	B05-V1-04
	3	yellow 1.8, 2.4	
HCD-PI-351D	1	-	B05-V1-04
	3	blue 0, 2.5 yellow 3, 8.5	
HCD-PI-352D	1	yellow 8	B05-V1-04
	3	-	
RCA-TI-112CA	1	yellow 472, 612	B05-V2-01

	3	-	
SEA-JI-1A	1	yellow 10^{-2}	B05-V2-01
	3	yellow 1	
RCB-TI-112CB	1	yellow 472, 612	B05-V2-02
	3	-	
SEB-JI-1B	1	yellow 10^{-2}	B05-V2-02
	3	yellow 1	
RCC-TI-112C	1	yellow 472, 612	B05-V2-03
	3	-	
SEC-JI-1C	1	yellow 10^{-2}	B05-V2-03
	3	yellow 1	
RCD-TI-112CD	1	yellow 472, 612	B05-V2-04
	3	-	
SED-JI-1D	1	yellow 10^{-2}	B05-V2-04
	3	yellow 1	

ANNUNCIATORS

NONE

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

CONTROL BOARD B06

LABELING

1. Unit 3 labels for the following are different as shown:

Component	Difference	Photo
WHITE INFO LABEL	1 "AUX FW PUMP A (TURBINE DRIVEN)" (black on white) 2 "ESS STM DRIVEN AUX FEED PUMP AFA-P01" (white on red)	B06-V3-02
WHITE INFO LABEL	1 "AUX FW PUMP B (MOTOR DRIVEN)" (black on white) 2 "ESS ELECTRIC AUX FEED PUMP AFB-P01" (white on green)	B06-V3-07
WHITE INFO LABEL	1 "AUX FW PUMP N (MOTOR DRIVEN)" (black on white) 2 "START UP AUX FEED PUMP AFN-P01" (white on black)	B06-B1-03
MAN-HS-918	1 "MAN-HS-918" 3 "MAN-HS-988"	B06-V3-13
MAN-HS-918	1 "MAN-HS-918A" 3 "MAN-HS-988A"	B06-V3-13
MAN-HS-918	1 "MAN-HS-915" 3 "MAN-HS-985"	B06-V3-13
MAN-HS-918	1 "MAN-HS-915A" 3 "MAN-HS-985A"	B06-V3-13
MAN-HS-918	1 "MAN-SS-918" 3 "MAN-SS-988"	B06-V3-13
MAN-HS-918	1 "MAN-SS-915" 3 "MAN-SS-985"	B06-V3-13

2. RJN-UJR-16B has the label below the recorder in Unit 1 and above in Unit 3.

   Photo: B06-V2-12

3. The following components have labels above in Unit 1 and below in Unit 3:

Component	Photo
AFN-HS-95	B06-B2-04

4. The deviation meter is not labeled in Unit 1 but has the following label in Unit 3:

   FWPT B MANUAL/AUTO CONTROL DEVIATION FTN-SDI-102

   Photo: B06-B2-05

MIMICS AND BACKGROUND SHADING

CONTROLS

1. The following controllers have an "A" and "M" rather than "AUTO" and "MAN" on the pushbuttons for Unit 3.

Number	Photo
SGN-FIC-1107	B06-V3-04
SGN-FIC-1108	B06-V3-06

2. The following guarded pushbuttons are red in Unit 3 and silver in the Unit 1:

Component Number	Photo
FTN-HS-S1	B06-B1-02
AFA-HS-54A	B06-B2-01
FTN-HS-52	B06-B1-04

DISPLAYS

LIGHTS

1. The following lights are improperly labeled in Unit 3:

Component	Row	Col	P/S	Verbage	Photo
SGA-HS-134A	1	1	1	UV-134A	B06-B1-02
			3	blank	
SGA-HS-134A	1	2	1	UV-134A	B06-B1-02
			3	blank	
SGA-HS-138A	1	1	1	UV-138A	B06-B1-02
			3	blank	
SGA-HS-138A	1	2	1	UV-138A	B06-B1-02
			3	blank	
RJN-UIC-18	2	4	1	blank	B06-V2-10
			3	BOTTLED SHUTDOWN	
	2	5	1	blank	

			3	COMPLETE SHUTDOWN	
LON-HS-53A	1	1	1	blank	B06-B2-16
			3	TEST	

METERS

1. The following meters have different ranges or divisions in Unit 1 and Unit 3:

Number	Unit	Range	Divisions (number/major/minor)	Photo
SGN-ZI-1122	1	0-100	25/5	B06-V2-06
	3	0-100	20/5	
SGN-ZI-1123	1	0-100	25/5	B06-V2-06
	3	0-100	20/5	
FWN-HS-103	1	0-100	20/5	B06-V3-05
	3	0-100	25/5	
SGN-HS-5	1	0-100	20/5	B06-B1-03
	3	0-100	25/5	
SGN-HS-5	1	0-100	20/5	B06-B1-05
	3	0-100	25/5	
EDN-HS-30	1	0-100	25/5	B06-V3-14
	3	0-100	20/10/5	
SGN-HS-1143	1	0-100	25/5	B06-V2-04
	3	0-100	20/10/5	

2. The following meters and controllers have one scale in Unit 1 and two in Unit 3:

Component Number	Photo
SGA-HIC-184A	B06-V2-01
SGN-FIK-1112	B06-V3-03

3. MAN-JIV-GO1 has two upper labels reading "BUCK" and "BOOST" in the plant and "BUCK - (VARS IN)" and "BOOST + (VARS OUT)" in the Simulator.

   Photo: B06-V1-06

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

CONTROL BOARD B07

LABELING

1. The following labels are missing in Unit 3:

Label	Photo
VENT VLV PV-47 CPN-ZS NHN-M26 (lower)	B07-B1-07

3. RJN-UJR-17 has the label on the top in Unit 1 and the bottom in Unit 3.

   Photo: B07-V2-03

4. The labels for the following recorders are between the recorders in Unit 1 and above their respective recorder in Unit 3:

Number	Photo
1JMTNUR302	B07-V2-04, B07-V1-03
1JMTNUR301	B07-V2-04
1JMTNTR303	B07-V2-05, B07-V1-04
1JMTNTR305	B07-V2-05
1JMNTJR1	B07-V2-06, B07-V1-05
1JMNTJR2	B07-V2-06

5. The labels for the following recorders begin with 1J in Unit 1 and 3J in Unit 3 and have a dash after the N in Unit 3:

Number	Photo
1JMTNUR302	B07-V2-04, B07-V1-03
1JMTNUR301	B07-V2-04
1JMTNTR303	B07-V2-05, B07-V1-04
1JMTNTR305	B07-V2-05
1JMNTJR1	B07-V2-06, B07-V1-05
1JMNTJR2	B07-V2-06

6. The major labels for each of the following pushbutton sets are below the sets in Unit 1 and above them in the Unit 3:

Number	Photo
NGN-L19	B07-V3-01
NGN-L20	B07-V3-01
NGN-L21	B07-V3-01
NGN-L22	B07-V3-01
NGN-L23	B07-V3-01
NGN-L24	B07-V3-01
NGN-L26	B07-V3-02
NGN-L28	B07-V3-02
NGN-L30	B07-V3-02

7. Major section label "COOLING WATER" reads "COOLING WTR" in Unit 3.

   Photo: B07-V3-03

MIMICS AND BACKGROUND SHADING

CONTROLS

1. The following controls are not in Unit 3:

Number	Photo
ASN-HS-126	B07-B2-10
ASN-HS-127	B07-B2-10
ASN-HS-138	B07-B2-10

2. The following pushbuttons are silver in Unit 1 and red in Unit 3:

Number	Photo
CWN-HS-1B	B07-B1-01
CWN-HS-2B	B07-B1-01
CWN-HS-3B	B07-B1-01
CWN-HS-4B	B07-B1-01

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

DISPLAYS

LIGHTS

NONE

METERS

1. The following meters are not in Unit 3:

Number	Photo
ASN-FI-114C	B07-B1-10

2. The following meters have different ranges or divisions in Unit 1 and Unit 3:

Number	P/S	Range	Divisions (number/major/minor)	Photo
CWN-HS-8	1	0-100	20/4	B07-B1-01
	2	0-100	25/5	

ANNUNCIATORS

1. The following annunciators are in Unit 1 but not in Unit 3:

Box	Window	Photo
1	B6	A7-1-1
1	B9	A7-1-1
1	A14	A7-1-2
1	A16	A7-1-2

HARDWARE DIFFERENCES
UNIT 1 TO UNIT 3

BACKPANELS

PLANT PROTECTION

1. "EXCORE SAFTEY CHANNEL" labels are not on Unit 3.

