H. B. ROBINSON STEAM ELECTRIC PLANT
SIMULATOR CERTIFICATION PACKAGE

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NRC FORM 474
(1-90)
10 CFR 55.45(b),
55.4 and 55.5

U.S. NUCLEAR REGULATORY COMMISSION

SIMULATION FACILITY CERTIFICATION

APPROVED BY OMB: NO. 3150-0138
EXPIRES: 9-30-92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 120 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0138), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

INSTRUCTIONS. This form is to be filed for initial certification, recertification (if required), and for any change to a simulation facility performance testing plan made after initial submittal of such a plan. Provide the following information, and check the appropriate box to indicate reason for submittal.

FACILITY
H.B. Robinson Steam Electric Plant Unit 2

DOCKET NUMBER
50- 261

LICENSEE
Carolina Power and Light Company

DATE
02/20/91

This is to certify that:
1. The above named facility licensee is using a simulation facility consisting solely of a plant-referenced simulator that meets the requirements of 10 CFR 55.45.
2. Documentation is available for NRC review in accordance with 10 CFR 55.45(b).
3. This simulation facility meets the guidance contained in ANSI/ANS 3.5, 1985, as endorsed by NRC Regulatory Guide 1.149.
   If there are any exceptions to the certification of this item, check here [xx] and describe fully on additional pages as necessary.

NAME *(or other identification)* AND LOCATION OF SIMULATION FACILITY
Robinson Simulator - H.B. Robinson SEP Training Building
Box 790, South Carolina Highway 151 & 23
Hartsville, South Carolina 29550

[X] SIMULATION FACILITY PERFORMANCE TEST ABSTRACTS ATTACHED. *(For performance tests conducted in the period ending with the date of this certification)*

DESCRIPTION OF PERFORMANCE TESTING COMPLETED *(Attach additional page(s) as necessary, and identify the item description being continued)*

See Section 4.0, "Certification Tests," and Appendix N, "Simulator Performance Test Abstracts."

[X] SIMULATION FACILITY PERFORMANCE TESTING SCHEDULE ATTACHED. *(For the conduct of approximately 25% of performance tests per year for the four year period commencing with the date of this certification.)*

DESCRIPTION OF PERFORMANCE TESTING TO BE CONDUCTED. *(Attach additional page(s) as necessary, and identify the item description being continued)*

See Section 4.0, "Certification Tests;" Appendix L, "Annual Test Listing;" and Appendix M, "25% Malfunction Test Listing (1991 - 1994)."

[ ] PERFORMANCE TESTING PLAN CHANGE. *(For any modification to a performance testing plan submitted on a previous certification)*

DESCRIPTION OF PERFORMANCE TESTING PLAN CHANGE *(Attach additional page(s) as necessary, and identify the item description being continued)*

NOT APPLICABLE - INITIAL CERTIFICATION

[ ] RECERTIFICATION *(Describe corrective actions taken, attach results of completed performance testing in accordance with 10 CFR § 55.45(b)(5)(iv). Attach additional page(s) as necessary, and identify the item description being continued.)*

NOT APPLICABLE - INITIAL CERTIFICATION

Any false statement or omission in this document, including attachments, may be subject to civil and criminal sanctions. I certify under penalty of perjury that the information in this document and attachments is true and correct.

SIGNATURE – AUTHORIZED REPRESENTATIVE

TITLE
Vice President,
Nuclear Services Department

DATE
3-21-91

In accordance with 10 CFR § 55.5, Communications, this form shall be submitted to the NRC as follows:

BY MAIL ADDRESSED TO: **Director, Office of Nuclear Reactor Regulation**
U.S. Nuclear Regulatory Commission
Washington, DC 20555

BY DELIVERY IN PERSON TO THE NRC OFFICE AT: **One White Flint North**
11555 Rockville Pike
Rockville, MD

INTRODUCTION

General Information

The H. B. Robinson Nuclear Power Plant Simulator Certification Package is provided to demonstrate compliance with the requirements of 10CFR55.45(b) including compliance with ANSI/ANS-3.5-1985 as implemented by NRC Regulatory Guide 1.149-1987. The subject simulator facility consists solely of a plant referenced full scope simulator, which is the primary vehicle for providing positive, practical license training and operational testing capability. The documentation provided herein is intended to constitute sufficient basis for the certification of the H. B. Robinson Simulator.

Simulator Configuration Control Board

The primary means of evaluation and review of the simulator operations is the Simulator Configuration Control Board (SCCB). This group is made up of Plant Operations, Operations Training, and Simulator Support Personnel. The SCCB will include at least one degreed engineer, one currently licensed Robinson Plant Operator, and one SRO licensed or certified simulator instructor. The group reviews all proposed changes to the simulator, such as changes to the scope of simulation, deficiencies, or any desired changes in simulator capability. These evaluations will be documented as training value assessments. The SCCB reviews outstanding simulator discrepancies for their impact on training so that high priority items can be identified. The SCCB reviews differences between the simulator and the plant to ensure they do not detract from training. Minutes of SCCB meetings are maintained to serve as a record of SCCB decisions. The qualifications of current SCCB members are included as Appendix A, Simulator Configuration Control Board Personnel Qualifications.

EXCEPTIONS TO ANSI/ANS-3.5

The exceptions identified during certification testing or the review/analysis of ANSI/ANS-3.5 are contained in Appendix B, Summary of Exceptions and Justifications. The exceptions are listed by ANSI-3.5 reference and subject. Each specific exception taken and its associated justification is addressed on an item by item basis and was reviewed and approved by the Simulator Configuration Control Board to ensure the exceptions do not detrimentally impact the license operator training program.

1.0 SIMULATOR INFORMATION

1.1 Simulator General

1.1.1 Owner: Carolina Power and Light Company

1.1.2 Reference Plant/Unit: H. B. Robinson Nuclear Power Plant, Unit #2, Westinghouse 3-Loop PWR

1.1.3 Simulator Supplier: Westinghouse Electric Corporation

1.1.4 Ready-for-Training Date: June 26, 1987

1.1.5 Type of Report: Initial Certification

1.2 Simulator Control Room

The Simulator Control Room was compared to the Reference Plant's Control Room in Certification Test 6.7, Physical Fidelity Comparison. The methodology and results of this certification test are included in the following:

- Performance Test Abstract 6.7, Physical Fidelity Comparison
- Appendix C, Summary of Deficiencies and Training Impact Analysis

1.2.1 Physical Arrangement:

The simulator control room arrangement is virtually the same as the reference plant control room. The specific differences are included in the following:

- Performance Test Abstract 6.7, Physical Fidelity Comparison
- Appendix C, Summary of Deficiencies and Training Impact Analysis

1.2.2 Panels and Equipment:

The simulator panels and equipment are virtually the same as the reference plant's. The specific differences are included in the following:

- Performance Test Abstract 6.7, Physical Fidelity Comparison

- Appendix C, Summary of Deficiencies and Training Impact Analysis

1.2.3 Systems:

All systems accessable from the reference plant control room are simulated. This includes all communication systems that a control room operator would use to communicate with an auxiliary operator or other support activities to the extent that the simulator instructor, when performing these remote activities, is able to communicate over the appropriate communication system.

1.2.4 Environment:

Some differences exist in the ceiling, lighting, and sound environment between the simulator and reference plant control rooms as a result of a recently completed plant modification. These differences are scheduled for resolution in 1992. None of the differences have significant training impact.

1.3 Simulator Instructor Interface

1.3.1 General Instructor System:

The H. B. Robinson Simulator has an instructors booth that is separated from the simulator control room and visually out of sight (one way mirrored glass) from the operators view. The instructor is able to observe the actions of the operator in the simulator control room from the booth.

The instructor controls all the functions of the simulator from the control booth. This is accomplished by using a control board and three control and monitoring CRTs. Using the control boards and CRTs, the instructor establishes simulator initial conditions, inputs operating malfunctions, simulates local operator actions, and is also able to interact with students using other special features of the simulator to be discussed later. The instructor is also able to monitor most plant parameters from the booth.

The instructor has the capability of operating the simulator from the instructors booth or from the simulator control room using a hand held remote operating device.

1.3.2 Simulator Initial Conditions:

After the simulator is started up by the instructor, there is the possibility of starting the simulator from 86 Initial Conditions (ICs). Conditions in individual ICs vary with respect to time in core life, power level, fission product concentration and equipment status. The description of the 86 ICs are as follows:

IC NUMBERS	ASSIGNMENT
1 through 35*	Prestored Initial Conditions*
36 through 39	For use by Simulator Support
40 through 48	For use as development or any other training requirement
49 through 84	For use by Training for Static Exams
85	Is a Default Snapshot IC
86	Is a Default IC to allow the instructor to return to the IC if it has been interrupted.

* CHANGE OF PRESTORED INITIAL CONDITIONS REQUIRES APPROVAL IN ACCORDANCE WITH PROCEDURE.

After selecting an IC, the Simulator is placed in run to commence operation at real time from that point.

1.3.3 Simulator Malfunction Selection:

Stored within the simulator is a wide array of simulated plant malfunctions ranging from major casualties to more isolated equipment failures. To select a particular malfunction, the instructor can input the malfunction number directly, if known, or select from a menu driven malfunction list for selected systems.

The instructor selects the time or condition at which the malfunction is to start. An unlimited number of malfunctions can be directed to occur at different times or, if desired, all at the same time.

A special feature of the simulator malfunction program is the ability of the instructor to select the severity of the malfunction and the rate at which the malfunction is to occur.

The status of any selected malfunction can be determined at any time from the instructors console. This includes the delay times, the severity factor, and the ramp time.

1.3.4 Overrides

1.3.4.1 Panel Overrides:

The instructor has the capability of selectively overriding any of the controls or indications available within the control room. This capability is accessed from the instructors console via the "OVR" pushbutton. These overrides include:

- Digital Output (lamp status)
- Analog Input (meter indication)
- Annunciator
- Status Light
- Digital Input (switch position)

Once the override is selected, a composition display will appear for the selected component I/O signal. Pretabbed data entry fields allow the instructor to:

- Enter desired state of override
- Set up final value and ramp time
- Set up desired delay time
- Activate override or exit

1.3.4.2 Transmitter Overrides:

The instructor has the capability of overriding all modelled Process Instrument Transmitters. This capability is accessed from the instructors console via the "XMTR OVR" pushbutton.

The instructor may review the description, current output and status of the transmitter overrides, via dynamically updated listings organized by plant system. The desired transmitter can be selected by cursor control or by entering the transmitter override mnemonic, which consists of the plant system ID and a unique identifier. If the instructor knows the mnemonic of the transmitter, the instructor may bypass the listing menus and enter the mnemonic directly.

A composition display will appear for the selected transmitter. Pretabbed data entry fields allow the instructor to:

- Enter the desired final output value.
- Select the ramp interval.
- Select the desired delay time.

1.3.5 Local Operator Actions (LOAs)

To add to the realism of actual plant operations, the H. B. Robinson simulator has the capability of simulating LOAs that alter plant operation and control room indications. An example of a LOA is the tripping of a back panel bistable with status light indication in the control room which changes the coincidence for actuation of, for example, a reactor trip.

LOAs are selected by the instructor from a menu or from direct input into the computer. Some remote components also appear on the P&ID graphic display which allows a components status to be changed via a touch screen.

1.3.6 Parameter and Equipment Monitoring

1.3.6.1 Plant Parameter Status Display:

One CRT in the instructors booth is capable of providing a "log shoot" of the status of plant parameters, such as reactor power, RCS temperature, pressurizer pressure, etc.

1.3.6.2 Equipment Status Display:

A CRT in the instructors booth allows the selection of certain systems, such as CVCS, to determine the status of the various pumps, valves, etc., in that system. The status is indicated as "on/off" or "open/closed".

1.3.6.3 Parameter Versus Time Plots:

Using the CRT in the instructors booth, the instructor is able to monitor graphical trends of up to three variables using vector graphics. The instructor selects the various parameter(s) that is desired to be plotted.

1.3.7 Simulator Special Features

1.3.7.1 Switch Check Status:

The switch check feature of the simulator allows the instructor to ensure the proper positioning of control room switches and potentiometers for each IC that is selected. A light on, or very near, a switch or potentiometer will blink if it is not in the proper position for the selected IC.

The instructor is able to review the status of all switches and potentiometers on the CRT when the SWITCH CHECK STATUS function is selected.

As an added feature, the instructor can override the switch check if the out of position switch is of little significance to the evolution to be run.

1.3.7.2 Freeze:

When this function is selected, the simulator is stopped at any point in a evolution. This is an instructor aid to evaluate plant conditions before or after an event. When it is desired to recommence operation of the simulator, the RUN function is selected and the simulator starts at the point that the freeze function was initiated.

1.3.7.3 Backtrack:

The backtrack function allows the instructor to back up and restart the simulator from some time back during the training session.

1.3.7.4 Snapshot:

The snapshot feature of the simulator enables the instructor to save a condition at any given point of an evolution. The instructor then can use the snapshot as an IC when desired. This includes saving the malfunctions that were selected. The snapshot is stored in a default IC (IC 85).

1.3.7.5 Replay:

The replay feature provides the instructor with the capability of freezing the simulator and to replay as much as 120 minutes prior to that point. This allows students to review trends in parameters and the effect that their actions had on plant operations.

1.3.7.6 Fast Time:

The fast time feature of the simulator allows the instructor to accelerate through some plant evolutions that are not training intensive to a point where more training intensive evolutions can be given their proper attention.

The following list of plant evolutions can be selected from the menu when the FAST TIME pushbutton is depressed:

* Fission product concentration and decay heat
* RCS heatup
* RCS cooldown
* Turbine system heatup
* Turbine system cooldown

When the FAST TIME pushbutton is selected by the instructor, the dynamics of the selected plant parameters will speed up while all other parameters remain at real time.

1.3.7.7 Slow Time:

The slow time feature of the simulator allows the instructor to slow the dynamics of a particular evolution or scenario. The students are then able to evaluate trends, parameters, etc., that may not be able to be observed in real time operation.

When the SLOW TIME pushbutton is depressed by the instructor, all plant dynamics are slowed to a preselected low frequency.

1.3.7.8 Automatic Exercise:

The automatic exercise feature of the simulator allows the selection of up to 20 preprogrammed lesson drills which will automatically step the simulator through a set of predefined operations and controls. This feature minimizes the setup and manipulations of the instructor by the instructor, and provides standard, repeatable, and preplanned exercises on the simulator.

1.3.7.9 Simulator Operating Limits:

In accordance with ANSI/ANS-3.5 Section 4.3, the simulator will alert the instructor by way of a message displayed on the control CRT, if any number of operating limits are exceeded which could lead to negative operator training, or indicate that simulation is proceeding out of the limits of model design. The limits used to alert the instructor are as follows:

- Safety Limit, Reactor Core, Core Protection Boundaries for 3-Loop Operation Curve
- Containment Temperature > 400 degrees F
- Containment Pressure > 90 psia
- RCS Pressure > 2750 psia
- Thermocouple Temperature > 1550 degrees
- RCS Boron > 2500 ppm
- RCS Boron < 0 ppm
- Steam Generator Pressure > 1400 psia
- Steam Generator Steam Flow > 10 MLBH
- Core Power > 120%
- Condenser Pressure > 20 psia

1.4 Operating Procedures for Referenced Plant

Simulator Control Room utilizes a controlled set of procedures identical to that used in the referenced unit's control room. These controlled procedures are part of the Simulator Design Basis Documentation. Procedures that cannot be performed in whole or in part, due to plant modifications not yet incorporated on the Simulator, are identified by License Training. These identified procedures are then modified for use on the Simulator and stamped "Information Copy - For Simulator Use Only". These stamped procedures are under the control of the Simulator Support Group and are revised once the Plant Modification has been incorporated on the Simulator.

1.5 Identify changes since last report

No changes -- initial report.

2.0 Simulator Design Data Base

The Simulator Design Data Base consists of reference plant drawings, reference plant procedures, reference plant technical manuals, reference plant system descriptions, reference and similar plant transient data, engineering best estimate transient data, and other appropriate material. A complete listing of the Design Basis Documentation is contained in Appendix D, H. B. Robinson Simulator Design Basis Documentation Index.

The original data base was updated with additional plant modification data prior to simulator delivery. This data brought the simulator to a plant design point of November 1985 as of delivery. Plant modification/change data have continued to be collected and analyzed for simulator applicability through formally controlled distribution of Plant Modifications, documentation updates, and plant procedure changes.

All changes to the simulator are presented to the Simulator Configuration Control Board (SCCB) for review and approval. Those changes rejected by the SCCB are rejected on the basis of a training value assessment.

3.0 **Simulator Discrepancy Resolution and Upgrading Programs**

3.1 Plant Modification Implementation

All Plant Modifications (PMs) which are approved for work and which have the potential to impact the simulator, are reviewed by the simulator operations staff for applicability to the simulator. This review is a continuous process and PMs are reviewed by the simulator staff in the same time frame during which they are presented to the plant staff. All PMs which have an effect on the simulator result in the initiation of a Simulator Modification Request (SMR) in accordance with Simulator Support Procedure SSP-217.1, Plant Modifications and Simulator Service Requests.

SMRs are prioritized and scheduled to be completed on the simulator within twelve months of their completion in the plant. If requested by the plant operations staff and agreed to by the Simulator Configuration Control Board (SCCB), the modification may be performed in the simulator prior to its completion in the plant in order that the operators may be trained prior to plant modification completion.

Actual modification to the simulator hardware or software is accomplished in accordance with SSP-217.3, Modification. Reference documents and other information used to perform the modification are filed with the completed SMR package and kept as part of the simulator Update Design Data Base.

Testing of the modification prior to its turnover is accomplished in accordance with SSP-217.4, Modification Testing.

3.2 Simulator Service Request Program

Deficiencies which are found as a result of simulator training or testing are used to generate Simulator Service Requests (SSRs). The SSR is used by the simulator operations and software staffs to evaluate the problem, and to identify the corrective action. Documentation used to research the problem is attached to the SSR for inclusion as part of the Simulator Update Design Data Base. Modifications which result from an SSR are tested in accordance with SSP-217.4, Modification Testing.

3.3 Simulator Configuration Management System

A Personal Computer based Configuration Management System is used for recording and tracking Simulator Service Requests and Simulator Modification Requests. Simulator Service Requests are entered into the system when written. The system automatically records the entry date, and assigns a sequential number to the SSR. The initiator checks whether the SSR is for a known problem or a proposed enhancement to the simulator and this information is entered into the system.

After the SSR is entered into the system, it is sent to the Simulator Specialist for disposition. The SSR is tested to ensure its validity and repeatability. Then the Specialist assigns a priority number and performs an initial impact on training analysis. If a member of the simulator staff initiated the SSR, the test may be skipped. The SSR is then assigned to a Software Specialist for work.

Plant Modifications (PMs) are reviewed by the Simulator Support Staff for applicability to the simulator. The PM is entered into the CMS computer when it is received. When the decision is made as to the PM's applicability, this information is also entered into the computer. If the PM is applicable, the CMS computer will automatically generate a Simulator Modification Request. In addition, it will automatically generate Simulator Work Orders which are assigned to the software and hardware personnel as applicable.

During the development of simulator software modifications, the support staff uses a development simulator system. This system runs independently of the training simulator system, and contains all the software modules. This allows software development and preliminary testing to be conducted simultaneously with training activities. The simulator support staff works to clear several SSR's and SMR's at one time. When several modifications are ready and testing time is available on the simulator, the development disk will become the training disk and final tests will be run with the new software load. There are actually three disks in use for the simulator. One is the previous training disk, one is the current training disk, and one is the development disk.

When PMs or SSRs are completed, their status is updated in the CMS computer. The CMS computer is used to printout weekly, and as other needs arise, reports as to the status of outstanding plant modifications and service requests.

The CMS computer is also used to generate schedules for and track completion of simulator preventive maintenance activities.

3.4 Simulator Configuration Control Board (SCCB) Evaluations

All simulator service requests, plant modifications/simulator modifications are presented to the SCCB for their concurrence and approval of the recommended impact on training evaluation and assigned priority.

3.5 Summary

For more details related to this topic, refer to Appendix E, Simulator Deficiencies and Plant Modifications.

4.0 Certification Tests

All phases of the simulator certification test process were developed, performed, reviewed and approved by presently or previously NRC licensed/certified individuals. Qualification descriptions of individuals involved in the certification process, including the Simulator Configuration Control Board members, are detailed in Appendix F, Certification Personnel Qualifications.

The selection of simulator performance test topics was determined based on ANSI/ANS 3.5-1985 requirements and a comprehensive review of the licensed operator training program (See Appendix G, Cross-Reference of Simulator Functions to Training Modules) and Operation Surveillance Tests (See Appendix H, Operations Surveillance Test Assessment).

Each simulator performance test was developed after a complete review of all available reference material relevant to the selected topic including extensive use of system descriptions, plant procedures, logic diagrams, block diagrams, control wire diagrams, Updated Final Safety Analysis Report, License Event Reports, Significant Operating Event Reports, reference or similar plant data, and appropriate technical manuals (See Appendix D, Simulator Design Basis Documentation).

The acceptance criteria for each individual simulator performance test is contained within the actual structure of the test itself. Each simulator performance test contains sign-off lines for each step of the test. If a simulator response was not as specified in a test step, the person performing the test was required to document the deficiencies within the test (See Appendix I, Examples of Simulator Performance Tests).

All deficiencies found during the performance of these tests were listed by system and reviewed for their impact on training. After this review, recommendations were presented to the Simulator Configuration Control Board for their concurrence and approval.

Simulator deficiencies and plant modifications are controlled in accordance with Training Instruction, TI-217, and Simulator Support Procedures, SSP-217.1, SSP-217.2, SSP-217.3, SSP-217.4, and SSP-217.5. These procedures govern all aspects of the SSR/SMR process, and comply with the requirements of the ANSI/ANS 3.5-1985. For more details related to this topic, refer to Appendix E, Simulator Deficiencies and Plant Modifications of this submittal package.

4.1 Certification Test Index

See Appendix J, Certification Test Index.

4.2 Simulator Test Procedures Satisfaction of ANSI/ANS-3.5 Requirements

The Certification Test Program covers all the requirements listed in ANSI/ANS-3.5. Appendix K is a cross-reference listing which shows which tests are applicable to which ANSI/ANS-3.5 items.

4.3 Certification Test Acceptance Criteria

4.3.1 Simulator Real Time Test

For the Simulator Real Time Test, the simulation must be proceeding in real time. This test ensures that processor utilization does not exceed 100% and that the operator is not distracted by hesitation in simulator real time performance.

4.3.2 Simulator Steady State Stability Test

For the Steady State Stability Test, the selected variables must not vary from their initial values by more than +/- 2% over a 60 minute period.

4.3.3 Simulator Steady State Comparison Tests

For the Steady State Comparison Tests, the simulator values for critical parameters must agree with the reference plant parameter value within +/- 2% band. Associated instrument loop error may be added to this band. For non-critical parameters, the agreement must be within +/- 10% plus instrument error. For parameters which exceed the allowable error, a Simulator Service Request (SSR) is required. All SSRs, including those found during the Certification Testing Program, are reviewed by the Simulator Configuration Control Board for their impact on training. The qualifications and makeup of the SCCB are described in Appendix A, Simulator Configuration Control Board Personnel Qualifications.

4.3.4 Normal Operations, Transient, Special and Malfunction Tests

For Normal Operations, Transient, Special and Malfunction Tests, the parameters observed must respond in the direction determined by a best estimate and not violate the physical laws of nature. Alarms and automatic actions which should occur do occur. Alarms and automatic actions which should not occur do not occur. Certification tests are reviewed by licensed or previously licensed operators/trainers with extensive plant experience. Where a test result is erroneous, an SSR will be written. All SSR's, including those found during the Certification Testing Program, are reviewed by the Simulator Configuration Control Board for their impact on training. The Qualifications of the team which reviewed the test results are included in Appendix F, Certification Personnel Qualifications.

4.4 Certification Test Schedule

4.4.1 Annual Operability Tests

The annual operability tests include the simulator Real Time Test, the Physical Fidelity Test, the Normal Operation/Steady State Tests, the Special Tests, and the Transient tests. These tests are listed in Appendix L, Annual Test Listing.

4.4.2 Malfunction Tests

These tests will be scheduled for continuing testing such that 25% are tested each year and all are tested during the four year period following the submittal of this report. See Appendix M, for Annual Schedules for 1991 through 1994.

4.5 Certification Test Abstracts

The certification test abstracts are a synopsis for each simulator performance test. The abstracts are divided into the categories of real time; normal operation, surveillance and steady state; transient; malfunctions; special and physical fidelity within Appendix N, Simulator Performance Test Abstracts.

4.6 Summary of Deficiencies by System with Training Impact Analysis and Exceptions

All deficiencies/exceptions that were identified during the performance of the certification tests are contained in Appendix C, Summary of Deficiencies, and Appendix B, Summary of Exceptions.

The deficiencies are grouped by system and listed by their Simulator Service Request (SSR) number.

The criteria established for the evaluation of each deficiency's status with respect to training are as follows:

Training Status

A. No negative impact on training - deficiency not needed to evaluate initiating event.

B. Instructors have capability of creating the proper simulator configuration - does not mislead operators.

C. This specific evolution should not be used in training until deficiencies are corrected. Does not impact training on the remainder of the system.

D. Training should not be conducted on this system until the deficiencies are corrected.

E. No training benefit achieved through correction of deficiency - prohibitive physical and manufacturing limitations.

After each specific deficiency was evaluated, recommendations were presented to the Simulator Configuration Control Board for their concurrence and approval.

The use of these recommendations in the development and maintenance of the Licensed Operator Simulator Training Program precludes the possibility of negative training, while the deficiencies are being corrected.

The exceptions are listed by ANSI 3.5 reference and title. Each specific exception taken and it's associated justification is addressed on an item by item bases.

These exceptions and associated justifications were presented to the Simulator Configuration Control Board for their concurrence and approval.

APPENDIX A

SIMULATOR CONFIGURATION CONTROL BOARD PERSONNEL QUALIFICATIONS

SIMULATOR CONFIGURATION CONTROL BOARD PERSONNEL QUALIFICATIONS

NAME: Richard S. Allen

TITLE: Manager - License Training

EDUCATION: Basic Electrical and Electronics, Electricians Mate "A" School, Nuclear Power School, Nuclear Power Training Unit, Submarine School, Regulators and Circuit Breakers, 64KW Motor Generator Set, Electronics Technology I & II - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO Certification, Carolina Power & Light Co., H. B. Robinson Plant
- SRO License, Carolina Power & Light Co., H. B. Robinson Plant
- RO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 22

SIMULATOR CONFIGURATION CONTROL BOARD PERSONNEL QUALIFICATIONS

NAME: Charles A. Bethea

TITLE: Manager - Training

EDUCATION: ET-A School and Nuclear Power School (U.S. Navy)

LICENSES/CERTIFICATIONS:

- RO Cold License, Carolina Power & Light Co., H. B. Robinson Plant
- SRO Hot License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT
NUCLEAR EXPERIENCE: 27

SIMULATOR CONFIGURATION CONTROL BOARD PERSONNEL QUALIFICATIONS

NAME: William M. Blaisdell

TITLE: Senior Specialist - Simulator

EDUCATION: Engineman School, Nuclear Power School, Nuclear Prototype & ELT School - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO Certification, Carolina Power & Light Co., H. B. Robinson Plant
- SRO License, Carolina Power & Light Co., H. B. Robinson Plant
- RO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 27

SIMULATOR CONFIGURATION CONTROL BOARD PERSONNEL QUALIFICATIONS

NAME: Ray H. Chambers

TITLE: Manager - Operations - H. B. Robinson - Nuclear

EDUCATION: B.S. Degree/Nuclear Engineering - North Carolina State University

LICENSES/CERTIFICATIONS:

- SRO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 18

SIMULATOR CONFIGURATION CONTROL BOARD PERSONNEL QUALIFICATIONS

NAME: Alson C. Sanders

TITLE: Manager - Simulator

EDUCATION: B.S. Degree - University of South Carolina

LICENSES/CERTIFICATIONS:

- SRO Certification, Carolina Power & Light Co., H. B. Robinson Plant
- SRO Certification, Carolina Power & Light Co., Shearon Harris Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 19

SIMULATOR CONFIGURATION CONTROL BOARD PERSONNEL QUALIFICATIONS

NAME: Robert A Steele

TITLE: Shift Foreman - Nuclear

EDUCATION: Electrician's Mate "A" School, Basic Nuclear Power School, NPTU Prototype, Electronic Technology - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO License, Carolina Power & Light Co., H. B. Robinson Plant
- RO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 19

SIMULATOR CONFIGURATION CONTROL BOARD PERSONNEL QUALIFICATIONS

NAME: Allen R. Wallace

TITLE: Operations Coordinator

EDUCATION: B.S. Degree/Nuclear Engineering - North Carolina State University

LICENSES/CERTIFICATIONS:

- SRO License, Carolina Power & Light Company, H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 17

APPENDIX B

SUMMARY OF EXCEPTIONS AND JUSTIFICATIONS

SIMULATOR SUMMARY OF EXCEPTIONS

ANSI Specification: 3.1.1(7)

Title: Startup, Shutdown and Power Operations With Less Than Full Reactor Coolant Flow

Exception: H.B. Robinson Plant takes exception to this requirement. There is no simulator performance test which will be performed as part of the H.B. Robinson simulator certification process.

Justification: H.B. Robinson Plant does not have procedures (nor is it permitted by Technical Specifications) for plant operations with less than full reactor coolant flow.

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1-25-91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/29/91
Manager Unit #2 Operations

Approved By: C Bethea 1/25/91
Manager - Training

SIMULATOR SUMMARY OF EXCEPTIONS

ANSI Specification: 3.1.1(9)

Title:	Core Performance Testing Such as Plant Heat Balance, Determination of Shutdown Margin, and Measurement of Reactivity Coefficients and Control Rod Worth Using Permanently Installed Instrumentation.
Exception:	H.B. Robinson Plant takes exception to the reactivity coefficient and control rod worth measurement portion of this requirement.
Justification:	H.B. Robinson, by design, does not have permanently installed instrumentation for core reactivity tests.

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1-25-91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF EXCEPTIONS

ANSI Specification: 3.1.2(12)

Title: Control Rod Failure Including Stuck Rods, Uncoupled Rods, Drifting Rods, Rod Drops, and Misaligned Rods

Exception: H.B. Robinson Plant takes exception to the uncoupled and drifting rods portion of this requirement.

Justification: Malfunctions of this nature are not applicable to the Westinghouse design control rod drive system.

Recommended By: Alan C Sanders 1/23/91
Manager - Simulator

Approved By: Richard D Allen 1-25-91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: C Bethea 1/25/91
Manager - Training

SIMULATOR SUMMARY OF EXCEPTIONS

ANSI Specification: 3.1.2(25)

Title: Reactor Pressure Control System Failure Including Turbine Bypass Failure(BWR)

Exception: H.B. Robinson Plant takes exception to this requirement. There is no simulator performance test which will be performed as part of the H.B. Robinson certification process.

Justification: H.B. Robinson Plant is a Westinghouse Pressurized Water Reactor (PWR). This requirement is not applicable to the H.B. Robinson simulator.

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1-25-91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: C Bethea 1/25/91
Manager - Training

SIMULATOR SUMMARY OF EXCEPTIONS

ANSI Specification: 4.3(3)&(5)

Title: Fuel Temperature Histories Indicative of Gross Fuel Failure and BWR Suppression Pool Temperature Greater Than the Highest Value at Which Condensation Instability is Known Not to Occur.

Exception: H.B. Robinson Plant takes exception to these requirements. These parameters are not monitored to alert the instructor of exceeding operating limits.

Justification: The H.B. Robinson simulator does not monitor fuel temperature histories, but it does monitor current fuel temperatures and warns the instructor if fuel temperatures exceed 1550 degrees F. BWR suppression pool temperature monitoring is not applicable to H.B. Robinson since the plant is a PWR design. Additionally, instructors are directed by procedure to monitor parameters that are indicative of negative training.

Recommended By: Alson C Sanders 3/6/91
Manager - Simulator

Approved By: Richard A Allen 3/6/91
Manager Licensed Training

Approved By: Roy H. Chambers 3/6/91
Manager Unit #2 Operations

Approved By: [signature] 3/6/91
Manager - Training

SIMULATOR SUMMARY OF EXCEPTIONS

ANSI Specification: 5.3

Title: Simulator Modification

Exception: H. B. Robinson Plant takes exception to the requirement that the simulator shall be modified as required within 12 months following the annual establishment of the simulator update design data. Six simulator modifications that resulted from plant modifications have not been incorporated for greater than 12 months. These include the following:

Plant Mod#	Title
M-927	230KV Switchyard Protection and Controls
M-966	RHR Cold Leg Recirculation Interlock
M-948	Upgrade of Pressurizer PORVs
M-980	Resupply Fans from BOP MCCs
M-979	Resupply Turbine Auxiliary Equipment from BOP MCCs
N/A	Core Cycle Upgrade

Justification: Licensed Training and Plant Operations Management have been made aware of these outstanding simulator modifications. Although deemed necessary due to training impact, the Simulator Configuration Control Board agreed that continued training prior to their implementation would not result in negative training. These modifications are scheduled to be incorporated during the 1992 Simulator Outages.

Full compliance with this requirement for all future modifications is expected.

SIMULATOR SUMMARY OF EXCEPTIONS

ANSI Specification: 5.3 (Continued)

Recommended By: Alson C Sanders 1/31/91
Manager - Simulator

Approved By: RJ Allen 1-31-91
Manager Licensing Training

Approved By: Ray A. Chamber 1/31/91
Manager Unit #2 Operations

Approved By: C Becker 1/31/91
Manager - Training

SIMULATOR SUMMARY OF EXCEPTIONS

ANSI Specification: Appendix B.1

Title: BWR Simulator Operability Test

Exception: H.B. Robinson Plant takes exception to this requirement. There is no simulator performance test which will be performed as part of the H.B. Robinson certification process.

Justification: This part of Appendix B applies to BWR plants only and H.B. Robinson is a PWR plant.

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1-25-91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

APPENDIX C

SUMMARY OF DEFICIENCIES
AND
TRAINING IMPACT ANALYSIS

SUMMARY OF DEFICIENCIES AND TRAINING IMPACT ANALYSIS

The deficiencies are grouped by system and listed by their Simulator Service Request (SSR) number.

The criteria established for the evaluation of each deficiency's status with respect to training is as follows:

<u>Training Status</u>

A. No negative impact on training - deficiency not needed to evaluate initiating event.

B. Instructors have capability of creating the proper simulator configuration - does not mislead operators.

C. This specific evolution should not be used in training until deficiencies are corrected. Does not impact training on the remainder of the system.

D. Training should not be conducted on this system until the deficiencies are corrected.

E. No training benefit achieved through correction of deficiency - prohibitive physical and manufacturing limitations.

After each specific deficiency was evaluated, recommendations were presented to the Simulator Configuration Control Board for their concurrence and approval.

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: CCW

Deficiencies by Simulator Service Request Number:	**Certification Test Abstract Number:**	**Training Status:**
1. 90-0534, RCP Oil Reservoir Hi/Lo clears when malfunction is cleared	5.2.7	C
2. 90-0535, Did not receive cooling water low flow alarm	5.2.7	C

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1-25-91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: C Bethea 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: CFW

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0492, Heater Drain Pumps started before level increased above the High Level Switch	5.3.12	B
2. 90-0512, Not receiving proper alarms on H.D. Tank. Normal and High Level Control Valves for H.D. Tank not programmed correctly. Need data on High High Level Controller for H.D. Tank	5.3.13	C
3. 90-0511, Temperature response to flooded heater incorrect	5.3.14.1	C
4. 90-0510, Temperature response to flooded heater incorrect	5.3.14.2	C
5. 90-0502, Standby Pump start interlock not functional for pump trip from failure of recirculation valve	5.3.16	B
6. 90-0513, Did not receive proper indication of break flow	5.3.26	A

Affected System: CFW (Continued)

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1-25-91
Manager Licensed Training

Approved By: Allen R Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: CNM

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0498, Containment Pressure response not correct.	5.18.9.2	B

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace Sr 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: CNS

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0311, Both CV Spray Pumps start with either malfunction entered RWST Level does not decrease during spray operation	5.5.1	B
2. 90-0520, Refueling water storage tank level, CV spray flow, and CV pump amperage responses to CV spray actuation and header leak were not as expected. Did not receive waste disposal alarm indicative of a leak in the auxiliary building.	5.5.3	C

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: CRF

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0457, Step counters for bank C did not move as expected during overlap failure	5.6.11	A
2. 90-0292, Rod urgent failure did not inhibit rod motion demand for the Group 2 rods of the affected cabinet	5.6.17	C

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [signature] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: CVC

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0508, LCV-115C did not close after malfunction was removed	5.7.2	B
2. 90-0288, LCV-115A did not fully position to the holdup tank	5.7.9	B
3. 90-0314, Improper R-11, R-12, & R-2 response to leak Improper PZR HTR alarm response	5.7.17	B
4. 90-0569, RCP Standpipe Hi/Lo/Lv did not alarm RCP 1 Standpipe Hi Permissive Status did not light	5.18.14	B

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: CWS

Deficiencies by Simulator Service Request Number:	**Certification Test Abstract Number:**	**Training Status:**
1. 90-0543, Circulating Water return temperature decreased when CWP Discharge Valve closed. It should increase.	5.8.1.1	B

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Coller 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: C Bellew 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: EDG

Deficiencies by Simulator Service Request Number:	**Certification Test Abstract Number:**	**Training Status:**
1. 90-0413, Diesels shutdown with local stop/start switch with the Remote/Local switch in "REMOTE"	2.10.401	B
2. 90-0414, Emergency Diesel Amperage is not effected by changes in power factor	2.10.401	A
3. 90-0522, Malfunction EDG1C has no effect	5.9.1	C

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace Sr 1/24/91
Manager Unit #2 Operations

Approved By: C Belfer 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: EHC

Deficiencies by Simulator Service Request Number:	**Certification Test Abstract Number:**	**Training Status:**
1. 90-0430, Overspeed Protection Control light failed to illuminate during overspeed condition.	5.12.2	B
2. 90-0631, Load Drop Anticipator circuit did not actuate during overspeed condition.	5.12.2	C

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: C Bolton 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: EPS

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0412, Failed to receive the EMERG GEN A/B AUTO TRIP annunciators when the associated breaker was opened locally	2.10.401	A
2. 90-0458, Spray Pump B did not attempt restart and then trip when control switch placed to stop.	5.5.2	C
3. 90-0521, Emergency Diesel Generator "B" to Bus E2 Breaker opened with Bus E2 Feeder Breaker open and malfunction in for "B" diesel Emergency Diesel Generator "A" to Bus E1 Breaker opened with Bus E1 Feeder Breaker open and malfunction in for "A" diesel	5.9.1	B

Affected System: EPS (Continued)

4.	90-0601, 6 recorders did not deenergize when appropriate instrument bus deenergized 7 recorders had pens that did not fail in proper direction "Channel on Test" lights did not go out when power lost for N31, N32, N35, N36, N41, and N42 3 indicating lights for AFW valve status did not go out when appropriate power was lost Level Indicator for Spray Additive Tank did not fail when appropriate power was lost PI-957, Channel 2 Containment Pressure on ICCM Panel did not deenergize when appropriate power lost	5.10.2	B
5.	90-0603, Bus No. 1 Breaker response to loss of power incorrect	5.10.4	C
6.	90-0604, Bus No. 2 Breaker response to loss of power incorrect	5.10.4	C

Affected System: EPS (Continued)

7.	90-0605, Bus No. 3 Breaker response to loss of power incorrect	5.10.4	C
8.	90-0615, 480V Bus 3 - Electrical Fire Pump was operable after power lost to bus	5.10.8	B
9.	90-0554, Grid Voltage did not change	5.10.9	C
10.	90-0523, Generator Line Voltage status light does not go out when OCB 52/17 opens	5.12.3	B
11.	90-0490, Tripped RHR Pump did not attempt to restart after malfunction cleared while Safety Injection actuation signal present	5.19.1	C
12.	90-0556, Improper breaker status light indication when racking out and then racking in a tripped safety injection pump breaker	5.24.4	B
13.	90-0557, Safety injection pump motor overload alarm not clearing when breaker is racked out	5.24.4	B

Affected System: EPS (Continued)

14. 90-0494, When the AC Pump is not running, the malfunction should not cause a loss of status lights until the pump tries to start	5.26.11	B

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: C Bethea 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: GEN

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0607, "Generator Motor Trip" Alarm not being received	5.26.18	A
2. 90-0607, "Generator Motor Trip" Alarm not being received	5.26.22	A

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: C Bethea 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: HVA

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0456, Alarm for CV Fan High Vibration clears before reset pushbutton is depressed.	5.13.1	B

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Cella 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace 1/24/91
Manager Unit #2 Operations

Approved By: C Belhea 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: MSC

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0436, Various valves do not attempt to open in manual when malfunction active	5.14.5	B
2. 90-0464, Waste Disposal Panel Alarm not received	5.25.6	B
3. 91-0011, The wall between the entrance area and control board area is not installed in the simulator.	6.7	E
4. 91-0012, Shift Foreman's area is not located in the same physical location nor is it the same size.	6.7	E
5. 91-0013, Distance between the II (Incore) Panel and the LP (Line) Panel is approximately 13 inches larger in the simulator.	6.7	E
6. 91-0014, The RVLIS/CM Panel is approximately 9 inches narrower	6.7	E

Affected System: MSC (Continued)

7.	91-0015, The Fire Protection Panel is not located in the same physical position as the reference plant.	6.7	E
8.	90-0656, The AO control board panel has the following differences: 1. Five annunciator windows are labeled incorrectly. 2. One meter labeled incorrectly. 3. One recorder scale different. 4. Containment Spray & Isolation, Feedwater Isolation buttons are different color. 5. One controller is missing a label. 6. One controller has label in wrong position. 7. Boric acid pump A&B label missing velcro. 8. Cover plates different. 9. Two status lights different.	6.7	A
9.	89-0282, Protection T_{avg} and delta T meters have wrong scale.	6.7	A

Affected System: MSC (Continued)

10.	90-0658, The BO control board panel has the following differences: 1. Three bistable status lights are incorrectly labeled. 2. Two annunciator windows are labeled incorrectly. 3. One breaker status light engraving is different. 4. One recorder label is not legible on the simulator. 5. Two labels are missing from boric acid and primary water totalizers. 6. First Out Reset is the wrong color. 7. One caution tag label is not installed on the simulator.	6.7	A
11.	90-0659, The CO control board panel has one meter label that is handwritten on the simulator and is printed in the reference plant.	6.7	A

Affected System: MSC (Continued)

12. 90-0660, The DO control board panel has the following differences: 1. AFW labels read different and lens need engraving. 2. One annunciator window is labeled incorrectly. 3. Four meter scales are different. 4. One meter label is different. 5. Auxiliary building supply and exhaust fans lens are different. 6. Steam Driven Auxiliary Feedwater Pump lens labels are different. 7. Moisture Separator Load < 10% status light reads different.	6.7	A
13. 90-0657, The ST control room panel has the following differences: 1. Various label plates missing. 2. One orange caution tag is missing. 3. One recorder has wrong scale. 4. Recorders are different model number. 5. Plate mounting screws are different.	6.7	A

Affected System: MSC (Continued)

14.	90-0662, The nuclear instrumentation panels have the following differences: 1. Fuses are different in shape 2. Ground plug is different in color on audio count rate drawer. 3. Scaler/Timer is a different model than plant.	6.7	E
15.	90-0661, 1. Various labels are in the wrong position. 2. Annunciators are different from reference plant. 3. Various radiation monitor drawers are labeled incorrectly. 4. Plastic cover different on Tigraph recorders. 5. One recorder has different color door. 6. Modules are arrange different.	6.7	A
16.	90-0664, The APDMS panel has one label with incorrect wording.	6.7	A

Affected System: MSC (Continued)

17.	90-0665, The LD Panel has the following differences: 1. Status board not spaced the same and pens missing. 2. Two annunciator windows are different. 3. One recorder has door with different color.	6.7	A
18.	90-0667, The RV/CM panels have the following differences: 1. Two tags are in the wrong location. 2. Four meter scales are incorrect. 3. Two CV water level panels are the wrong color. 4. Three labels are incorrect. 5. Two blank labels are missing.	6.7	A
19.	90-0666, The incore instrumentation panels have various tags missing and some incorrectly worded.	6.7	A
20.	91-0016, Control switches are different on simulator.	6.7	E
21.	91-0017, PA handsets are missing labels.	6.7	A

Affected System: MSC (Continued)

22.	91-0026, Phones on desks have different numbers than reference plant.	6.7	A
23.	90-0663, The GP panel has the following differences: 1. Extra labeling at bottom of instrument panel. 2. Relay boxes reset switches are different color. 3. One label is a different color. 4. Serial numbers on relay boxes are different.	6.7	A
24.	90-0045 (MOD 1010), Lighting & sound levels are not the same due to outstanding plant modifications.	6.7	A

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard J Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: MSS

Deficiencies by Simulator Service Request Number:	**Certification Test Abstract Number:**	**Training Status:**
1. 91-0008, Simulator computed value for Main Generator Megawatts is too high for full power conditions.	2.0.2	A
2. 90-0526, With Gland Sealing Steam supplying the Main Turbine Gland Seals - vacuum did not degrade to point of Turbine Trip.	5.26.16	C
3. 90-0533, Data Pool Variable for Gland Sealing Steam Flow not responding.	5.26.16	A

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Cecco 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [signature] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: NIS

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0432, N-35 P-6 Setpoint out of tolerance N-36 P-6 Setpoint out of tolerance N-41 P-10 Setpoint out of tolerance N-41 Overpower trip low range setpoint out of tolerance	2.10.001	B
2. 90-0599, Power Range Nuclear Instrumentation response to rod recovery was not as expected.	5.6.3	B

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Cecle 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: PPL

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0553, SG Narrow Range Level did not alarm when 1/3 channels greater than 75% SG 2 Narrow Range Hi Level did not alarm when 1/3 channels greater than 75% SG 3 Narrow Range Hi Level did not alarm when Bistables were tripped	5.3.21	B
2. 90-0466, Source Range Trip blocked Permissive light did not light	5.16.14	B

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible signature] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: RCS

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0536, "B" RCP vibration decreased, should have increased	5.2.7	C
2. 89-0337, Incore thermocouple incorrectly spikes to high temperature when switching to cold leg recirculation	5.18.1	C
3. 90-0537, Vibration not reaching selected value	5.18.16	A

Recommended By: Alan C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A [illegible] 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: RHR

	Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1.	90-0548, CCW Temperature increased when FCV-605 was failed open.	5.19.3	C
2.	90-0544, Pressurizer level initially decreased but then increased prior to leak being isolated.	5.19.5	C
3.	90-0545, Waste Disposal Alarm not received.	5.19.5	C

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S [illegible] 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: RMS

Deficiencies by Simulator Service Request Number:	**Certification Test Abstract Number:**	**Training Status:**
1. 90-0509, Radiation Monitors R-2, R-11, and R-12 did not respond	5.6.5	B
2. 88-0034, Radiation Monitors did not increase or alarm	5.7.17	B
3. 90-0555, Area Radiation Monitor R-2, no response Area Radiation Monitor R-7, no response No area Radiation Monitor Hi Rad Alarm	5.17.4	B

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: RPS

Deficiencies by Simulator Service Request Number:	**Certification Test Abstract Number:**	**Training Status:**
1. 90-0633, Improper Feedpump response when affected Steam Generator Feedwater Isolation Reset Pushbutton depressed	5.3.20	A
2. 91-0003, With only one train of SI reset, neither reactor trip breaker should have closure capability. The reactor trip breaker in the reset train could be closed	5.24.6	A

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: SIS

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0558, Improper breaker status light indication for safety injection pump B when tripped. Light indicates breaker is closed but safety injection flow goes to zero.	5.24.4	C
2. 90-0531, Various valves failed their stroke time.	6.6	A

Recommended By: Olson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard S Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: C Bethea 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: SWS

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 90-0606, Five temperature related alarms not received.	5.25.1	C
2. 88-0075, Lo Flow alarm setpoint set at wrong value.	5.25.2	A
3. 90-0504, System Flow response when faulted HVH cooler isolated incorrect.	5.25.2	C
4. 90-0463, HVH Lo Flow Alarms not received.	5.25.6	C

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard A Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/24/91
Manager Unit #2 Operations

Approved By: [illegible] 1/25/91
Manager - Training

SIMULATOR SUMMARY OF DEFICIENCIES

Affected System: TUR

Deficiencies by Simulator Service Request Number:	Certification Test Abstract Number:	Training Status:
1. 91-0004, With the remote turbine trip failure malfunction entered, the reactor was manually tripped. This should have resulted in a main generator negative sequence trip and 86/BU generator lockout relay actuation. These responses did not occur as expected.	5.26.2	C
2. 90-0440, When the DC Pump is not running, the malfunction should not cause a loss of status lights until the pump tries to start.	5.26.11	B
3. 90-0575, Turning Gear Motor Alarm not received in one verification.	5.26.13	C

Affected System: TUR (Continued)

4.	90-0584, a) Turbine Lube Oil Discharge Temperature response incorrect. b) Turbine vibration did not reach appropriate magnitude. c) Turbine coast down duration inappropriate.	5.26.14	C
5.	90-0583, Breaker Tripped when pump not running.	5.26.19	B
6.	90-0608, Header Pressure not decreasing at proper rate.	5.26.22	A

Recommended By: Alson C Sanders 1/23/91
Manager - Simulator

Approved By: Richard D Allen 1/25/91
Manager Licensed Training

Approved By: Allen R. Wallace for 1/29/91
Manager Unit #2 Operations

Approved By: C Bethea 1/25/91
Manager - Training

APPENDIX D

H. B. ROBINSON SIMULATOR DESIGN BASIS DOCUMENTATION

H. B. ROBINSON SIMULATOR DESIGN BASIS DOCUMENTATION

File Index #	Title
1	CP&L H. B. Robinson Control and Protection Instrumentation System, Volume II - Book 1
2	CP&L H. B. Robinson Control and Protection Instrumentation System, Volume II - Book 2
3	CP&L H. B. Robinson Control and Protection Instrumentation System, Volume III
4	CP&L H. B. Robinson Instruction Manuals
5	Instruction Manual for High Range Containment Monitor
6	CP&L H. B. Robinson E. H. Governor Control System Double Ended Wiring List
7	CP&L H. B. Robinson Process Radiation Monitor, Volume 1
8	CP&L H. B. Robinson Aux. Electrical Distribution System Expansion
9	Mod. 851: 4160V Bus #5
10	CP&L H. B. Robinson Steam Electric Plant EH Turbine Control
11	CP&L H. B. Robinson Radiation Monitor Data
12	CP&L H. B. Robinson Main Control Board Manual
13	Steam Gen. Model 44 Thermal Hydraulic Design Data Report
14	H. B. Robinson Technical Library Index
15	H. B. Robinson Lundell Controls - Annunciators/Alarms
16	Westinghouse Heat Exchange Equipment Nuclear Measurements Corp. NMC Model AM-221
17	Pressurizer Tech. Manual Aux. Heat Exchangers Tech. Manual Miniature Detector Flux Mapping System
18	Westinghouse Aux. Transformers Power Autotransformers I. B. Mer 078-12
19	Westinghouse Switchgear & Transformer 27-4-3662-I

File Index #	Title
20	Westinghouse (Tracerlab) Radiation Monitor System, Volume 1
21	H. B. Robinson Process Radiation Monitoring
22	Canberra 3KV P.S. Model 3002
23	Rod Position Indication System Core Cooling Monitor, Volume 1
24	Westinghouse 739, 328KW Steam Turbine, Volume 1 Oper. and Control
25	Westinghouse Tech. Manual Heat Exchange Equipment Westinghouse Tech. Manual Nuclear Reactor Rod Controller
26	Westinghouse Steam Turbines, Volume III - Book 2 H. B. Robinson Valve Stroke Time List
27	Power Range Axial Offset Calibration Detector Currents Annunciator with Reflash Calibration Electrical Mech. MFG. Size 2 and 3 SCR Voltage Regulators Gould Station Battery Install. and Operating Instr.
28	Yuba Heat Transfer Corp. 3rd and 6th PT Heaters Feedwater Heater Spec. Sheet
29	Westinghouse 739, 328KW Steam Turbine, Volume III, EH Control System Westinghouse Tech. Manual Generator and Hydrogen Cooled Turbine Gen.
30	H. B. Robinson Instrument List
31	Power Transformer Mer 077-12 Nuclear Measurements Air Monitor NMC Model RAK-221F
32	Nuclear Measurements Corp. NMC Model AM-2FS
33	H. B. Robinson ERFIS: Scan Plan and RTD Coeff's Tech. Manual Monthly Operating Summary Cycle 10 Jan./Feb. Victoreen Inc. Area Monitoring System Model 855 Series

File Index #	Title
34	Basler Electric Co. Series Boost Exciter-Regulator - Part No. 90, 50300-100, Type SB SR LV Electric Machinery MFG. Co. 700 Series Synchronous Gen. Fixed In-core Neutron Detector System Westinghouse Prodac 250 Address Book Computer I/O List Westinghouse Flux Mapping System Wiring and Photos Westinghouse EH High Pressure Fluid Control and Lubricating Oil System
35	Westinghouse Core Cooling Monitor, Volume 2 IRD Mechanalysis, Inc. RCP Vibration Monitor System
36	H. B. Robinson Engine Gen. Set and Accessories - Model 3800TD - Book 1
37	H. B. Robinson Engine Gen. Set and Accessories - Model 3800TD - Book 2
38	H. B. Robinson Diesel Gen. 2600KW - Book 1
39	H. B. Robinson Diesel Gen. 2600KW - Book 2
40	Westinghouse 739, 328KW Steam Turbine, Volume II Descriptive Materials Unholtz-Dickie Corp. Operating and Servicing Instructions Model P-22 MHA IV Valve Monitor Auxiliary Feedwater System Modification
41	Westinghouse Type SL Core Form Power Transformer RGR-2112 Westinghouse 25000 Amp 25KV Isolated Phase Bus Westinghouse Startup Transformer RBR-6837
42	J. B. Nottingham Co. Duraline Div. N245, N295, and N395 Berg-Gibson MFG. Battery Charger Model F-68-60-25-T2 Deltron Inc. Regulated Power Supply Fluke Model 412 B High Voltage DC Power Supply Electric Machinery MFG. Brushless Rotating Exciter with Rotating Rectifier Unit
43	Nuclear Measurement Corp. NMC Model PCC-11T DS-1T Nuclear Measurement Decade Counting System with PR-4 Printer (SDS-2P-SP)_
44	H. B. Robinson Nuclear Detectors and Systems H. B. Robinson NV-32A High Voltage P.S. NB-25A Charge Sensitive Pre Amp with Overloading Sensing Automatic Alpha/Beta Counting System - Operation and Maintenance UDC - Vibration Test Equipment

File Index #	Title
45	CP&L H. B. Robinson Performance and Heat Balance Data PP-2, Rev.1
46	H. B. Robinson 230KV Switchyard Operation Instruction H. B. Robinson Electrical Load List
47	Westinghouse (Tracerlab) Radiation Monitoring System, Volume 1
48	Westinghouse (Tracerlab) Radiation Monitoring System, Volume 2
49	CP&L H. B. Robinson Control and Protection Instrumentation System, Volume 1
50	CP&L H. B. Robinson Reactor Vessel Level System Equipment Ref. Manual
51	HBR Test Procedures (Handlers)
52	CP&L H. B. Robinson Pump Curves
53	CP&L H. B. Robinson Maintenance Management Manual, Volume 4 - Book 1 of 5
54	CP&L H. B. Robinson Maintenance Management Manual, Volume 4 - Book 2 of 5
55	CP&L H. B. Robinson Maintenance Management Manual, Volume 4 - Book 3 of 5
56	CP&L H. B. Robinson Maintenance Management Manual, Volume 4 - Book 4 of 5
57	CP&L H. B. Robinson Maintenance Management Manual, Volume 4 - Book 5 of 5
58	H. B. Robinson Valve List
59	H. B. Robinson E.H. Turbine Control
60	H. B. Robinson Switchyard Test Procedures
61	H. B. Robinson Certification Test Procedures

File Index #	Title
62	H. B. Robinson Plant Data Packages

Data Pkg. No.	
1.	MSIV closed at 100% power - hard copy data, CR logs, ERFIS tape.
2.	MFW Pump trip @ 87% power (no Rx trip) - hard copy data, CR logs, ERFIS tape.
3.	Normal shutdown 100% to CSD - CR logs, ERFIS tape.
4.	Turbine runback 75% to 50%, PORV and steam dump operation - CR logs, hard copy data and ERFIS tape.
5.	Turbine runback, limiter failed 66% to 53% - hard copy data, CR logs, ERFIS tapes.
6.	Power ascension, CSD to 100% - CR logs and ERFIS tapes.
7.	Turbine runback, 100% to 46% - hard copy data, CR logs, ERFIS tapes.
8.	Rx trip from 100%, 2 Power Range NIs in test - hard copy data, CR logs, ERFIS tape.
9.	Power decrease 100% to 60% @ 10%/hr - CR logs, hard copy data, ERFIS tape.
10.	Rx trip, 100% power, Feed Reg. Valve failed closed - hard copy data, CR logs, ERFIS tape.
11.	Plant Operating Experience Report, Rx trip, SI, all 3 RCPs turned off at 100% power.
12.	Post Trip Report, 14% power, Hi Hi level - P-250 printout.
13.	Post Trip Report, 50% power, Lo Lo level.
14.	Post Trip Report , 72% power, spike on Instrument Buses 2 and 7 caused excessive feedwater flow.
15.	Post Trip Report, 33% power, I&C placed two Power Range Monitors in trip mode.

File Index #	Title

Data Pkg. No.	
16.	Post Trip Report, 80.7% power, loss of offsite power.
17.	Post Trip Report, 13.5% power, Hi Hi level.
18.	Post Trip Report, 0% power, steam line header pressure low SI signal.
19.	Post Trip Report, 10% power, Generator motoring.
20.	Post Trip Report, 98.5% power, spike on OP Delta T Channel while other channel in trip.
21.	Post Trip Report, 100% power, cooldown from over-boration, pressurizer low pressure trip.
22.	Post Trip Report, 99.5% power, testing Rx Protection System.
23.	Post Trip Report, 99.6% power, "B" Feed Reg Valve failed open Hi Hi level.
24.	Incident Report, CSD, Low Temperature Over Pressure Protection System operation (graphs).
25.	Incident Report, RCP turned off due to high seal leakage (graphs).
26.	Incident Report, LTOP actuation (graphs).
27.	Post Trip Report, 100% power, FRV failed closed, Lo Level & SF/FF mismatch.
28.	Post Trip Report, 72% power, Lo level & SF/FF mismatch.
29.	Incident Report, 100% power, SG PORV opened - graphs on SF, FF, Press & Power.
30.	Post Trip Report, 60% power, all control valves closed, turbine trip.
31.	Post Trip Report, 60% power, testing TROTS.
32.	Post Trip Report, 30% power, High SF-Low Tavg Trip, steam dumps opened.

File Index #	Title

Data Pkg. No.

33. OSTs performed on reference plant.

- OST-001 - NUCLEAR INSTRUMENTATION SOURCE RANGE, INTERMEDIATE RANGE, POWER RANGE WEEKLY (WHILE REACTOR IS SHUTDOWN) PRIOR TO STARTUP (IF NOT DONE WITHIN THE PREVIOUS 7 DAYS)
- OST-002 - NUCLEAR INSTRUMENTATION POWER RANGE BI-WEEKLY (REACTOR CRITICAL AND BELOW P-10)
- OST-003 - NUCLEAR INSTRUMENTATION POWER RANGE
- OST-004 - NUCLEAR INSTRUMENTATION POWER RANGE (BI-WEEKLY) (POWER LEVEL ABOVE 25% AND BELOW P-8)
- OST-005 - NUCLEAR INSTRUMENTATION POWER RANGE (BI-WEEKLY) (POWER LEVEL ABOVE P-8)
- OST-006 - NUCLEAR INSTRUMENTATION SOURCE RANGE AND INTERMEDIATE RANGE BI-WEEKLY (POWER ABOVE P-6), PRIOR TO SCHEDULED SHUTDOWN INTERVAL
- OST-007 - NUCLEAR INSTRUMENTATION COMPARATOR CHANNEL (WEEKLY - REACTOR SHUTDOWN) (BI-WEEKLY REACTOR AT POWER)
- OST-008 - NUCLEAR INSTRUMENTATION STARTUP RATE CHANNEL WEEKLY INTERVAL (WHILE REACTOR IS SHUTDOWN) BI-WEEKLY INTERVAL (WHILE REACTOR AT POWER) PRIOR TO STARTUP (IF NOT DONE IN THE PREVIOUS 7 DAYS)
- OST-009 - NUCLEAR INSTRUMENTATION AUDIO COUNT RATE CHANNEL WEEKLY (WHILE REACTOR IS SHUTDOWN) BI-WEEKLY (REACTOR AT POWER) PRIOR TO SCHEDULED SHUTDOWN

File Index #	Title

Data Pkg. No.

- OST-011 - ROD CLUSTER CONTROL EXERCISE & ROD POSITION INDICATION BY-WEEKLY INTERVAL
- OST-051 - REACTOR COOLANT SYSTEM LEAKAGE EVALUATION (DAILY)
- OST-054 - CORE COOLING MONITOR CHANNEL CHECK (MONTHLY)
- OST-055 - REACTOR VESSEL LEVEL INSTRUMENTATION SYSTEM (RVLIS) (MONTHLY)
- OST-107 - BORIC ACID BLENDER CONTROL, VALVE AND PUMP OPERATION (MONTHLY)
- OST-109 - CHEMICAL AND VOLUME CONTROL SYSTEM CHECK VALVE CVC-266 BACK LEAKAGE TEST (COLD SHUTDOWN GREATER THAN 48 HOURS, UNLESS PREVIOUSLY COMPLETED WITHIN NINETY DAYS)
- OST-161 - ACCUMULATOR ISOLATION AND CHECK VALVE OPERABILITY TEST (COLD SHUTDOWN)
- OST-255 - RHR AND SI SYSTEM CHECK VALVE TEST (REFUELING INTERVAL)
- OST-401 - EMERGENCY DIESELS (SLOW SPEED START) (BIWEEKLY)
- OST-409 - EMERGENCY DIESELS (RAPID SPEED START) (SEMI-ANNUALLY)
- OST-501 - MAIN STEAM ISOLATION VALVES (REFUELING)
- OST-551 - TURBINE VALVE AND TRIP FUNCTIONAL TEST (MONTHLY INTERVAL DURING POWER OPERATION)
- OST-553 - TURBINE MECHANICAL OVERSPEED TRIP TEST (REFUELING)

File Index #	Title

Data Pkg. No.	
	• OST-905 - RADIATION MONITORING SYSTEM (DAILY)
34.	Pressurizer Pressure Control Graphs and Special Project Report.
35.	Condensate Storage Tank Curve 8.4 - Gallons vs. Indicated Level; RWST Curve - Gallons vs. Indicated Level.
36.	N-31 and N-32 LP-703.
37.	Westinghouse Study of Main Steam Line Break at Hot Shutdown (H.B. Robinson).
38.	Ginna Comparison of Simulator to Plant Trip.
39.	Ginna Comparison of Simulator to Engineering Data for MSIVs Closure.
40.	Ginna Comparison of Simulator to Engineering Data for Maximum Rate Power Ramp.
41.	Ginna Comparison of Simulator to Engineering Data for LOCA.
42.	Transient Analysis for H.B. Robinson Simulator Project, WCAP 11202.
43.	WCAP 7844, Plant Startup Test Report.
44.	NUREG/CR-4966, Loss of Feedwater Overfill by AFW Pumps.
45.	Special Procedure 833, Testing of Pneumatically Controlled Components.
46.	100% steady state plant data.
47.	60% steady state plant data.
48.	Kewaunee License Event Reports (1986-1990)
49.	Point Beach Transients (LERs & RETRAN Analysis).
50.	H.B. Robinson Computer Analysis of Core Response to Drop/Recovery of Control Rods.

File Index #	Title

	Data Pkg. No.	
	51.	Shearon Harris Nuclear Training Simulator Validation Program Report.
	52.	Dropped Rod Transient Analysis for the H.B. Robinson Simulator Project, June 1986.
	53.	Post Trip/Safeguards Review Report, Main Generator Fire, Shearon Harris Nuclear Plant, 10/9/89.
	54.	Post Trip/Safeguards Review Report, RCP "C" Tripped Causing a Low Flow in One RC Loop Rx Trip @ 100% Power, Shearon Harris Nuclear Plant, 6/17/87.
	55.	CP&L H.B. Robinson Unit 2 ECCS Small Break Reanalysis.
	56.	Abnormal Occurrence Report, Failure of "C" RCP Seal System, H.B.R. Unit 2, 5/1/75.
	57.	Post Trip/Safeguards Review Report, PT-485 Removed From Service Causing LO-LO S/G Level Trip, H.B.R. Unit 2, 8/22/85.
	58.	Post Trip/Safeguards Review Report, Main Transformer Deluge Actuation Causing Fault Pressure Signal, 86P Generator Lockout and Turbine/Rx Trip, H.B.R. Unit 2, 9/11/85.
	59.	Post Trip/Safeguards Review Report, FC-414 in Test by I&C When Instrument Buss #2 Spike Occurred Causing 2/3 RC Loop 1 Low Flow Bistables & Rx Trip, H.B.R. Unit 2, 9/17/95.

63	H. B. Robinson Simulator Baseline Documents, CWDs, Safequards System Drawings, P&IDs, Logic Diagrams, RPS Drawings, and Block Diagrams
64	H. B. Robinson Plant Operating Manual and Plant Manuals (located in Simulator Control Room Area)
65	H. B. Robinson Plant ERFIS Documents (located in Computer Support Area)
66	H. B. Robinson Unit 2, Cycle 14, Startup and Operations Report
67	H. B. Robinson Unit 2, Feedwater Heaters, Heater Drain Tank, Turbine Lube Oil Reservoir and RCP Standpipe Drawings

APPENDIX E

SIMULATOR DEFICIENCIES AND PLANT MODIFICATIONS

SIMULATOR DEFICIENCIES AND PLANT MODIFICATIONS

This appendix contains the following flowpaths and forms that demonstrate the procedural control of simulator deficiencies and plant modifications:

1. Configuration Management Flow, (TI-217)

2. Plant Modification (PM), (SSP-217.1, Exhibit A)

3. Simulator Service Request (SSR), (SSP-217.1, Exhibit B)

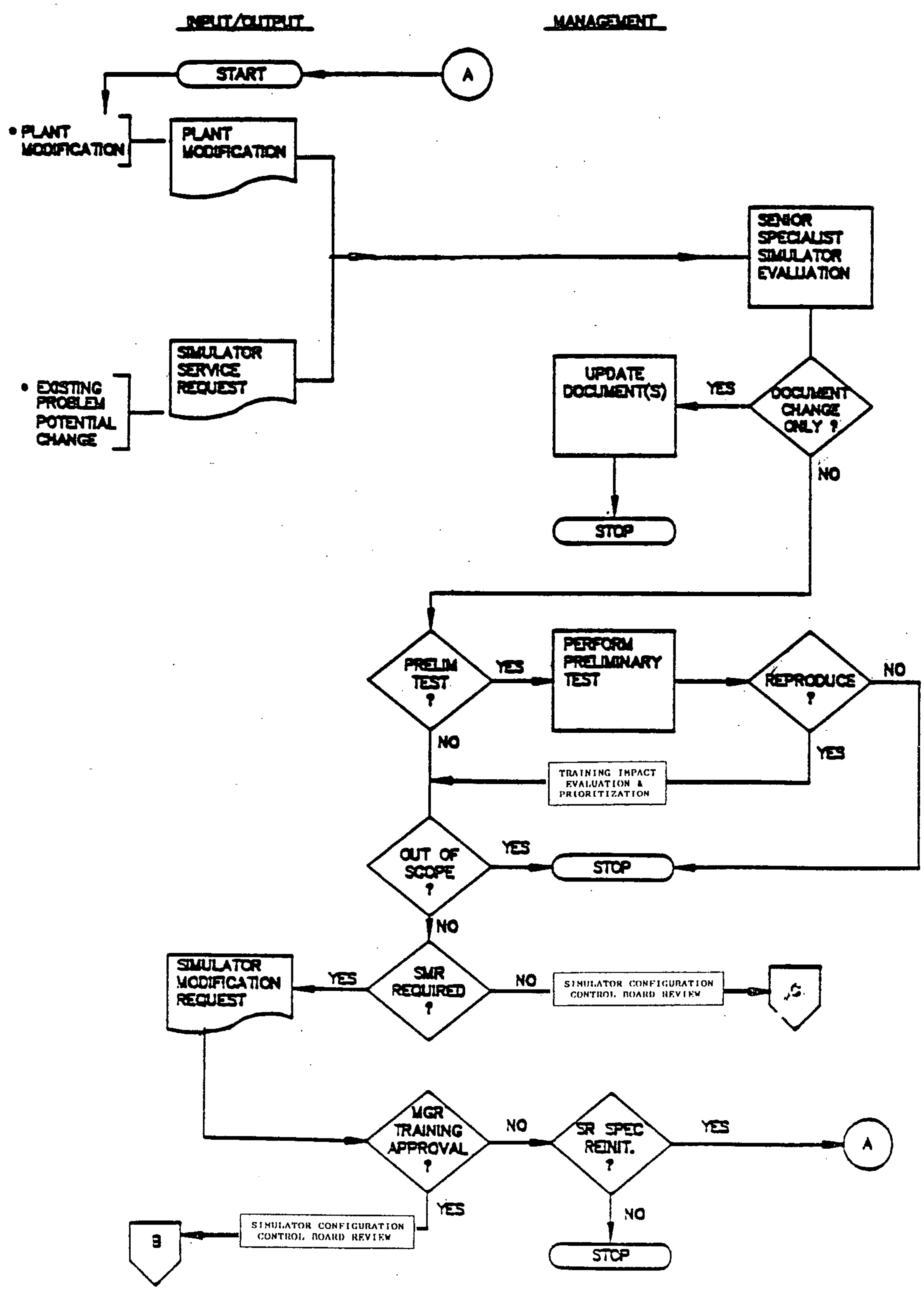
4. Simulator Modification Request (SMR), (SSP-217.2, Exhibit A)

5. Work Order, (SSP-217.2, Exhibit B)

6. Training Impact Evaluation Form (SSP-217.1 Exhibit C)

Each plant modification (PM) or identified deficiency results in the implementation of the Configuration Management Flowpath.
A Simulator Service Request (SSR) can be generated by any individual identifying a simulator problem. All plant modifications are reviewed for simulator applicability. In cases where a simulator modification is deemed necessary, a Simulator Modification Request (SMR) will be generated. In all cases, the Configuration Management System (CMS) will track the SSR, PM/SMR through all phases until completion. Major steps of this process include, initiating event (SSR,PM), CMS tracking activation, validation and verification of event, training impact evaluation, prioritization, work assignment, documentation update, and CMS tracking closeout.