   Photo: BACK-05, BACK-10, BACK-15

BOP ESFAS PANELS

NONE

FEEDWATER CONTROL PANELS 1 AND 2

NONE

ENVIRONMENTAL DIFFERENCES

The Simulator environment is compared to the control room environment in each of the Palo Verde Units. Differences are identified and presented in a matrix. Each difference is analyzed for its impact on the ability of the Simulator to meet the requirements of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for the Units.

ENVIRONMENTAL DIFFERENCES

Simulator	Unit 1	Unit 2	Unit 3
Blue carpet demarcation line	Blue carpet demarcation line	Brown carpet demarcation line	Blue carpet demarcation line

The only difference in the Simulator and Unit 2's carpet demarcation lines is the color of the line. This line serves to indicate the area of the Simulator and control room which may not be entered without the operating crew's permission. The line serves the same purpose and is plainly visible in both the Simulator and control room. This difference is not considered so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

Simulator	Unit 1	Unit 2	Unit 3
none	maintenance computer terminal	maintenance computer terminal	maintenance computer terminal

The difference between the Simulator and each control room is the same in this instance. The terminals located in the control rooms afford the operating crew access to Palo Verde's wide area network and corporate computer resources. The operating crews use these terminals to access information about the maintenance status of plant equipment. The same information can be obtained in the Simulator by a simulated call to a maintenance supervisor (i.e., the Simulator Instructor). This difference is not considered to be so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 1, 2, or 3.

Simulator	Unit 1	Unit 2	Unit 3
5 shelf bookcase	none	none	none

This bookcase is located in the Simulator in the place where a door to the Unit Shift Supervisor office is located in each of the Units. Since no unit operations are effected from the Shift Supervisors office, the absence of the office and door is considered irrelevant to the Simulator environment. The book shelf contains information which is also available to the operating crews in the Units. For these reasons, this difference is not considered to be so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 1, 2, or 3.

ENVIRONMENTAL DIFFERENCES

Simulator	Unit 1	Unit 2	Unit 3
4 drawer file cabinet	none	none	none

This file cabinet is located in the Simulator in the place where a door to the Unit Shift Supervisor office is located in each of the Units. Since no unit operations are effected from the Shift Supervisors office, the absence of the office and door is considered irrelevant to the Simulator environment. The file cabinet contains information which is also available to the operating crews in the Units. For these reasons, this difference is not considered to be so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 1, 2, or 3.

Simulator	Unit 1	Unit 2	Unit 3
Microphones located in center of each main board	none	none	none

The microphones mounted on the Simulator control panels have been placed there to facilitate recording of training sessions. No similar capability is required in the Units. The microphones are relatively small and do not constitute a hinderance to the Operators in using any of the controls or instrumentation located on the panels. Since the presence of the microphones does not affect the means, methods, or ability to operate the Simulator as the plants, this difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 1, 2, or 3.

Simulator	Unit 1	Unit 2	Unit 3
Cameras suspended from ceiling	none	none	none

The cameras in the Simulator have been placed there to facilitate recording of training sessions. No similar capability is required in the Units. The cameras are relatively small and do not constitute a hinderance to the Operators in using any of the controls or instrumentation located on the panels. Since the presence of the cameras does not affect the means, methods, or ability to operate the Simulator as the plants, this difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 1, 2, or 3.

ENVIRONMENTAL DIFFERENCES

Simulator	Unit 1	Unit 2	Unit 3
Halon nozzles protrude from ceiling	none	none	none

The Simulator is protected by a halon fire suppression system which is not operated from the Simulator control panels. The units are not halon protected and consequently, do not contain halon nozzles. The nozzles are relatively small and do not constitute a hinderance to the Operators in using any of the controls or instrumentation located on the panels. Since the presence of the nozzles does not affect the means, methods, or ability to operate the Simulator as the plants, this difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 1, 2, or 3.

Simulator	Unit 1	Unit 2	Unit 3
Thermostat	Ambient temperature controllers	Ambient temperature controllers	Ambient temperature controllers

The Simulator's ambient temperature is controlled by a thermostat located on the back wall of the Simulator. The thermostat is tied into the Administration building's ventilation system. The Units employ two temperature controller devices located on stanchions between boards one and two and six and seven. The temperature controllers are the only instruments located on these structures. The Simulators temperature is controlled automatically and is not subject to simulated failures. The Units temperatures are controlled automatically but are subject to failures. For most scenarios, this is not significant since a complete loss of control room temperature control would require a simultaneous loss of two safety trains. Additionally, the volume of air in the control room environment represents a large mass of thermal inertia. For a complete loss of cooling, the control room temperature would rise slowly over a period of time. For this reason, no consequential instrument failures are postulated or simulated as a result of elevated ambient temperatures. Thus, the difference in Simulator temperature control is only physical and not considered operationally significant. Since the difference is not considered operationally significant, the difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 1, 2, or 3.

ENVIRONMENTAL DIFFERENCES

Simulator	Unit 1	Unit 2	Unit 3
NRC Red Phone not functional	NRC Red Phone functional	NRC Red Phone functional	NRC Red Phone functional

The NRC Red Phone is the system used to facilitate communications between the NRC's Bethesda Operations Center and the Units. This phone does not function in the Simulator. The Simulator should possess the capability for the Operators to communicate with the Simulator Instructor using the appropriate communications system. Since the phone would be used after any reactor trip or more severe transient, this phone could be needed frequently. This difference is considered significant with respect to Section 3.2.3 of ANSI/ANS 3.5-1985 as qualified by NRC Reg Guide 1.149. This difference will be identified to the Simulator users and corrected in the second quarter of 1991.

Simulator	Unit 1	Unit 2	Unit 3
Backpanel locations	Backpanel locations	Backpanel locations	Backpanel locations

The location and arrangement of the Simulator backpanels are different from the Unit control rooms. The location differences result from limited backpanel area in the building housing the simulation facility. To the greatest extent possible, the Simulator backpanels have been arranged such that an Operator would have to use the same control area exit to access each panel as would be used in the units. The amount of time required for an Operator to reach a backpanel to affect an operation may be slightly different. With the exception of the remote shutdown panels, the backpanels are located in areas adjacent to the control area in each of the Units. Thus, the amount of time to reach a panel is not significantly different. The remote shutdown panels are installed for training purposes only and are considered outside the scope of Simulator Certification. These differences are not so significant that they have an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 1, 2, or 3.

DESIGN DIFFERENCES

This section presents the design differences between the Palo Verde Units and the Simulator.

The Palo Verde Units are considered virtually identical. All three Units were constructed "Post-TMI" and incorporate TMI back-fit items in the original design as described in the Plant FSAR.