CONFIGURATION MANAGEMENT FLOW



CONFIGURATION MANAGEMENT FLOW (CONTINUED)

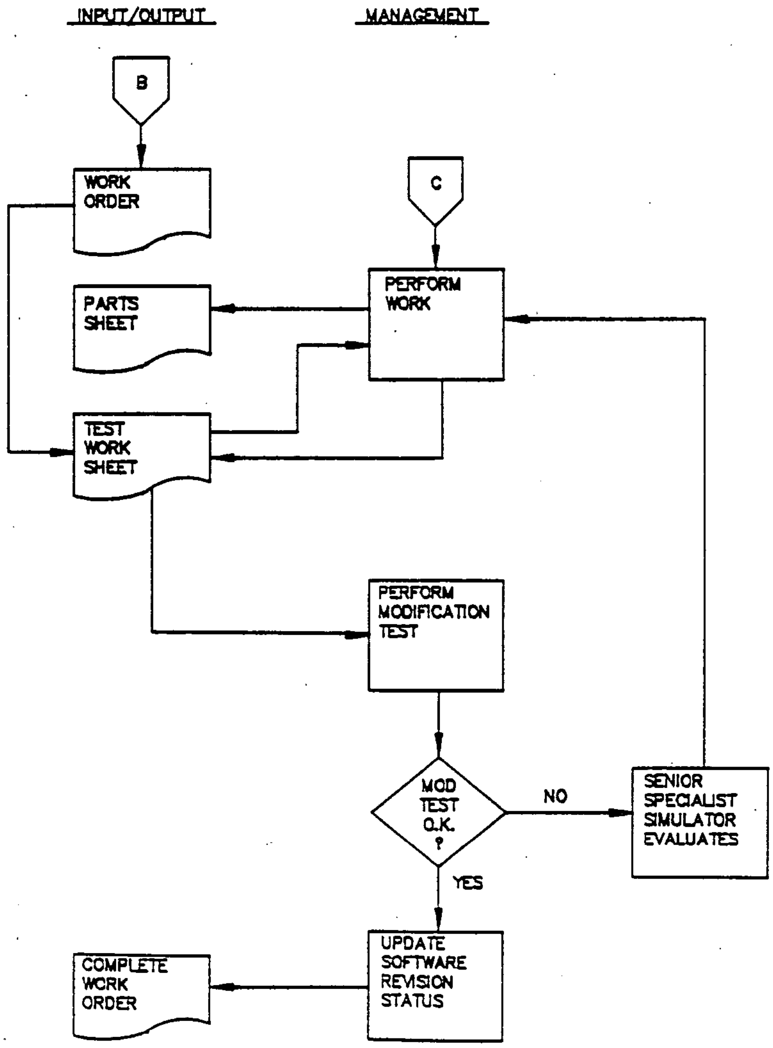


EXHIBIT A

CMS#___-______

PLANT MODIFICATION (PM) ENTRY DATE______

Section 1:

PLANT MODIFICATION NUMBER: ____________________ REV: ____

TITLE: ____________________

Section 2:

SYSTEM ____________

COMPLETE DESCRIPTION OF PLANT MODIFICATION: ____________

REVIEW OF PLANT MODIFICATION

PRELIMINARY TEST REQUIRED: YES [ ] NO [ ]

PRELIMINARY TEST RESULTS: ____________

[ ] NOT APPLICABLE

[ ] APPLICABLE

REVIEWER COMMENTS: ______________________________

REVIEWER SIGNATURE: ______________________ DATE: ________

APPROVAL SIGNATURE: ______________________ DATE: ________

EXHIBIT B

CMS# _____-_______

SIMULATOR SERVICE REQUEST (SSR) ENTRY DATE ________

Section 1:

TITLE: ____

INITIATOR NAME: ______________________ DATE:___/___/___

IC NUMBER: _______________

REFERENCE DOCUMENTS: ______________________________

____

DETAILED DESCRIPTION OF PROBLEM: ___________________

____

____

____

____

Section 2:

EVALUATION OF SIMULATOR SERVICE REQUEST

PRELIMINARY TEST REQUIRED? YES [ ] NO [ ]

PRELIMINARY TEST RESULTS: __________________________

____

____

____

____

REPRODUCED [ ] NOT REPRODUCED [ ]

SSR EVALUATOR RECOMMENDATION

OUT OF SCOPE [ ] CANNOT REPRODUCE [ ] MAINTENANCE OR REPAIR [ ]

SIMULATOR MODIFICATION REQUEST [ ]

SYSTEM: ______________ PRIORITY (1-4) __________

EXISTING PROBLEM [ ] POTENTIAL CHANGE [ ]

DESCRIBE WHY: ____

____

____

MAINTENANCE OR REPAIR: SOFTWARE [ ] HARDWARE [ ] HW & SW [ ]

TEST WORKSHEET COMPLETE: __________ SYSTEM DOCUMENTATION [ ]

EVALUATOR SIGNATURE: ________________________ DATE: ______________

Section 3:

ACTION INITIATION DATE: ____________

ACTION TAKEN:

SYSTEM(S) EFFECTED: ____

DOCUMENT(S) REVISED: ____

DESCRIBE IN DETAIL ACTION TAKEN ON PAGE THREE.

NAME:____ DATE:_________HOURS:____

Section 4:

	INITIALS	DATE	
TESTS COMPLETE & SATISFACTORY:	_______	_______	N/A [ ]
TEST WORKSHEET ATTACHED [ ]			
SOFTWARE REVISION STATUS UPDATE:	_______	_______	N/A [ ]
SOFTWARE DOCUMENT UPDATE COMPLETE:	_______	_______	N/A [ ]
HARDWARE DOCUMENT UPDATE COMPLETE:	_______	_______	N/A [ ]

ACTION COMPLETE DATE: ______________

TOTAL HOURS ______________

WORK PERFORMED BY: ________________________

CMS# _____-_______

SIMULATOR SERVICE REQUEST (SSR)

ACTION TAKEN: ____

EXHIBIT A

SIMULATOR MODIFICATION REQUEST

CMS#___-__________

Entry Date________

SECTION 1:

PLANT MOD NUMBER (IF APPLICABLE):____________________

TITLE:____________________

____

SECTION 2:

THE SMR AFFECTS THE FOLLOWING:

CONTROL ROOM: INDICATIONS [ ] CONTROLS [ ] COMPONENTS [ ]

OUTSIDE CONTROL ROOM: INDICATIONS [ ] CONTROLS [ ] COMPONENTS [ ]

SYSTEM FLOW PATH [ ] CONTROL LOGIC/POWER [ ]

EXPLAIN ALL YES CHECKS (IDENTIFIED DIFFERENCES):

____

____

____

____

____

____

____

CHECK IF ANSI 3.5 IMPACT [ ]

DESCRIBE ANSI IMPACT:____________________

____

____

____

____

____

____

ESTIMATED HOURS		ESTIMATED MATERIAL COST	
SOFTWARE	________		
HARDWARE	________	HARDWARE	__________
OPERATIONS	________		
TOTAL EST. HOURS	________		

REMARKS: ______________________________

____

____

____

____

____

____

____

RECOMMEND: YES [ ] NO [ ] ______________________ DATE: / /
EVALUATOR

REVIEW/APPROVAL OF SIMULATOR MODIFICATION REQUEST

AGREE [ ] DISAGREE [ ] REVIEWER: ______________________ DATE: / /
MANAGER - SIMULATOR

AGREE [ ] DISAGREE [ ] APPROVAL: ______________________ DATE: / /
MANAGER - TRAINING

REVIEW/APPROVAL REMARKS: ______________________________

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____

____

WORK ORDER REQUEST: ______________________________

____

____

____

EXHIBIT B

WORK ORDER

WO#________

Entry Date______

Section 1:

TITLE:____

____

PLANT MOD NUMBER (IF APPLICABLE):____________________

Section 2:

SCHEDULED COMPLETION DATE: ___/___/___ SOFTWARE ( ) HARDWARE ( )

AFFECTED PLANT REFERENCE MATERIAL:

____________________ ____________________

____________________ ____________________

____________________ ____________________

____________________ ____________________

____________________ ____________________

____________________ ____________________

____________________ ____________________

____________________ ____________________

DESCRIPTION OF WORK:____

____

____

____

____

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____

TEST WORK SHEET INITIATED:________

Section 3:

ACTION TAKEN: ______________________________

ENTRY COMPLETED BY: ______________

SYSTEM(S) AFFECTED: ______________ ______________ ______________

SOFTWARE REV. STATUS UPDATE COMPLETE: __/__/__ INITIALS: ________

WORK COMPLETE DATE: __/__/__ INITIALS: ________

SIMULATOR DOCUMENTATION AFFECTED:

Section 4:

TESTS COMPLETE & SATISFACTORY: __/__/__ INITIALS: ________ WO LOG: ________

SYSTEM DIAGRAM UPDATE COMPLETE: __/__/__ INITIALS: ________

SOFTWARE DOC. UPDATE COMPLETE: __/__/__ INITIALS: ________

WORK ORDER COMPLETE: __/__/__ INITIALS: ________

TOTAL HOURS USED: ________ WORK PERFORMED BY: ______________

WORK ORDER REVIEW COMPLETE: ______________ DATE: __/__/__

MANAGER - SIMULATOR

EXHIBIT C

TRAINING IMPACT EVALUATION FORM

SSR/SMR# _________ - _________ **SYSTEM:** ___________

PRIORITY: _________ **TRAINING IMPACT:** ___________

PLANT MODIFICATION # ___________________
(If applicable)

Recommended By: ____________________________________ **Date:** / /
Senior Specialist - Simulator

Copy of SSR/SMR and this form sent to:

1) **Manager - License Training** _________ **Initials**

2) **Unit #2 Operations Manager** _________ **Initials**

Approved By: ____________________________________ **Date:** / /
Chairman Simulator Configuration Control Board (SCCB)

SSR/SMR Action Complete Date: / /

Manager - License Training: _________ **Initials**

Unit #2 Operations Manager Informed: _________ **Initials**

Chairman SCCB Informed: _________ **Initials**

Note: Priority assigned per SSP 217.5
Training Status Assigned per SSP 217.1

Distribution:

Al Sanders
Steve Allen
Ray Chambers

APPENDIX F

CERTIFICATION
PERSONNEL QUALIFICATIONS

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Richard S. Allen

TITLE: Manager - License Training

EDUCATION: Basic Electrical and Electronics, Electricians Mate "A" School, Nuclear Power School, Nuclear Power Training Unit, Submarine School, Regulators and Circuit Breakers, 64KW Motor Generator Set, Electronics Technology I & II - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO Certification, Carolina Power & Light Co., H. B. Robinson Plant
- SRO License, Carolina Power & Light Co., H. B. Robinson Plant
- RO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 22

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Charles A. Bethea

TITLE: Manager - Training

EDUCATION: ET-A School and Nuclear Power School (U.S. Navy)

LICENSES/CERTIFICATIONS:

- RO Cold License, Carolina Power & Light Co., H. B. Robinson Plant
- SRO Hot License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT
NUCLEAR EXPERIENCE: 27

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: William M. Blaisdell

TITLE: Senior Specialist - Simulator

EDUCATION: Engineman School, Nuclear Power School, Nuclear Prototype & ELT School - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO Certification, Carolina Power & Light Co., H. B. Robinson Plant
- SRO License, Carolina Power & Light Co., H. B. Robinson Plant
- RO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 27

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Ray H. Chambers

TITLE: Manager - Operations - H. B. Robinson - Nuclear

EDUCATION: B.S. Degree/Nuclear Engineering - North Carolina State University

LICENSES/CERTIFICATIONS:

- SRO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 18

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Stephen M. Dean

TITLE: Senior Operations Consultant

EDUCATION: Nuclear Engineering Technology Specialization - Thomas A. Edison State College (92 Credit Hours)
A.S. Degree - Charter Oak College

LICENSES/CERTIFICATIONS:

- SRO Certification, Georgia Power Company, Plant Vogtle
- SRO Certification, Combustion Engineering, Inc.
- RO License, Carolina Power & Light Company, H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 12

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: William K. Drane

TITLE: Project Specialist

EDUCATION: B.S., Physics/B.S., Chemistry - Butler University
Nuclear Power School and Prototype - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO Certification, Carolina Power & Light Co., Shearon Harris Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 12

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Robert L. Lewis

TITLE: Senior Operations Consultant

EDUCATION: Business Administration - Tennessee Polytechnic Institute University of Tennessee Evening School (1958-1962) Various TVA Training Schools

LICENSES/CERTIFICATIONS:

- SRO License, Sequoyah Nuclear Plant
- SRO Certification (AEC), Oak Ridge National Lab

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 33

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: David A. Neal

TITLE: Senior Specialist - Operator Training

EDUCATION: A.S. Degree - University of New York

LICENSES/CERTIFICATIONS:

- SRO Certification, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 7

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Mitchell A. Rodger

TITLE: Principle Specialist

EDUCATION: Licensing & Certification Classes, Rancho Seco Plant

LICENSES/CERTIFICATIONS:

- SRO Certification, Sacramento Municipal Utility District, Rancho Seco Plant
- RO License, Sacramento Municipal Utility District, Rancho Seco Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 7

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Alson C. Sanders

TITLE: Manager - Simulator

EDUCATION: B.S. Degree - University of South Carolina

LICENSES/CERTIFICATIONS:

- SRO Certification, Carolina Power & Light Co., H. B. Robinson Plant
- SRO Certification, Carolina Power & Light Co., Shearon Harris Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 19

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Victor L. Smith

TITLE: Senior Specialist - Operator Training

EDUCATION: U.S. Naval Power School & Naval Nuclear Power Training - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 20

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Richard R. Stebbins

TITLE: Senior Specialist - Operator Training

EDUCATION: Basic Electricity School, Electronics School, Electricians "A" School, Navy Nuclear Power School & Nuclear Prototype Training - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 20

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Robert A Steele

TITLE: Shift Foreman - Nuclear

EDUCATION: Electrician's Mate "A" School, Basic Nuclear Power School, NPTU Prototype, Electronic Technology - U.S. Navy

LICENSES/CERTIFICATIONS:

- SRO License, Carolina Power & Light Co., H. B. Robinson Plant
- RO License, Carolina Power & Light Co., H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 19

CERTIFICATION PERSONNEL QUALIFICATIONS

NAME: Allen R. Wallace

TITLE: Operations Coordinator

EDUCATION: B.S. Degree/Nuclear Engineering - North Carolina State University

LICENSES/CERTIFICATIONS:

- SRO License, Carolina Power & Light Company, H. B. Robinson Plant

YEARS OF RELEVANT NUCLEAR EXPERIENCE: 17

APPENDIX G

CROSS REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL AIR1	ACT,1000,0,60	CV air header break	RO/SRO-SE-004	LOSS OF INSTRUMENT AIR
MAL AIR1A	ACT,1000,1	CV air header break	LOR-SS-24	LOSS OF INSTRUMENT AIR
MAL AIR1A	0-1000 scfm/0-3600 sec	LOSS OF IA TO CONTAINMENT HDR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL AIR1B	ACT,500	TB air header leak	SR-SE-030	LOSS OF INSTRUMENT AIR
MAL AIR1B	0-1000 scfm/0-3600 sec	LOSS OF IA TO AUX. BLDG HDR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL AIR1B	ACT,1000,1	AB air header break	LOR-SS-24	LOSS OF INSTRUMENT AIR
MAL AIR1C	ACT,1000	TB air header leak	SR-SE-030	LOSS OF INSTRUMENT AIR
MAL AIR1C	0-1000 scfm/0-3600 sec	LOSS OF IA TO TURB BLDG HDR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL AIR1C	ACT,?,?	IA leak in turbine building	RO-SE-049	LOSS OF INSTRUMENT AIR
MAL AIR1C	ACT,1000,1	TB air header break	LOR-SS-24	LOSS OF INSTRUMENT AIR
MAL AIR2A		LOSS OF IA COMPRESSOR A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL AIR2A	ACT,60	IA compressor A trip	RO/SRO-SE-004	LOSS OF INSTRUMENT AIR
MAL AIR2A	0-1000 scfm/0-3600 sec	LOSS OF IA COMPRESSOR A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL AIR2B	ACT,60	IA compressor B trip	RO/SRO-SE-004	LOSS OF INSTRUMENT AIR
MAL AIR2B		LOSS OF IA COMPRESSOR B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL AIR2C		LOSS OF IA COMPRESSOR C	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL AIR2D		LOSS OF PRIMARY AIR COMPRESS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL AIR2E		LOSS OF SERVICE AIR COMPRESS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW1A	ACT	CCW pump A trip	RO-SE-061	LOSS OF COMPONENT COOLING WATER
MAL CCW1A	ACT,180	CCW pump A trip	RO/SRO-SE-002	EXCESSIVE RCS LEAKAGE
MAL CCW1A		CCW PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW1A	ACT,10	CCW pump A trip	LOR-SE-89-14	SIMULATOR EXAM 89-14
MAL CCW1A			AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW1A-C	ACT	CCW pump trip	RO-SE-068	SGTR WITH SG SAFETY VALVE FAILED OPEN
MAL CCW1A-C	ACT	CCW pump trip	LOR-SE-89-12	SIMULATOR EXAM 89-12
MAL CCW1A/B/	ACT	CCW pump trip	SR-SE-017	SG PORV FAILING OPEN WITH BLACKOUT
MAL CCW1B	ACT,300	CCW pump B trip	LOR-SS-18	LOSS OF SHUTDOWN COOLING
MAL CCW1B		CCW PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW1C		CCW PUMP C TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW2A	0-100%/1-3600 sec	LOSS CCW TO RHR HX A - 749A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW2B	0-100%/1-3600 sec	LOSS CCW TO RHR HX B - 749B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW3	ACT	CCW to SW leak	JPM-CR-032	RESPOND TO CCW SURGE TANK LEVEL ALARM
MAL CCW3A	ACT,1000,0,0,PR<50	CCW leak to SW	SR-SE-029	LOSS OF COMPONENT COOLING WATER

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CCW3A	0-1000 gpm/0-3600 sec	CCW LEAK TO SW - HX A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW3B	ACT,1000,0,0,PR<50	CCW leak to SW	SR-SE-029	LOSS OF COMPONENT COOLING WATER
MAL CCW3B	0-1000 gmp/0-3600 sec	CCW LEAK TO SW - HX B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW4A	0-100%/0-3600 sec	CCW TO RCPs - CC-716A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW4A	ACT,0,2	Shut CC-716A (CCW to RCPs)	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL CCW4B	0-100%/0-3600 sec	CCW TO RCPs - CC-716B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW5A	0-100 gpm/0-3600 sec	REACTOR COOLANT HX LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW5B	0-100 gpm/0-3600 sec	PRESS LIQUID SAMPLE HX LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW5C	0-100 gpm/0-3600 sec	PRESS STEAM SAMPLE HX LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW5D	0-100 gpm/0-3600 sec	SG BLOWDOWN SAMPLE HX A LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW5E	0-100 gpm/0-3600 sec	SG BLOWDOWN SAMPLE HX B LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW5F	0-100 gpm/0-3600 sec	SG BLOWDOWN SAMPLE HX C LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW6	0-2000 gpm/0-3600 sec	RUPTURE CCW LINE INSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW6	ACT,560,10	560 gpm CCW leak in CV	LOR-SS-22	STEAM GENERATOR TUBE RUPTURE
MAL CCW6	ACT,1500,500	CCW rupture in CV	LOR-SE-89-14	SIMULATOR EXAM 89-14
MAL CCW7A	0-50 gpm/0-3600 sec	RCP A UPPER BRG OIL CLR LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW7B	0-50 gpm/0-3600 sec	RCP A LOWER BRG OIL CLR LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW7C	0-50 gpm/0-3600 sec	RCP B UPPER BRG OIL CLR LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW7D	0-50 gpm/0-3600 sec	RCP B LOWER BRG OIL CLR LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW7E	0-50 gpm/0-3600 sec	RCP C UPPER BRG OIL CLR LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW7F	0-50 gpm/0-3600 sec	RCP C LOWER BRG OIL CLR LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CCW8	ACT,100	TCV-144 failure	RO-SE-064	INADEQUATE CORE COOLING
MAL CCW8	0(o)-100%(c)/0-3600 sec	TCV-144 CONTROLLER FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW10A	ACT,90,0,0,RFWHV26A	V2-6A SG A FW isol valve fail	RO/SRO-SE-006	MAIN STEAM BREAK/EXCESSIVE FEEDWATER
MAL CFW10A	0-100%/0-3600 sec	FW ISOLATION VLV V2-6A FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW10B	0-100%/0-3600 sec	FW ISOLATION VLV V2-6B FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW10C	0-100%/0-3600 sec	FW ISOLATION VLV V2-6C FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW11	0-100%/0-3600 sec	COND POLISHING SYSTEM BLOCKED	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW12A	ACT	Heater drain pump A trip	LOR-SS-08	LOSS OF LETDOWN/LOSS OF HEATER DRAIN PUMPS
MAL CFW12A		HEATER DRAIN PUMP 1A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW12A/B	ACT,0,FNISPR.GT.85	Heater drain pump trips	RO-SE-019	ATWS
MAL CFW12B	ACT	Heater drain pump B trip	LOR-SS-08	LOSS OF LETDOWN/LOSS OF HEATER DRAIN PUMPS
MAL CFW12B		HEATER DRAIN PUMP 1B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CFW13A	0-1E6 lbm/hr/0-3600 sec	HP FW HEATER 6A TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW13B	0-1E6 lbm/hr/0-3600 sec	HP FW HEATER 6B TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14A	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 1A TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14A	ACT,1E6,1800	LP FW HTR 1A tube rupture	RO-SE-061	LOSS OF COMPONENT COOLING WATER
MAL CFW14B	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 1B TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14C	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 2A TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14D	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 2B TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14E	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 3A TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14E	ACT,1E6,900,40	LP HTR 3A tube leak	RO/SRO-SE-002	EXCESSIVE RCS LEAKAGE
MAL CFW14F	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 3B TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14G	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 4A TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14H	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 4B TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14I	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 5A TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW14J	0-1E6 lbm/hr/0-3600 sec	LP FW HEATER 5B TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW15A	ACT	MFW pump A trip	LOR-SS-04	MAIN FEEDWATER PUMP TRIP/MANUAL RUNBACK
MAL CFW15A		MFW PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW15A/B	ACT	MFW pump trip	SR-SE-024	ATWS WITH EJECTED ROD
MAL CFW15A/B	ACT,0,FNISPR.GE.80	MFW pump trip	SR-SE-004	STEAM GENERATOR TUBE RUPTURE
MAL CFW15A/B	ACT,120	MFW pump trip	RO-SE-039	ATWS WITH LOSS OF FW/EJECTED ROD
MAL CFW15B		MFW PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW16A	0-100%/0-3600 sec	FW PMP A RECIRC VLV FCV-1444	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW16B	0-100%/0-3600 sec	FW PMP B RECIRC VLV FCV-1445	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW17A	AC,100,120,0,JMLMSS9	LCV-478 (SG A FCV) fails open	RO/SRO-SE-006	MAIN STEAM BREAK/EXCESSIVE FEEDWATER
MAL CFW17A	ACT,100	SG A FCV fails 100% open	SR-SE-025	LOSS OF ALL AC WITH LOCA 1
MAL CFW17A	ACT,100,?,60	LCV-478 (SG A FCV) fails open	RO/SRO-SE-005	EXCESSIVE FEEDWATER/ATWS
MAL CFW17A	0-100%/0-3600 sec	FW CONTROL VLV (478) POSITION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW17A-C	ACT,10	MFW FCV failed at 10%	SR-SE-004	STEAM GENERATOR TUBE RUPTURE
MAL CFW17A-C	ACT,0	FCV fails closed	RO-SE-037	STEAM GENERATOR TUBE RUPTURE
MAL CFW17A-C	ACT,0	MFW FCV fails shut	RO-SE-043	LOSS OF CONDENSER VACUUM
MAL CFW17A-C	ACT,?	MFW FCV failure	SR-SE-018	MISALIGNED CONTROL ROD
MAL CFW17B	ACT,100,10	FCV-488 fails open	LOR-SS-05	SG OVERFEED/PARTIAL LOSS OF AC POWER
MAL CFW17B	ACT,0,60	B MFW reg. valve fails shut	LOR-SS-07	ANTICIPATED TRANSIENT WITHOUT SCRAM
MAL CFW17B	0-100%/0-3600 sec	FW CONTROL VLV (488) POSITION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CFW17C	0-100%/0-3600 sec	FW CONTROL VLV (498) POSITION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW18A	0-1.2E7 lb/hr/0-3600 sec	FEEDLINE BREAK IN CV TO SG A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW18B	0-1.2E7 lb/hr/0-3600 sec	FEEDLINE BREAK IN CV TO SG B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW18C	0-1.2E7 lb/hr/0-3600 sec	FEEDLINE BREAK IN CV TO SG C	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW19		TOTAL LOSS OF FEEDWATER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW19	ACT	Total loss of feedwater	JPM-CR-015	ESTABLISH RCS BLEED AND FEED
MAL CFW19	ACT	Total loss of feedwater	SR-SE-010	LOSS OF HEAT SINK
MAL CFW19	ACT	Loss of all feedwater	RO-SE-069	LOSS OF HEAT SINK
MAL CFW19	ACT	Total loss of feedwater	LOR-SS-23	LOSS OF ALL FEEDWATER
MAL CFW1A		MOTOR-DRIVEN AFW PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW1A	ACT	MD AFW pump A trip	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL CFW1B	ACT	MD AFW pump B trip	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL CFW1B		MOTOR-DRIVEN AFW PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW1C	ACT	Trip SD AFW pump	LOR-SS-05	SG OVERFEED/PARTIAL LOSS OF AC POWER
MAL CFW1C	ACT	TD AFW pump trip	RO-SE-064	INADEQUATE CORE COOLING
MAL CFW1C	ACT	TD AFW pump trip	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL CFW1C	ACT	SD AFW pump trip	LOR-SS-15	LOSS OF OFFSITE POWER WITH FAILURE OF EDG B
MAL CFW1C		TURBINE-DRIVEN AFW PUMP TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW2	0-2000 rpm/0-3600 sec	TD AFW PUMP SPEED CONTROL OSC	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW20A		INADVERTENT FW ISOL. FROM SG	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW20A-C	ACT	Spurious MFW isolation	RO-SE-035	STARTUP WITH MALFUNCTIONS
MAL CFW20B		INADVERTENT FW ISOL. FROM SG	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW20C		INADVERTENT FW ISOL. FROM SG	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW21		SG HIGH LEVEL TRIP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW22A	0-1.2E7 lb/hr/0-3600 sec	FW A BREAK-FLOW DET & CH VLV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW22B	0-1.2E7 lb/hr/0-3600 sec	FW B BREAK-FLOW DET & CH VLV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW22C	0-1.2E7 lb/hr/0-3600 sec	FW C BREAK-FLOW DET & CH VLV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW23A	0-1.2E7 lb/hr/0-3600 sec	FW A BREAK-REG VLV & FLOW DET	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW23B	0-1.2E7 lb/hr/0-3600 sec	FW B BREAK-REG VLV & FLOW DET	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW24	ACT,1.2E7	Large MFW header break	RO-SE-064	INADEQUATE CORE COOLING
MAL CFW24	ACT,1E6,30	MFW header break	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL CFW24	0-1.2E7 lb/hr/0-3600 sec	FEEDLINE BREAK IN MFW HEADER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW24	ACT,1.2E7,5	MFW line break (1.2E7 lbm/hr)	LOR-SS-23	LOSS OF ALL FEEDWATER

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CFW24	ACT,1.2E7	Large MFW header break	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL CFW25A	0-1.2E7 lb/hr/0-3600 sec	FW LEAK BEFORE HP FW HTR 6A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW25B	0-1.2E7 lb/hr/0-3600 sec	FW LEAK BEFORE HP FW HTR 6B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW26A	0-1.2E7 lb/hr/0-3600 sec	LEAK AT DISCHARGE OF FW PUMP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW26B	0-1.2E7 lb/hr/0-3600 sec	LEAK AT DISCHARGE OF FW PUMP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW27	0-100%/0-3600 sec	COND PUMP RECIRC VLV FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW28A	ACT,?,100	MFW pump lube oil leak	RO-SE-041	REACTOR STARTUP/CVCS MALFUNCTIONS
MAL CFW28A	0-20 gpm/0-3600 sec	LOSS LUBE OIL ON MFW PUMP A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW28B	0-20 gpm/0-3600 sec	LOSS LUBE OIL ON MFW PUMP B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW29	0-10000 gpm/0-3600 sec	CONDENSATE STORAGE TANK LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW3A	0-1E5 lbm/hr/0-3600 sec	TD AFW STM SUPPLY LEAK - SG A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW3B	0-1E5 lbm/hr/0-3600 sec	TD AFW STM SUPPLY LEAK - SG B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW3C	0-1E5 lbm/hr/0-3600 sec	TD AFW STM SUPPLY LEAK - SG C	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW4A	0-900 gpm/0-3600 sec	AFW LINE A RUPTURE OUTSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW4B	0-900 gpm/0-3600 sec	AFW LINE B RUPTURE OUTSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW4C	0-900 gpm/0-3600 sec	AFW LINE C RUPTURE OUTSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW5A	0-900 gpm/0-3600 sec	AFW LINE A RUPTURE INSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW5B	0-900 gpm/0-3600 sec	AFW LINE B RUPTURE INSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW5C	0-900 gpm/0-3600 sec	AFW LINE C RUPTURE INSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW6A	0-100%/0-3600 sec	AFW ISOLATION VLV V2-16A FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW6B	0-100%/0-3600 sec	AFW ISOLATION VLV V2-16B FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW6C	0-100%/0-3600 sec	AFW ISOLATION VLV V2-16C FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW7A	0-100%/0-3600 sec	FW BYPASS VLV FCV-479 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW7B	0-100%/0-3600 sec	FW BYPASS VLV FCV-489 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW7C	0-100%/0-3600 sec	FW BYPASS VLV FCV-499 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW8	0-100%/0-3600 sec	TD AFW FLOW CONTROL VLV FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW9A		CONDENSATE PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CFW9B		CONDENSATE PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND1A	0-1000 gpm/0-3600 sec	CONDENSER A (BOX 1) TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND1B	0-1000 gpm/0-3600 sec	CONDENSER A (BOX 2) TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND1C	0-1000 gpm/0-3600 sec	CONDENSER B (BOX 1) TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND1D	0-1000 gpm/0-3600 sec	CONDENSER B (BOX 2) TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND2	ACT,1000,2700	Condenser air in-leakage	SR-SE-018	MISALIGNED CONTROL ROD

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CND2	ACT,325,1800	Condenser air in-leakage	RO-SE-043	LOSS OF CONDENSER VACUUM
MAL CND2	0-1000 scfm/0-3600 sec	CONDENSER AIR IN-LEAKAGE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND2	ACT,?,?	Condenser air in-leakage	SR-SE-026	BLACKOUT
MAL CND2	ACT,1000,120	Condenser air in-leakage	LOR-SS-13	LOSS OF INSTRUMENT BUS3/LOWERING VACUUM
MAL CND2	ACT,375,90	Loss of condenser vacuum	LOR-SE-89-05	SIMULATOR EXAM 89-5
MAL CND2	ACT,500	Loss of condenser vacuum	LOR-SE-89-05	SIMULATOR EXAM 89-5
MAL CND3A		LOSS CONDENSER VACUUM PUMP A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND3B		LOSS CONDENSER VACUUM PUMP B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND4A		VACUUM PUMP A BROKEN SHAFT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND4B		VACUUM PUMP B BROKEN SHAFT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CND5	0-56 inches/0-3600 sec	HOTWELL LEVEL CONTROLLER FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CNS1A		FALSE CV SPRAY ACTUATION TRN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CNS1B		FALSE CV SPRAY ACTUATION TRN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CNS2A	ACT	CV spray pump A failure	LOR-SS-01	LARGE BREAK LOSS OF COOLANT ACCIDENT
MAL CNS2A		CV SPRAY PUMP A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CNS2A	ACT	CV spray pump A trips	LOR-SS-21	STEAM BREAK DURING REACTOR STARTUP
MAL CNS2B	ACT	CV spray pump B failure	LOR-SS-01	LARGE BREAK LOSS OF COOLANT ACCIDENT
MAL CNS2B	ACT	CV spray pump B trips	LOR-SS-21	STEAM BREAK DURING REACTOR STARTUP
MAL CNS2B		CV SPRAY PUMP B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CNS3A	0-1800 gpm/0-3600 sec	CV SPRAY PUMP A DISCH LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CNS3B	0-1800 gpm/0-3600 sec	CV SPRAY PUMP B DISCH LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF1	1=1AC,2=2AC,3=1BD,4=2BD	POWER CABINET URGENT FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF10A	ACT,4,?	Shorted IRPI secondary coil	RO-SE-048	STEAM DUMP FAILURE
MAL CRF10A	PCO,PCS,SCO,SCS,BO,BS/ROD	IRPI OPEN OR SHORTED COIL (1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF10B	PCO,PCS,SCO,SCS,BO,BS/ROD	IRPI OPEN OR SHORTED COIL (2)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF10C	PCO,PCS,SCO,SCS,BO,BS/ROD	IRPI OPEN OR SHORTED COIL (3)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF10D	PCO,PCS,SCO,SCS,BO,BS/ROD	IRPI OPEN OR SHORTED COIL (4)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF11A	ACT,150	Improper bank A to B overlap	SR-SE-003	REACTOR STARTUP WITH MALFUNCTIONS
MAL CRF11A	0-612 steps	IMPROPER BANK OVERLAP (A&B)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF11B	0-612 steps	IMPROPER BANK OVERLAP (B&C)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF11C	0-612 steps	IMPROPER BANK OVERLAP (C&D)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF11C	ACT,334	Improper bank C to D overlap	RO-SE-072	REACTOR STARTUP FOR RO CERTIFICATION 2
MAL CRF12	ACT,C1	Step counter failure	RO-SE-071	REACTOR STARTUP FOR RO CERTIFICATION 1

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CRF12	A1,A2,B1,B2,C1,C2,D1,D2	STEP COUNTER FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF13	0-10 degrees F	ROD SPEED DEADBAND FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF14A		IR ROD STOP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF14B		PR ROD STOP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF14C		OTDT ROD STOP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF14D		OPDT ROD STOP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF14E		ROD BOTTOM ROD STOP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF14F		LOW POWER ROD STOP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF14G		NIS ROD DROP ROD STOP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF15	-10/+10 degrees F	T-AVE SUMMER FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF16A		LOSS OF ROD DRIVE MG SET A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF16B	ACT	B rod drive MG set trips	RO-SE-073	REACTOR STARTUP FOR RO CERTIFICATION 3
MAL CRF16B		LOSS OF ROD DRIVE MG SET B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF17	1=1AC,2=2AC,3=1BD,4=2BD	LOSS OF POWER TO PWR CABINET	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF18A	ROD (K14,etc)/0-228 step	BENT SHAFT ON ROD (1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF18B	ROD (K14,etc)/0-228 step	BENT SHAFT ON ROD (2)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF18C	ROD (K14,etc)/0-228 step	BENT SHAFT ON ROD (3)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF18D	ROD (K14,etc)/0-228 step	BENT SHAFT ON ROD (4)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF2	ACT,0,XT:CBDD.GE.128	Rods fail to move	SR-SE-029	LOSS OF COMPONENT COOLING WATER
MAL CRF2	ACT,120	Rods fail to move	RO-SE-021	DROPPED ROD
MAL CRF2	ACT	Failure of rods to move	RO-SE-069	LOSS OF HEAT SINK
MAL CRF2	ACT	Rods fail to move	LOR-SE-89-04	SIMULATOR EXAM 89-4
MAL CRF2	ACT	Rods fail to move	LOR-SE-89-07	SIMULATOR EXAM 89-7
MAL CRF2		RODS FAIL TO MOVE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF3A	ACT,?	Dropped rod	RO-SE-057	LOCA AND DROPPED ROD
MAL CRF3A	ACT,?	Dropped rod	RO-SE-066	INADVERTANT MSIV CLOSURE
MAL CRF3A	ACT,?	Dropped rod	SR-SE-006	DROPPED ROD
MAL CRF3A	ACT,G3	Dropped rod	LOR-SE-89-03	SIMULATOR EXAM 89-3
MAL CRF3A	ACT,F14	Dropped rod	LOR-SS-17	DROPPED ROD/PZR SAFETY VALVE LEAK
MAL CRF3A	ROD (K14,F2,etc)	DROPPED ROD (SELECTION 1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF3A-D	ACT,(any rod),30	Dropped rod	RO-SE-021	DROPPED ROD
MAL CRF3B	ACT,C9	Dropped rod	LOR-SE-89-03	SIMULATOR EXAM 89-3
MAL CRF3B	ROD (K14,F2,etc)	DROPPED ROD (SELECTION 2)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CRF3C	ROD (K14,F2,etc)	DROPPED ROD (SELECTION 3)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF3D	ROD (K14,F2,etc)	DROPPED ROD (SELECTION 4)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF4A	ACT,?,?	Stuck control rod	SR-SE-018	MISALIGNED CONTROL ROD
MAL CRF4A	ACT,2,?	Stuck shutdown rod	RO-SE-043	LOSS OF CONDENSER VACUUM
MAL CRF4A	ACT,D8	Rod D8 stuck	JPM-CR-036	CONTROL ROD MISALIGNMENT
MAL CRF4A	ACT,2,H8	Rod H8 stuck	LOR-SS-21	STEAM BREAK DURING REACTOR STARTUP
MAL CRF4A	ACT,2,J13	Rod J13 stuck	LOR-SS-09	SMALL LOSS OF COOLANT ACCIDENT
MAL CRF4A	1=TRIP,2=UNTRIP/ROD (K14)	STUCK ROD (SELECTION 1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF4A	ACT,2,H12	Rod H12 stuck	LOR-SS-16	MISALIGNED CONTROL ROD/RCP SEAL FAILURE
MAL CRF4A	ACT,2,L7	Rod L7 stuck	LOR-SS-12	PRESSURIZER SPRAY VALVE FAILURE
MAL CRF4A	ACT,?,?	Stuck rod bank D	RO-SE-059	LOSS OF ALL AC POWER 1
MAL CRF4A	ACT,2,J5	Rod J5 stuck	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL CRF4A,B	ACT,(2 SD rods)	Stuck rods	RO-SE-022	ABNORMAL CV CONDITIONS
MAL CRF4B	1=TRIP,2=UNTRIP/ROD (K14)	STUCK ROD (SELECTION 2)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF4B	ACT,2,K4	Rod K4 stuck	LOR-SS-09	SMALL LOSS OF COOLANT ACCIDENT
MAL CRF4B	ACT,2,H8	Rod H8 stuck	LOR-SS-12	PRESSURIZER SPRAY VALVE FAILURE
MAL CRF4B	ACT,2,G13	Rod G13 stuck	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL CRF4C	1=TRIP,2=UNTRIP/ROD (K14)	STUCK ROD (SELECTION 3)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF4C	ACT,2,K12	Rod K12 stuck	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL CRF4D	1=TRIP,2=UNTRIP/ROD (K14)	STUCK ROD (SELECTION 4)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF4D	ACT,2,B6	Rod B6 stuck	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL CRF5A	0-2000 gpm/ROD (K14,etc)	ROD EJECTION (SELECTION 1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF5A	ACT,?,?	Rod ejection/LOCA	RO-SE-039	ATWS WITH LOSS OF FW/EJECTED ROD
MAL CRF5A	ACT,?,?	Rod ejection/LOCA	SR-SE-024	ATWS WITH EJECTED ROD
MAL CRF5A	ACT,H8,60,0,2	Rod ejection (60 gpm leak)	LOR-SE-89-07	SIMULATOR EXAM 89-7
MAL CRF5A	ACT,H8,250	Rod ejection (250 gpm leak)	LOR-SE-89-07	SIMULATOR EXAM 89-7
MAL CRF5A	ACT,2000,H8	Rod ejection/2000 gpm LOCA	LOR-SS-09	SMALL LOSS OF COOLANT ACCIDENT
MAL CRF5B	0-2000 gpm/ROD (K14,etc)	ROD EJECTION (SELECTION 2)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF5C	0-2000 gpm/ROD (K14,etc)	ROD EJECTION (SELECTION 3)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF5D	0-2000 gpm/ROD (K14,etc)	ROD EJECTION (SELECTION 4)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF6A	ACT,8	Uncontrolled auto rod motion	RO-SE-037	STEAM GENERATOR TUBE RUPTURE
MAL CRF6A	ACT,72	Uncontrolled auto rod motion	RO-SE-069	LOSS OF HEAT SINK
MAL CRF6A	ACT,60,0,JMEPS2D	Uncontrolled auto rod motion	RO/SRO-SE-007	LOSS OF INSTRUMENT BUS

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CRF6A	8-72 steps/min	UNCONTROLLED AUTO ROD MOTION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF6B	ACT	Uncontrolled man rod motion	RO-SE-069	LOSS OF HEAT SINK
MAL CRF6B	ACT,0,JMCRF6A	Uncontrolled man rod motion	RO/SRO-SE-007	LOSS OF INSTRUMENT BUS
MAL CRF6B		UNCONTROLLED MAN ROD MOTION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF7	1-72 steps/min	AUTO ROD SPEED CONTROL FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CRF8	ACT,547	T-ref fails to 547 degrees	RO-SE-059	LOSS OF ALL AC POWER 1
MAL CRF8	547-575 degrees F	T-REF FAILURE (ROD CONTROL)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC		Aux spray valve open	JPM-CR-035	PZR PRESSURE CONTROL MALFUNCTION
MAL CVC10	0-200 gpm/0-3600 sec	REGENERATIVE HX TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC11	0-300 gpm/0-3600 sec	NON-REGENERATIVE HX TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC12	0-100%/0-3600 sec	SEAL WATER HX TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC13	ACT,100,10	BA filter 100% clogged	LOR-SS-22	STEAM GENERATOR TUBE RUPTURE
MAL CVC13	0-100%/0-3600 sec	BORIC ACID FILTER PLUGGED	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC14	0-100%/0-3600 sec	RCS FILTER PLUGGED	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC15A	0-100%(20-77 gpm)/0-3600s	CHARGING PUMP A SPEED CONTROL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC15B	0-100%(20-77 gpm)/0-3600s	CHARGING PUMP B SPEED CONTROL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC15C	0-100%(20-77 gpm)/0-3600s	CHARGING PUMP C SPEED CONTROL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC16A	0-100%/0-3600 sec	ORIFICE ISO VLV 200A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC16A-C	ACT,0	Orifice iso. valve failure	RO-SE-041	REACTOR STARTUP/CVCS MALFUNCTIONS
MAL CVC16B	0-100%/0-3600 sec	ORIFICE ISO VLV 200B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC16C	0-100%/0-3600 sec	ORIFICE ISO VLV 200C FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC17	0-500 gpm/0-3600 sec	LTDN LEAK IN CV BEFORE ORI IS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC18	0-100%/0-3600 sec	FAILURE OF AUX SPRAY VLV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC19A	0-100%/0-3600 sec	FAILURE OF NORM CHG VLV 310A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC19B	0-100%/0-3600 sec	FAILURE OF ALT CHG VLV 310B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC1A	0-100%/0-3600 sec	LTDN ISO VLV 460A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC1A/B	ACT,0	CVC-460A or B failed shut	RO-SE-067	TURBINE MALFUNCTIONS
MAL CVC1A/B	ACT,0	CVC-460A or B shut	RO-SE-070	SGTR WITH PRESSURIZER PORV FAILURE
MAL CVC1A/B	ACT,0	CVC-460A or B fails shut	SR-SE-014	MAIN STEAM LINE BREAK
MAL CVC1A/B	ACT,0	CVC-460A or B shut	RO-SE-051	MSLB AND LOSS OF LETDOWN
MAL CVC1B	0-100%/0-3600 sec	LTDN ISO VLV 460B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC2	0-100%/0-3600 sec	VCT OUTLET LCV-115C FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC20	0-165 gpm/0-3600 sec	VCT DIVERT TO HUT LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CVC21	0-100%/0-3600 sec	LCV-115B (RWST TO CHG) FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC22A		BORIC ACID PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC22A/B	ACT,200	Boric acid pump trip	RO/SRO-SE-003	RCP MALFUNCTIONS
MAL CVC22A/B	ACT	Boric acid pump trip	RO-SE-044	RCP MALFUNCTIONS
MAL CVC22B		BORIC ACID PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC23	ACT,100,600,90	Seal water return filter plug	RO/SRO-SE-006	MAIN STEAM BREAK/EXCESSIVE FEEDWATER
MAL CVC23	0-100%/0-3600 sec	PLUG SEAL WTR RETURN FILTER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC24A	0-200 gpm/0-3600 sec	CHG LEAK:LCV-115C&CHG PP SUCT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC24B	0-200 gpm/0-3600 sec	CHG LEAK:CHG PP DISC & FT-122	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC24C	0-200 gpm/0-3600 sec	CHG LEAK:FCV-121 & CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC24D	0-200 gpm/0-3600 sec	CHG LEAK:IN CV BEFORE REG.HX	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC24E	0-200 gpm/0-3600 sec	CHG LEAK:REG. HX & CVC-310A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC25	ACT,200	MU selector switch failure	RO/SRO-SE-003	RCP MALFUNCTIONS
MAL CVC25		FAILURE OF MAKEUP SELECTOR SW	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC3	0-165 gpm/0-3600 sec	LTDN LINE LEAK INSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC3	ACT,165	Letdown line leak	RO/SRO-SE-010	COMMUNICATIONS TRAINING
MAL CVC4	0-165 gpm/0-3600 sec	LTDN LINE LEAK OUTSIDE CV	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC5A	ACT,50	Charging pump A trip	RO/SRO-SE-001	FIRE IN CHARGING PUMP ROOM
MAL CVC5A		CHARGING PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC5A-C	ACT	Charging pump trip	RO-SE-048	STEAM DUMP FAILURE
MAL CVC5A-C	ACT	Charging pump trip	RO-SE-063	LOAD REJECTION WITH FAILED STEAM DUMP
MAL CVC5A-C	ACT	Charging pump trip	SR-SE-012	RCP SEAL FAILURES WITH ATWS
MAL CVC5B		CHARGING PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC5C	ACT,60	Charging pump C trip	RO/SRO-SE-001	FIRE IN CHARGING PUMP ROOM
MAL CVC5C		CHARGING PUMP C TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC6A		PRIMARY WATER PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC6B		PRIMARY WATER PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC7	ACT,100	PCV-145 fails 100% open	SR-SE-005	RCS COOLDOWN WITH MALFUNCTIONS
MAL CVC7	0-100%/0-3600 sec	PCV-145 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC8		LOSS OF LTDN (BLOWN FUSE)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CVC9	ACT,20	LCV-115A diverts 20%	RO-SE-045	LOCA - PRESSURIZER PORV FAILURE
MAL CVC9	0-100%/0-3600 sec	LCV-115A CONTROLLER FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CWS1A		CIRCULATING WATER PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL CWS1A-C	ACT	Circ. water pump trip	SR-SE-003	REACTOR STARTUP WITH MALFUNCTIONS
MAL CWS1A-C	ACT	Circ. water pump trip	RO-SE-062	BLACKOUT
MAL CWS1A/B/	ACT	Circ. water pump trip	SR-SE-026	BLACKOUT
MAL CWS1B		CIRCULATING WATER PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL CWS1C		CIRCULATING WATER PUMP C TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG1A	ACT	EDG A failure	SR-SE-009	LOSS OF ALL AC POWER 1
MAL EDG1A	ACT	EDG A failure	RO-SE-056	MSLB - SG SAFETY VALVE
MAL EDG1A	ACT	EDG A failure	SR-SE-025	LOSS OF ALL AC WITH LOCA 1
MAL EDG1A		EDG A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG1A	ACT,0	EDG A failure	LOR-SE-89-04	SIMULATOR EXAM 89-4
MAL EDG1A	ACT	EDG A failure	RO-SE-059	LOSS OF ALL AC POWER 1
MAL EDG1B	ACT	EDG B failure	SR-SE-009	LOSS OF ALL AC POWER 1
MAL EDG1B	ACT	EDG B failure	LOR-SE-89-14	SIMULATOR EXAM 89-14
MAL EDG1B		EDG B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG1B	ACT	EDG B failure	SR-SE-025	LOSS OF ALL AC WITH LOCA 1
MAL EDG1B	ACT	EDG B failure	LOR-SS-10	LOSS OF STARTUP POWER SUPPLY WHILE OPERATING
MAL EDG1B	ACT	EDG B failure	RO-SE-059	LOSS OF ALL AC POWER 1
MAL EDG1B	ACT	EDG B failure	LOR-SS-15	LOSS OF OFFSITE POWER WITH FAILURE OF EDG B
MAL EDG1B	ACT	EDG B failure	LOR-SS-21	STEAM BREAK DURING REACTOR STARTUP
MAL EDG1C		DS DIESEL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG3A		EDG A BKR INADVERTENT TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG3B		EDG B BKR INADVERTENT TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG3B	ACT	EDG B breaker trip	RO-SE-064	INADEQUATE CORE COOLING
MAL EDG3C		DS DIESEL BKR INADVERT TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4A	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4B	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 2)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4C	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 3)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4D	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 4)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4E	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 5)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4F	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 6)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4G	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 7)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4H	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 8)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG4I	1=Trn A,2=Trn B,3=Both	DG LOAD SEQUENCER (BLOCK 9)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL EDG5A	430-530/0-3600 sec	DG A VOLTAGE REG FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG5B	430-530/0-3600 sec	DG B VOLTAGE REG FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EDG5C	430-530/0-3600 sec	DS DG VOLTAGE REG FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS1	ACT,FNISPR.LT.0.4	West bus lockout	SR-SE-017	SG PORV FAILING OPEN WITH BLACKOUT
MAL EPS1	ACT	West bus lockout	SR-SE-026	BLACKOUT
MAL EPS1	ACT	West bus lockout	RO-SE-062	BLACKOUT
MAL EPS1	ACT	West Bus lockout	RO-SE-047	MSLB w/LOSS OF OFFSITE POWER
MAL EPS1	ACT	West bus lockout	SR-SE-011	MAIN STEAM LINE BREAK WITH BLACKOUT
MAL EPS1		WEST BUS LOCKOUT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS10		SOUTH BUS LOCKOUT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS11		NORTH BUS LOCKOUT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS12		EAST BUS LOCKOUT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS13	ACT	Loss of startup transformer	SR-SE-015	SGTR WITH FAILED PRESSURIZER PORV
MAL EPS13	ACT,0,FNISPR.GT.70	Loss of startup transformer	RO-SE-029	BLACKOUT
MAL EPS13	ACT	Loss of startup transformer	JPM-CR-028	RESTORATION OF NORMAL POWER AFTER LOSS OF STARTUP
MAL EPS13	ACT	Loss of startup transformer	LOR-SS-10	LOSS OF STARTUP POWER SUPPLY WHILE OPERATING
MAL EPS13	ACT	Loss of startup transformer	RO-SE-059	LOSS OF ALL AC POWER 1
MAL EPS13	ACT,FNISPR.LT.0.1	Loss of startup transformer	SR-SE-025	LOSS OF ALL AC WITH LOCA 1
MAL EPS13	ACT	Loss of startup transformer	SR-SE-009	LOSS OF ALL AC POWER 1
MAL EPS13	ACT	Loss of startup transformer	LOR-SS-15	LOSS OF OFFSITE POWER WITH FAILURE OF EDG B
MAL EPS13		LOSS OF START-UP TRANSFORMER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS2A		LOSS OF 120V INSTRUMENT BUS 1	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS2A	ACT	Loss of instr. bus 1	SR-SE-021	ATWS WITH LOSS OF INSTRUMENT BUS
MAL EPS2A		Loss of instr. bus 1	LOR-SE-89-15	SIMULATOR EXAM 89-15
MAL EPS2B		LOSS OF 120V INSTRUMENT BUS 2	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS2B	ACT	Loss instr. bus 2	RO-SE-049	LOSS OF INSTRUMENT AIR
MAL EPS2B	ACT,20	Loss instr. bus 2	RO/SRO-SE-001	FIRE IN CHARGING PUMP ROOM
MAL EPS2C	ACT	Loss instr. bus 3	JPM-CR-031	LOSS OF INSTRUMENT BUS
MAL EPS2C		LOSS OF 120V INSTRUMENT BUS 3	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS2D	ACT,180	Loss instr. bus 4	RO/SRO-SE-007	LOSS OF INSTRUMENT BUS
MAL EPS2D		LOSS OF 120V INSTRUMENT BUS 4	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS2E		LOSS OF 120V INSTRUMENT BUS 5	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS2F		LOSS OF 120V INSTRUMENT BUS 6	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL EPS2G		LOSS OF 120V INSTRUMENT BUS 7	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS2G	ACT,20	Loss instr. bus 7	RO/SRO-SE-004	LOSS OF INSTRUMENT AIR
MAL EPS2H		LOSS OF 120V INSTRUMENT BUS 8	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS2I		LOSS OF 120V INSTRUMENT BUS 9	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS3A	1-100 1=NORMAL	MCC-A GROUND FAULT (125V DC)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS3B	1-100 1=NORMAL	MCC-B GROUND FAULT (125V DC)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS3C	1-100 1=NORMAL	MCC-C GROUND FAULT (125V DC)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS4A		LOSS OF 4160V BUS 1	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS4B		LOSS OF 4160V BUS 2	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS4C		LOSS OF 4160V BUS 3	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS4D		LOSS OF 4160V BUS 4	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS5A	ACT	Loss of E-1 fdr bkr 52-18B	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL EPS5A		LOSS OF E1 FDR BREAKER 52-18B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS5B	ACT	E-2 feeder breaker (28B) open	RO-SE-064	INADEQUATE CORE COOLING
MAL EPS5B		LOSS OF E2 FDR BREAKER 52-28B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS6	?	?	RO-SE-070	SGTR WITH PRESSURIZER PORV FAILURE
MAL EPS6	A=22B,B=29B,BOTH	52-22B AND/OR 52-29B TRIPS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS7	ACT	Loss of aux. transformer	LOR-SE-89-15	SIMULATOR EXAM 89-15
MAL EPS7		LOSS OF UNIT AUX TRANSFORMERS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS8A		LOSS OF 480V BUS1	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS8B		LOSS OF 480V BUS2A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS8C		LOSS OF 480V BUS2B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS8D		LOSS OF 480V BUS3	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS8E		LOSS OF 480V BUS4	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL EPS9	180-230 KVolts/0-3600 sec	DEGRADED SYSTEM VOLTAGE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL GEN1	ACT,?,?	Voltage regulator failure	SR-SE-014	MAIN STEAM LINE BREAK
MAL GEN1	ACT,?,?	Voltage regulator failure	RO-SE-051	MSLB AND LOSS OF LETDOWN
MAL GEN1	ACT,20,120	Voltage regulator failure	RO-SE-039	ATWS WITH LOSS OF FW/EJECTED ROD
MAL GEN1	ACT,20,120	Voltage regulator failure	SR-SE-024	ATWS WITH EJECTED ROD
MAL GEN1	ACT,?	Voltage regulator failure	RO-SE-065	ATWS
MAL GEN1	0-30 KVolts/0-3600 sec	MAIN GEN VOLT REGULATOR FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL GEN2		TURB TRIP FAILURE ON GEN TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL GEN3A	1=trip fails,2=inadv.trip	GEN BREAKER 52-8 FAILURES	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL GEN3B	1=trip fails,2=inadv.trip	GEN BREAKER 52-9 FAILURES	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL GEN4	ACT,?	Excitation oscillation	RO-SE-035	STARTUP WITH MALFUNCTIONS
MAL GEN4	10-100 sec	OSCILLATING VOLTAGE REGULATOR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL GEN5	ACT,50	Load rejection	RO-SE-052	LOAD REJECTION WITH FAILED OPEN PZR PORV
MAL GEN5	ACT,70	30% load rejection	RO-SE-063	LOAD REJECTION WITH FAILED STEAM DUMP
MAL GEN5	0-100%	LOAD REJECTION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL GEN5	ACT,100	100% load rejection	LOR-SS-15	LOSS OF OFFSITE POWER WITH FAILURE OF EDG B
MAL GEN6	ACT,?,PR.LE.50	Generator trip	RO-SE-070	SGTR WITH PRESSURIZER PORV FAILURE
MAL GEN6	ACT,?,?	Main generator trip	SR-SE-015	SGTR WITH FAILED PRESSURIZER PORV
MAL GEN6	ACT,?,?	Generator trip	SR-SE-026	BLACKOUT
MAL GEN6	ACT,?,?	Generator trip	RO-SE-059	LOSS OF ALL AC POWER 1
MAL GEN6	ACT,5,?	Generator Unit Aux. Diff. tri	RO-SE-062	BLACKOUT
MAL GEN6	1-8 (TRIP),0-3 (PHASE)	GENERATOR TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL GEN7	ACT,?,?	Generator hydrogen leak	SR-SE-011	MAIN STEAM LINE BREAK WITH BLACKOUT
MAL GEN7	ACT,?,?	Generator hydrogen leak	RO-SE-047	MSLB w/LOSS OF OFFSITE POWER
MAL GEN7	0-90 psia/0-3600 sec	GENERATOR HYDROGEN LEAKAGE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL GEN8	ACT,59.5,60,PR.GT.70	Grid frequency decrease	RO-SE-065	ATWS
MAL GEN8	ACT,58,300	Grid frequency decreases	SR-SE-008	SMALL BREAK LOCA
MAL GEN8	55-65 HZ/0-3600 sec	GRID FREQUENCY VARIES	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL HVA1A		CV FAN COOLER HVH-1 TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL HVA1B		CV FAN COOLER HVH-2 TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL HVA1C		CV FAN COOLER HVH-3 TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL HVA1D		CV FAN COOLER HVH-4 TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSC1	SPARE	SPARE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSC3	N51,N52,BOTH	NI51/NI52 HI VOLTS FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSC4A	ACT,2	Train B Phase A Isol. Failure	LOR-SS-09	SMALL LOSS OF COOLANT ACCIDENT
MAL MSC4A	1=on,2=off	PHASE A FAILURE (TRAIN A)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSC4B	ACT,1	Inadv. Phase A Isol. Train B	SR-SE-011	MAIN STEAM LINE BREAK WITH BLACKOUT
MAL MSC4B	ACT,1	Inadvertant Phase B isolation	RO-SE-047	MSLB w/LOSS OF OFFSITE POWER
MAL MSC4B	1=on,2=off	PHASE A FAILURE (TRAIN B)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSC5A	1=on,2=off	PHASE B FAILURE (TRAIN A)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSC5B	1=on,2=off	PHASE B FAILURE (TRAIN B)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS10		INADVERT MAIN STM ISOLATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL MSS1A	ACT,1E7,5	SG A steam break (1E7 lbm/hr)	LOR-SS-21	STEAM BREAK DURING REACTOR STARTUP
MAL MSS1A	0-1E7 lbm/hr/0-3600 sec	STEAM LINE BREAK IN CV SG A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS1A	ACT,1E6,600	SG A steam break (1E6 lbm/hr)	LOR-SS-21	STEAM BREAK DURING REACTOR STARTUP
MAL MSS1A-C	ACT,?,?	MSLB inside CV	RO-SE-056	MSLB - SG SAFETY VALVE
MAL MSS1A-C	ACT,?,?	MSLB inside CV	SR-SE-014	MAIN STEAM LINE BREAK
MAL MSS1A-C	ACT,?,?	MSLB inside CV	RO-SE-051	MSLB AND LOSS OF LETDOWN
MAL MSS1A-C	1E7,10	MSLB inside CV	LOR-SE-89-08	SIMULATOR EXAM 89-8
MAL MSS1B	ACT,1E7,?,?	SG B MSLB	RO/SRO-SE-014	CONTROL ROOM WATCH-STANDING
MAL MSS1B	0-1E7 lbm/hr/0-3600 sec	STEAM LINE BREAK IN CV SG B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS1C	ACT,5E6	SG C steam break	JPM-CR-006	IDENTIFY AND ISOLATE FAULTED STEAM GENERATOR
MAL MSS1C	0-1E7 lbm/hr/0-3600 sec	STEAM LINE BREAK IN CV SG C	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS2A	ACT,1E7	SG A MSLB outside CV	RO-SE-034	MAIN STEAM LINE BREAK
MAL MSS2A	0-1E7 lbm/hr/0-3600 sec	STEAM BREAK OUTSIDE CV SG A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS2A-C	ACT,3E6	MSLB downstream MSIVs	RO-SE-047	MSLB w/LOSS OF OFFSITE POWER
MAL MSS2A-C	ACT,1E7,?	MSLB downstream MSIVs	SR-SE-011	MAIN STEAM LINE BREAK WITH BLACKOUT
MAL MSS2B	0-1E7 lbm/hr/0-3600 sec	STEAM BREAK OUTSIDE CV SG B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS2C	0-1E7 lbm/hr/0-3600 sec	STEAM BREAK OUTSIDE CV SG C	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS3A	ACT,2	MSIV A fails open	LOR-SE-89-12	SIMULATOR EXAM 89-12
MAL MSS3A	ACT,2	MSIV A fails open	RO-SE-034	MAIN STEAM LINE BREAK
MAL MSS3A	ACT,2,0	MSIV A fails open	RO/SRO-SE-006	MAIN STEAM BREAK/EXCESSIVE FEEDWATER
MAL MSS3A	1=closes,2=fail to close	MSIV FAILURE SG A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS3A,B	ACT,2	MSIV A fails open	RO-SE-058	MSLB WITH MSIV FAILURE TO CLOSE
MAL MSS3A-C	ACT,1	MSIV fails closed	RO-SE-066	INADVERTANT MSIV CLOSURE
MAL MSS3A-C	ACT,1	MSIV fails closed	SR-SE-006	DROPPED ROD
MAL MSS3B	1=closes,2=fail to close	MSIV FAILURE SG B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS3C	1=closes,2=fail to close	MSIV FAILURE SG C	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS4A	ACT,0,0	SG A PORV failed closed	LOR-SE-89-04	SIMULATOR EXAM 89-4
MAL MSS4A	0-100%,0-3600 sec	SG A PORV (RVI-1) FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS4A/B/	ACT,100,0,FNISPR<0.4	SG PORV fails open	SR-SE-017	SG PORV FAILING OPEN WITH BLACKOUT
MAL MSS4B	ACT,100	SG B PORV fails open	LOR-SE-89-05	SIMULATOR EXAM 89-5
MAL MSS4B	0-100%,0-3600 sec	SG B PORV (RVI-2) FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS4C	0-100%,0-3600 sec	SG C PORV (RVI-3) FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS4C	ACT,15,3	SG C PORV stuck 15% open	LOR-SS-14	SGTR WITH CONCURRENT STEAM LEAK

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL MSS5	0-100%	SD CONTROLLER MODULATION FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS6A	0-100%	STUCK SD VALVE (PRV-1324 A-1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS6A	ACT,100	PRV-1324A-1 stuck open	RO-SE-048	STEAM DUMP FAILURE
MAL MSS6A	ACT,100	Steam dumps stuck open	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL MSS6A-E	ACT,0	Steam dump valves failed clos	LOR-SE-89-04	SIMULATOR EXAM 89-4
MAL MSS6B	0-100%	STUCK SD VALVE (PRV-1324 A-1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS6B	ACT,100	Steam dumps stuck open	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL MSS6C	ACT,100	Steam dumps stuck open	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL MSS6C	0-100%	STUCK SD VALVE (PRV-1324 B-1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS6D	0-100%	STUCK SD VALVE (PRV-1324 B-2)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS6D	ACT,100	Steam dumps stuck open	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL MSS6E	0-100%	STUCK SD VALVE (PRV-1324 B-3)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS6E	ACT,100	Steam dumps stuck open	LOR-SS-11	SI CAUSED BY OVERCOOLING
MAL MSS8A		STM ISO VLV V1-8A FAILS CLOSE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS8B		STM ISO VLV V1-8B FAILS CLOSE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS8C		STM ISO VLV V1-8C FAILS CLOSE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL MSS9	ACT,1E7,0,181	Main steam header break	RO-SE-058	MSLB WITH MSIV FAILURE TO CLOSE
MAL MSS9	ACT,1E6,90,150	Main steam header break	RO/SRO-SE-006	MAIN STEAM BREAK/EXCESSIVE FEEDWATER
MAL MSS9	1E7,0,0,XCRFMFNS1<1	Main steam header break	LOR-SE-89-12	SIMULATOR EXAM 89-12
MAL MSS9	ACT,5E4,60	Small main steam header break	LOR-SS-15	LOSS OF OFFSITE POWER WITH FAILURE OF EDG B
MAL MSS9	ACT,5E4,60	Small main steam header break	LOR-SS-21	STEAM BREAK DURING REACTOR STARTUP
MAL MSS9	0-1E7 lbm/hr/0-3600 sec	MAIN STEAM HEADER LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS10A	I=INSTRUMENT,C=CONTROL	SR N-31 FUSES BLOWN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS10B	I=INSTRUMENT,C=CONTROL	SR N-32 FUSES BLOWN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS11A	I=INSTRUMENT,C=CONTROL	IR N-35 FUSES BLOWN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS11B	I=INSTRUMENT,C=CONTROL	IR N-36 FUSES BLOWN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS12A	I=INSTRUMENT,C=CONTROL	PR N-41 FUSES BLOWN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS12A-D	ACT,?	PR NI fuse failure	RO-SE-045	LOCA - PRESSURIZER PORV FAILURE
MAL NIS12A-D	ACT,?	PR NI fuse failure	RO-SE-068	SGTR WITH SG SAFETY VALVE FAILED OPEN
MAL NIS12A-D	ACT,?	PR NI fuse failure	RO-SE-046	DEMO - TURBINE RUNBACK
MAL NIS12A-D	ACT,?	PR NI fuse failure	RO-SE-065	ATWS
MAL NIS12A-D	ACT,?,0,FNISPR.GT.60	PR NI fuse failure	SR-SE-009	LOSS OF ALL AC POWER 1
MAL NIS12A-D	ACT,C,0,FNISPR.GT.95	PR NI ctrl power fuse failure	RO-SE-019	ATWS