The Simulator uses Palo Verde Unit 1 as the design Reference-Plant. Design differences between the Simulator and Unit 1 are presented in the section that discusses the Simulator Modeling Assumptions and Simplifications. Collectively, the assumptions and simplifications have been reviewed and evaluated for their impact on the ability to Certify the Simulator. No assumptions or simplifications were identified which would have an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Palo Verde Unit 1.

DESIGN DIFFERENCES

Design differences between Palo Verde Unit 1 and 2, and Unit 1 and 3 were researched to identify any differences which might impact the ability of the Simulator to be Certified.

The research was conducted by a drawing review of the site design electrical one-line, instrument schematic, and piping and instrumentation drawings. The site design drawings contain annotations indicating design differences between the three Units. The differences were characterized according to their significance to the operation of the Units.

Each difference was evaluated against the Certification requirements. None of the differences is considered to be so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units 2 and 3.

DESIGN DIFFERENCES

DESIGN IMPLEMENTATION.DIFFERENCES

Plant Modifications and Site Modifications at PVNGS are normally implemented in all three Units. There exists however,a difference in when the modification is implemented in each Unit. The Simulator is an accurate and up-to-date representation of Unit 1 as of the data freeze date of March 1, 1990 so there are no implementation differences between Unit 1 and the Simulator listed.

A listing of all Site Modifications (SM) and Plant Change Packages (PCP) which had ever been issued (up to the data freeze date) was evaluated for potential impact on Simulation. The closure date for the modifications which were determined to have impact were checked, and any SM or PCP which had been implemented in at least one Unit, but not all three Units is included on the following listing labeled "Design Implementation Differences".

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-CE-001	01-MAY-88		16-JUN-88
DESCRIPTION:	REPLACE GENERATOR TEMPERATURE MONITORING SYSTEM.		
1-SM-CH-009	02-DEC-88		21-NOV-89
DESCRIPTION:	CHANGE SETPOINTS SEAL INJECTION FILTERS AND REACTOR DRAIN TANK CONTROL VALVE.		
1-SM-ED-010	04-AUG-89		03-FEB-91
DESCRIPTION:	INSTALL MECHANICAL TRAVEL STOPS ON THE FOLLOWING CONTROL VALVES TO LIMIT VALVE TRAVEL/MASS FLOWRATE TO THE MAXIMUM OPERATIONAL VALVE PLUS A 10% MARGIN.		
1-SM-NA-001	01-SEP-90	17-APR-88	
DESCRIPTION:	REPLACE THE SYNCHRONIZING SWITCH OPERATORS WITH ONES THAT ARE KEYED DIFFERENTLY FROM THE MOTOR OPERATED VALVE SWITCHES AND ANNUNCIATOR RESET SWITCHES TO PREVENT MULTIPLE SYNCHRONIZATION.		
1-SM-NH-002	21-MAR-90	25-AUG-89	
DESCRIPTION:	ON MCC CUBICLE E-NHN-M3013 INSTALL CLOSE/TRIP PUSHBUTTON CAPABILITIES. 2) FROM OUTPUT LUGS OF CUBICLE RUN 1-3/C#4 CONDUCTOR TO LIGHTING "J" BOX LOCATED ON SOUTH END OF MCC ENCLOSURE.		

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-PN-001		28-MAY-88	28-MAY-88

DESCRIPTION: DISABLE THE AUTOMATIC FORWARD TRANSFER FEATURE OF THE STATIC BYPASS SWITCH WHEN A REVERSE TRANSFER OF THE SWITCH HAS OCCURRED BECAUSE OF AN INVERTER FAILURE. MANUAL TRANSFER.

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-QB-002		12-JUN-88	12-JUN-88

DESCRIPTION: CHANGE CIRCUIT FEED FROM NORMAL SOURCE DOSE-1 AND 3 TO ESSENTIAL SOURCE D74-04 AS INDICATED ON ATTACHED FCR'S. SUPERSEDES SITE MODS 1, 2, 3-SM-QB-001.

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-QF-003			16-DEC-87

DESCRIPTION: MOVE CABLE 3ECIOUNC3RD IN 3ENANQ01 FROM TB FM04, FM05, FM06 TO 3ENEQ01 TO FK04, FK05, FK06. MOVE CABLE 3ECI02NC3RH IN 3ENANQ01 FROM TBFM01, FM02, FM03 TO 3ENANQ01 TBFK01, FK02.

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-RC-001	25-APR-87	19-OCT-88	

DESCRIPTION: INSTALL FUSE BLOCKS, FUSES, AND REVISE WIRING IN SWITCHGEAR CUBICLES, E-NAN-S01L, -S01M, -S02L, AND -S02M.

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-RJ-013		28-JUN-88	28-JUN-88

DESCRIPTION: CHANGE THE PULSE CONVERSION CONSTANT FROM 1.000E-01 TO 2.000E-01 ON PULSE POINTS NAJ31, 32, 41 AND NAJ42 IN THE PMS DATABASE.

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-RJ-014	28-JUN-88		
DESCRIPTION:	CYCLIC POINTS NAJ72C, NAJ73C AND NAJ4C ARE BEING USED IN PLACE OTHER THAN METERING LOG NO. 1.		
1-SM-RJ-015	14-FEB-90	20-JUL-90	
DESCRIPTION:	CHANGE S/G LEVEL AND FLOW INPUTS TO SEPARATE BOARDS ON PMS.		
1-SM-RJ-018			08-FEB-89
DESCRIPTION;	DELETE UNIT 1 SPECIFIC COMPUTER PID QFYS1 FROM UNIT 2 DATABASE.		
1-SM-RJ-019			03-NOV-89
DESCRIPTION:	CCIP/TMIP UPGRADE "CYCLE 2 COLSS".		
1-SM-RK-004	08-JUL-88		24-OCT-88
DESCRIPTION:	DELETE ANNUNCIATOR POINT CI02 AND CI07, AND THEIR ASSOCIATED PMS ALARM POINTS CIYS1 AND CIYS4. CHANGE ANNUNCIATOR WINDOW 7C10B TO READ 'TURBINE BUILDING ACID STORAGE TANK TRBL'.		

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-RM-002		05-JUN-88	20-OCT-89

DESCRIPTION: MODIFY THE FOXBORO MODEL 226 AND 227 RECORDERS AND HOUSINGS PER THE ATTACHED SERVICE INSTRUCTIONS. BASICALLY, A SEISMIC RAMP IS ADDED TO THE RECORDER.

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-RM-004		01-JUN-90	20-JUN-88

DESCRIPTION: CHANGE CONTROL ROOM ELECTRICAL MIMIC BUS NAMEPLATES.

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-RM-015		07-NOV-89	05-JUL-89

DESCRIPTION: EED TO CHANGE SETPOINTS ON RECORDERS JRMNTJR-002, 003 AND JMTNTR-303. i&c SHOP TO OBTAIN 'PROGRAM' PRINTOUT FROM EACH AFFECTED RECORDER TO VERIFY CORRECT PROGRAMMING.

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-SB-010		31-MAY-90	

DESCRIPTION: IMPLEMENT REV. 04 SOFTWARE FOR CORE PROTECTION CALCULATOR SYSTEM IN UNIT 2.

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-SB-014	13-JAN-90	19-JAN-90	

DESCRIPTION: LOWER MINIMUM TRIP SETPOINT TO -0.075 VOLTS TO ACCOUNT FOR INSTRUMENT ERROR. MINIMUM TRIP SETPOINT HAS NO SAFETY-RELATED FUNCTION.