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL NIS12B	I=INSTRUMENT,C=CONTROL	PR N-42 FUSES BLOWN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS12B	ACT,I	NI-42 instr. power fuse fails	LOR-SS-06	LT-459 O.O.S./NI-42 FAILURE WITH RUNBACK
MAL NIS12C	I=INSTRUMENT,C=CONTROL	PR N-43 FUSES BLOWN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS12D	I=INSTRUMENT,C=CONTROL	PR N-44 FUSES BLOWN	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS13A	1-100 noise/sig/0-3600 s	NOISY SOURCE RANGE CHANNEL 31	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS13B	1-100 noise/sig/0-3600 s	NOISY SOURCE RANGE CHANNEL 32	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS14A		FAILURE SR TO BLOCK - TRAIN A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS14A/B	ACT	SR NI fails to block	RO-SE-035	STARTUP WITH MALFUNCTIONS
MAL NIS14B		FAILURE SR TO BLOCK - TRAIN B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS15A		FAILURE SR N-31 TO RE-ENERGIZ	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS15B		FAILURE SR N-32 TO RE-ENERGIZ	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS1A	ACT,?	SR NI fails	SR-SE-021	ATWS WITH LOSS OF INSTRUMENT BUS
MAL NIS1A	1-1E6 CPV/0-3600 sec	SR N-31 CHANNEL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS1A/B	ACT,?	SR NI fails	RO-SE-056	MSLB - SG SAFETY VALVE
MAL NIS1B	1-1E6 CPV/0-3600 sec	SR N-32 CHANNEL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS2A	2-1E3/2-3600 sec	SR N-31 PULSE HT DISCRIMINATR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS2A/B	ACT,?,10,0	SR NI pulse ht discr. failure	RO/SRO-SE-006	MAIN STEAM BREAK/EXCESSIVE FEEDWATER
MAL NIS2B	2-1E3/2-3600 sec	SR N-32 PULSE HT DISCRIMINATR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS3A		N-31 HI VOLTS DISCONNECT FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS3A,B	ACT	SR NI block failure	SR-SE-003	REACTOR STARTUP WITH MALFUNCTIONS
MAL NIS3A/B	ACT	SR NI Hi volt turnoff failure	RO-SE-041	REACTOR STARTUP/CVCS MALFUNCTIONS
MAL NIS3B		N-32 HI VOLTS DISCONNECT FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS4A	300-2500 volts	SR N-31 HIGH VOLTAGE FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS4B	300-2500 volts	SR N-32 HIGH VOLTAGE FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS5A	ACT,5E-9,0,SR<-9.5	NI-35 failure	RO-SE-068	SGTR WITH SG SAFETY VALVE FAILED OPEN
MAL NIS5A	-11 to -3 (log 10) amps	IR N-35 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS5B	ACT,-11,0	IR NI-36 fails low	LOR-SS-09	SMALL LOSS OF COOLANT ACCIDENT
MAL NIS5B	-11 to -3 (log 10) amps	IR N-36 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS6A	-1E-5to1E-5 amps/0-3600s	IR N-35 GAMMA COMPENSATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS6A/B	ACT,5E-9	I.R. N.I. comp. volt. failure	RO-SE-031	LOSS OF COOLANT ACCIDENT
MAL NIS6B	-1E-5to1E-5 amps/0-3600s	IR N-36 GAMMA COMPENSATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS7A	0-70%/0-3600 sec	PR N-41 DETECTOR A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS7B	0-70%/0-3600 sec	PR N-41 DETECTOR B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL NIS7C	0-70%/0-3600 sec	PR N-42 DETECTOR A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS7D	0-70%/0-3600 sec	PR N-42 DETECTOR B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS7E	0-70%/0-3600 sec	PR N-43 DETECTOR A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS7F	0-70%/0-3600 sec	PR N-43 DETECTOR B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS7G	0-70%/0-3600 sec	PR N-44 DETECTOR A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS7H	0-70%/0-3600 sec	PR N-44 DETECTOR B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS8A	0-120%/0-3600 sec	PR N-41 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS8B	0-120%/0-3600 sec	PR N-42 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS8C	0-120%/0-3600 sec	PR N-43 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS8D	0-120%/0-3600 sec	PR N-44 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS9A	1=A,2=B,3=C,4=D,5=E/0-5	INCORE DRIVE UNIT FAILURE (1)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL NIS9B	1=A,2=B,3=C,4=D,5=E/0-5	INCORE DRIVE UNIT FAILURE (2)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS1	0-4E6 lbm/hr/0-3600 sec	PZR STEAM SPACE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS2A	0-100%/0-3600 sec	PZR SPRAY VLV 455A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS2B	0-100%/0-3600 sec	PZR SPRAY VLV 455B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS2B	ACT,100,10	PZR spray vlv fails 100% open	LOR-SS-12	PRESSURIZER SPRAY VALVE FAILURE
MAL PRS3A	ACT,0	PORV 456 failed closed	JPM-CR-015	ESTABLISH RCS BLEED AND FEED
MAL PRS3A	0-100%/0-3600 sec	PORV 456 FAILURE (WITH INTLK)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS3B	0-100%/0-3600 sec	PORV 455C FAILURE (WITH INTLK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS3C	ACT,0,1	PORV 456 failed shut	LOR-SS-18	LOSS OF SHUTDOWN COOLING
MAL PRS3C	ACT,100	PORV 456 fails open	RO-SE-045	LOCA - PRESSURIZER PORV FAILURE
MAL PRS3C	ACT,100	PORV 456 fails open	RO-SE-063	LOAD REJECTION WITH FAILED STEAM DUMP
MAL PRS3C	ACT,100,0	PORV 456 fails open	RO-SE-070	SGTR WITH PRESSURIZER PORV FAILURE
MAL PRS3C	ACT,100,0,0,	PORV 456 fails open	SR-SE-015	SGTR WITH FAILED PRESSURIZER PORV
MAL PRS3C	0-100%/0-3600 sec	PORV 456 FAILURE (W/O INTLK)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS3D	ACT,100,0,0,RRCH455C	PORV 455C fails open	RO/SRO-SE-009	TMI-2 SCENARIO
MAL PRS3D	ACT,0,1	PORV 455C failed shut	LOR-SS-18	LOSS OF SHUTDOWN COOLING
MAL PRS3D	ACT,100	PORV 455C fails open	RO-SE-052	LOAD REJECTION WITH FAILED OPEN PZR PORV
MAL PRS3D	ACT,?,?,ARCSPRTS>0	PORV 455C fails open	SR-SE-013	ATWS WITH FAILED PRESSURIZER PORV
MAL PRS3D	ACT,100,0	PORV 455C fails open	RO-SE-070	SGTR WITH PRESSURIZER PORV FAILURE
MAL PRS3D	0-100%/0-3600 sec	PORV 455C FAILURE (W/O INTLK)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS4A	0-100%/0-3600 sec	PZR SAFETY VLV 551A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS4A-C	ACT,100	PZR safety valve 100% open	RO-SE-060	LOCA - PRESSURIZER SAFETY VALVE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL PRS4A-C	ACT,10	PZR safety valve 10% open	RO-SE-060	LOCA - PRESSURIZER SAFETY VALVE
MAL PRS4A-C	ACT,100,300	PZR safety valve 100% open	RO-SE-055	LOCA - PRESSURIZER SAFETY VALVE
MAL PRS4A/B/	ACT,30,600	PZR safety valve 30% open	SR-SE-020	PRESSURIZER SAFETY VALVE LEAK
MAL PRS4A/B/	ACT,25,0,0,FNISPR<50	PZR safety valve 25% open	SR-SE-025	LOSS OF ALL AC WITH LOCA 1
MAL PRS4B	0-100%/0-3600 sec	PZR SAFETY VLV 551B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS4C	0-100%/0-3600 sec	PZR SAFETY VLV 551C FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS4C	ACT,100,5	PZR safety valve fails open	LOR-SS-02	PRESSURIZER CODE SAFETY VALVE LOCA
MAL PRS4C	ACT,1.5,1	PZR safety leak (1.5%)	LOR-SS-17	DROPPED ROD/PZR SAFETY VALVE LEAK
MAL PRS5A		PZR BACKUP HTR GP A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS5B		PZR BACKUP HTR GP B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS6	ACT,-50	Press control setpt drift	RO-SE-058	MSLB WITH MSIV FAILURE TO CLOSE
MAL PRS6	-550-250 psi/0-3600 sec	PZR PRESS CONTROL BAND SHIFT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL PRS7	547-575.4 deg/0-3600 sec	PZR LEVEL CONTROL BAND SHIFT	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS		LOCA	JPM-CR-007	ALIGN SI SYSTEM FOR COLD LEG RECIRCULATION
MAL RCS10	0-30 gpm/0-3600 sec	REACTOR VESSEL FLANGE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS11A	0-10 gpm/0-3600 sec	OIL LEAK FROM RCP A UPPER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS11B	0-10 gpm/0-3600 sec	OIL LEAK FROM RCP B UPPER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS11C	0-10 gpm/0-3600 sec	OIL LEAK FROM RCP C UPPER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS11D	0-10 gpm/0-3600 sec	OIL LEAK FROM RCP A LOWER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS11E	0-10 gpm/0-3600 sec	OIL LEAK FROM RCP B LOWER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS11F	0-10 gpm/0-3600 sec	OIL LEAK FROM RCP C LOWER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS12A	0-400 gpm/0-3600 sec	RCP A THERMAL BARRIER LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS12A-C	ACT,15	RCP thermal barrier leak	RO-SE-061	LOSS OF COMPONENT COOLING WATER
MAL RCS12A-C	ACT,30,0,120	RCP thermal barrier leak	RO/SRO-SE-002	EXCESSIVE RCS LEAKAGE
MAL RCS12B	0-400 gpm/0-3600 sec	RCP B THERMAL BARRIER LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS12C	0-400 gpm/0-3600 sec	RCP C THERMAL BARRIER LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS12C	ACT,400,0,7	RCP thermal barrier leak	LOR-SE-89-12	SIMULATOR EXAM 89-12
MAL RCS13A	0-400 gpm/0-3600 sec	RCP A #1 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS13A-C	ACT,10	RCP #1 seal failure	RO-SE-054	RCP SEAL FAILURE
MAL RCS13A-C	ACT,10,10	RCP #1 seal failure	RO-SE-044	RCP MALFUNCTIONS
MAL RCS13A-C	ACT,20	RCP #1 seal failure	SR-SE-027	RCP SEAL FAILURE
MAL RCS13A-C	ACT,?,?	RCP #1 seal failure	SR-SE-012	RCP SEAL FAILURES WITH ATWS
MAL RCS13B	ACT,15,5	RCP #1 seal failure, 15 gpm	LOR-SS-16	MISALIGNED CONTROL ROD/RCP SEAL FAILURE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL RCS13B	0-400 gpm/0-3600 sec	RCP B #1 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS13B	ACT,400,0	RCP B # 1 seal failure	LOR-SE-89-11	SIMULATOR EXAM 89-11
MAL RCS13B	ACT,10,120	RCP B # 1 seal failure	LOR-SE-89-11	SIMULATOR EXAM 89-11
MAL RCS13C	0-400 gpm/0-3600 sec	RCP C #1 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS14A	0-400 gpm/0-3600 sec	RCP A #2 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS14A-C	ACT,11,10,180	RCP #2 seal failure	RO/SRO-SE-003	RCP MALFUNCTIONS
MAL RCS14A-C	ACT,?,?	RCP #2 seal failure	SR-SE-012	RCP SEAL FAILURES WITH ATWS
MAL RCS14B	0-400 gpm/0-3600 sec	RCP B #2 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS14B	ACT,400,0	RCP B # 2 seal failure	LOR-SE-89-11	SIMULATOR EXAM 89-11
MAL RCS14C	0-400 gpm/0-3600 sec	RCP C #2 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS15A	0-400 gpm/0-3600 sec	RCP A #3 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS15B	ACT,400,0	RCP B # 3 seal failure	LOR-SE-89-11	SIMULATOR EXAM 89-11
MAL RCS15B	0-400 gpm/0-3600 sec	RCP B #3 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS15C	0-400 gpm/0-3600 sec	RCP C #3 SEAL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS16A	0-30 mils/0-3600 sec	RCP A VIBRATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS16B	0-30 mils/0-3600 sec	RCP B VIBRATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS16C	ACT,25	RCP high vibration	LOR-SE-89-12	SIMULATOR EXAM 89-12
MAL RCS16C	0-30 mils/0-3600 sec	RCP C VIBRATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS1A	ACT,100	DBA LOCA - loop 1 cold leg	JPM-CR-008	VERIFY SAFETY INJECTION ACTUATION
MAL RCS1A	ACT,100	DBA LOCA - loop 1 cold leg	JPM-CR-003	MANUALLY INITIATE CONTAINMENT SPRAY
MAL RCS1A	ACT,25	25% DBA LOCA - Lp 1 cold leg	LOR-SS-01	LARGE BREAK LOSS OF COOLANT ACCIDENT
MAL RCS1A	0-100%/0-3600 sec	LOOP 1 COLD LEG LOCA	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS1A-F	ACT,100	DBA LOCA	SR-SE-028	ABNORMAL CV CONDITIONS
MAL RCS1A-F	ACT,100	DBA LOCA	SR-SE-022	LOSS OF COOLANT ACCIDENT
MAL RCS1ACE	ACT,100	DBA LOCA-Loop1,2,or3 cold leg	SR-SE-016	LOCA AT COLD SHUTDOWN
MAL RCS1B	0-100%/0-3600 sec	LOOP 1 HOT LEG LOCA	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS1C	ACT,?	DBA LOCA - Loop 2 cold leg	RO-SE-057	LOCA AND DROPPED ROD
MAL RCS1C	0-100%/0-3600 sec	LOOP 2 COLD LEG LOCA	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS1D	0-100%/0-3600 sec	LOOP 2 HOT LEG LOCA	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS1E	ACT,0.11,700	LOCA	LOR-SE-89-03	SIMULATOR EXAM 89-3
MAL RCS1E	0-100%/0-3600 sec	LOOP 3 COLD LEG LOCA	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS1F	100,5,	LOCA	LOR-SE-89-15	SIMULATOR EXAM 89-15
MAL RCS1F	0-100%/0-3600 sec	LOOP 3 HOT LEG LOCA	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL RCS2	ACT,OC	RCP trip	RO-SE-054	RCP SEAL FAILURE
MAL RCS2A	UF,UV,OC	RCP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS2A/B/	ACT,?	RCP trip	SR-SE-027	RCP SEAL FAILURE
MAL RCS2B	UF,UV,OC	RCP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS2C	UF,UV,OC	RCP C TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS2C	ACT,OC	RCP trip	LOR-SE-89-12	SIMULATOR EXAM 89-12
MAL RCS3A	0-30 mils	RCP A LOCKED ROTOR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS3B	0-30 mils	RCP B LOCKED ROTOR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS3C	0-30 mils	RCP C LOCKED ROTOR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS4A	0-30 mils	RCP A SHAFT BREAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS4B	0-30 mils	RCP B SHAFT BREAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS4C	0-30 mils	RCP C SHAFT BREAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS5	ACT,500	RCS boron change to 500 ppm	RO/SRO-SE-013	PREMATURE CRITICALITY
MAL RCS5	0-3000 ppm	VAR. RCS BORON CONCENTRATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS5	ACT,1215	RCS boron change to 1215 ppm	RO-SE-012	REFUELING STARTUP
MAL RCS5	ACT,60,3600	RCS boron change to 60 ppm	RO-SE-035	STARTUP WITH MALFUNCTIONS
MAL RCS5	ACT,	Increase RCS boron 75 ppm	RO-SE-018	REACTOR TRIP
MAL RCS5	ACT,170,240,0	RCS boron change to 170 ppm	RO/SRO-SE-013	PREMATURE CRITICALITY
MAL RCS6A		TRAIN A ICCM PLASMA DISPLAY	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS6B		TRAIN B ICCM PLASMA DISPLAY	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS8	0-240 gpm/0-3600 sec	REACTOR VESSEL VENT LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS9A	ACT,225,6	225 gpm Loop 1 cold leg leak	LOR-SE-89-14	SIMULATOR EXAM 89-14
MAL RCS9A	ACT,50	50 gpm Loop 1 col leg leak	RO-SE-031	LOSS OF COOLANT ACCIDENT
MAL RCS9A	0-1000 gpm/0-3600 sec	LOOP 1 COLD LEG LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS9A	ACT,700	700 gpm loop 1 cold leg leak	JPM-CR-004	RESPOND TO AN ATWS EVENT
MAL RCS9A-F	ACT,50	50 gpm RCS leak	SR-SE-028	ABNORMAL CV CONDITIONS
MAL RCS9A-F	ACT,40	40 gpm RCS leak	RO-SE-061	LOSS OF COMPONENT COOLING WATER
MAL RCS9A-F	ACT,300,120,220	300 gpm RCS leak	RO/SRO-SE-002	EXCESSIVE RCS LEAKAGE
MAL RCS9B	ACT,1000	1000 gpm RCS leak	RO-SE-031	LOSS OF COOLANT ACCIDENT
MAL RCS9B	0-1000 gpm/0-3600 sec	LOOP 1 HOT LEG LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS9C	ACT,50	50 gpm Loop 2 cold leg leak	SR-SE-008	SMALL BREAK LOCA
MAL RCS9C	ACT,225,6	225 gpm Loop 2 cold leg leak	LOR-SE-89-14	SIMULATOR EXAM 89-14
MAL RCS9C	0-1000 gpm/0-3600 sec	LOOP 2 COLD LEG LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL RCS9D	0-1000 gpm/0-3600 sec	LOOP 2 HOT LEG LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS9E	ACT,30,2	Loop 3 30 gpm hot leg leak	LOR-SE-89-06	SIMULATOR EXAM 89-6
MAL RCS9E	ACT,225,6	225 gpm Loop 3 cold leg leak	LOR-SE-89-14	SIMULATOR EXAM 89-14
MAL RCS9E	75,180	75 gpm RCS leak	LOR-SE-89-03	SIMULATOR EXAM 89-3
MAL RCS9E	ACT,75	Loop 3 75 gpm hot leg leak	LOR-SE-89-06	SIMULATOR EXAM 89-6
MAL RCS9E	ACT,600	Loop 3 600 gpm hot leg leak	LOR-SE-89-06	SIMULATOR EXAM 89-6
MAL RCS9E	0-1000 gpm/0-3600 sec	LOOP 3 COLD LEG LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RCS9F	0-1000 gpm/0-3600 sec	LOOP 3 HOT LEG LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR1A	ACT	RHR pump A trip	SR-SE-005	RCS COOLDOWN WITH MALFUNCTIONS
MAL RHR1A	ACT	RHR pump A trip	SR-SE-022	LOSS OF COOLANT ACCIDENT
MAL RHR1A		RHR PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR1A/B	ACT	RHR pump trip	RO-SE-057	LOCA AND DROPPED ROD
MAL RHR1B	ACT	RHR pump B trip	SR-SE-016	LOCA AT COLD SHUTDOWN
MAL RHR1B	ACT	RHR pump B trip	SR-SE-022	LOSS OF COOLANT ACCIDENT
MAL RHR1B		RHR PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR2	0-100%/0-3600 sec	RHR HX FLOW CONTROL VLV FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR3	0-100%/0-3600 sec	RHR HX BYPASS (FCV-605) FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR4	0-100%/0-3600 sec	FAILURE OF HCV-142	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR5A	0-3500 gpm/0-3600 sec	RHR LINE LEAK (TRAIN A)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR5B	0-3500 gpm/0-3600 sec	RHR LINE LEAK (TRAIN B)	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR5B	ACT,3500	RHR leak - 3500 gpm	JPM-CR-030	LOSS OF RESIDUAL HEAT REMOVAL (SHUTDOWN COOLING)
MAL RHR6A	0-100%/0-3600 sec	RHR SUMP VALVE 861A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR6B	0-100%/0-3600 sec	RHR SUMP VALVE 861B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR6C	0-100%/0-3600 sec	RHR SUMP VALVE 860A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR6D	0-100%/0-3600 sec	RHR SUMP VALVE 860B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR7A	0-1000 gpm/0-3600 sec	RHR HX A TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR7B	0-1000 gpm/0-3600 sec	RHR HX B TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RHR8	0-100%/0-3600 sec	RHR RELIEF VLV RHR-706 FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RMS1		SAMPLE PUMP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RMS2	ACT,200,120	Waste gas tank rupture	RO-SE-069	LOSS OF HEAT SINK
MAL RMS2	0-100000 curies/0-3600 s	WASTE GAS DECAY TANK RUPTURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RMS3	0-100000 curies/0-3600 s	LIQUID WASTE TANK RUPTURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RPS1A	1=opens/2=fails to open	REACTOR TRIP BKR A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL RPS1A	1=opens/2=fails to open	REACTOR TRIP BKR A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	RO-SE-039	ATWS WITH LOSS OF FW/EJECTED ROD
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	RO-SE-042	DEMO - UNCONTROLLED ROD WITHDRAWAL
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	SR-SE-021	ATWS WITH LOSS OF INSTRUMENT BUS
MAL RPS1A,B	ACT,2,3,0	Reactor trip bkrs fail shut	RO-SE-019	ATWS
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	RO-SE-050	SPURIOUS SAFETY INJECTION
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	RO-SE-018	REACTOR TRIP
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	RO-SE-063	LOAD REJECTION WITH FAILED STEAM DUMP
MAL RPS1A,B	ACT,?,3	RTB A (and/or?) B fail open	RO-SE-022	ABNORMAL CV CONDITIONS
MAL RPS1A,B	ACT,2,3,60	Reactor trip bkrs fail shut	RO/SRO-SE-005	EXCESSIVE FEEDWATER/ATWS
MAL RPS1A,B	ACT,2,1	Reactor trip bkrs fail shut	RO-SE-053	DEMO - LOSS OF RCP/MSIV CLOSURE
MAL RPS1A,B	ACT,2,1,0	Reactor trip bkrs fail shut	RO/SRO-SE-006	MAIN STEAM BREAK/EXCESSIVE FEEDWATER
MAL RPS1A,B	ACT,1	Inadvertent reactor trip	RO-SE-017	PROCEDURE REVIEW - REACTOR AND TURBINE TRIP
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	SR-SE-022	LOSS OF COOLANT ACCIDENT
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	SR-SE-012	RCP SEAL FAILURES WITH ATWS
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	SR-SE-024	ATWS WITH EJECTED ROD
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	SR-SE-013	ATWS WITH FAILED PRESSURIZER PORV
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	RO-SE-069	LOSS OF HEAT SINK
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	JPM-CR-004	RESPOND TO AN ATWS EVENT
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	SR-SE-010	LOSS OF HEAT SINK
MAL RPS1A,B	ACT,2,1,0	Reactor trip bkrs fail shut	RO/SRO-SE-009	TMI-2 SCENARIO
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	RO-SE-065	ATWS
MAL RPS1A,B	ACT,2,1	Auto reactor trip failure	LOR-SE-89-05	SIMULATOR EXAM 89-5
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	LOR-SS-07	ANTICIPATED TRANSIENT WITHOUT SCRAM
MAL RPS1A,B	ACT,2,3	Reactor trip bkrs fail shut	LOR-SE-89-11	SIMULATOR EXAM 89-11
MAL RPS1B	1=opens/2=fails to open	REACTOR TRIP BKR B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RPS1B	1=opens/2=fails to open	REACTOR TRIP BKR B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RPS1C	1=opens/2=fails to open	RX TRIP BYPASS BKR A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RPS1D	1=opens/2=fails to open	RX TRIP BYPASS BKR B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RPS2A		AMSAC INADVERTANT TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RPS2B	ACT	AMSAC failure to trip	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL RPS2B	ACT	AMSAC failure to trip	LOR-SE-89-11	SIMULATOR EXAM 89-11

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL RPS2B		AMSAC FAILURE TO TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL RPS3	ACT	Steam dump permissive failure	RO-SE-052	LOAD REJECTION WITH FAILED OPEN PZR PORV
MAL RPS3	ACT	Steam dump permissive failure	LOR-SS-12	PRESSURIZER SPRAY VALVE FAILURE
MAL RPS3	ACT	Steam dump permissive failure	RO-SE-063	LOAD REJECTION WITH FAILED STEAM DUMP
MAL RPS3	ACT	Steam dump permissive failure	SR-SE-013	ATWS WITH FAILED PRESSURIZER PORV
MAL RPS3		STEAM DUMP PERMISSIVE FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1A	0-100%/0-3600 sec	SG A SAFETY VLV SV1-1A FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1A-D	100,5	SG A safety valves open	LOR-SE-89-04	SIMULATOR EXAM 89-4
MAL SGN1A-L	A,100,0,FNISPR.GT.20	MS safety valve stuck open	RO-SE-056	MSLB - SG SAFETY VALVE
MAL SGN1B	0-100%/0-3600 sec sec	SG A SAFETY VLV SV1-2A FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1C	ACT,9,60	Safety valve leaking	LOR-SE-89-10	SIMULATOR EXAM 89-10
MAL SGN1C	0-100%/0-3600 sec	SG A SAFETY VLV SV1-3A FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1D	0-100%/0-3600 sec	SG A SAFETY VLV SV1-4A FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1E	ACT,100,0,RMSHMSIB<0	Safety valve SV1-1B 100% open	SR-SE-019	SGTR WITH SG SAFETY VALVE FAILING OPEN
MAL SGN1E	0-100%/0-3600 sec	SG A SAFETY VLV SV1-1B FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1F	0-100%/0-3600 sec	SG A SAFETY VLV SV1-2B FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1G	0-100%/0-3600 sec	SG A SAFETY VLV SV1-3B FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1H	0-100%/0-3600 sec	SG A SAFETY VLV SV1-4B FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1I	0-100%/0-3600 sec	SG A SAFETY VLV SV1-1C FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1I	ACT,100	SG C safety valve open	RO-SE-068	SGTR WITH SG SAFETY VALVE FAILED OPEN
MAL SGN1J	0-100%/0-3600 sec	SG A SAFETY VLV SV1-2C FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1K	0-100%/0-3600 sec	SG A SAFETY VLV SV1-3C FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN1L	0-100%/0-3600 sec	SG A SAFETY VLV SV1-4C FAILUR	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN2A	ACT,600,10	600 gpm SGTR SG A	LOR-SS-22	STEAM GENERATOR TUBE RUPTURE
MAL SGN2A	ACT,30,30	30 gpm SG A tube leak	LOR-SE-89-01	SIMULATOR EXAM 89-1
MAL SGN2A	0-600 gpm/0-3600 sec	SG A TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN2A	ACT,600,3000	600 gpm SGTR SG A	LOR-SE-89-10	SIMULATOR EXAM 89-10
MAL SGN2A	ACT,600,300	600 gpm SGTR SG A	LOR-SE-89-01	SIMULATOR EXAM 89-1
MAL SGN2A-C	ACT,60	60 gpm SG tube leak	SR-SE-015	SGTR WITH FAILED PRESSURIZER PORV
MAL SGN2A-C	ACT,80	80 gpm SG tube leak	RO-SE-070	SGTR WITH PRESSURIZER PORV FAILURE
MAL SGN2A-C	ACT,40	40 gpm SG tube leak	SR-SE-004	STEAM GENERATOR TUBE RUPTURE
MAL SGN2A-C	ACT,30	30 gpm SG tube leak	RO-SE-037	STEAM GENERATOR TUBE RUPTURE
MAL SGN2A-C	ACT,?	SGTR	SR-SE-004	STEAM GENERATOR TUBE RUPTURE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL SGN2A-C	ACT,600	600 gpm SGTR	RO-SE-037	STEAM GENERATOR TUBE RUPTURE
MAL SGN2A-C	ACT,600	600 gpm SGTR	SR-SE-015	SGTR WITH FAILED PRESSURIZER PORV
MAL SGN2A/B/	ACT,600,1800	600 gpm SGTR	SR-SE-023	SGTR WITH LOSS OF PRESSURIZER PRESSURE CONTROL
MAL SGN2B	ACT,400,2400	400 gpm tube leak SG B	SR-SE-019	SGTR WITH SG SAFETY VALVE FAILING OPEN
MAL SGN2B	0-600 gpm/0-3600 sec	SG B TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN2C	ACT,90,10	90 gpm tube leak SG C	LOR-SS-19	STEAM GENERATOR TUBE LEAK AT POWER
MAL SGN2C	ACT,600,10	600 gpm SGTR SG C	LOR-SS-14	SGTR WITH CONCURRENT STEAM LEAK
MAL SGN2C	ACT,600	600 gpm SGTR SG C	RO-SE-068	SGTR WITH SG SAFETY VALVE FAILED OPEN
MAL SGN2C	0-600 gpm/0-3600 sec	SG C TUBE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN3A	0-100%/0-3600 sec	SG A LEVEL PROGRAM FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN3A-C	ACT,100,60	MFRV controller failure	RO-SE-055	LOCA - PRESSURIZER SAFETY VALVE
MAL SGN3B	0-100%/0-3600 sec	SG B LEVEL PROGRAM FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN3C	0-100%/0-3600 sec	SG C LEVEL PROGRAM FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN4A	0-100%/0-60 sec	UNSTABLE SG A CONTROLLER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN4B	0-100%/0-60 sec	UNSTABLE SG B CONTROLLER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SGN4C	0-100%/0-60 sec	UNSTABLE SG C CONTROLLER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS1A	ACT,2	SI Train A fails to initiate	SR-SE-019	SGTR WITH SG SAFETY VALVE FAILING OPEN
MAL SIS1A	ACT,2	SI Train A fails to initiate	JPM-CR-008	VERIFY SAFETY INJECTION ACTUATION
MAL SIS1A	ACT,1	Train A SI initiation	SR-SE-022	LOSS OF COOLANT ACCIDENT
MAL SIS1A	1=init/2=fail to init	SI FAILURE TRAIN A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS1A,B	ACT,1	Train A/B SI initiation	RO-SE-050	SPURIOUS SAFETY INJECTION
MAL SIS1A/B	ACT,2	SI fails to initiate	RO-SE-034	MAIN STEAM LINE BREAK
MAL SIS1B	ACT,2	SI Train B fails to initiate	SR-SE-012	RCP SEAL FAILURES WITH ATWS
MAL SIS1B	ACT,2	SI Train B fails to initiate	JPM-CR-008	VERIFY SAFETY INJECTION ACTUATION
MAL SIS1B	ACT,1	Train B SI initiation	SR-SE-022	LOSS OF COOLANT ACCIDENT
MAL SIS1B	1=init/2=fail to init	SI FAILURE TRAIN B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS2A	0-50 gpm/0-3600 sec	LOOP 1 ACCUMULATOR LEAKAGE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS2A-C	ACT,?,?	Accumulator leak	RO-SE-048	STEAM DUMP FAILURE
MAL SIS2B	0-50 gpm/0-3600 sec	LOOP 2 ACCUMULATOR LEAKAGE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS2C	ACT	Loop 3 accumulator leak	JPM-CR-019	FILL A SAFETY INJECTION ACCUMULATOR
MAL SIS2C	0-50 gpm/0-3600 sec	LOOP 3 ACCUMULATOR LEAKAGE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS3A	0-100 cuft/min/0-3600 sec	NITROGEN LEAK ACCUMULATOR 1	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS3A-C	ACT,?,?	Accumulator nitrogen leak	RO-SE-059	LOSS OF ALL AC POWER 1

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL SIS3B	ACT	Nitrogen leak loop 2 accum.	JPM-CR-020	PRESSURIZE A SAFETY INJECTION ACCUMULATOR
MAL SIS3B	0-100 cuft/min/0-3600 sec	NITROGEN LEAK ACCUMULATOR 2	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS3B	ACT,10,5	Accum. B nitrogen leak	LOR-SS-20	CCW LEAK/PT-446 FAILURE
MAL SIS3C	0-100 cuft/min/0-3600 sec	NITROGEN LEAK ACCUMULATOR 3	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS4A	ACT,0,PT:455.LT.2000	SI pump A failure	RO/SRO-SE-009	TMI-2 SCENARIO
MAL SIS4A		SI PUMP A FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS4B	ACT,0	SI pump B failure	RO/SRO-SE-009	TMI-2 SCENARIO
MAL SIS4B		SI PUMP B FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS4C	ACT	SI pump C failure	LOR-SS-02	PRESSURIZER CODE SAFETY VALVE LOCA
MAL SIS4C		SI PUMP C FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS5	0-1000 gpm/0-3600 sec	RUPTURE OF BORON INJECTION TK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS6A		FAILURE SI TRAIN A TIMER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS6B		FAILURE SI TRAIN B TIMER	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS7A	0-1000 gpm/0-3600 sec	SI PUMP A SUCTION LINE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS7B	0-1000 gpm/0-3600 sec	SI PUMP B SUCTION LINE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS7C	0-1000 gpm/0-3600 sec	SI PUMP C SUCTION LINE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SIS8	0-10000 gpm/0-3600 sec	RWST LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS10	0-100%/0-3600 sec	TCV-1650 (HYDROGEN) FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS11	0-100%/0-3600 sec	TCV-1673 (TURBINE LO) FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS1A		SERVICE WATER PUMP A TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS1A-D	ACT	SW pump trip	RO-SE-062	BLACKOUT
MAL SWS1A-D	ACT	SW pump trip	SR-SE-026	BLACKOUT
MAL SWS1B		SERVICE WATER PUMP B TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS1C		SERVICE WATER PUMP C TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS1D		SERVICE WATER PUMP D TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS2A	0-400 gpm/0-3600 sec	CV CLR SW LEAK TO HVH A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS2A-D	ACT,?,?,10	HVH cooler leak	RO-SE-022	ABNORMAL CV CONDITIONS
MAL SWS2B	0-400 gpm/0-3600 sec	CV CLR SW LEAK TO HVH B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS2C	0-400 gpm/0-3600 sec	CV CLR SW LEAK TO HVH C	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS2D	0-400 gpm/0-3600 sec	CV CLR SW LEAK TO HVH D	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS2D	ACT,400,10	400 gpm SW leak on HVH-4	LOR-SS-08	LOSS OF LETDOWN/LOSS OF HEATER DRAIN PUMPS
MAL SWS3A	0-20000 gpm/0-3600 sec	SW PUMP A DISCH PIPE TEE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS3B	0-20000 gpm/0-3600 sec	SW PUMP B DISCH PIPE TEE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL SWS4A	ACT,20000	SW leak - north header	SR-SE-030	LOSS OF INSTRUMENT AIR
MAL SWS4A	0-20000 gpm/0-3600 sec	SW NORTH HEADER LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS4A/B	ACT,20000	SW header leak	RO-SE-064	INADEQUATE CORE COOLING
MAL SWS4B	ACT,10000,30,150	SW header leak	RO/SRO-SE-013	PREMATURE CRITICALITY
MAL SWS4B	0-20000 gpm/0-3600 sec	SW SOUTH HEADER LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS5	0-10000 gpm/0-3600 sec	LEAK AFTER TI-1666 IN T.B.	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS6A	0-4000 gpm/0-3600 sec	SW BOOSTER PUMP A SUCT LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS6B	0-4000 gpm/0-3600 sec	SW BOOSTER PUMP B SUCT LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS8A	0-100%/0-3600 sec	TCV-1660 (EDG A) FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS8B	0-100%/0-3600 sec	TCV-1661 (EDG B) FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL SWS9	0-100%/0-3600 sec	TCV-1678 (EXCITER) FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR1	ACT	Inadvertent turbine trip	RO-SE-029	BLACKOUT
MAL TUR1	ACT	Inadvertent turbine trip	RO-SE-019	ATWS
MAL TUR1	ACT	Inadvertent turbine trip	RO-SE-058	MSLB WITH MSIV FAILURE TO CLOSE
MAL TUR1	ACT	Inadvertent turbine trip	RO-SE-065	ATWS
MAL TUR1	ACT	Inadvertent turbine trip	SR-SE-013	ATWS WITH FAILED PRESSURIZER PORV
MAL TUR1	ACT	Inadvertent turbine trip	LOR-SS-07	ANTICIPATED TRANSIENT WITHOUT SCRAM
MAL TUR1		INADVERTENT TURBINE TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR10	-0.5 to 15 V/0-3600 sec	AEH MEGAWATT CHANNEL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR11A		BEARING LUBE OIL AC PUMP TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR11B		BEARING LUBE OIL DC PUMP TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR12A		LOSS OF EH PUMP A	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR12B		LOSS OF EH PUMP B	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR13		TURNING GEAR FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR14	0-100 gpm/0-3600 sec	MLO PUMP DISCHARGE LINE LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR15A	0-100%/0-3600 sec	MSR SAFETY MS-299 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR15B	0-100%/0-3600 sec	MSR SAFETY MS-300 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR15C	0-100%/0-3600 sec	MSR SAFETY MS-301 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR15D	0-100%/0-3600 sec	MSR SAFETY MS-302 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR15E	0-100%/0-3600 sec	MSR SAFETY MS-303 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR15F	0-100%/0-3600 sec	MSR SAFETY MS-304 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR15G	0-100%/0-3600 sec	MSR SAFETY MS-305 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR15H	0-100%/0-3600 sec	MSR SAFETY MS-306 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL TUR16	0-3600 sec	LOSS OF GLAND SEAL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR17	0-100%/0-3600 sec	MSR TIMER CONTROL FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR18	0-100 gpm/0-3600 sec	EH RESERVOIR LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR19		TURB BRG LIFT OIL PUMP TRIP	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR20A	3-15 sec/0-3600 sec	ROD DROP RNBK TIME DELAY FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR20B	0-5 sec/0-3600 sec	DELTA T RNBK TIME DELAY FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR21A	ACT,2	Turb. limiter runback inhibit	LOR-SS-17	DROPPED ROD/PZR SAFETY VALVE LEAK
MAL TUR21A	ACT,1	Turb limiter runback initiate	LOR-SS-04	MAIN FEEDWATER PUMP TRIP/MANUAL RUNBACK
MAL TUR21A	ACT,2	Turb. limiter runback inhibit	LOR-SS-13	LOSS OF INSTRUMENT BUS3/LOWERING VACUUM
MAL TUR21A	1=runback,2=fails to rnbk	TURB LOAD LIMIT RUNBACK FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR21B	ACT,2	Turb. ref. runback inhibit	LOR-SS-17	DROPPED ROD/PZR SAFETY VALVE LEAK
MAL TUR21B	ACT,1	Turb. ref. runback initiate	LOR-SS-04	MAIN FEEDWATER PUMP TRIP/MANUAL RUNBACK
MAL TUR21B	ACT,2	Turb. ref. runback inhibit	LOR-SS-13	LOSS OF INSTRUMENT BUS3/LOWERING VACUUM
MAL TUR21B	1=runback,2=fails to rnbk	TURB LOAD REF RUNBACK FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR22	0-100 gpm/0-3600 sec	EH HIGH PRESSURE FLUID LEAK	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR2A	ACT	Manual turbine trip failure	RO-SE-055	LOCA - PRESSURIZER SAFETY VALVE
MAL TUR2A	ACT	Manual turbine trip failure	RO-SE-035	STARTUP WITH MALFUNCTIONS
MAL TUR2A	ACT	Manual turbine trip failure	SR-SE-020	PRESSURIZER SAFETY VALVE LEAK
MAL TUR2A	ACT,0	Manual turbine trip failure	RO/SRO-SE-007	LOSS OF INSTRUMENT BUS
MAL TUR2A		MANUAL TURBINE TRIP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR2B	ACT	Auto turbine trip failure	SR-SE-020	PRESSURIZER SAFETY VALVE LEAK
MAL TUR2B	ACT	Auto turbine trip failure	LOR-SE-89-02	SIMULATOR EXAM 89-2
MAL TUR2B	ACT	Auto turbine trip failure	SR-SE-010	LOSS OF HEAT SINK
MAL TUR2B	ACT	Auto turbine trip failure	RO-SE-053	DEMO - LOSS OF RCP/MSIV CLOSURE
MAL TUR2B	ACT,0	Auto turbine trip failure	RO/SRO-SE-007	LOSS OF INSTRUMENT BUS
MAL TUR2B	ACT	Auto turbine trip failure	RO-SE-055	LOCA - PRESSURIZER SAFETY VALVE
MAL TUR2B	ACT	Auto turbine trip failure	LOR-SS-09	SMALL LOSS OF COOLANT ACCIDENT
MAL TUR2B	ACT	Auto turbine trip failure	LOR-SE-89-10	SIMULATOR EXAM 89-10
MAL TUR2B	ACT	Auto turbine trip failure	RO-SE-069	LOSS OF HEAT SINK
MAL TUR2B	ACT	Auto turbine trip failure	LOR-SE-89-05	SIMULATOR EXAM 89-5
MAL TUR2B	ACT	Auto turbine trip failure	LOR-SE-89-11	SIMULATOR EXAM 89-11
MAL TUR2B		AUTO TURBINE TRIP FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR3A	0-50%/1=sinusoid,2=random	STOP VLV SV-1 OSCILLATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE

CROSS-REFERENCE OF SIMULATOR FUNCTIONS TO TRAINING MODULE

MALFUNCTION	MALFUNCTION OPTIONS	MALFUNCTION DESCRIPTION	TRAINING MODULE	MODULE NAME
MAL TUR3B	0-50%/1=sinusoid,2=random	STOP VALVE SV-2 OSCILLATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR3C	0-50%/1=sinusoid,2=random	GOV. VALVE GV-1 OSCILLATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR3D	0-50%/1=sinusoid,2=random	GOV. VALVE GV-2 OSCILLATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR3E	0-50%/1=sinusoid,2=random	GOV. VALVE GV-3 OSCILLATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR3F	0-50%/1=sinusoid,2=random	GOV. VALVE GV-4 OSCILLATION	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4A	0-100%/0-3600 sec	TURBINE BEARING #1 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4B	0-100%/0-3600 sec	TURBINE BEARING #2 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4C	0-100%/0-3600 sec	TURBINE BEARING #3 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4D	0-100%/0-3600 sec	TURBINE BEARING #4 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4E	ACT,25	Turb. #5 bearing hi vibr	RO-SE-048	STEAM DUMP FAILURE
MAL TUR4E	0-100%/0-3600 sec	TURBINE BEARING #5 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4F	0-100%/0-3600 sec	TURBINE BEARING #6 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4G	0-100%/0-3600 sec	TURBINE BEARING #7 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4H	0-100%/0-3600 sec	TURBINE BEARING #8 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR4I	0-100%/0-3600 sec	TURBINE BEARING #9 FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR5A	0-100%/0-3600 sec	TURB STOP VALVE SV-1 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR5B	0-100%/0-3600 sec	TURB STOP VALVE SV-2 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR5C	0-100%/0-3600 sec	TURB STOP VALVE GV-1 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR5D	0-100%/0-3600 sec	TURB STOP VALVE GV-2 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR5E	ACT,100,10	Gov. Vlv 3 opens 100%	RO-SE-045	LOCA - PRESSURIZER PORV FAILURE
MAL TUR5E	0-100%/0-3600 sec	TURB STOP VALVE GV-3 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR5F	ACT,100,60	Gov. valve 4 open	RO-SE-067	TURBINE MALFUNCTIONS
MAL TUR5F	0-100%/0-3600 sec	TURB STOP VALVE GV-4 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR6A	0-100%/0-3600 sec	INTERCEPT VALVE 1 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR6B	0-100%/0-3600 sec	INTERCEPT VALVE 2 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR6C	0-100%/0-3600 sec	INTERCEPT VALVE 3 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR6D	0-100%/0-3600 sec	INTERCEPT VALVE 4 FAILURE	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR7		LOAD REF CHANNEL MONITOR FAIL	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR8A	0-120%/0-3600 sec	MAIN SPEED CHANNEL FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR8B	0-120%/0-3600 sec	AUX SPEED CHANNEL FAILS	AVAILABLE MAL	AVAILABLE MALFUNCTIONS FROM INSTRUCTOR INTERFACE
MAL TUR8B	ACT,0,30	Aux. speed channel failure	RO-SE-035	STARTUP WITH MALFUNCTIONS

APPENDIX H

OPERATIONS SURVEILLANCE TEST ASSESSMENT

OPERATIONS SURVEILLANCE TEST ASSESSMENT

Each Operations Surveillance Test (OST) was evaluated to determine whether it should be incorporated into a Simulator Performance Test. The decision to include an OST was based on the following criteria:

1. Control Room Interface, which was divided into three categories:

   a. Major Control Room Interface - a majority of manipulations and observations related to the OST are performed from the control room.

   b. Minimum Control Room Interface - very few steps and observations related to the OST are performed from the control room. For example, a pump is started/stopped and the remaining procedural steps are performed outside the control room, such as obtaining vibration readings and local pressure/flow/temperature readings.

   c. Performed Outside Control Room - OST is performed on local equipment and no relevant control room manipulation or observation.

2. Whether the OST is performed on a safety related system or component. ANSI/ANS-3.5-1985, Section 3.1.1(10) requires that the simulator be capable of simulating continuously, and in real time, operator conducted surveillance testing on safety related equipment and systems.

All OSTs evaluated to have major control room interface and performed on safety related systems and components were incorporated into the simulator testing program, unless the initial conditions required by the OST could not be satisfied on the simulator due to modelling restrictions (example: RCS vented to containment). Also, OSTs having major control room interface and performed on non-safety related equipment and systems were included in the testing program to provide enhancement of the testing program.

OSTs found to have minimum control room interface were not incorporated into Simulator Performance Tests due to the lack of training/testing benefit, except for those OSTs containing valve stroke testing on safety related systems. The valve testing portion of those OSTs were incorporated into Simulator Performance Test 6.6, Valve Stroke Test.

The OSTs performed exclusively outside the control room were not incorporated into the simulator performance tests.

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-001	NUC. INST. SO. RGE, INTER. RGE, PWR. RGE.-WEEKLY-(WHILE REA. IS SHUTDOWN)-PRIOR TO STARTUP (IF NOT DN WITHIN PREV. 7 DAYS)		X		X	2.10.001	
OST-002	NUCLEAR INSTRUMENTATION POWER RANGE BI-WEEKLY (POWER LEVEL ABOVE 2% AND BELOW P-10)		X		X	2.10.001	
OST-003	NUCLEAR INSTRUMENTATION POWER RANGE BI-WEEKLY (POWER LEVEL ABOVE P-10 AND BELOW 25% F.P.)		X		X	2.10.001	
OST-004	NUCLEAR INSTRUMENTATION POWER RANGE (BI-WEEKLY) (POWER LEVEL ABOVE 25% AND BELOW P-8)		X		X	2.10.001	
OST-005	NUCLEAR INSTRUMENTATION POWER RANGE (BI-WEEKLY) (POWER LEVEL ABOVE P-8)		X		X	2.10.001	
OST-006	NUC. INST. SOURCE RANGE AND INTERMEDIATE RANGE BI-WEEKLY (PWR ABOVE P-6), PRIOR TO SCHEDULED SHUTDOWN INTERVAL		X		X	2.10.006	

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-007	NUCLEAR INSTRUMENTATION COMPARATOR CHANNEL (WEEKLY - REACTOR SHUTDOWN) (BI-WEEKLY REACTOR AT POWER)		X		X	2.10.007	
OST-008	NUCLEAR INSTRUMENTATION STARTUP RATE CHANNEL WEEKLY INTERVAL (WHILE REACTOR IS SHUTDOWN) BI-WEEKLY INTERVAL		X		X	2.10.008	
OST-009	NUC. INST. AUDIO COUNT RATE CHANNEL WEEKLY (WH REA IS SD) BI-WEEKLY (REA AT POWER) PRIOR TO SCHEDULED SHUTDOWN		X		X	2.10.009	
OST-010	POWER RANGE CALORIMETRIC DURING POWER OPERATION DAILY		X		X	2.9.1	
OST-011	ROD CLUSTER CONTROL EXERCISE & ROD POSITION INDICATION BI-WEEKLY INTERVAL		X		X	2.10.011	
OST-051	REACTOR COOLANT SYSTEM LEAKAGE EVALUATION (DAILY)		X		X	2.10.051	

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-052	RCS LEAKAGE TEST & EXAM. PRIOR TO STARTUP FOLLOWING AN OPENING OF THE PRIM. SYS. (REFUELING AND/OR STARTUP INTERVAL)	X			X		
OST-053	INSPECTION FOR REACTOR COOLANT SYSTEM LEAKAGE (PRIOR TO AND FOLLOWING COOLDOWN) (REFUELING INTERVAL)			X	X		
OST-054	CORE COOLING MONITOR CHANNEL CHECK (MONTHLY)		X		X	2.10.054	
OST-055	REACTOR VESSEL LEVEL INSTRUMENTATION SYSTEM (RVLIS) (MONTHLY)		X		X	2.10.055	
OST-101	CHEMICAL AND VOLUME CONTROL SYSTEM COMPONENT TEST (QUARTERLY)	X			X		
OST-102	CHEMICAL AND VOLUME CONTROL SYSTEM VALVE TEST (QUARTERLY)	X			X		6.6
OST-104	CHEMICAL AND VOLUME CONTROL SYSTEM INTEGRITY TEST (ANNUAL)	X			X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-105	CHEMICAL AND VOLUME CONTROL SYSTEM - PURIFICATION SYSTEM INTEGRITY TEST (ANNUAL)			X	X		
OST-106	CHEMICAL AND VOLUME CONTROL SYSTEM - BORON RECYCLE SYSTEM (CVCS HOLDUP TANKS) INTEGRITY TEST (ANNUAL)			X	X		
OST-107	BORIC ACID BLENDER CONTROL, VALVE AND PUMP OPERATION (MONTHLY)		X		X	2.10.107	
OST-108	BORIC ACID PUMPS INSERVICE INSPECTION (QUARTERLY)	X			X		
OST-109	CVCS SYS. CHECK VALVE CVC-266 BACK LKG. TEST (COLD SHUTDOWN GREATER THAN 48 HRS., UNLESS PREV. COMPLETED WITHIN 90 DYS)		X		X	2.10.109	
OST-110	BORIC ACID PUMPS I I FLOW TEST (COLD SHUTDOWN GREATER THAN 48 HOURS UNLESS PREVIOUSLY PERFORMED WITHIN 90 DAYS)	X			X		
OST-151	SAFETY INJECTION SYSTEM COMPONENT TEST (QUARTERLY)	X			X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-152	SAFETY INJECTION SYSTEM COMPONENT TEST (QUARTERLY)		X		X		6.6
OST-154	SAFETY INJECTION SYSTEM HIGH HEAD CHECK VALVE TEST (REFUELING)	X			X		
OST-155	SAFETY INJECTION SYSTEM INTEGRITY TEST (ANNUAL)	X			X		
OST-157	SI AND CONTAINMENT SPRAY SYS. VALVE TEST (COLD SHUTDOWN GREATER THAN 48 HRS., UNLESS PERF. WITHIN THE PREV. 90 DAYS)	X			X		6.6
OST-158	SAFETY INJECTION AND CONTAINMENT SPRAY SYSTEMS FLOWPATH VERIFICATION MONTHLY INTERVAL (AT POWER)			X	X		
OST-159	ACCUMULATOR CHECK VALVES BACK LEAKAGE TEST (REFUELING AND STARTUP INTERVAL)	X			X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-160	HL, CL, & RHR CL CHECK VALVES BACK LKGE TEST (REF. & COLD SD INTERVAL OF >72 HRS UNLESS PERFORMED IN PRECEDING 9 MONTHS	X			X		
OST-161	ACCUMULATOR ISOLATION AND CHECK VALVE OPERABILITY TEST (COLD SHUTDOWN)		X		X	2.10.161	
OST-162	EMERGENCY DIESEL GENERATOR AUTO START ON LOSS OF POWER AND SAFETY INJECTION - EMERGENCY DIESEL TRIPS DEFEAT (REFUELING)		X		X	(Note 1)	
OST-163	SAFETY INJECTION TEST (REFUELING)		X		X	(Note 1)	
OST-201	MOTOR DRIVEN AUXILIARY FEEDWATER SYSTEM COMPONENT TEST (MONTHLY)	X			X		6.6
OST-202	STEAM DRIVEN AUXILIARY FEEDWATER SYSTEM COMPONENT TEST (MONTHLY)	X			X		6.6

NOTE 1: Initial conditions for OST requires RCS vented to containment.

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-204	STEAM DRIVEN AUXILIARY FEEDWATER PUMP EMERGENCY COOLING SYSTEM CHECK VALVE TEST (QUARTERLY)			X	X		
OST-205	STEAM DRIVEN AFW SYSTEM VALVE TEST (PRIOR TO HEATUP IF OST-202 HAS NOT BEEN PERFORMED WITHIN THE PREVIOUS 31 DAYS)		X		X		6.6
OST-206	STM. DRIVEN AFW PUMP FLOW TEST (AT PWR PRIOR TO SD TO COLD SD OR AT PWR FOL. EA. COLD SD IF NOT PERF. WITHIN PREV. 31 DYS)	X			X		
OST-207	MOTOR DRIVEN AFW PUMP FLOW TEST (COLD SHUTDOWN GREATER THAN 48 HRS, IF NOT PERFORMED WITHIN THE PREVIOUS 31 DAYS)	X			X		
OST-251	RHR COMPONENT TEST (QUARTERLY)	X			X		
OST-252	RHR COMPONENT TEST (QUARTERLY)		X		X		6.6

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-253	RHR PUMP FLOW TEST REFUELING OR COLD SHUTDOWN GREATER THAN 48 HOURS, IF NOT PERFORMED WITHIN THE PREVIOUS 92 DAYS	X			X		
OST-254	RESIDUAL HEAT REMOVAL SYSTEM LEAK TEST (ANNUAL)	X			X		
OST-255	RHR AND SI SYSTEM CHECK VALVE TEST (REFUELING INTERVAL)		X		X	2.10.255	
OST-301	SERVICE WATER SYSTEM (REFUELING)	X			X		
OST-302	SERVICE WATER SYSTEM COMPONENT TEST (QUARTERLY)	X			X		6.6
OST-305	SERVICE WATER CHEMICAL ADDITION SYSTEM VALVE TEST (QUARTERLY)			X	X		
OST-351	CONTAINMENT SPRAY SYSTEM (REFUELING)	X			X		
OST-352	CONTAINMENT SPRAY SYSTEM COMPONENT TEST (QUARTERLY)	X			X		
OST-353	CONTAINMENT SPRAY SYSTEM COMPONENT TEST (QUARTERLY)		X		X		6.6

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-355	CONTAINMENT SPRAY SYSTEM INTEGRITY TEST (ANNUAL)	X			X		
OST-401	EMERGENCY DIESELS (SLOW SPEED START) (BI-WEEKLY)	X			X	2.10.401	
OST-402	DIESEL FUEL OIL SYSTEM FLOW TEST (QUARTERLY)			X	X		
OST-403	DIESEL FUEL OIL TRANSFER PUMPS TEST (MONTHLY)			X	X		
OST-404	DIESEL GENERATORS EMERGENCY FIELD FLASHING AND MANUAL CLOSURE OF GENERATORS MAIN BREAKERS (REFUELING)	X			X		
OST-405	TSC/EOF/PAP DIESEL GENERATOR (SEMI-ANNUAL)			X			
OST-406	TSC/EOF/PAP DIESEL GENERATOR (WEEKLY)			X			
OST-407	VERIFICATION OF COMPONENT RESPONSE TO BLACKOUT SEQUENCE (REFUELING)	X			X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-408	DIESEL FUEL OIL STORAGE TANK DRAIN AND REFILL REFUELING			X	X		
OST-409	EMERGENCY DIESELS (RAPID SPEED START) (SEMI-ANNUALLY)	X			X		
OST-451	LIQUID WASTE DISPOSAL SYSTEM INTEGRITY TEST (ANNUAL)			X			
OST-452	WASTE GAS SYSTEM INTEGRITY TEST (ANNUAL)			X			
OST-501	MAIN STEAM ISOLATION VALVES (REFUELING)		X		X	2.10.501	
OST-502	STEAM GENERATOR SECONDARY LEAK TEST (INTERVAL: AS NECESSARY)			X			
OST-551	TURBINE VALVE AND TRIP FUNCTIONAL TEST (MONTHLY INTERVAL DURING POWER OPERATION)		X		X	2.10.551	
OST-553	TURBINE MECHANICAL OVERSPEED TRIP TEST (REFUELING)		X			2.10.553	

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-554	TURBINE BEARING OIL SYSTEM AND E-H CONTROL SYSTEM HYDRAULIC COMPONENTS TEST (WEEKLY)			X			
OST-602	UNIT NO. 2 FIRE WATER SYSTEM VALVES (MONTHLY)			X	X		
OST-603	MOTOR DRIVEN FIRE WATER PUMP AND ENGINE DRIVEN FIRE WATER PUMP TEST (WEEKLY)			X	X		
OST-608	UNIT NO. 1 FIRE WATER SYSTEM FLOW PATH VALVES (MONTHLY)			X	X		
OST-609	INSPECTION OF FIRE PROTECTION SYSTEM (YEARLY)			X	X		
OST-610	UNIT NO. 2 PORTABLE FIRE EXTINGUISHERS, FIRE HOSE STATIONS & HOUSES (MONTHLY)			X	X		
OST-611	LOW VOLTAGE FIRE DETECTION AND ACTUATION SYSTEM ZONES 1, 2, 3, 4, 5, 6 AND 7 (SEMI-ANNUAL)			X	X		
OST-612	LOW VOLTAGE FIRE DETECTION AND ACTUATION SYSTEM ZONES 8, 9, 10, 11, AND 12 (SEMI-ANNUAL)			X	X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-613	LOW VOLTAGE FIRE DETECTION AND ACTUATION SYSTEM ZONES 13, 14, AND 15 (SEMI-ANNUAL)			X	X		
OST-614	LOW VOLTAGE FIRE DETECTION AND ACTUATION SYSTEM ZONES 16, 17, 18 AND 19 (SEMI-ANNUAL INTERVAL)			X	X		
OST-615	LOW VOLTAGE FIRE DETECTION AND ACTUATION SYSTEM ZONES 20, 21, AND 22 (SEMI-ANNUAL INTERVAL)			X	X		
OST-616	LOW VOLTAGE FIRE DETECTION AND ACTUATION SYSTEM ZONES 23, 27, 28, 29, AND 30 (SEMI-ANNUAL INTERVAL)			X	X		
OST-617	LOW VOLTAGE FIRE DET. & ACTU. SYS. ZONES 24, 25A, B, C AND 26 COLD SD EXCEEDING 24 HRS. IF NOT PERF. IN THE PREV. 6 MONTHS			X	X		
OST-619	LOW VOLTAGE FIRE DETECTION SYSTEM RADWASTE FACILITY (SEMI-ANNUAL)			X	X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-620	CARBON DIOXIDE SUPPRESSION SYSTEM WEIGHT TEST (SEMI-ANNUAL)			X	X		
OST-621	DIESEL GENERATOR CO2 SYSTEM CYLINDER WEIGHT TEST (SEMI-ANNUAL)			X	X		
OST-622	FIRE SUPPRESSION WATER SYSTEM MOTOR DRIVEN FIRE PUMP TEST (EIGHTEEN MONTHS)			X	X		
OST-623	FIRE BARRIER PENETRATION SEAL INSPECTION (REFUELING)			X	X		
OST-624	FIRE DAMPER INSPECTION (REFUELING)			X	X		
OST-625	FIRE DOOR INSPECTION (SEMI-ANNUALLY)			X	X		
OST-626	ACTUATION & FLOW TEST FOR CABLE VAULT CO2 SUPPRESSION SYSTEM (EIGHTEEN MONTHS)			X	X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-627	ACTUATION AND FLOW TEST FOR EMERGENCY DIESEL GENERATORS CO2 "CARDOX" SUPPRESSION SYSTEM (EIGHTEEN MONTH)			X	X		
OST-628	ACTUATION AND FLOW TEST FOR HALON 1301 SYSTEM (EIGHTEEN MONTH)			X	X		
OST-629	PRE-ACTION SPRINKLER SYSTEM AND DRY STANDPIPE SYSTEM FUNCTIONAL TEST (YEARLY)			X	X		
OST-630	HALON 1301 SUPPRESSION SYSTEM WEIGHT TEST (SEMI-ANNUAL)			X	X		
OST-631	RADWASTE BUILDING SPRINKLER SYSTEM DRAIN AND FLUSH TEST (QUARTERLY)			X	X		
OST-632	UNIT NO. 2 FIRE SUPPRESSION WATER SYSTEM FLOW TEST (THREE (3) YEAR)			X	X		
OST-633	INTERIOR FIRE HOSE HYDROSTATIC TEST (THREE YEAR)			X	X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-634	FIRE BRIGADE SELF-CONTAINED BREATHING APPARATUS (S.C.B.A) INSPECTION (MONTHLY)			X			
OST-635	FLOW TEST FOR RCP "A" PRE-ACTION SPRINKLER SYSTEM (EIGHTEEN MONTHS)			X			
OST-636	FLOW TEST FOR RCP "B" PRE-ACTION SPRINKLER SYSTEM (EIGHTEEN MONTHS)			X			
OST-637	FLOW TEST FOR RCP "C" PRE-ACTION SPRINKLER SYSTEM (EIGHTEEN MONTHS)			X			
OST-638	ELECTRICAL PENETRATION AREA, PRE-ACTION SPRINKLER SYSTEM (EIGHTEEN MONTHS)			X	X		
OST-639	FIRE BUILDING EQUIPMENT INVENTORY (MONTHLY)			X			
OST-640	SELF-CONTAINED DC EMERGENCY LIGHTING SYSTEM (SEMI-ANNUAL)			X			

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-641	FLUSHING CONTAINMENT VESSEL (C.V.) HOSE STATIONS (REFUELING)			X	X		
OST-642	MAIN TRANSFORMER DELUGE SYSTEM FLOW TEST (ANNUALLY)			X			
OST-643	AUXILIARY TRANSFORMER DELUGE SYSTEM FLOW TEST (ANNUALLY)			X			
OST-644	HYDROGEN SEAL OIL DELUGE SYSTEM FLOW TEST (ANNUALLY)			X			
OST-645	TURBINE LUBE OIL DELUGE SYSTEM FLOW TEST (ANNUALLY)			X			
OST-646	FIRE SUPPRESSION WATER SYSTEM ENGINE DRIVEN FIRE PUMP TEST (EIGHTEEN MONTHS)			X	X		
OST-647	EXTERIOR FIRE HOSE HYDROSTATIC TEST (ANNUAL)			X	X		
OST-648	CCW ROOM ONE-HOUR RATED FIRE BARRIER WRAP INSPECTION (18 MONTHS)			X	X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-649	ZONE 12 AND ZONE 14 PRE-ACTION SPRINKLER SYSTEM FLOW AND LOW AIR ALARMS TEST (QUARTERLY)			X			
OST-651	BULK WAREHOUSE SPRINKLER SYSTEM DRAIN AND ALARM TEST (QUARTERLY)			X			
OST-654	EOF/TSC BUILDING SPRINKLER SYSTEM DRAIN AND ALARM TEST (QUARTERLY)			X			
OST-659	PAP BUILDING SPRINKLER SYSTEM DRAIN AND ALARM TEST (QUARTERLY)			X			
OST-660	PAP/EOF DIESEL GENERATOR BUILDING FIRE DETECTION ALARM TEST(S) (SEMI-ANNUALLY)			X			
OST-662	E&RC BUILDING SPRINKLER SYSTEM DRAIN AND ALARM TEST (QUARTERLY)			X			
OST-664	CHEMICAL/BARREL STORAGE WAREHOUSE SPRINKLER SYSTEM TEST (QUARTERLY)			X			

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-665	INSPECTION OF PORTABLE FIRE EXTINGUISHERS AND FIRE HOSE STATIONS (BALANCE OF SITE) (MONTHLY)			X			
OST-669	RCA PROCESSING BUILDING SPRINKLER SYSTEM DRAIN AND ALARM TEST (QUARTERLY)			X			
OST-672	DESIGN ENGINEERING BUILDING SPRINKLER SYSTEM DRAIN AND ALARM TEST (QUARTERLY)			X			
OST-701	INSERVICE INSPECTION VALVE TEST (QUARTERLY)		X		X		6.6
OST-702	ISI SECONDARY SIDE VALVE TEST (COLD SHUTDOWN GREATER THAN 48 HOURS, UNLESS PREVIOUSLY COMPLETED WITHIN NINETY DAYS)		X		X		6.6
OST-703	ISI PRIMARY SIDE VALVE TEST (COLD SHUTDOWN GREATER THAN 48 HOURS, UNLESS PREVIOUSLY COMPLETED WITHIN NINETY DAYS)		X		X		6.6

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-704	ISI PURGE VALVE TEST (PRIOR TO PURGE VALVE USE UNLESS PREVIOUSLY COMPLETED WITHIN NINETY DAYS)		X		X		6.6
OST-901	HVH CONDENSATE MEASURING SYSTEM (WEEKLY)			X			
OST-902	CONTAINMENT FAN COOLERS COMPONENT TEST (MONTHLY)	X			X		6.6
OST-905	RADIATION MONITORING SYSTEM (DAILY)		X		X	2.10.905	
OST-906	EMERGENCY CONTROL STATION TEST (REFUELING)	X			X		
OST-907	POST ACCIDENT CONTAINMENT VENTING SYSTEM LEAK REDUCTION PROGRAM (ANNUAL)			X	X		
OST-908	COMPONENT COOLING SYSTEM COMPONENT TEST (QUARTERLY)	X			X		6.6
OST-909	SAMPLING SYSTEM INTEGRITY TEST (ANNUAL)			X	X		

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-910	DEDICATED SHUTDOWN DIESEL GENERATOR (WEEKLY)			X	X		
OST-911	DEDICATED SHUTDOWN CONTROL STATION TEST (REFUELING)	X			X		
OST-912	DEDICATED SHUTDOWN MIMIC PANEL TEST REFUELING INTERVAL	X					
OST-913	LOCAL CLEARANCE AND TEST REQUEST, CAUTION TAG, AND TEMPORARY MODIFICATION LOG AUDIT (QUARTERLY)	X					
OST-914	OPERATIONS REFUELING OUTAGE TEST PROCEDURE (REFUELING)					(Note 2)	
OST-915	COMPONENT COOLING SYSTEM HYDROSTATIC TEST (5 YEAR REFUELING INTERVAL)	X			X		
OST-916	OPERATIONAL TEST OF THE POST ACCIDENT HYDROGEN VENTING AND CONTAINMENT SAMPLING SYSTEMS (REFUELING)			X			
OST-918	DEDICATED SHUTDOWN INSTRUMENTATION CHECK (MONTHLY)	X					

Note 2: OST references other OSTs to be performed during refueling.

OPERATIONS SURVEILLANCE TEST

Assessment for Simulator Performance Tests

Procedure	Title	Minimum Control Room Interface	Major Control Room Interface	Performed Outside Control Room	Safety Related	Complete Testing in SPT#	Partial Testing in SPT#
OST-919	NRC EMERGENCY NOTIFICATION SYSTEM PHONE CHECK (MONTHLY)	X			X		
OST-920	OPERATIONS COLD SHUTDOWN TEST PROCEDURE (COLD SHUTDOWN)					(Note 3)	
OST-922	DEDICATED SHUTDOWN EQUIPMENT IDENTIFICATION AUDIT (SEMI-ANNUAL)			X			
OST-923	COMPONENT COOLING PUMP FLOW TEST (REFUELING)	X					

Note 3: OST references other OSTs to be performed during cold shutdown.

APPENDIX I

EXAMPLES OF SIMULATOR PERFORMANCE TESTS

SIMULATOR PERFORMANCE TEST

TEST No.: 1.0 **Rev. No.:** 1

TEST TITLE: Real Time Simulation Verification

TEST CATEGORY: Computer Real Time Test

TEST APPROVAL:

REVIEWED: William M Blaisdell DATE: 3-6-91

APPROVED: Alson C Sanders DATE: 3/6/91

FINAL TEST RESULTS:

______ Test Completed Satisfactorily
______ Test Completed Satisfactorily With Deficiencies
______ Test Unsatisfactory

SUBMITTED: ____________________ DATE: __________

REVIEWED: ____________________ DATE: __________
Manager - Simulator

CMS ENTRY MADE: ________

Real Time Simulation Verification Test (1.0)

NOTES

1. The average frequency rate value (Dutyfile) shall be equal to 318($\pm$.1).

2. If a simulator initial condition (IC) other than specified is used, indicate on the test record the alternate IC used.

3. If malfunctions or evolutions other than specified are used, indicate on the test record the alternate malfunctions or evolutions used.

Real Time Simulation Verification Test (1.0)

I. TEST PURPOSE

This simulator performance test verifies the simulator's simulation of dynamic performance is in the same time base relationships, sequences, durations, rates, and accelerations as the dynamic performance of the reference plant. This verification is accomplished by monitoring the number of times the simulator math model programs run and comparing those values against simulator design.

II. REFERENCES

A. ANS/ANSI-3.5-1985
B. Design Basis and Model Documentation, Carolina Power and Light Company, H. B. Robinson Nuclear Training Simulator, Westinghouse Simulator Department, Nuclear Services Integration Division.
C. UNIX and Realtime Applications, Datapro Magazine, May 1990

III. SIMULATOR FUNCTIONS VERIFIED BY TEST 1.0

None

IV. PREREQUISITE TESTS: None.

V. 100% POWER, STEADY STATE REAL TIME VERIFICATION

A. Initialize the simulator to IC-5 (100% Power, BOL). ______

B. Ensure simulator is in FREEZE. ______

C. Start the REALTIME TEST program by entering "CALL RT:START" at the instructor's CRT keyboard. ______

NOTE: To monitor realtime parameters while running the test, perform the following (Optional):

To monitor program frequencies (iterations/second):

```
COMMAND:  FILE REALFREQ
COMMAND:  &lt; 'PARAMETER MON' PUSHBUTTON &gt;
COMMAND:  RUN 5
```

To monitor program times (milliseconds/iteration):

```
COMMAND:  FILE REALTIME
COMMAND:  &lt; 'PARAMETER MON' PUSHBUTTON &gt;
COMMAND:  RUN 5
```

To monitor program times (milliseconds/second):

```
COMMAND:  FILE REALMSEC
COMMAND:  &lt; 'PARAMETER MON' PUSHBUTTON &gt;
COMMAND:  RUN 5
```

To monitor realtime test parameters:

```
COMMAND:  FILE REALTEST
COMMAND:  &lt; 'PARAMETER MON' PUSHBUTTON &gt;
COMMAND:  RUN 5
```

D. Place the simulator in RUN and allow it to stabilize. ______

E. Start the REALTIME TEST data collection program (DUTYFILE) by entering "SET RT:MIN=5" at the instructor's CRT Keyboard. ______

NOTE: The data collection program has a 10 second time delay before it starts, after placing the simulator in RUN.

F. Allow the simulator to run for approximately 6 minutes after completion of Step E above, then place the simulator in FREEZE. ______

G. Using one of the computer terminals in the instructor station, do the following:

1. Ensure selector switch for terminal is on the computer being used ie. training computer. ______

2. Wake up terminal by typing Control A simultaneously two times. ______

3. When prompt asks for owner name, type in System. ______

4. Go to Step H when you see the TSM > prompt. ______

H. Print the REALTIME TEST data collection program results by typing "PRINT ^(SYSTEM)DUTYFILE" at the Gould Computer Terminal TSM> prompt. ______

I. Verify the average frequency rate value from the DUTYFILE printout is equal to 318 ($\pm$.1). ______

J. If continuing to Section VI or Section VII of this test, "N/A" this step and proceed with the test. If not continuing this test, type "CALL RT:STOP" at the instructor's CRT Keyboard and enter. At the Gould Computer Terminal TSM > prompt, type "X" and enter. ______

VI. **MULTIPLE MALFUNCTION REALTIME VERIFICATION**

A. Initialize the simulator to IC-5 (100% Power, BOL). ______

B. Ensure simulator is in FREEZE. ______

C. If this test is being continued from Section V of this test, "N/A" this step and continue with Step D. If Section V was not run prior to this section, start the REALTIME TEST program by entering "CALL RT:START" at the instructor's CRT Keyboard. ______

Real Time Simulation Verification Test (1.0)

NOTE: To monitor realtime parameters while running the test, perform the following (Optional):

To monitor program frequencies (iterations/second):

COMMAND: FILE REALFREQ
COMMAND: < 'PARAMETER MON' PUSHBUTTON >
COMMAND: RUN 5

To monitor program times (milliseconds/iteration):

COMMAND: FILE REALTIME
COMMAND: < 'PARAMETER MON' PUSHBUTTON >
COMMAND: RUN 5

To monitor program times (milliseconds/second):

COMMAND: FILE REALMSEC
COMMAND: < 'PARAMETER MON' PUSHBUTTON >
COMMAND: RUN 5

To monitor realtime test parameters:

COMMAND: FILE REALTEST
COMMAND: < 'PARAMETER MON' PUSHBUTTON >
COMMAND: RUN 5

D. Enter the following malfunctions:

1. MSS1A, ACT, 0, 60
2. SGN2B, ACT, 600, 0, 180
3. RCS1E, ACT, 100, 0, 300
4. EPS13, ACT, 420

E. Start the REALTIME TEST data collection program (DUTYFILE) by entering "SET RT:MIN=10" at the instructor's CRT Keyboard.

NOTE: The data collection program has a 10 second time delay before it starts, after placing the simulator in RUN.

F. Place the simulator in RUN and allow it to run for approximately 11 minutes, then place the simulator in FREEZE. ______

G. Using one of the computer terminals in the instructor station, do the following:

1. Ensure selector switch for terminal is on the computer being used ie. training computer. ______

2. Wake up terminal by typing Control A simultaneously two times. ______

3. When prompt asks for owner name, type in System. ______

4. Go to Step H when you see the TSM> prompt. ______

H. Print the REALTIME TEST data collection program results by typing "PRINT ^(SYSTEM)DUTYFILE" at the Gould Computer Terminal TSM> prompt. ______

I. Verify the average frequency rate value from the DUTYFILE printout is equal to 318 (±.1). ______

J. If continuing to Section VII of this test, "N/A" this step and proceed with the test. If not continuing this test, type "CALL RT:STOP" at the instructor's CRT Keyboard and enter. At the Gould Computer Terminal TSM > prompt, type "X" and enter. ______

VII. **POWER CHANGES/TURBINE RUNBACK REALTIME VERIFICATION**

A. Initialize the simulator to IC-5 (100% Power, BOL). ______

B. Ensure simulator is in FREEZE. ______

C. If this test is being continued from Section V or VI of this test, "N/A" this step and continue with Step D. If Section V or VI was not run prior to this section, start the REALTIME TEST program by entering "CALL RT:START" at the instructor's CRT Keyboard. ______

Real Time Simulation Verification Test (1.0)

NOTE: To monitor realtime parameters while running the test, perform the following (Optional):

To monitor program frequencies (iterations/second):

COMMAND: FILE REALFREQ
COMMAND: < 'PARAMETER MON' PUSHBUTTON >
COMMAND: RUN 5

To monitor program times (milliseconds/iteration):

COMMAND: FILE REALTIME
COMMAND: < 'PARAMETER MON' PUSHBUTTON >
COMMAND: RUN 5

To monitor program times (milliseconds/second):

COMMAND: FILE REALMSEC
COMMAND: < 'PARAMETER MON' PUSHBUTTON >
COMMAND: RUN 5

To monitor realtime test parameters:

COMMAND: FILE REALTEST
COMMAND: < 'PARAMETER MON' PUSHBUTTON >
COMMAND: RUN 5

D. Place the simulator in RUN and allow it to stabilize. ______

E. Start the REALTIME TEST data collection program (DUTYFILE) by entering "SET RT:MIN=30" at the instructor's CRT Keyboard. ______

NOTE: The data collection program has a 10 second time delay before it starts, after placing the simulator in RUN.