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
1-SM-SF-006	30-JAN-90		19-JAN-90
DESCRIPTION:	TO REVISE FWCS STEAM GENERATOR LOW LEVEL ALARM TO 10%.		
1-SM-SQ-025	23-JUL-88		23-JUL-88
DESCRIPTION:	SOFTWARE CHANGES FOR THE RMS MINI-COMPUTER.		
1-SM-SS-002	01-SEP-90	28-OCT-87	
DESCRIPTION:	INSTALL 3-30 MINUTE AGASTAT TIME DELAY TO PREVENT UNNECESSARY AUTO DILUTIONS. INSTALL PRESSURE RELIEFS TO ALLOW A SAMPLE FLOWPATH TO DEAR SYSTEM OF HIHI(02) SIGNAL.		
1-SM-ST-001		06-OCT-89	
DESCRIPTION:	DELETE ANNUNCIATORS POINTS ST02 AND ST03. DELETE PMS POINTS STLS41 AND STYS1. SPARE ANNUNCIATOR WINDOW 7C05 AND SPARE CABLE A-E-ST01NC1RB.		
84-01-CD-007		24-DEC-85	
DESCRIPTION:	REVISE SETPOINTS ON FLOW CONTROLLERS.		
84-01-PN-001		22-MAY-86	
DESCRIPTION:	ADD STATIC TRANSFER TO CLASS 1E INVERTERS.		

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
84-01-SS-004	07-MAY-86		30-APR-87
DESCRIPTION:	PROVIDE POWER AND CONTROL INDEPENDENT OF THE CONTROL ROOM FOR VALVES SSA-UV203, SSB-UV200, AND SSN-HV15.		
85-01-AF-001	07-APR-85		
DESCRIPTION:	REINFORCE PIPE SUPPORTS TO RELIEVE OVERSTRESSED STRUCTURAL STEEL.		
85-01-CD-008	22-MAY-86		
DESCRIPTION:	ADD LOCTITE AND REPLACE THE PLASTIC SECURING NUTS ON CONDENSATE PUMP.		
85-01-CD-017		08-JUN-88	
DESCRIPTION:	REPLACE SEAL WATER FLOW INDICATORS WITH NEW INDICATORS THAT HAVE APPROPRIATE SCALES AND NO ALARM OUTPUTS. DISCONNECT ALARM WIRING.		
85-01-CD-032	01-JAN-88	14-APR-86	
DESCRIPTION;	PROVIDE OVER-VOLTAGE PROTECTIVE RELAYS FOR SOLENOID VALVES.		
85-01-CP-005	11-AUG-88	28-SEP-87	
DESCRIPTION:	ADD A 10" VALVE (PV-43) DOWNSTREAM OF ISOLATION VALVE DER 85-026.		

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
85-01-FW-012		29-JAN-86	
DESCRIPTION:	REVISE LOW PRESSURE SETPOINT TO ELIMINATE NUISANCE ALARMS IN CONTROL ROOM.		
85-01-GR-006	23-AUG-90	10-JUN-86	
DESCRIPTION:	REMOVE PRESSURE SWITCHES FROM COMPRESSOR AND CAP LINES.		
85-01-GR-013	22-AUG-90	03-JUN-87	
DESCRIPTION:	REROUTE WATER AND OXYGEN ANALYZER TAPEOFF, REROUTE GRS SURGE TANK DRAIN LINE, AND LOW PT TO REMOVE WATER FROM GRS.		
85-01-GR-016		10-DEC-85	
DESCRIPTION:	ADD TIME DELAY RELAY TO OVERRIDE CIRCUIT TO ALLOW ACTUATION RELAY ENOUGH TIME FOR RESET.		
85-01-HD-004	16-APR-86		
DESCRIPTION:	SWAP WIRES FROM NC TO NO ON 41 RELAY AND SWAP WIRE FROM NO TO NC ON ALARM MOD AND RESET.		

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
85-01-RI-004	25-JUL-85	09-SEP-86	
DESCRIPTION:	REVISE MICDS AND PMS INTERFACE TO RESOLVE PROBLEMS DTS COVERED DURING TESTING.		
85-01-RK-012		07-OCT-86	
DESCRIPTION:	CHANGE SETPOINT FOR BOTH THE PDSL'S AND PUSH'S IN BATTERY ROOMS.		
85-01-SA-001	11-SEP-90	09-APR-88	
DESCRIPTION:	CHANGE ENGRAVING ON PUSHBUTTON TO CSAS/SIAS.		
85-01-SB-052	05-AUG-88	29-SEP-88	
DESCRIPTION:	REPLACE VARIABLE SETPOINT CARDS J642, J735, AND J638 WITH NEW ONES SUPPLIED BY CE.		
85-01-SB-054		02-AUG-90	
DESCRIPTION:	ADDITIONAL TRIP IS REQUIRED IN THE POWER SUPPLY FEED FROM CEDM M-G SETS TO EXISTING REACTOR TRIP BREAKERS.		
85-01-SQ-012	14-JAN-86		
DESCRIPTION:	SUPPLY ALTERNATE POWER SOURCE FOR THE RMS MINIM COMPUTER (RMS UPGRADES).		

DESIGN IMPLEMENTATION DIFFERENCES

DOCUMENT NUMBER	CLSD-U1	CLSD-U2	CLSD-U3
85-13-RJ-005	21-SEP-87		
DESCRIPTION:	PROGRAM ERRORS DISCOVERED IN THE PMS CECOR SNAPSHOT SOFTWARE.		
87-01-SD-017	26-JAN-90		
DESCRIPTION:	SWAP STEAM GENERATOR STEAM FLOW INPUT SIGNALS LOCATED ON ERFDADS CARDS AO-6 WITH OTHERS SO ALL FOUR STEAM FLOW SIGNALS WON'T BE ON SAME CARD.		

PROCEDURE DIFFERENCES

Controlled copies of Unit 1 Normal, Abnormal, Recovery and Emergency procedures are used for all examinations in the Simulator. No separate Simulator Operations procedures are used on the Palo Verde Simulator. Therefore, no differences between the Simulator's procedures and Unit 1 procedures exist. This analysis and summary of procedure differences was performed by comparing each Unit 1 procedure to the same Unit 2 and 3 procedure. Identified differences are evaluated relative to their impact on the ability of the Simulator to meet the guidance of ANSI/ANS-3.5-1985, as qualified by NRC Reg. Guide 1.149 for all Units.

The following nomenclature is used throughout the analysis and summary:

1-2: Difference between Unit 1 and Unit 2 procedure

1-3: Difference between Unit 1 and Unit 3 procedure

PROCEDURE DIFFERENCES

ABNORMAL OPERATIONS PROCEDURES

Emergency Boration

41AO-1ZZ01, Rev. 3, PCN 01
42AO-2ZZ01, Rev. 2, PCN 01
43AO-3ZZ01, Rev. 2, PCN 01

1:2 No Differences

1:3 No Differences

Load Rejection

41AO-1ZZ02, Rev. 6, PCN's 01-06
42AO-2ZZ02, Rev. 4, PCN's 01-05
43AO-3ZZ02, Rev. 4, PCN's 01-07

1:2 Paragraph 3.18

Unit 1 directs Operators to select 3 in/min chart speed. Unit 2 procedure directs the Operators to set the chart speed to slow speed.

Since this difference is editorial, it is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

1:3 No Difference

Loss of Turbine Cooling Water

41AO-1ZZ03, Rev. 3, PCN 02
42AO-2ZZ03, Rev. 2, PCN 01
43AO-3ZZ03, Rev. 1

1:2 No Differences

PROCEDURE DIFFERENCES

1:3 No Differences

Loss of Plant Cooling Water

41AO-1ZZ04, Rev. 2, PCN's 01-07
42AO-2ZZ04, Rev. 1, PCN's 01-07
43AO-3ZZ04, Rev. 0, PCN's 01-07

1:2 No Differences

1:3 Paragraph 4.4 & 4.5

Unit 1 procedure directs the Operators to stop the Service Air Compressor before the Instrument Air Compressors. Unit 3 procedure directs the Operators to stop all air compressors in a single step. The Unit 1 procedure does not contain a step to verify that priority valve IAN-PV-1 closes to isolate the Service Air Header. Unit 3 procedure contains a step to verify IAN-PV-1 closes at 90 psig. Unit 1 procedure contains two steps numbered 4.5, and another two steps numbered 4.5.1. Unit 3 does not contain any redundantly numbered steps.

Since the Simulator contains sufficient functionality to allow operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units. The additional differences are editorial and are not so significant that they have an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

Paragraph 6.1

Unit 1 procedure directs the Operators to consider performing a plant shutdown per 41OP-1ZZ10. Unit 3 procedure requires the Operators to perform a plant shutdown per 43OP-3ZZ10.

Since the Simulator contains sufficient functionality to allow operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

<u>Loss of Nuclear Cooling Water</u>

41AO-1ZZ05, Rev. 3, PCN 01
42AO-2ZZ05, Rev. 2, PCN 01
43AO-3ZZ05, Rev. 1, PCN 01

1:2 No Differences

1:3 No Differences

<u>Loss of Instrument Air</u>

41AO-1ZZ06, Rev. 3, PCN's 01-03
42AO-2ZZ06, Rev. 2, PCN's 01-03
43AO-3ZZ06, Rev. 2, PCN's 01-03

1:2 Appendix D, 1.4.3.3

Unit 1 provides guidance on the loss of instrument air to the Auxiliary Boiler. Unit 2 does not contain similar guidance.

Since the Simulator contains sufficient functionality to allow operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

1:3 Appendix D, 1.4.3.3

Unit 1 provides guidance on the loss of instrument air to the Auxiliary Boiler. Unit 3 does not contain similar guidance.

PROCEDURE DIFFERENCES

Since the Simulator contains sufficient functionality to allow operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

<u>Loss of Condenser Vacuum</u>

41AO-1ZZ07, Rev. 2, PCN 01
42AO-2ZZ07, Rev. 1, PCN 01
43AO-3ZZ07, Rev. 0, PCN 01

1:2 No Differences

1:3 No Differences

<u>Steam Generator Tube Leak</u>

41AO-1ZZ08, Rev. 3, PCN's 01-04
42AO-2ZZ08, Rev. 2, PCN's 01-04
43AO-3ZZ08, Rev. 2, PCN's 01-04

1:2 No Differences

1:3 No Differences

<u>Dropped or Slipped CEA</u>

41AO-1ZZ11, Rev. 7
42Ao-2ZZ11, Rev. 5, PCN's 01-03
43AO-3ZZ11, Rev. 5

1:2 No Differences

1:3 No Differences

PROCEDURE DIFFERENCES

Degraded Electrical Power

41AO-1ZZ12, Rev. 3, PCN's 01-24
42AO-2ZZ12, Rev. 1, PCN's 01-07
43AO-3ZZ12, Rev. 1, PCN's 01-16

1:2	Paragraph 4.1.5	Unit 1 procedure contains instructions on the effects of a loss of buses 1-E-NAN-S05 and S06, which causes a loss of power to WRF. Since 2-E-NAN-S05 and S06 do not affect WRF, Unit 2 procedure does not contain such guidance. Since the Simulator contains sufficient functionality to permit operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.
	Appendices	The Unit 1 procedure contains additional load lists which do not appear in the Unit 2 procedure. The lists address items specific to Unit 1, e.g., the switchyard and auxiliary boiler. The Simulator is modeled on Unit 1 and uses Unit 1 procedures for all operating exams, and since all Palo Verde Operators are multi-Unit licensed this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.
1:3	Paragraph 4.1.5	Unit 1 procedure contains instructions on the effects of a loss of buses 1-E-NAN-S05 and S06, which causes a loss of power to WRF. Since 3-E-NAN-S05 and S06 do not affect WRF, Unit 3 procedure does not contain such guidance. Since the Simulator contains sufficient functionality to permit operation in accordance with both Units procedures, this difference is not so significant that it has

an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

Appendices

The Unit 1 procedure contains additional load lists which do not appear in the Unit 3 procedure. The lists address items specific to Unit 1, e.g., the switchyard and auxiliary boiler.

The Simulator is modeled on Unit 1 and uses Unit 1 procedures for all operating exams, and since all Palo Verde Operators are multi-Unit licensed, this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

<u>Natural Circulation Cooldown</u>

41AO-1ZZ13, Rev. 2, PCN's 01-10
42AO-2ZZ13, Rev. 1, PCN's 01-09
43AO-3ZZ13, Rev. 0, PCN's 01-09

1:2 No Differences

1:3 No Differences

<u>Excessive RCS Leakrate</u>

41AO-1ZZ14, Rev. 2, PCN's 01-03
42AO-2ZZ14, Rev. 1, PCN's 01-03
43AO-3ZZ14, Rev. 1, PCN's 01-02

1:2 No Differences

1:3 No Differences

PROCEDURE DIFFERENCES

Loss of Class 1E Instrument AC Power

41AO-1ZZ15, Rev. 4, PCN's 01-02
42AO-2ZZ15, Rev. 3, PCN's 01-02
43AO-3ZZ15, Rev. 2, PCN's 01-02

1:2	Sections 2-5	The procedures contains different instructions for the restoration of the class 1E instrument power supplies. This difference arises from a difference in equipment installed in the two Units. All procedure differences are relative to local operations to restore the power supply and are transparent to the control room Operators. This difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.
1:3	Sections 2-5	The procedures contains different instructions for the restoration of the class 1E instrument power supplies. This difference arises from a difference in equipment installed in the two Units. All procedure differences are relative to local operations to restore the power supply and are transparent to the control room Operators. This difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

Loss of Non-Class 120 V AC 1E Instrument Power

41AO-1ZZ16, Rev. 1, PCN's 01-06
42AO-2ZZ16, Rev. 0, PCN's 01-07
43AO-3ZZ16, Rev. 0, PCN's 01-07

1:2 No Differences

1:3 No Differences

PROCEDURE DIFFERENCES

Loss of 125 V DC Class 1E Electrical Power

41AO-1ZZ17, Rev. 2, PCN's 01-03
42AO-2ZZ17, Rev. 1, PCN's 01-03
43AO-3ZZ17, Rev. 1, PCN's 01-03

1:2	Paragraph	2.1.4 3.1.4 6.1 7.1	The Unit 1 procedure directs the Operators to dispatch an Operator to manually transfer bus supply power from the inverter to the voltage regulator. The Unit 2 procedure does not contain similar guidance. Unit 1 does not have a Static Transfer Switch. Since the Simulator contains sufficient functionality to permit operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.
	Paragraph	2.4.3 3.4.2 6.3 7.3	The Unit 1 procedure directs the Operators to dispatch an Operator to manually transfer bus supply power from the voltage regulator to the inverter. The Unit 2 procedure does not contain similar guidance. Unit 1 does not have a Static Transfer Switch. Since the Simulator contains sufficient functionality to permit operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.
1:3	Paragraph	2.1.4 3.1.4 6.1 7.1	The Unit 1 procedure directs the Operators to dispatch an Operator to manually transfer bus supply power from the inverter to the voltage regulator. The Unit 3 procedure does not contain similar guidance. Unit 1 does not have a Static Transfer Switch. Since the Simulator contains sufficient functionality to permit operation in accordance with both Units procedures, this difference is not so significant that it has

an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

Paragraph	2.4.3 3.4.2	The Unit 1 procedure directs the Operators to dispatch an Operator to manually transfer bus supply power from the voltage regulator to the inverter. The Unit 3 procedure does not contain similar guidance. Unit 1 does not have a Static Transfer Switch. Since the Simulator contains sufficient functionality to permit operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