F. Perform the following manipulations during the 35 minute period following completion of Step E above:

1. Initiate a turbine runback by pulling a fuse from one of the power range drawers. ______

   a. After the turbine runback has initiated, re-insert the fuse and reset the ROD DROP bistable on the affected drawer. ______

   b. Perform borations and dilutions of the RCS using the makeup system. ______

   c. Perform reactor power increases and decreases at varying rates. ______

G. After approximately 35 minutes of completing Step E above, place the simulator in FREEZE. ______

H. Using one of the computer terminals in the instructor station, do the following:

1. Ensure selector switch for terminal is on the computer being used ie. training computer. ______

2. Wake up terminal by typing Control A simultaneously two times. ______

3. When prompt asks for owner name, type in <u>System</u>. ______

4. Go to Step H when you see the TSM> prompt. ______

I. Print the REALTIME TEST data collection program results by typing "PRINT ^(SYSTEM)DUTYFILE" at the Gould Computer Terminal TSM> prompt. ______

J. Verify the average frequency rate value from the DUTYFILE printout is equal to 318 ($\pm$.1). ______

K. Stop the REALTIME test program by typing "CALL RT:STOP" at the instructor's CRT Keyboard and enter. ______

L. At the Gould Computer Terminal TSM > prompt, type "X" and enter. ______

Real Time Simulation Verification Test (1.0)

TEST RESULTS

I. TEST COMPLETED SATISFACTORILY WITH NO DEFICIENCIES

Signature ____________________ Date __________

II. TEST COMPLETED SATISFACTORILY WITH DEFICIENCIES LISTED BELOW, PARTIAL RETEST ACCEPTABLE

Signature ____________________ Date __________

Test Item No.	Section Requiring Retest	Comments	SSR No.	SSR Cleared

RETEST: Signature ____________________ Date __________

RETEST: Signature ____________________ Date __________

III. TEST COMPLETED UNSATISFACTORILY, COMPLETE RETEST REQUIRED

Signature ____________________ Date __________

SSR No.: __________

Real Time Simulation Verification Test (1.0)

TEST REMARKS

Real Time Simulation Verification Test (1.0)

APPENDIX 1
DATA POINTS

PLANT PARAMETER	DATA POOL VARIABLE	RECORDING RANGE
Required Data Points:		
"DUTYFILE" Data Points	N/A	N/A
Supplementary Data Points:		
"REALFREQ" Data Points	FREQXPS X = 1,2,4,8	0-16
"REALTIME" Data Points	TIMEXPS X = 1,2,4,8	0-200
"REALMSEC" Data Points	MSECXPS X = 1,2,4,8	0-200
"REALTEST" Data Points	RT:MIN	0-30
	RT:SEC	0-1800
	RT:REM	0-1800
	RT:LOW	0-318
	RT:HIGH	318-400
	RT:AVE	280-340
	RT:FIL	T/F

Real Time Simulation Verification Test (1.0)

APPENDIX 2
SIMULATOR DATA COLLECTED DURING TEST

ITEMIZE ATTACHED DATA[1]:

[1]strip charts, ERFIS tape idenfication, completed operating procedures, ERFIS/computer curves or tables)

Real Time Simulation Verification Test (1.0)

ATTACHMENT 1
BENCHMARK DATA

1.1 UNIX and Realtime Applications, Datapro Magazine, May 1990

SIMULATOR PERFORMANCE TEST

TEST No.: 2.10.011 **Rev. No.:** 1

TEST TITLE: Rod Cluster Control Exercise and Rod Position Indication Test

TEST CATEGORY: Normal Operations Test

TEST APPROVAL:

REVIEWED: William M Blandell DATE: 3-6-91

APPROVED: Alson C Sanders DATE: 3/6/91

FINAL TEST RESULTS:

_____ Test Completed Satisfactorily
_____ Test Completed Satisfactorily With Deficiencies
_____ Test Unsatisfactory

SUBMITTED: ______________________ DATE: __________

REVIEWED: ______________________ DATE: __________
Manager - Simulator

CMS ENTRY MADE: ________

Rod Cluster Control Exercise and Rod Position Indication Test (2.10.011)

NOTES

1. The SLOW TIME, FREEZE, BACKTRACK, and REPLAY features of the simulator may be used as desired to aid testing. The FAST TIME feature shall not be used.
2. The simulator instructor facility's graphic trending capabilities, the 8-pen recorder, the ERFIS computer, or any other data collection device may be used to aid the verifications required by this test.
3. Apply the tolerance to parameter values as specified in the modified procedure(s) appended to this Simulator Performance Test.
4. All simulator responses including alarm function and/or protective system action shall be as specified within this Simulator Performance Test including the modified plant procedure(s) appended to this Simulator Performance Test.
5. If a simulator initial condition (IC) other than specified is used, ensure the IC will not prohibit the completion of this test. The IC shall have the reactor in one of the following conditions:

   Power Operation
   Hot Shutdown
   Cold Shutdown

   Indicate on the test record if a different IC is used.

Rod Cluster Control Exercise and Rod Position Indication Test (2.10.011)

I. TEST PURPOSE

This simulator performance test verifies the ability of simulating continuously, and in real time, a Rod Cluster Control Exercise and Rod Position Indication, Operations Surveillance Test. The simulator's ability to calculate plant system parameters corresponding to this evolution, displaying these parameters on the appropriate instrumentation, and providing proper alarm or protective action, or both, will be verified. This test will verify simulator response for Operations Surveillance Test, OST-011.

II. REFERENCES

A. OST-011, Rev.7
B. ANSI/ANS-3.5-1985

III. SIMULATOR FUNCTIONS VERIFIED BY TEST 2.10.011

None

IV. PREREQUISITE TESTS: None.

Rod Cluster Control Exercise and Rod Position Indication Test (2.10.011)

V. **TEST DESCRIPTION**

A. Ensure Appendix 2.1 is a modified version of the latest revision of OST-011, Rod Cluster Control Exercise and Rod Position Indication By-Weekly Interval. ______

B. Initialize the simulator to IC-5 (100% Power, Steady State, Equilibrium Xenon, 200 Steps on 'D' Bank) ______

C. Ensure recording of required data points is established as indicated on Appendix 1. ______

D. Complete testing using appropriate sections of Appendix 2.1 including associated data sheets. ______

NOTE: When discrepancies requiring partial retest are identified, record the plant procedure number in the "Test Item No" column of the "TEST RESULTS" page. Identify the procedural steps (i.e., Step ___ to Step ___) that will comprise the retest in the "Section Requiring Retest" column.

E. Record any discrepancies found during the performance of this test in the "TEST RESULTS" section. ______

Rod Cluster Control Exercise and Rod Position Indication Test (2.10.011)

ABBREVIATIONS

1.	OST	Operations Surveillance Test
2.	RPI	Rod Position Indication
3.	RCCA	Rod Cluster Control Assembly
4.	RTGB	Reactor Turbine Generator Board

Rod Cluster Control Exercise and Rod Position Indication Test (2.10.011)

TEST RESULTS

I. **TEST COMPLETED SATISFACTORILY WITH NO DEFICIENCIES**

Signature ____________________ Date __________

II. **TEST COMPLETED SATISFACTORILY WITH DEFICIENCIES LISTED BELOW, PARTIAL RETEST ACCEPTABLE**

Signature ____________________ Date __________

Test Item No.	Section Requiring Retest	Comments	SSR No.	Retest Complete

RETEST: Signature ____________________ Date __________

RETEST: Signature ____________________ Date __________

III. **TEST COMPLETED UNSATISFACTORILY, COMPLETE RETEST REQUIRED**

Signature ____________________ Date __________

SSR No.: __________

Rod Cluster Control Exercise and Rod Position Indication Test (2.10.011)

TEST REMARKS

Rod Cluster Control Exercise and Rod Position Indication Test (2.10.011)

APPENDIX 1
DATA POINTS

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE

Required Data Points: None.

Supplementary Data Points: None.

Rod Cluster Control Exercise and Rod Position Indication Test
(2.10.011)

APPENDIX 2
SIMULATOR DATA COLLECTED DURING TEST

ITEMIZE ATTACHED DATA[1]:

2.1 Modified OST-011

[1]strip charts, ERFIS tape identification, completed operating procedures, ERFIS/computer curves or tables)

Rod Cluster Control Exercise and Rod Position Indication Test (2.10.011)

ATTACHMENT 1
BENCHMARK DATA

Attachment 1.1 OST-011 Performed by Plant 8-12-90

APPENDIX 2.1 OF SIMULATOR

PERFORMANCE TEST 2.10.011

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON SEG PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 9

OPERATIONS SURVEILLANCE TEST PROCEDURE

OST-011

ROD CLUSTER CONTROL EXERCISE & ROD POSITION INDICATION

BY-WEEKLY INTERVAL

THIS PROCEDURE IS UNDER THE CONTROL OF THE SIMULATOR SUPPORT SUB-UNIT. ALL ADDITIONS/DELETIONS WERE PERFORMED BY THIS SUB-UNIT.

REVISION 7

Effective Date 9-17-87

RECOMMENDED BY: [redacted]

Unit 2 - Operating Supervisor Date

APPROVED BY: [redacted]

Manager - Operations Date

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TABLE OF CONTENTS

1.0 PURPOSE

1.1 This test verifies the proper operability of each of the full-length control rod assemblies, the rod drive mechanisms, and the associated control and indicating circuits.

1.2 Performance of this test conforms with the requirements of Item Two (2) of Table 4.1-3 and Item 9, Table 4.1-1 of the Tech. Specs.

2.0 REFERENCES

2.1 Technical Specifications, 3.10.1.5, Table 4.1-3 and 4.1-1

2.2 OST-551, Turbine Valve and Trip Functional Test

2.3 AOP-001, Malfunction of Reactor Control System

2.4 OMM-015, Operations Surveillance Testing

3.0 PREREQUISITES

3.1 This test may be performed during:
Power Operation (Reference Section 4.1)
Hot Shutdown (Reference Section 4.2)
Cold Shutdown (Reference Section 4.3)

3.2 If Power Conditions exist, the controlling rod bank is in the normal operating band.

3.3 ~~If Power Conditions exist and Control Bank "D" is less than 215 steps, this test should be conducted in conjunction with OST-551, if appropriate.~~

3.0 PREREQUISITES (Continued)

3.4 This revision is the latest revision available and has been verified against the Revision Status List.

______________(Print) ______________________ ______________
Name Signature Date

3.5 ~~The Shift Foreman has given his permission to conduct this test.~~

~~______________________________ Shift Foreman ______________ Date~~

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Power Operation

4.1.1 Do not exceed 19 step movement on any non-controlling group Full Length RCCA being tested at power operation condition.

4.1.2 Each controlling bank Full Length RCCA is to be moved a minimum of 19 steps on the group counters from their initial position and then returned to their original positions.

4.1.3 If Control Bank "D" is greater than or equal to 215 steps on the group counters, then perform Section 7.6 and N/A Sections ~~7.7 and~~ 7.8.

4.1.4 If Control Bank "D" is less than 215 steps on the group counters, then perform the applicable Section ~~7.7 or~~ 7.8, N/A the non-applicable section and Section 7.6.

4.1.5 Each non-controlling Full Length RCCA Bank is to be moved 19 steps on the group counters from the fully withdrawn or full inserted position and then be returned to original positions.

4.1.6 During power testing, Reactor Coolant average temperature changes in excess of 4°F are to be compensated for by repositioning the controlling rod bank.

4.0 PRECAUTIONS AND LIMITATIONS (Continued)

4.1.7 During reduced power testing, Reactor Coolant average temperature changes in excess of 4°F are to be compensated for by varying Turbine Load when testing the controlling rod bank.

4.1.8 ~~Ensure Load Dispatcher is notified prior to performing Section 7.8.~~

4.2 Hot Shutdown

4.2.1 Do not exceed 19 step movement on any Full Length Rod Control Assembly being tested at hot shutdown condition.

4.2.2 Each Full Length RCCA Bank is to be moved 19 steps on the group counters from the fully withdrawn or fully inserted position and then be returned to original positions.

4.2.3 ~~When testing at zero power ensure that proper shutdown margins are being maintained for the existing condition.~~

4.3 Cold Shutdown

4.3.1 Do not exceed 38 step movement on any Full Length Rod Control Assembly being tested at cold shutdown conditions.

4.3.2 When testing at cold shutdown, ensure all rods are inserted except for selected bank being tested.

4.3.3 In cold shutdown condition, each Full Length RCCA bank is to be moved 38 steps on the group counters from the fully inserted position and then be returned to the original position.

5.0 SPECIAL TOOLS AND EQUIPMENT

None applicable.

6.0 ACCEPTANCE CRITERIA

6.1 Each rod operates as described in this procedure as indicated on the RTGB instrumentation.

6.2 For bank positions at or above 200 steps, the individual rod position is acceptable if the rod position indication (RPI) is within ±15 inches of the bank demand position.

6.3 For bank positions below 200 steps, the individual rod position is acceptable if the rod position indication (RPI) is within ±7.5 inches of the average of the rod position indications of the given bank.

6.4 ~~AOP-001, Malfunction of Reactor Control System, will govern and initiate any corrective actions for a suspected misaligned control rod.~~

6.5 The reviewing and approving authorities may accept this surveillance test in accordance with the provisions set forth in OMM-015, Operations Surveillance Testing.

7.0 PROCEDURE

INITIALS

7.1 Shutdown Bank "A" Rods

7.1.1 Record initial rod heights on ATTACHMENT 8.1. ______

7.1.2 Position the ROD BANK SELECTOR switch to Shutdown Bank "A" position. ______

7.1.3 Using the IN-HOLD-OUT lever, position Shutdown Bank "A" rods, using step counter indication, the required number of steps as dictated by plant conditions stated in the Precautions. ______

7.1.4 Record tested rod heights on ATTACHMENT 8.1. ______

7.1.5 Using the IN-HOLD-OUT lever, return rods to original position as indicated by the step counters. ______

7.1.6 Record restored rod heights on ATTACHMENT 8.1 ______

7.1.7 Testing Shutdown Bank "A" rods complete. ______

7.2 Shutdown Bank "B" Rods

7.2.1 Record initial rod heights on ATTACHMENT 8.1. ______

7.2.2 Position the ROD BANK SELECTOR switch to Shutdown Bank "B" position. ______

7.2.3 Using the IN-HOLD-OUT lever, position Shutdown Bank "B" rods, using step counter indication, the required number of steps as dictated by plant conditions stated in the Precautions. ______

7.2.4 Record tested rod heights on ATTACHMENT 8.1. ______

7.2.5 Using the IN-HOLD-OUT lever, return rods to original position as indicated by the step counters. ______

7.2.6 Record restored rod heights on ATTACHMENT 8.1. ______

7.2.7 Testing Shutdown Bank "B" rods complete. ______

7.0 PROCEDURE (Continued) INITIALS

7.3 Control Bank "A" Rods

7.3.1 Record initial rod heights on ATTACHMENT 8.1. ________

7.3.2 Position the ROD BANK SELECTOR switch to Control Bank "A" position. ________

7.3.3 Using the IN-HOLD-OUT lever, position Control Bank "A" rods, using step counter indication, the required number of steps as dictated by plant conditions stated in the Precautions. ________

7.3.4 Record tested rod heights on ATTACHMENT 8.1. ________

7.3.5 Using the IN-HOLD-OUT lever, return rods to original position as indicated by the step counters. ________

7.3.6 Record restored rod heights on ATTACHMENT 8.1. ________

7.3.7 Testing Control Bank "A" rods complete. ________

7.4 Control Bank "B" Rods

7.4.1 Record initial rod heights on ATTACHMENT 8.1. ________

7.4.2 Position the ROD BANK SELECTOR switch to Control Bank "B" position. ________

7.4.3 Using the IN-HOLD-OUT lever, position Control Bank "B" rods, using step counter indication, the required number of steps as dictated by plant conditions stated in the Precautions. ________

7.4.4 Record tested rod heights on ATTACHMENT 8.1. ________

7.4.5 Using the IN-HOLD-OUT lever, return rods to original position as indicated by the step counters. ________

7.4.6 Record restored rod heights on ATTACHMENT 8.1. ________

7.4.7 Testing Control Bank "B" rods complete. ________

7.0	PROCEDURE (Continued)	INITIALS
7.5	Control Bank "C" Rods	
7.5.1	Record initial rod heights on ATTACHMENT 8.1.	______
7.5.2	Position the ROD BANK SELECTOR switch to Control Bank "C" position.	______
7.5.3	Using the IN-HOLD-OUT lever, position Control Bank "C" rods, using step counter indication, the required number of steps as dictated by plant conditions stated in the Precautions.	______
7.5.4	Record tested rod heights on ATTACHMENT 8.1.	______
7.5.5	Using the IN-HOLD-OUT lever, return rods to original position as indicated by the step counters.	______
7.5.6	Record restored rod heights on ATTACHMENT 8.1.	______
7.5.7	Testing Control Bank "C" rods complete.	______

NOTE

For performance of Control Bank "D" utilizing one of the following three methods, N/A the sections not used:

Method 1 (Section 7.6) applies:
1) At Cold Shutdown or,
2) At Hot Shutdown or,
3) At Power with Control Bank "D" greater than or equal to 215 steps on group counter.

~~Method 2 (Section 7.7) applies:~~
~~1) At Power with Control Bank "D" less than 215 steps on the group counters in conjunction with performance of OST-551, Turbine Valve and Trip Functional Test.~~

Method 3 (Section 7.8) applies:
1) At Reduced Power with Control Bank "D" less than 215 steps on the group counter.

7.0 PROCEDURE (Continued) INITIALS

7.6 Control Bank "D" Rods - Method 1

7.6.1 Record initial rod heights on ATTACHMENT 8.1.

7.6.2 Position the ROD BANK SELECTOR switch to Control Bank "D" position.

7.6.3 Using the IN-HOLD-OUT lever, position Control Bank "D" rods, using step counter indication, the required number of steps as dictated by plant conditions stated in the Precautions.

7.6.4 Record tested rod heights on ATTACHMENT 8.1.

7.6.5 Using the IN-HOLD-OUT lever, return rods to original position as indicated by the step counters.

7.6.6 Record restored rod heights on ATTACHMENT 8.1.

7.6.7 Testing of Control Bank "D" rods is complete.

7.7 Control Bank "D" Rods - Method 2

7.7.1 Record initial rod heights on ATTACHMENT 8.1.

7.7.2 Perform power reduction according to Plant Procedures to conduct OST-551, Turbine Valve and Trip Functional Test.

7.7.3 Record tested rod heights on ATTACHMENT 8.1 after a minimum of 19 steps of rod movement as indicated by the group counter.

7.7.4 Continue with OST-551 as conditions dictate.

7.7.5 Record restored rod heights on ATTACHMENT 8.1 when rods are returned to their original position as indicated by the group counter.

7.7.6 Testing of Control Bank "D" rods is complete.

7.0 PROCEDURE (Continued) INITIALS

7.8 Control Bank "D" Rods - Method 3

NOTE

~~Inform the Load Dispatcher that there maybe a swing in load prior to continuing.~~

7.8.1 Record initial rod heights on ATTACHMENT 8.1. ______

7.8.2 Position the ROD BANK SELECTOR switch to Control Bank "D" position. ______

7.8.3 Using the IN-HOLD-OUT lever, position Control Bank "D" rods, using step counter indication, the required number of steps as dictated by plant conditions stated in the Precautions. ______

NOTE

Reactor Coolant average temperature changes in excess of 4°F are to be compensated for by varying Turbine Load in accordance with plant procedures.

7.8.4 Record tested rod heights on ATTACHMENT 8.1. ______

7.8.5 Using the IN-HOLD-OUT lever, return rods to original position as indicated by the step counters. ______

7.8.6 Record restored rod heights on ATTACHMENT 8.1. ______

7.8.7 Turbine Load restored to pre-test conditions (if applicable). ______

7.8.8 Testing and Control Bank "D" Rods is complete. ______

7.9 System Restoration

7.9.1 When testing of all banks is complete, return ROD BANK SELECTOR switch to the pre-test position. ______

7.0 **PROCEDURE** (Continued) INITIALS

7.10 Alignment Determination

7.10.1 Complete Steps 1 - 7 on each page of ATTACHMENT 8.1 for each rod bank. ________

8.0 **ATTACHMENTS**

8.1 RCC Exercise and RPI Data Sheet

8.2 Certification and Review Form

RCC EXERCISE AND RPI DATA SHEET

SHUTDOWN BANK "A" RODS

STEP NO.	ROD POSITION INDICATION	G3	C9	J13	N7	J3	C7	G13	N9
7.1.1	Initial Rod Height (Inches)								
7.1.4	Tested Rod Height (Inches)								
7.1.6	Restored Rod Height (Inches)								
3)	Difference btw Step 7.1.6 Rod Height and Step 2) below (Inches)								
6)	Difference btw Step 7.1.6 Rod Height and Step 5) below (Inches)								

GROUP COUNTER	1	2
Initial Height (Steps)		
Tested Height (Steps)		
Restored Height (Steps)		

INITIALS

1) Are the Restored Height Group Counters ≥200 steps? Yes No (Circle One) ______
If yes, go to Step 2 and N/A Steps 5, 6, and 7.
If no, go to Step 5 and N/A Steps 2, 3, and 4.

2) Convert the Restored Height Group Counter indication to inches by: $\frac{\text{Group Counter Ind.}}{8} \times 5$ inches ______ inches ______

3) Record in the blocks for 3) above, the difference between each RPI Restored Rod Height and the value calculated in Step 2). ______

4) Are all the values recorded in the blocks for 3) above, less than or equal to 15 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

5) Calculate the average bank position by adding the individual restored rod height position indications and dividing by the number of rods in the bank. ______ Average Position (inches) ______

6) Record in the blocks for 6) above, the difference between each RPI Restored Rod Height and the value calculated in Step 5). ______

7) Are all the values recorded in the blocks for 6) above, less than or equal to 7.5 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

RCC EXERCISE AND RPI DATA SHEET

SHUTDOWN BANK "B" RODS

STEP NO.	ROD POSITION INDICATION	E5	E11	L11	L5	H6	F8	H10	K8
7.2.1	Initial Rod Height (Inches)								
7.2.4	Tested Rod Height (Inches)								
7.2.6	Restored Rod Height (Inches)								
3)	Difference btw Step 7.2.6 Rod Height and Step 2) below (Inches)								
6)	Difference btw Step 7.2.6 Rod Height and Step 5) below (Inches)								

GROUP COUNTER	1	2
Initial Height (Steps)		
Tested Height (Steps)		
Restored Height (Steps)		

INITIALS

1) Are the Restored Height Group Counters ≥200 steps? Yes No (Circle One) ______
If yes, go to Step 2 and N/A Steps 5, 6, and 7.
If no, go to Step 5 and N/A Steps 2, 3, and 4.

2) Convert the Restored Height Group Counter indication to inches by: $\frac{\text{Group Counter Ind.}}{8} \times 5$ inches ______ inches ______

3) Record in the blocks for 3) above, the difference between each RPI Restored Rod Height and the value calculated in Step 2). ______

4) Are all the values recorded in the blocks for 3) above, less than or equal to 15 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

5) Calculate the average bank position by adding the individual restored rod height position indications and dividing by the number of rods in the bank. ______ Average Position (inches) ______

6) Record in the blocks for 6) above, the difference between each RPI Restored Rod Height and the value calculated in Step 5). ______

7) Are all the values recorded in the blocks for 6) above, less than or equal to 7.5 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

RCC EXERCISE AND RPI DATA SHEET

CONTROL BANK "A" RODS

STEP NO.	ROD POSITION INDICATION	G5	E9	J11	L7	J5	E7	G11	L9
7.3.1	Initial Rod Height (Inches)								
7.3.4	Tested Rod Height (Inches)								
7.3.6	Restored Rod Height (Inches)								
3)	Difference btw Step 7.3.6 Rod Height and Step 2) below (Inches)								
6)	Difference btw Step 7.3.6 Rod Height and Step 5) below (Inches)								

GROUP COUNTER	1	2
Initial Height (Steps)		
Tested Height (Steps)		
Restored Height (Steps		

INITIALS

1) Are the Restored Height Group Counters ≥200 steps? Yes No (Circle One) ______
If yes, go to Step 2 and N/A Steps 5, 6, and 7.
If no, go to Step 5 and N/A Steps 2, 3, and 4.

2) Convert the Restored Height Group Counter indication to inches by: $\frac{\text{Group Counter Ind.}}{8}$ x 5 inches ______ inches ______

3) Record in the blocks for 3) above, the difference between each RPI Restored Rod Height and the value calculated in Step 2). ______

4) Are all the values recorded in the blocks for 3) above, less than or equal to 15 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

5) Calculate the average bank position by adding the individual restored rod height position indications and dividing by the number of rods in the bank. ______ Average Position (inches) ______

6) Record in the blocks for 6) above, the difference between each RPI Restored Rod Height and the value calculated in Step 5). ______

7) Are all the values recorded in the blocks for 6) above, less than or equal to 7.5 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

RCC EXERCISE AND RPI DATA SHEET

CONTROL BANK "B" RODS

STEP NO.	ROD POSITION INDICATION	F2	B10	K14	P6	K2	B6	F14	P10
7.4.1	Initial Rod Height (Inches)								
7.4.4	Tested Rod Height (Inches)								
7.4.6	Restored Rod Height (Inches)								
3)	Difference btw Step 7.4.6 Rod Height and Step 2) below (Inches)								
6)	Difference btw Step 7.4.6 Rod Height and Step 5) below (Inches)								

GROUP COUNTER	1	2
Initial Height (Steps)		
Tested Height (Steps)		
Restored Height (Steps)		

INITIALS

1) Are the Restored Height Group Counters ≥200 steps? Yes No (Circle One) ______
If yes, go to Step 2 and N/A Steps 5, 6, and 7.
If no, go to Step 5 and N/A Steps 2, 3, and 4.

2) Convert the Restored Height Group Counter indication to inches by: $\frac{\text{Group Counter Ind.}}{8} \times 5$ inches ______ inches ______

3) Record in the blocks for 3) above, the difference between each RPI Restored Rod Height and the value calculated in Step 2). ______

4) Are all the values recorded in the blocks for 3) above, less than or equal to 15 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

5) Calculate the average bank position by adding the individual restored rod height position indications and dividing by the number of rods in the bank. ______ Average Position (inches) ______

6) Record in the blocks for 6) above, the difference between each RPI Restored Rod Height and the value calculated in Step 5). ______

7) Are all the values recorded in the blocks for 6) above, less than or equal to 7.5 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

RCC EXERCISE AND RPI DATA SHEET

CONTROL BANK "C" RODS

STEP NO.	ROD POSITION INDICATION	F4	D10	K12	M6	K4	D6	F12	M10
7.5.1	Initial Rod Height (Inches)								
7.5.4	Tested Rod Height (Inches)								
7.5.6	Restored Rod Height (Inches)								
3)	Difference btw Step 7.5.6 Rod Height and Step 2) below (Inches)								
6)	Difference btw Step 7.5.6 Rod Height and Step 5) below (Inches)								

GROUP COUNTER	1	2
Initial Height (Steps)		
Tested Height (Steps)		
Restored Height (Steps)		

INITIALS

1) Are the Restored Height Group Counters ≥200 steps? Yes No (Circle One) ______
If yes, go to Step 2 and N/A Steps 5, 6, and 7.
If no, go to Step 5 and N/A Steps 2, 3, and 4.

2) Convert the Restored Height Group Counter indication to inches by: $\frac{\text{Group Counter Ind.}}{8} \times 5$ inches ______ inches ______

3) Record in the blocks for 3) above, the difference between each RPI Restored Rod Height and the value calculated in Step 2). ______

4) Are all the values recorded in the blocks for 3) above, less than or equal to 15 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

5) Calculate the average bank position by adding the individual restored rod height position indications and dividing by the number of rods in the bank. ______ Average Position (inches) ______

6) Record in the blocks for 6) above, the difference between each RPI Restored Rod Height and the value calculated in Step 5). ______

7) Are all the values recorded in the blocks for 6) above, less than or equal to 7.5 inches? (If no, notify Shift Foreman.) Yes No N/A (Circle One) ______

RCC EXERCISE AND RPI DATA SHEET
CONTROL BANK "D" RODS

STEP NO.	ROD POSITION INDICATION	D8	M8	H4	H8	H12
*	Initial Rod Height (Inches)					
*	Tested Rod Height (Inches)					
*	Restored Rod Height (Inches)					
3)	Difference btw RPI Restored Rod Height above and Step 2) below (Inches)					
6)	Difference btw RPI Restored Rod Height above and Step 5) below (Inches)					

GROUP COUNTER	1	2
Initial Height (Steps)		
Tested Height (Steps)		
Restored Height (Steps)		

INITIALS

1) Are the Restored Height Group Counters ≥200 steps? Yes No (Circle One) ______
If yes, go to Step 2 and N/A Steps 5, 6, and 7.
If no, go to Step 5 and N/A Steps 2, 3, and 4.

2) Convert the Restored Height Group Counter indication to inches by: $\frac{\text{Group Counter Ind.}}{8} \times 5$ inches ______ inches ______

3) Record in the blocks for 3) above, the difference between each RPI Restored Rod Height and the value calculated in Step 2). ______

4) Are all the values recorded in the blocks for 3) above, less than or equal to 15 inches? Yes No N/A (Circle One) ______
(If no, notify Shift Foreman.)

5) Calculate the average bank position by adding the individual restored rod height position indications and dividing by the number of rods in the bank. ______ Average Position (inches) ______

6) Record in the blocks for 6) above, the difference between each RPI Restored Rod Height and the value calculated in Step 5). ______

7) Are all the values recorded in the blocks for 6) above, less than or equal to 7.5 inches? Yes No N/A (Circle One) ______
(If no, notify Shift Foreman.)

* As per Method 1, 2, or 3 (see Sections 7.6, 7.7, and 7.8)

SURVEILLANCE TEST PROCEDURE
CERTIFICATION AND REVIEW FORM

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test) ______________________

____

____

	Initials	Name (Print)	Date
Test Performed by			

Test Complete: Date ________ Time ________

Test Satisfactory: Yes / No (Circle one)

Reviewed by: ______________________ Date ________
Unit 2 - Shift Foreman

Comments: (Required if results were unsatisfactory) ______________________

____

____

____

____

Approved by: ______________________ Date ________
Unit 2 - Operating Supervisor

SIMULATOR PERFORMANCE TEST

TEST No.: 2.0.2 **Rev. No.:** 5

TEST TITLE: Full Power - Steady State Comparison Test

TEST CATEGORY: Steady State Operations Test

TEST APPROVAL:

REVIEWED: William M Blaisdell DATE: 3-6-91

APPROVED: Olson C Sanders DATE: 3/6/91

FINAL TEST RESULTS:

_____ Test Completed Satisfactorily
_____ Test Completed Satisfactorily With Deficiencies
_____ Test Unsatisfactory

SUBMITTED: ______________________ DATE: __________

REVIEWED: ______________________ DATE: __________
Manager - Simulator

CMS ENTRY MADE: ________

Full Power - Steady State Comparison Test (2.0.2)

NOTES

1. This simulator performance test is a revision of Acceptance Test Procedure (ATP) 14.4.3.1.
2. The SLOW TIME, FREEZE, BACKTRACK, and REPLAY features of the simulator may be used as desired to aid testing.
3. The simulator instructor facility's graphic trending capabilities, the 8-pen recorder, the ERFIS computer, or any other data collection device may be used to aid the verifications required by this test.
4. The simulator computed values for critical parameters shall agree within ± 2% of the reference plant parameters. Apply an additional ± 2% (of full scale) tolerance to account for reference plant instrument error.
5. The simulator computed values for noncritical parameters shall agree within ± 10% of the reference plant parameters. Apply an additional ± 2% (of full scale) tolerance to account for reference plant instrument error.
6. The simulator indicated values for critical parameters shall agree within ± 2% (of full scale) of the simulator computed values.
7. The simulator indicated values for noncritical parameters shall agree within ± 2% (of full scale) of the simulator computed values.
8. The simulator initial condition (IC) used for this test should be selected based on the time in core life in which the reference plant data was taken in Appendix 2.1, "Data Points for Simulator Steady State Comparison."
9. Reactor (Core) Thermal Power will not be documented in this test since all parameters required for the calculation of that value will be compared individually.

Full Power - Steady State Comparison Test (2.0.2)

I. TEST PURPOSE

This simulator performance test verifies the simulator's accuracy related to full power values for which valid reference plant information is available. Simulator computed value accuracy is verified to be within ± 2% for critical parameters and ± 10% for noncritical parameters of the reference plant, with an additional 2% (of full scale) tolerance to account for reference plant instrument error. Also, the simulator indicated values are verified to be within ± 2% for critical parameters and noncritical parameters of the simulator computed values.

II. REFERENCES

A. ANSI/ANS-3.5-1985
B. Regulatory Guide 1.149
C. MMM-006
D. OMM-001

III. SIMULATOR FUNCTIONS VERIFIED BY TEST 2.0.2

None

IV. PREREQUISITE TESTS: None.

Full Power - Steady State Comparison Test (2.0.2)

V. **TEST DESCRIPTION**

A. Collect plant values per Appendix 2.1, "Data Points For Simulator Steady State Comparison" with the plant at full power. ______

B. Initialize the simulator to one of the following ICs based on the effective full power days (EFPD) recorded for the plant parameter value in Appendix 2.1: ______

BOL, IC-5 ______

MOL, IC-20 ______

EOL, IC-13 ______

C. Establish simulator systems status and external parameters to the extent possible per reference plant values recorded in Appendix 2.1. ______

D. Allow simulator to stabilize prior to continuing with this test. ______

E. Collect simulator computed values per Appendix 2.1. ______

IMPORTANT: Ensure simulator computed values are converted into the same units as the parameter being compared to, e.g., lbm/sec into gpm, psia into psig, etc.