<u>Loss of 125 V DC Non-Class 1E Electrical Power</u>

41AO-1ZZ18, Rev. 3, PCN 01
42AO-2ZZ18, Rev. 2, PCN 01
43AO-3ZZ18, Rev. 1, PCN 01

1:2 No Differences

1:3 No Differences

<u>Plant Shutdown From Main Control Room Only</u>

41AO-1ZZ20, Rev. 1, PCN's 01-10
42AO-2ZZ20, Rev. 1, PCN's 01-10
43AO-3ZZ20, Rev. 0, PCN's 01-11

1:2 No Differences

1:3 No Differences

PROCEDURE DIFFERENCES

Loss of Shutdown Cooling

41AO-1ZZ22, Rev. 6, PCN's 01-04
42AO-2ZZ22, Rev. 2, PCN's 01-03
43AO-3ZZ22, Rev. 3, PCN's 01-02

1:2 No Differences

1:3 No Differences

NI System Malfunction

41AO-1ZZ24, Rev. 3, PCN 01
42AO-2ZZ24, Rev. 2, PCN 01
43AO-3ZZ24, Rev. 2, PCN 01

1:2 No Differences

1:3 No Differences

Irradiated Fuel Damage

41AO-1ZZ26, Rev. 2, PCN 01
42AO-2ZZ26, Rev. 1, PCN 01
43AO-3ZZ26, Rev. 1, PCN 01

1:2 No Differences

1:3 No Differences

Shutdown Outside Control Room

41AO-1ZZ27, Rev. 2, PCN's 01-11
42AO-2ZZ27, Rev. 1, PCN's 01-11
43AO-3ZZ27, Rev. 0, PCN's 01-11

1:2 No Differences

PROCEDURE DIFFERENCES

1:3 No Differences

Inadvertent SIAS and/or CIAS

41AO-1ZZ28, Rev. 4, No PCN's
42AO-2ZZ28, Rev. 3, No PCN's
43AO-3ZZ28, Rev. 3, No PCN's

1:2 No Differences

1:3 No Differences

Reactor Coolant Pump and Motor Emergency

41AO-1ZZ29, Rev. 3, PCN's 01-03
42AO-2ZZ29, Rev. 2, PCN's 01-04
43AO-3ZZ29, Rev. 2, PCN's 01-03

1:2 No Differences

1:3 No Differences

Inadvertent CSAS

41AO-1ZZ30, Rev. 2, PCN's 01-03
42AO-2ZZ30, Rev. 1, PCN's 01-03
43AO-3ZZ30, Rev. 1, PCN's 01-03

1:2 No Differences

1:3 No Differences

PROCEDURE DIFFERENCES

Inadvertent MSIS

41AO-1ZZ31, Rev. 1, PCN's 01-03
42AO-2ZZ31, Rev. 0, PCN's 01-04
43AO-3ZZ31, Rev. 0, PCN's 01-03

1:2 No Differences

1:3 No Differences

Inadvertent AFAS

41AO-1ZZ32, Rev. 3, PCN 01
42AO-2ZZ32, Rev. 2, PCN 01
43AO-3ZZ32, Rev. 1, PCN 01

1:2 No Differences

1:3 No Differences

RRS Malfunction

41AO-1ZZ34, Rev. 2, PCN 01
42AO-2ZZ34, Rev. 1, PCN 01
43AO-3ZZ34, Rev. 1, PCN 01

1:2 No Differences

1:3 No Differences

Continuous CEA Withdrawal

41AO-1ZZ35, Rev. 2, No PCN's
42AO-2ZZ35, Rev. 1, No PCN's
43AO-3ZZ35, Rev. 1, No PCN's

1:2 No Differences

PROCEDURE DIFFERENCES

1:3 No Differences

Continuous CEA Insertion

41AO-1ZZ36, Rev. 2, PCN 01
42AO-2ZZ36, Rev. 1, PCN's 01-02
43AO-3ZZ36, Rev. 1, PCN 01

1:2 No Differences

1:3 No Differences

Loss of Letdown Flow

41AO-1ZZ37, Rev. 3, No PCN's
42AO-2ZZ37, Rev. 2, No PCN's
43AO-3ZZ37, Rev. 2, No PCN's

1:2 No Differences

1:3 No Differences

Loss of Heating Ventilation and Air Conditioning

41AO-1ZZ42, Rev. 2, No PCN's
42AO-2ZZ42, Rev. 1, No PCN's
43AO-3ZZ42, Rev. 1, No PCN's

1:2 No Differences

1:3 No Differences

PROCEDURE DIFFERENCES

Rx Power Cutback (Loss of Feedpump)

41AO-1ZZ43, Rev. 2, PCN's 01-03
42AO-2ZZ43, Rev. 1, PCN's 01-04
43AO-3ZZ43, Rev. 0, PCN's 01-04

1:2 No Differences

1:3 No Differences

Shutdown Outside the Control Room Due to Smoke or Fire

41AO-1ZZ44, Rev. 2, PCN's 01-16
42AO-2ZZ44, Rev. 1, PCN's 01-16
43AO-3ZZ44, Rev. 0, PCN's 01-16

1:2 No Differences

1:3 No Differences

Condenser Tube Rupture

41AO-1ZZ49, Rev. 3, PCN's 01-03
42AO-2ZZ49, Rev. 3, PCN's 01-03
43AO-3ZZ49, Rev. 1, PCN's 01-03

1:2 No Differences

1:3 No Differences

Venting the Charging Pumps

41AO-1ZZ50, Rev. 3, PCN 01
42AO-2ZZ50, Rev. 3, PCN 01
43AO-3ZZ50, Rev. 1, PCN 01

1:2 No Differences

PROCEDURE DIFFERENCES

1:3 No Differences

Diesel Generator Operations after ESFAS Actuation

41AO-1ZZ52, Rev. 2, No PCN's
42AO-2ZZ52, Rev. 2, No PCN's
43AO-3ZZ52, Rev. 2, No PCN's

1:2 No Differences

1:3 No Differences

Loss of Refueling Pool and/or Spent Fuel Pool Level

41AO-1ZZ53, Rev. 2, PCN's 01-02
42AO-2ZZ53, Rev. 1, PCN's 01-03
43AO-3ZZ53, Rev. 1, PCN's 01-02

1:2 No Differences

1:3 No Differences

Monitoring Reactor Vessel Inventory With RVLMS Inoperable

41AO-1ZZ54, Rev. 1, PCN 01
42AO-2ZZ54, Rev. 1, PCN 01
43AO-3ZZ54, Rev. 1, PCN 01

1:2 No Differences

1:3 No Differences

PROCEDURE DIFFERENCES

RECOVERY OPERATIONS PROCEDURES

Reactor Trip

41RO-1ZZ01, Rev. 2, PCN's 01-07
42RO-2ZZ01, Rev. 1, PCN's 01-06
43RO-3ZZ01, Rev. 0, PCN's 01-06

1:2 No Differences

1:3 No Differences

Excessive Steam Demand

41RO-1ZZ02, Rev. 2, PCN's 01-04
42RO-2ZZ02, Rev. 1, PCN's 01-04
43RO-3ZZ02, Rev. 0, PCN's 01-04

1:2 No Differences

1:3 No Differences

Loss of Secondary Coolant

41RO-1ZZ03, Rev. 2, PCN's 01-05
42RO-2ZZ03, Rev. 1, PCN's 01-05
43RO-3ZZ03, Rev. 0, PCN's 01-05

1:2 No Differences

1:3 No Differences

PROCEDURE DIFFERENCES

Loss of Forced Circulation

41RO-1ZZ04, Rev. 2, PCN's 01-05
42RO-2ZZ04, Rev. 1, PCN's 01-05
42RO-3ZZ04, Rev. 0, PCN's 01-04

1:2 No Differences

1:3 No Differences

Loss of Feedwater

41RO-1ZZ05, Rev. 2, PCN's 01-06
42RO-2ZZ05, Rev. 1, PCN's 01-04
43RO-3ZZ05, Rev. 0, PCN's 01-04

1:2 No Differences

1:3 No Differences

Steam Generator Tube Rupture

41RO-1ZZ06, Rev. 2, PCN's 01-07
42RO-2ZZ06, Rev. 1, PCN's 01-06
43RO-3ZZ06, Rev. 0, PCN's 01-05

1:2 No Differences

1:3 No Differences

Loss of Coolant Accident

41RO-1ZZ07, Rev. 2, PCN's 01-09
42RO-2ZZ07, Rev. 1, PCN's 01-10
43RO-3ZZ07, Rev. 0, PCN's 01-08

1:2 No Differences

PROCEDURE DIFFERENCES

1:3 No Differences

Small Loss of Coolant Accident

41RO-1ZZ08, Rev. 2, PCN's 01-13
42RO-2ZZ08, Rev. 1, PCN's 01-12
43RO-3ZZ08, Rev. 0, PCN's 01-11

1:2 No Differences

1:3 No Differences

Blackout

41RO-1ZZ09, Rev. 2, PCN's 01-05
42RO-2ZZ09, Rev. 1, PCN's 01-04
43RO-3ZZ09, Rev. 0, PCN's 01-04

1:2	Paragraph 15.4	The Unit 1 procedure instructs the Operators to shutdown the engine driven fire pumps. The Unit 2 procedure does not contain similar instructions. Unit 2 has no controls for the engine driven fire pump. Since the Simulator contains sufficient functionality to permit operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.
1:3	Paragraph 15.4	The Unit 1 procedure instructs the Operators to shutdown the engine driven fire pumps. The Unit 3 procedure does not contain similar instructions. Unit 3 has no controls for the engine driven fire pump. Since the Simulator contains sufficient functionality to permit operation in accordance with both Units procedures, this difference is not so significant that it has an impact on the Simulator to meet the guidance of

ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

Functional Recovery Procedure

41RO-1ZZ10, Rev. 2, PCN's 01-12
42RO-2ZZ10, Rev. 1, PCN's 01-12
43RO-3ZZ10, Rev. 0, PCN's 01-11

1:2 App. L

This section instructs the Operators how to line up an alternate units condensate cross tie header. Since each Unit considers the other two to be alternates the instructions in this section are necessarily different.

The Simulator is modeled on Unit 1 and Unit 1 procedures are used in the Simulator for all examinations. Thus, this difference is not so significant that it has an impact on the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

App. S

This section instructs the Operators how to refill the CST from and alternate Units CST. Since each Unit considers the other two to be alternates, the instructions in this section are necessarily different.

The Simulator is modeled on Unit 1 and Unit 1 procedures are used in the Simulator for all examinations. Thus, this difference is not so significant that it has an impact on the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

1:3 App. L

This section instructs the Operators how to line up an alternate units condensate cross tie header. Since each Unit considers the other two to be alternates the instructions in this section are necessarily different.

The Simulator is modeled on Unit 1 and Unit 1 procedures are used in the Simulator for all

examinations. Thus, this difference is not so significant that it has an impact on the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

App. S

This section instructs the Operators how to refill the CST from and alternate Units CST. Since each Unit considers the other two to be alternates the instructions in this section are necessarily different.

The Simulator is modeled on Unit 1 and Unit 1 procedures are used in the Simulator for all examinations. Thus, this difference is not so significant that it has an impact on the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

EMERGENCY OPERATIONS PROCEDURE

Emergency Operations

41EP-1ZZ01, Rev. 3, PCN's 01-18
42EP-2ZZ01, Rev. 1, PCN's 01-17
43EP-3ZZ01, Rev. 0, PCN's 01-12

1:2 Appendix X

The Unit 1 procedure provides the Operators with guidance in isolating the Unit 1 condensate system from the other Units. The Unit 2 procedure is necessarily different because it requires the operation of different valves to accomplish the same objective for the Unit 2 condensate system.

The Simulator is modeled on Unit 1 and uses Unit 1 procedures for all operating exams, and since all Palo Verde Operators are multi-Unit licensed this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

PROCEDURE DIFFERENCES

Appendix DD — This appendix provides the Operators with guidance in the use of an alternate Units diesel generator. Since each Unit considers the others as alternates, the instructions in this Appendix are different for each Unit.

The Simulator is modeled on Unit 1 and uses Unit 1 procedures for all operating exams, and since all Palo Verde Operators are multi-Unit licensed this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

Appendix EE — This appendix provides the Operators with guidance in the cross connection of an alternate Units CST. Since each Unit considers the others as alternates, the instructions in this Appendix are different for each Unit.

The Simulator is modeled on Unit 1 and uses Unit 1 procedures for all operating exams, and since all Palo Verde Operators are multi-Unit licensed this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

1:3 Appendix X — The Unit 1 procedure provides the Operators with guidance in isolating the Unit 1 condensate system from the other Units. The Unit 3 procedure is necessarily different because it requires the operation of different valves to accomplish the same objective for the Unit 3 condensate system.

The Simulator is modeled on Unit 1 and uses Unit 1 procedures for all operating exams, and since all Palo Verde Operators are multi-Unit licensed this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

PROCEDURE DIFFERENCES

Appendix DD	This appendix provides the Operators with guidance in the use of an alternate Units Diesel Generator. Since each Unit considers the others as alternates the instructions in this Appendix are different for each Unit. The Simulator is modeled on Unit 1 and uses Unit 1 procedures for all operating exams, and since all Palo Verde Operators are multi-Unit licensed this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.
Appendix EE	This appendix provides the Operators with guidance in the cross connection of an alternate Units CST. Since each Unit considers the others as alternates the instructions in this Appendix are different for each Unit. The Simulator is modeled on Unit 1 and uses Unit 1 procedures for all operating exams, and since all Palo Verde Operators are multi-Unit licensed this difference is not so significant that it has an impact on the ability of the Simulator to meet the guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for both Units.

TECHNICAL SPECIFICATION DIFFERENCES

Controlled copies of Unit 1 Technical Specifications are used for all examinations in the Simulator. No separate Simulator Technical Specifications are used on the Palo Verde Simulator. Therefore, no differences between the Simulator's Technical Specifications and Unit 1 Technical Specifications exist. This analysis and summary of Technical Specification differences was performed by comparing Unit 1 Technical Specifications to Unit 2 and 3 Technical Specifications. Differences are identified and evaluated relative to their impact on the ability of the Simulator to meet the guidance of ANSI/ANS-3.5-1985, as qualified by NRC Reg. Guide 1.149 for all Units.

The following nomenclature is used throughout the analysis and summary:

TS:	Technical Specification
1-2:	Difference between Unit 1 and Unit 2 Technical Specification
1-3:	Difference between Unit 1 and Unit 3 Technical Specification

TECHNICAL SPECIFICATION DIFFERENCES

TS 2.1.1.1

1-2: None

1-3: Unit 1 TS references the requirements of Section 6.7.1. Unit 3 TS references the requirements of Section 6.7. The difference between these specifications is editorial. The requirements of Section 6.7.1 in Unit 1 TS are the same as the requirements of Section 6.7 in Unit 3 TS. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 2.1.1.2

1-2: None

1-3: Unit 1 TS references the requirements of Section 6.7.1. Unit 3 TS references the requirements of Section 6.7. The difference between these specifications is editorial. The requirements of Section 6.7.1 in Unit 1 TS are the same as the requirements of Section 6.7 in Unit 3 TS. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 2.1.2

1-2: None

1-3: Unit 1 TS references the requirements of Section 6.7.1. Unit 3 TS references the requirements of Section 6.7. The difference between these specifications is editorial. The requirements of Section 6.7.1 in Unit 1 TS are the same as the requirements of Section 6.7 in Unit 3 TS. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 3.1.3.1

1-2: Unit 1 TS references Figure 3.1-2A in paragraph 3.1.3.1.c.2.a). Unit 2 TS makes no reference to Figure 3.1-2A in the same paragraph. The paragraph in question directs the Operators to maintain the allowable CEA sequence and insertion limits shown on Figures 3.1-2A, 3.1-3 and 3.1-4. Figure 3.1-2A, however, does not provide CEA

sequence and insertion limits. It is believed that this reference in the Unit 1 TS is in error. The difference described here is editorial since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: Unit 1 TS references Figure 3.1-2A in paragraph 3.1.3.1.c.2.a). Unit 3 TS makes no reference to Figure 3.1-2A in the same paragraph. The paragraph in question directs the Operators to maintain the allowable CEA sequence and insertion limits shown on Figures 3.1-2A, 3.1-3 and 3.1-4. Figure 3.1-2A, however, does not provide CEA sequence and insertion limits. It is believed that this reference in the Unit 1 TS is in error. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 3.1.3.2

1-2: None

1-3: The Unit 3 TS action statement 3.1.3.2.c stipulates that the requirements of TS 3.1.3.5 must also be met. Unit 1's TS does not make a similar requirement. For losses of position indicating channels the requirements of TS 3.1.3.5 can be complied with on the Simulator. Since the TS can be complied with in both cases this difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 3.1.3.6

1-2: Figure 3.1-3 provides the CEA insertion limits with COLSS in service. The limits prescribed by the Unit 1 TS are more restrictive than those provided by the Unit 2 TS. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: Figure 3.1-3 provides the CEA insertion limits with COLSS in service. The limits prescribed by the Unit 1 TS are more restrictive than those provided by the Unit 3 TS. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 3.1.3.7

1-2: None

1-3: The Unit 1 TS does not specify different actions for continued operation with one or two CEAC's out of service. The Unit 3 TS requires the same action as the Unit 1 TS for one CEAC out of service and requires the plant to be placed in Hot Standby in 6 hours if two CEAC's are inoperable. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS Fig. 3.2-2

1-2: The CPC calculated minimum DNBR for one CEAC inoperable is more restrictive for Unit 1 than for Unit 2. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: The CPC calculated minimum DNBR for one CEAC inoperable is more restrictive for Unit 1 than for Unit 3. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TECHNICAL SPECIFICATION DIFFERENCES

TS Fig. 3.2-2A

1-2: The CPC calculated minimum DNBR for all CEAC's inoperable is more restrictive for Unit 1 than for Unit 2. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: The CPC calculated minimum DNBR for all CEAC's inoperable is more restrictive for Unit 1 than for Unit 3. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 3.4.1.2

1-2: The applicability of the Unit 1 TS is affected by Special Test Exception 3.10.9. The Unit 2 TS makes no allowance for Special Test Exceptions. Since the Special Test Exception affects the applicability of the TS not the actions required, the difference is inconsequential to the means, methods and ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: The applicability of the Unit 1 TS is affected by Special Test Exception 3.10.9. The Unit 3 TS makes no allowance for Special Test Exceptions. Since the Special Test Exception affects the applicability of the TS not the actions required, the difference is inconsequential to the means, methods and ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TECHNICAL SPECIFICATION DIFFERENCES

TS 3.4.1.3

1-2: The applicability of the Unit 1 TS is affected by Special Test Exception 3.10.9. The Unit 2 TS makes no allowance for Special Test Exceptions. Since the Special Test Exception affects the applicability of the TS not the actions required, the difference is inconsequential to the means, methods and ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: The applicability of the Unit 1 TS is affected by Special Test Exception 3.10.9. The Unit 3 TS makes no allowance for Special Test Exceptions. Since the Special Test Exception affects the applicability of the TS not the actions required, the difference is inconsequential to the means, methods and ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 3.4.5.2

1-2: Unit 1 TS allows a one time only extension to the time required to be in Cold Shutdown. This extension is applicable only to the power ascension program. Unit 2 TS contains no such provision. Since the extension is no longer applicable to the operation of the Unit the difference is editorial only. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: Unit 1 TS allows a one time only extension to the time required to be in Cold Shutdown. This extension is applicable only to the power ascension program. Unit 3 TS contains no such provision. Since the extension is no longer applicable to the operation of the Unit the difference is editorial only. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TECHNICAL SPECIFICATION DIFFERENCES

TS Table 4.4-5

1-2: The reactor vessel material surveillance capsule withdrawal schedule specifies different withdrawal times for capsules 1, 2 and 3. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: The reactor vessel material surveillance capsule withdrawal schedule specifies different withdrawal times for capsules 1, 2 and 3. The difference described here is inconsequential since the means, methods and ability to operate the Simulator are unaffected by the difference. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 3.7.1.6

1-2: The applicability of the Unit 1 TS is affected by Special Test Exception 3.10.9. The Unit 2 TS makes no allowance for Special Test Exceptions. Since the Special Test Exception affects the applicability of the TS not the actions required, the difference is inconsequential to the means, methods and ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: The applicability of the Unit 1 TS is affected by Special Test Exception 3.10.9. The Unit 3 TS makes no allowance for Special Test Exceptions. Since the Special Test Exception affects the applicability of the TS not the actions required, the difference is inconsequential to the means, methods and ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TECHNICAL SPECIFICATION DIFFERENCES

TS 3.10.10

1-2: Unit 2 does not have a TS 3.10.10. This TS is a Special Test Exception which affects the applicability of TS 3.4.1.2, 3.4.1.3 and 3.7.1.6 and is used only during the Startup Natural Circulation Cooldown Test at 80% power. Since the specification affects only the applicability of the other specifications, it does not affect the means, methods or ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: Unit 3 does not have a TS 3.10.10. This TS is a Special Test Exception which affects the applicability of TS 3.4.1.2, 3.4.1.3 and 3.7.1.6 and is used only during the Startup Natural Circulation Cooldown Test at 80% power. Since the specification affects only the applicability of the other specifications it does not affect the means, methods or ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

TS 3.11.1

1-2: The Unit 1 TS contains a special one time only provision for concentrations of radioactive effluent to the onsite evaporation ponds. The provision has expired and is no longer applicable to Unit 1. Unit 2 TS does not contain a similar provision. Since the provision is no longer effective, the difference in the TS is editorial only and does not affect the means, methods and ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 2.

1-3: The Unit 1 TS contains a special one time only provision for concentrations of radioactive effluent to the onsite evaporation ponds. The provision has expired and is no longer applicable to Unit 1. Unit 3 TS does not contain a similar provision. Since the provision is no longer effective, the difference in the TS is editorial only and does not affect the means, methods and ability to operate the Simulator. This difference is not so significant that it has an impact on the ability of the Simulator to meet the requirements and guidance of ANSI/ANS 3.5-1985 as qualified by NRC Reg. Guide 1.149 for Unit 3.

OPERATIONAL CHARACTERISTIC DIFFERENCES

The operational records of the Palo Verde Units were researched to identify differences in the operational characteristics of the Units. The Palo Verde Units are considered virtually identical. All three Units were constructed "Post-TMI", and incorporate TMI back-fit items in the original design as described in the Plant's FSAR. The Simulator uses Palo Verde Unit 1 as the design Reference-Plant. Except as noted in the Test Abstracts, the Simulator possesses the same operational characteristics as Unit 1.

Operational Characteristic differences between Palo Verde Unit 1 and 2 and Unit 1 and 3 were researched to identify any differences which might impact the ability of the Simulator to be Certified. The research was conducted by reviewing all available records of each Unit's transients.

No differences in the operational characteristics of the Palo Verde Units were noted.