F. Verify simulator control board indications for critical parameters are within ± 2% (of full scale) of the simulator computed values. ______

G. Verify simulator control board indications for noncritical parameters are within ± 2% (of full scale) of the simulator computed values. ______

H. Verify simulator computed values for critical parameters agree within ± 2% of the reference plant parameters values. Apply an additional ± 2% (of full scale) tolerance to account for reference plant instrument error. ______

I. Verify simulator computed values for noncritical parameters agree within ± 10% of the reference plant parameters values. Apply an additional 2% (of full scale) tolerance to account for reference plant instrument error. ______

J. Record any discrepancies found during the performance of this test in the "TEST RESULTS" section. ______

Full Power - Steady State Comparison Test (2.0.2)

TEST RESULTS

I. **TEST COMPLETED SATISFACTORILY WITH NO DEFICIENCIES**

Signature ____________________ Date __________

II. **TEST COMPLETED SATISFACTORILY WITH DEFICIENCIES LISTED BELOW, PARTIAL RETEST ACCEPTABLE**

Signature ____________________ Date __________

Test Item No.	Section Requiring Retest	Comments	SSR No.	Retest Complete

RETEST: Signature ____________________ Date __________

RETEST: Signature ____________________ Date __________

III. **TEST COMPLETED UNSATISFACTORILY, COMPLETE RETEST REQUIRED**

Signature ____________________ Date __________

SSR No.: __________

Full Power - Steady State Comparison Test (2.0.2)

TEST REMARKS

Full Power - Steady State Comparison Test (2.0.2)

APPENDIX 1
DATA POINTS

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE

Required Data Points:

Data Points per Appendix 2.1, Data Points For Simulator Steady State Comparison

Supplementary Data Points: None.

Full Power - Steady State Comparison Test (2.0.2)

APPENDIX 2
SIMULATOR DATA COLLECTED DURING TEST

ITEMIZE ATTACHED DATA[1]:

2.1 Data Points For Simulator Steady State Comparison

[1]strip charts, ERFIS tape identification, completed operating procedures, ERFIS/computer curves or tables)

Full Power - Steady State Comparison Test (2.0.2)

ATTACHMENT 1
BENCHMARK DATA

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Information Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)
N/A	Cycle	N/A			N/A
N/A	MWD/MTU	N/A			N/A
N/A	EFPD	N/A		N/A	N/A
N/A	RCS Boron Concentration	XRCS			N/A
N/A	Bank D GR1 Step Counter	MCRFPA(11)			
N/A	Bank D GR2 Step Counter	MCRFPA(12)			
N/A	Number of MFW Pumps Running	Equip. Status CFW			
N/A	Number of Heater Drain Pumps Running	Equip. Status CFW			
N/A	Number of Condensate Pumps Running	Equip. Status CFW			
PI-1310	L.P. Turb A Cond. Press	PT:1310			
PI-1312	L.P. Turb A Cond. Press	PT:1312			
PI-1311	L.P. Turb B Cond. Press	PT:1311			
PI-1313	L.P. Turb B Cond. Press	PT:1313			

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Information Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)
N/A	Number of Circulating Water Pumps Running	Equip. Status CFW	______	______	______
TE-3091A	Condenser A Circ Water Inlet Temp (SP1)	TLAKE	______	______	N/A
TE-3092A	Condenser B Circ Water Inlet Temp (SP1)	TLAKE	______	______	N/A
Local	Condenser Circ Water Outlet Temp	TCWSCNO	______	______	N/A

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
FI-414	RCS CH I Loop 1 Flow	FT:414	______(1)	______	______	2.40	______	______
FI-415	RCS CH II Loop 1 Flow	FT:415	______(1)	______	______	2.40	______	______
FI-416	RCS CH III Loop 1 Flow	FT:416	______(1) ______(A)	______	______	2.40 ____(B)	______	______
FI-424	RCS CH I Loop 2 Flow	FT:424	______(2)	______	______	2.40	______	______
FI-425	RCS CH II Loop 2 Flow	FT:425	______(2)	______	______	2.40	______	______
FI-426	RCS CH III Loop 2 Flow	FT:426	______(2) ______(A)	______	______	2.40 ____(B)	______	______
FI-434	RCS CH I Loop 3 Flow	FT:434	______(3)	______	______	2.40	______	______
FI-435	RCS CH II Loop 3 Flow	FT:435	______(3)	______	______	2.40	______	______
FI-436	RCS CH III Loop 3 Flow	FT:436	______(3) ______(A)	______	______	2.40 ____(B)	______	______

(1) Average Plant Parameter Values for FI-414, FI-415, and FI-416 for comparison to Simulator Computed Values.
(2) Average Plant Parameter Values for FI-424, FI-425, and FI-426 for comparison to Simulator Computed Values.
(3) Average Plant Parameter Values for FI-434, FI-435, and FI-436 for comparison to Simulator Computed Values.

(A) Average Plant Parameter Value.
(B) 2% of Average Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
TI-410	Loop 1 Cold Leg Temp	TT:410	____	____	____	14.00 ____(C)	____	____
TI-413	Loop 1 Hot Leg Temp	TT:413	____	____	____	14.00 ____(C)	____	____
TI-420	Loop 2 Cold Leg Temp	TT:420	____	____	____	14.00 ____(C)	____	____
TI-423	Loop 2 Hot Leg Temp	TT:423	____	____	____	14.00 ____(C)	____	____
TI-430	Loop 3 Cold Leg Temp	TT:430	____	____	____	14.00 ____(C)	____	____
TI-433	Loop 3 Hot Leg Temp	TT:433	____	____	____	14.00 ____(C)	____	____
LI-459A	CH I PRZR Level	LT:459A	____(4)	____	____	2.00	____	____
LI-460	CH II PRZR Level	LT:460	____(4)	____	____	2.00	____	____
LI-461	CH III PRZR Level	LT:461	____(4) ____(A)	____	____	2.00 ____(B)	____	____

(4) Average Plant Parameter Values for LI-459A, LI-460, and LI-461 for comparison to Simulator Computed Values.

(A) Average Plant Parameter Value.
(B) 2% of Average Plant Parameter Value.
(C) 2% of Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
PI-455	Prot CH I PRZR Press	PT:455	______(5)			16.00		
PI-456	Prot CH II PRZR Press	PT:456	______(5)			16.00		
PI-457	Prot CH III PRZR Press	PT:457	______(5) ______(A)			16.00 ___(B)		
TI-412A	Loop #1 Protection Delta-T	TT:412A				1.50 ___(C)		
TI-412D	Loop #1 Protection T_{avg}	TT:412D				1.50 ___(C)		
TI-422A	Loop #2 Protection Delta-T	TT:422A				1.50 ___(C)		
TI-422D	Loop #2 Protection T_{avg}	TT:422D				1.50 ___(C)		
TI-432A	Loop #3 Protection Delta-T	TT:432A				1.50 ___(C)		

(5) Average Plant Parameter Values for PI-455, PI-456, and PI-457 for comparison to Simulator Computed Values.

(A) Average Plant Parameter Value.
(B) 2% of Average Plant Parameter Value.
(C) 2% of Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
TI-432D	Loop #3 Protection T_{avg}	TT:432D				1.50 (C)		
LR-459	PZR Ref Level %	BPCSRF				2.00 (C)		
TR-408	Reference T_{avg}	TPCSRF				1.50 (C)		
LI-474	CH I SG 1 Nar Range Level	LT:474	(6)			2.00		
LI-475	CH II SG 1 Nar Range Level	LT:475	(6)			2.00		
LI-476	CH III SG 1 Nar Range Level	LT:476	(6) (A)			2.00 (B)		
PI-474	CH I SG 1 Steam Press	PT:474	(7)			28.00		
PI-475	CH II SG 1 Steam Press	PT:475	(7)			28.00		
PI-476	CH III SG 1 Steam Press	PT:476	(7) (A)			28.00 (B)		

(6) Average Plant Parameter Values for LI-474, LI-475, and LI-476 for comparison to Simulator Computed Values.

(7) Average Plant Parameter Values for PI-474, PI-475, and PI-476 for comparison to Simulator Computed Values.

(A) Average Plant Parameter Value.
(B) 2% of Average Plant Parameter Value.
(C) 2% of Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
FI-476	CH I SG 1 Feedwater Flow	FT:476	______(8)	______	______	8E4	______	______
FI-477	CH II SG 1 Feedwater Flow	FT:477	______(8) ______(A)	______	______	8E4 ___(B)	______	______
FI-474	CH I SG 1 Steam Flow	FT:474	______(9)	______	______	8E4	______	______
FI-475	CH II SG 1 Steam Flow	FT:475	______(9) ______(A)	______	______	8E4 ___(B)	______	______
LI-484	CH I SG 2 Nar Range Level	LT:484	______(10)	______	______	2.00	______	______
LI-485	CH II SG 2 Nar Range Level	LT:485	______(10)	______	______	2.00	______	______
LI-486	CH III SG 2 Nar Range Level	LT:486	______(10) ______(A)	______	______	2.00 ___(B)	______	______

(8) Average Plant Parameter Values for FI-476 and FI-477 for comparison to Simulator Computed Values.
(9) Average Plant Parameter Values for FI-474 and FI-475 for comparison to Simulator Computed Values.
(10) Average Plant Parameter Values for LI-484, LI-485, and LI-486 for comparison to Simulator Computed Values.

(A) Average Plant Parameter Value.
(B) 2% of Average Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
PI-484	CH I SG 2 Steam Press	PT:484	______(11)	______	______	28.00	______	______
PI-485	CH II SG 2 Steam Press	PT:485	______(11)	______	______	28.00	______	______
PI-486	CH III SG 2 Steam Press	PT:486	______(11) ______(A)	______	______	28.00 ___(B)	______	______
FI-486	CH I SG 2 Feedwater Flow	FT:486	______(12)	______	______	8E4	______	______
FI-487	CH II SG 2 Feedwater Flow	FT:487	______(12) ______(A)	______	______	8E4 ___(B)	______	______
FI-484	CH I SG 2 Steam Flow	FT:484	______(13)	______	______	8E4	______	______
FI-485	CH II SG 2 Steam Flow	FT:485	______(13) ______(A)	______	______	8E4 ___(B)	______	______

(11) Average Plant Parameter Values for PI-484, PI-485, and PI-486 for comparison to Simulator Computed Values.
(12) Average Plant Parameter Values for FI-486 and FI-487 for comparison to Simulator Computed Values.
(13) Average Plant Parameter Values for FI-484 and FI-485 for comparison to Simulator Computed Values.

(A) Average Plant Parameter Value.
(B) 2% of Average Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
LI-494	CH I SG 3 Nar Range Level	LT:494	______(14)	______	______	2.00	______	______
LI-495	CH II SG 3 Nar Range Level	LT:495	______(14)	______	______	2.00	______	______
LI-496	CH III SG 3 Nar Range Level	LT:496	______(14) ______(A)	______	______	2.00 ____(B)	______	______
PI-494	CH I SG 3 Steam Press	PT:494	______(15)	______	______	28.00	______	______
PI-495	CH II SG 3 Steam Press	PT:495	______(15)	______	______	28.00	______	______
PI-496	CH III SG 3 Steam Press	PT:496	______(15) ______(A)	______	______	28.00 ____(B)	______	______
FI-496	CH I SG 3 Feedwater Flow	FT:496	______(16)	______	______	8E4	______	______
FI-497	CH II SG 3 Feedwater Flow	FT:497	______(16) ______(A)	______	______	8E4 ____(B)	______	______

(14) Average Plant Parameter Values for LI-494, LI-495, and LI-496 for comparison to Simulator Computed Values.

(15) Average Plant Parameter Values for PI-494, PI-495, and PI-496 for comparison to Simulator Computed Values.

(16) Average Plant Parameter Values for FI-496 and FI-497 for comparison to Simulator Computed Values.

(A) Average Plant Parameter Value.

(B) 2% of Average Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
FI-494	CH I SG 3 Steam Flow	FT:494	______(17)			8E4		
FI-495	CH II SG 3 Steam Flow	FT:495	______(17) ______(A)			8E4 ___(B)		
N/A	Megawatts	SMSS				16.00		
PI-464	CH I Steam Header Press	PT:464	______(18)			28.00		
PI-466	CH II Steam Header Press	PT:466	______(18)			28.00		
PI-468	CH III Steam Header Press	PT:468	______(18) ______(A)			28.00 ___(B)		
PI-446	Turbine First Stage Press	PT:446	______(19)			12.00		
PI-447	Turbine First Stage Press	PT:447	______(19) ______(A)			12.00 ___(B)		

(17) Average Plant Parameter Values for FI-494 and FI-495 for comparison to Simulator Computed Values.
(18) Average Plant Parameter Values for PI-464, PI-466, and PI-468 for comparison to Simulator Computed Values.
(19) Average Plant Parameter Values for PI-446 and PI-447 for comparison to Simulator Computed Values.

(A) Average Plant Parameter Value.
(B) 2% of Average Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
NI-41	Percent Full Power	FNISPR(1)				2.40 ___(C)		
NI-42	Percent Full Power	FNISPR(2)				2.40 ___(C)		
NI-43	Percent Full Power	FNISPR(3)				2.40 ___(C)		
NI-44	Percent Full Power	FNISPR(4)				2.40 ___(C)		
TT-3004	SG A Feedwater Temp	TT:3004			N/A	11.50 ___(C)		N/A
TT-3005	SG B Feedwater Temp	TT:3005			N/A	11.50 ___(C)		N/A
TT-3006	SG C Feedwater	TT:3006			N/A	11.50 ___(C)		N/A
N/A	SG A Blowdown Flow Rate (OST-010)	WSGBBD(1)			N/A	2% of Plant Value		N/A
N/A	SG B Blowdown Flow Rate (OST-010)	WSGBBD(2)			N/A	2% of Plant Value		N/A
N/A	SG C Blowdown Flow Rate (OST-010)	WSGBBD(3)			N/A	2% of Plant Value		N/A

(C) 2% of Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Non-Critical Data Points:

Inst.	Parameter	Simulator Data Pool Variable	Plant Parameter Value	Simulator Computed Value	Simulator Display Value (RTGB)	2% of Full Scale	Simulator Computed Value Verified	Simulator Display Value Verified
LI-462	Cold Calibrated PRZR Level	LT:462				2.00 ___(D)		
LT-477	SG A Wide Range Level	LT:477				2.00 ___(D)		
LT-487	SG B Wide Range Level	LT:487				2.00 ___(D)		
LT-497	SG C Wide Range Level	LT:497				2.00 ___(D)		
PI-1420	Main Feedwater Header Press	PT:1420				30.00 ___(D)		
PI-1458	Cond. Pumps Header Press	PT:1458				16.00 ___(D)		

(D) 10% of Plant Parameter Value.

DATA POINTS FOR SIMULATOR STEADY STATE COMPARISON

Attach ERFIS (REAL GD SP6): ________

Attach Copy of Latest OST-010: ________

Attach CAOC Parameters (REAL GD SP2): ________

Plant Data Recorded By: ______________________________ Date: __________________

Simulator Data Recorded By: ______________________________ Date: __________________

SIMULATOR PERFORMANCE TEST

TEST No.: 4.1 **Rev. No.:** 1

TEST TITLE: Manual Reactor Trip Transient Test

TEST CATEGORY: Transient Test

TEST APPROVAL:

REVIEWED: William M Blaisdell DATE: 3-6-91

APPROVED: Alson C Sanders DATE: 3/6/91

FINAL TEST RESULTS:

_____ Test Completed Satisfactorily
_____ Test Completed Satisfactorily With Deficiencies
_____ Test Unsatisfactory

SUBMITTED: ________________ DATE: ________

REVIEWED: ________________ DATE: ________
Manager - Simulator

CMS ENTRY MADE: ______

Manual Reactor Trip Transient Test (4.1)

NOTES

1. The SLOW TIME, FREEZE, BACKTRACK, and REPLAY features of the simulator may be used as desired to aid testing.
2. The simulator instructor facility's graphic trending capabilities, the 8-pen recorder, the ERFIS computer, or any other data collection device may be used to aid the verifications required by this test.
3. The initial condition (IC) for this Simulator Performance Test shall have the simulator at approximately 100% Power, Steady State Xenon and Decay Heat.
4. This Simulator Performance Test requires that no subsequent operator action, other than specified, shall be performed following the initiation of the transient.
5. All simulator responses shall be as follows:
   a. Parameter changes are in the proper direction.
   b. The physical laws of nature are not violated.
   c. Alarms and automatic actions which should occur do.
   d. Alarms and automatic actions which should not occur do not.
   e. System Interactions provide a total system integrated response.

Manual Reactor Trip Transient Test (4.1)

I. **TEST PURPOSE**

This simulator performance test verifies that the initiation of a manual reactor trip produces the integrated plant response indicative of the reference plant.

II. **REFERENCES**

A. Updated FSAR H. B. Robinson
B. ANSI-3.5-1985
C. EPRI NP-6701

III. **SIMULATOR FUNCTIONS VERIFIED BY TEST 4.1**

None

IV. **PREREQUISITE TESTS:** None.

V. MANUAL REACTOR TRIP TRANSIENT TEST

A. Initialize the simulator to IC-5. ______

B. Ensure recording of required data points is established as indicated on Appendix 1, with a resolution of 0.5 seconds or less. ______

NOTE: This Simulator Performance Test requires that no subsequent operator action, other than specified, shall be performed following the initiation of the transient.

C. Initiate a Manual Reactor Trip. ______

D. Start the second charging pump and place in automatic. ______

E. Control Auxiliary Feedwater Flow as necessary to prevent exceeding 50% Steam Generator level on LI-474, LI-484, and LI-494. ______

F. Allow this Transient Test to run a minimum of 30 minutes. ______

G. Place the simulator in FREEZE. ______

H. Verify the actual parameter responses are as per Table I, Transient Response Parameter Verification and initial the appropriate space. ______

I. Using engineering evaluation and/or operational assessment, ensure the following simulator responses were observed during this test: ______

1. Parameter changes were in the proper direction.
2. Physical laws of nature were not violated.
3. Alarms and automatic actions which should have occurred did occur.
4. Alarms and automatic actions which should not have occurred did not occur.
5. System interactions provided a total system integrated response.

Manual Reactor Trip Transient Test (4.1)

TABLE I
Transient Response Parameter Verification

Parameter	Expected Response	Actual Agrees with Expected Response (Initials)
1. Neutron Flux		
a. NI-41B % Full Power	Decreases to minimum value on all 4 Power Range Channels	________
b. NI-42B % Full Power		________
c. NI-43B % Full Power		________
d. NI-44B % Full Power		________
e. NI-35B Intermediate Range Amps	Decreases	________
f. NI-36B Intermediate Range Amps	Decreases	________
g. NI-31B Source Range CPS	Decreases	________
h. NI-32B Source Range CPS	Decreases	________
2. RCS Average Temperature		
a. MEDIAN T_{avg} TR-408 Pen 1	Decreases and then stabilizes at approximately 547°F	________
3. Pressurizer Pressure		
a. PI-444, Channel I Pressurizer Pressure	Decreases and then stabilizes at approximately 2235 psig	________
b. PI-445, Channel II Pressurizer Pressure		________
4. Pressurizer Level		
a. LI-459A, Channel I Pressurizer Level	Decreases and then stabilizes at approximately 22.2%	________
b. LI-460, Channel II Pressurizer Level		________

Manual Reactor Trip Transient Test (4.1)

TABLE I (cont.)
Transient Response Parameter Verification

Parameter	Expected Response	Actual Agrees with Expected Response (Initials)
5. Pressurizer Temperature		
a. TI-453, Pressurizer Liquid b. TI-454, Pressurizer Vapor	Decreases and then stabilizes back to their approximate value prior to trip	________
6. Total Steam Flow		
a. FI-474, S/G 1 Steam Flow	Decreases	________
b. FI-484, S/G 2 Steam Flow	Decreases	________
c. FI-494, S/G 3 Steam Flow	Decreases	________
7. Total Feedwater Flow		
a. FI-476, S/G 1 Feedwater	Decreases	________
b. FI-486, S/G 2 Feedwater	Decreases	________
c. FI-496, S/G 3 Feedwater	Decreases	________
8. RCS Hot Leg Temperature		
a. TI-413, Loop 1 Hot Leg	Decreases and then stabilizes at approximately 547°F	________
b. TI-423, Loop 2 Hot Leg		________
c. TI-433, Loop 3 Hot Leg		________

Manual Reactor Trip Transient Test (4.1)

TABLE I (cont.)
Transient Response Parameter Verification

Parameter	Expected Response	Actual Agrees with Expected Response (Initials)
9. RCS Cold Leg Temperature		
a. TI-410, Loop 1 Cold Leg	Increases and then stabilizes at approximately 547°F	________
b. TI-420, Loop 2 Cold Leg		________
c. TI-430, Loop 3 Cold Leg		________
10. Steam Generator Pressure		
a. PI-474, S/G 1	Increases and then stabilizes at approximately 1000 psig	________
b. PI-484, S/G 2		________
c. PI-494, S/G 3		________
11. Steam Generator Level		
a. LI-474, S/G 1 Narrow Range	Decreases and then increase due to AFW flow	________
b. LI-484, S/G 2 Narrow Range		________
c. LI-494, S/G 3 Narrow Range		________

NOTE: Steam Generator level increase in Step 11, is dependant upon the duration of this Transient.

Manual Reactor Trip Transient Test (4.1)

TEST RESULTS

I. **TEST COMPLETED SATISFACTORILY WITH NO DEFICIENCIES**

______________________________ Signature ______________ Date

II. **TEST COMPLETED SATISFACTORILY WITH DEFICIENCIES LISTED BELOW, PARTIAL RETEST ACCEPTABLE**

______________________________ Signature ______________ Date

Test Item No.	Section Requiring Retest	Comments	SSR No.	SSR Cleared

RETEST: ______________________________ Signature ______________ Date

RETEST: ______________________________ Signature ______________ Date

III. **TEST COMPLETED UNSATISFACTORILY, COMPLETE RETEST REQUIRED**

______________________________ Signature ______________ Date

SSR No.: ______________

Manual Reactor Trip Transient Test (4.1)

TEST REMARKS

Manual Reactor Trip Transient Test (4.1)

APPENDIX 1
DATA POINTS

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE
Required Data Points:			
NI-41B Percent Full Power	FNISPR(1)	NIN0041A	0-120
NI-42B Percent Full Power	FNISPR(2)	NIN0042A	0-120
NI-43B Percent Full Power	FNISPR(3)	NIN0043A	0-120
NI-44B Percent Full Power	FNISPR(4)	NIN0044A	0-120
NI-35B Amperes Neutron Level	FNISIR(1)	NIN0035A	E-11-E-3
NI-36B Amperes Neutron Level	FNISIR(2)	NIN0036A	E-11-E-3
NI-31B CPS Neutron Level	FNISSR(1)	NIN0031A	1-E6
NI-32B CPS Neutron Level	FNISSR(2)	NIN0032A	1-E6
Median T_{avg} (TR-408)	TPCSTAAV	RCT0461A	540-615
CH I PRZR Press (PI-444)	PT:444	RCP0483A	1700-2500
CH II PRZR Press (PI-445)	PT:445	RCP0480A	1700-2500
CH I PRZR Level (LI-459A)	LT:459A	RCL0480A	0-100
CH II PRZR Level (LI-460)	LT:460	RCL0481A	0-100
PRZR Vapor Temp (TI-454)	TT:454	RCT0481A	100-700
PRZR Liquid Temp (TI-453)	TT:453	RCT0480A	100-700
Ch I SG 1 Steam Flow (FI-474)	FT:474	MSF0405A	0-4E6
CH I SG 2 Steam Flow (FI-484)	FT:484	MSF0425A	0-4E6
CH I SG 3 Steam Flow (FI-494)	FT:494	MSF0445A	0-4E6
CH I SG 1 Feedwater Flow (FI-476)	FT:476	FWF0403A	0-4E6
CH I SG 2 Feedwater Flow (FI-486)	FT:486	FWF0423A	0-4E6

Manual Reactor Trip Transient Test (4.1)

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE
CH I SG 3 Feedwater Flow (FI-496)	FT:496	FWF0443A	0-4E6
Loop 1 Hot Leg Temp (TI-413)	TT:413	RCT0419A	0-700
Loop 2 Hot Leg Temp (TI-423)	TT:423	RCT0439A	0-700
Loop 3 Hot Leg Temp (TI-433)	TT:433	RCT0459A	0-700
Loop 1 Cold Leg Temp (TI-410)	TT:410	RCT0406A	0-700
Loop 2 Cold Leg Temp (TI-420)	TT:420	RCT0426A	0-700
Loop 3 Cold Leg Temp (TI-430)	TT:430	RCT0446A	0-700
CH I SG 1 Steam Press (PI-474)	PT:474	MSP0400A	0-1400
CH I SG 2 Steam Press (PI-484)	PT:484	MSP0420A	0-1400
CH I SG 3 Steam Press (PI-494)	PT:494	MSP0440A	0-1400
CH I SG 1 Nar Range Level (LI-474)	LT:474	FWL0400A	0-100
CH I SG 2 Nar Range Level (LI-484)	LT:484	FWL0420A	0-100
CH I SG 3 Nar Range Level (LI-494)	LT:494	FWL0440A	0-100
RCS Wide Range Level (PI-402)	PT:402	RCP0499A	0-3000
Nar Range Containment Press (PI-950B)	PT:950B	N/A	(-0.5)-1.0
CH I Containment Press (PI-950A)	PT:950A	CVP1010A	(-0.5)-75
Containment Temp (TI-950B)	TT:950B	CVT1000A	0-300
Relief Non-Condense Mass to PRT	ARCSPRTN	N/A	0-5000
Relief Steam Mass to PRT	ARCSPRTS	N/A	0-5000
Relief Water Mass to PRT	ARCSPRTW	N/A	0-5000

Manual Reactor Trip Transient Test (4.1)

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE
RCS CH I Loop 1 Flow (FI-414)	FT:414	RCF0400A	0-120
RCS CH I Loop 2 Flow (FI-424)	FT:424	RCF0420A	0-120
RCS CH I Loop 3 Flow (FI-434)	FT:434	RCF0440A	0-120
PRZR Surge Line Temp (TI-450)	FT:450	RCT0482A	100-700
ICCM A RVLIS - Upper Range Level (LT-511AA)	LT:511AA	RCL0486	0-120
ICCM A RVLIS - Full Range Level (LT-511AB)	LT:511AB	RCL0487	0-120
ICCM A RVLIS - Dynamic Range Level (LT:511AC)	LT:511AC	RCL0488	0-120
RCS Subcooling	N/A	RCT0003	(-100)-100
SG A Wide Range level	LT:477	FWL0403A	0-100
SB B Wide Range Level	LT:487	FWL0423A	0-100
SG C Wide Range Level	LT:497	FWL0443A	0-100
Channel I CV Water Level	BCNMSUMP	SIL5321A	3.5-423.5

Supplementary Data Points: None.

Manual Reactor Trip Transient Test (4.1)

APPENDIX 2
SIMULATOR DATA COLLECTED DURING TEST

ITEMIZE ATTACHED DATA[1]:

---

[1]strip charts, ERFIS tape identification, completed operating procedures, ERFIS/computer curves or tables)

Manual Reactor Trip Transient Test (4.1)

ATTACHMENT 1
BENCHMARK DATA

SIMULATOR PERFORMANCE TEST

TEST No.: 5.14.4 **Rev. No.:** 4

TEST TITLE: Phase A Isolation Signal Failure Test

TEST CATEGORY: Malfunction Test

TEST APPROVAL:

REVIEWED: William M Blaisdell DATE: 3-6-91

APPROVED: Alson C Sanders DATE: 3/6/91

FINAL TEST RESULTS:

_____ Test Completed Satisfactorily
_____ Test Completed Satisfactorily With Deficiencies
_____ Test Unsatisfactory

SUBMITTED: ____________________ DATE: __________

REVIEWED: ____________________ DATE: __________
Manager - Simulator

CMS ENTRY MADE: ________

Phase A Isolation Signal Failure Test (5.14.4)

NOTES

1. This simulator performance test is a revision of Acceptance Test Procedure (ATP) 14.5.14.4, Rev. 1.
2. The SLOW TIME, FREEZE, BACKTRACK, and REPLAY features of the simulator may be used as desired to aid testing.
3. The simulator instructor facility's graphic trending capabilities, the 8-pen recorder, the ERFIS computer, or any other data collection device may be used to aid the verifications required by this test.
4. Apply a ± 2% (of full scale) tolerance to parameter values when making verifications using control panel meters to account for allowed simulator instrument error.
5. Setpoint verifications:
   a. The simulator's parameter monitoring feature may be used to verify setpoints, in which case, a ± 0% tolerance should be applied.
   b. Setpoints provided in brackets [] or parentheses () are provided as information aids to the person conducting the simulator performance test and need not be verified.
6. If power level or time-in-core-life or both are not critical to the outcome of a test, a simulator initial condition (IC) other than that specified may be used. Indicate on the test record if a different IC is used.
7. Plant response following actuation of safety injection (SI), phase A isolation, and containment ventilation isolation is verified in simulator performance test 3.5, Engineered Safeguards Tests.

Phase A Isolation Signal Failure Test (5.14.4)

I. TEST PURPOSE

This simulator performance test verifies that MALFUNCTION MSC4 can fail each train of containment phase A isolation, either preventing actuation or causing inadvertent actuation of the selected train.

II. REFERENCES

A. B-190628, Sh. 89, Rev.12 (PS-956A/B)
B. B-190628, Sh. 91, Rev. 11 (PS-956C/D)
C. B-190628, Sh. 94, Rev. 13 (PS-956E/F)
D. B-190628, Sh. 98, Rev. 10 (PS-956G/H)
E. B-190628, Sh. 125, Rev. 12 (RC-516)
F. B-190628, Sh. 126, Rev. 11 (RC-553)
G. B-190628, Sh. 127, Rev. 16 (RC-519A/B)
H. B-190628, Sh. 136, Rev. 3 (RC-550)
I. B-190628, Sh. 151A, Rev.12 (CVC-200A)
J. B-190628, Sh. 151B, Rev.14 (CVC-200A)
K. B-190628, Sh. 152A, Rev.14 (CVC-200B)
L. B-190628, Sh. 152B, Rev.15 (CVC-200B)
M. B-190628, Sh. 153A, Rev.11 (CVC-200C)
N. B-190628, Sh. 153B, Rev.13 (CVC-200C)
O. B-190628, Sh. 154, Rev. 9 (CVC-204A)
P. B-190628, Sh. 155, Rev. 8 (CVC-204B)
Q. B-190628, Sh. 316, Rev. 11 (SI-855)
R. B-190628, Sh. 229, Rev. 9 (CC-739)
S. B-190628, Sh. 340, Rev. 13 (WD-1786)
T. B-190628, Sh. 341, Rev. 14 (WD-1787)
U. B-190628, Sh. 342, Rev.12 (WD-1794)
V. B-190628, Sh. 343, Rev. 13 (WD-1789)
W. B-190628, Sh. 346, Rev. 13 (WD-1721)
X. B-190628, Sh. 347, Rev. 15 (WD-1722)
Y. B-190628, Sh. 348, Rev. 14 (WD-1728)
Z. B-190628, Sh. 349, Rev. 13 (WD-1723)
AA. B-190628, Sh. 590, Rev. 13 (IA-PCV-1716)
BB. B-190628, Sh. 594, Rev. 10 (IVSW-PCV-1922A/B)
CC. B-190628, Sh. 599, Rev. 9 (RMS-1/2/3/4)
DD. B-190628, Sh. 627, Rev. 12 (AFW CONTROLS)
EE. B-190628, Sh. 628A, Rev. 2 (SG SAMPLE VALVES)
FF. B-190628, Sh. 630C, Rev.15 (SG BD VALVES/AFW CONTROLS)
GG. B-190628, Sh. 748, Rev. 1 (FP-248)
HH. B-190628, Sh. 749, Rev. 1 (FP-249)
II. B-190628, Sh. 750, Rev. 1 (FP-256)
JJ. B-190628, Sh. 751, Rev. 1 (FP-258)
KK. SD-006, Rev. 15
LL. CP-300-5379-2759, Rev. 15

Phase A Isolation Signal Failure Test (5.14.4)

II. **REFERENCES** (Continued)

MM. CP-380-5379-3232, Rev. 23
NN. CP-380-5379-3235, Rev. 19
OO. CP-380-5379-3236, Rev. 10

III. **SIMULATOR FUNCTIONS VERIFIED BY TEST 5.14.4**

A. MAL MSC4A: Inadvertent CNMT Isol Phase A or Failure to Activ. (Train A)
B. MAL MSC4B: Inadvertent CNMT Isol Phase A or Failure to Activ. (Train B)

IV. **PREREQUISITE TESTS:** None.

Phase A Isolation Signal Failure Test (5.14.4)

V. FAILURE OF TRAIN A PHASE A ISOLATION TO ACTUATE

A. Initialize the simulator to IC-3 (Hot Shutdown, BOL). ______

B. Ensure recording of required data points is established as indicated on Appendix 1. ______

C. Fail train A containment phase A isolation [MAL MSC4A ACT 2]. ______

NOTE: This malfunction simulates failure of the train A containment phase A isolation relay CA-1 to energize.

D. Perform the following:

1. Open all letdown orifice isolation valves:

   a. LTDN ORIFICE CVC-200A ______

   b. LTDN ORIFICE CVC-200B ______

   c. LTDN ORIFICE CVC-200C ______

2. Open PW TO CV ISO RC-519A&B. ______

3. Using the local operator action function [LOA], open the following valves:

   a. PS-956A thru PS-956H (VALVES TO NUCLEAR SAMPLING HEAT EXCHANGERS) [LOA MSC 1 (one LOA for all valves)] ______

   b. RC-516 and RC-553 (PRT TO GAS ANALYZER RC 516 & RC 553) [LOA PRS T] ______

   c. RC-550 (N2 SUPPLY TO PRT RC 550) [LOA PRS] ______

   d. WD-1721 (WASTE DISP VLV 1721 OPEN SW. MOMENTARY) [LOA MSC T] ______

   e. WD-1786 (WASTE DISP VLV 1786 OPEN SW. MOMENTARY) [LOA MSC T] ______

4. Verify that no lights are lit on the CONTAINMENT ISOLATION PHASE A status light panel. ______

5. Verify that RAD MONITORS R-11 & 12 VALVES RMS 1-2-3-4 SHUT is not lit on the CONTAINMENT VENTILATION ISOLATION status light panel. ______

6. Open CV VAC RELIEF/V12-12 & V12-13 ______

7. Open CV PRESS RELIEF/V12-10 & V12-11 ______

8. Start CV PURGE FAN HVE-1A and verify the following: ______

   a. V12-6 OPEN and V12-7 OPEN status lights light ______

   b. V12-8 OPEN and V12-9 OPEN status lights light ______

   c. CV INTAKE DAMPER indicates OPEN ______

NOTE: If desired, create a snap-shot with these conditions to use for section VI, VII, and VIII testing.

E. Manually actuate containment phase A isolation by depressing either CONTAINMENT ISOLATION INITIATE pushbutton. ______

NOTE: Complete plant response to containment phase A isolation is verified in simulator performance test 3.5, Engineered Safeguards Tests.

NOTE: The phase A train A actuation relays are CA10X, CA11X, CA12X and CA13X.

The phase A train B actuation relays are CA20X, CA21X, CA22X, and CA23X.

The phase A relay (or relays) that actuate a component are given in brackets for the verifications that follow.

F. Verify the following:

1. Valve positions at the valve control switches indicate as follows:

   a. LTDN LINE ISO CVC-204A: **open** [CA11X] ______

   b. LTDN LINE ISO CVC-204B: **shut** [CA21X] ______

Phase A Isolation Signal Failure Test (5.14.4)

c. CCW FROM EXCESS LTDN HX CC-739: **shut** [CA10X or CA20X] ______

NOTE: CC-739 will shut if either train of phase A isolation actuates (relay CA10X or relay CA20X energized causes valve to shut).

d. LTDN ORIFICE CVC-200A: **open** [CA10X] ______

e. LTDN ORIFICE CVC-200B: **shut** [CA20X] ______

f. LTDN ORIFICE CVC-200C: **open** [CA10X] ______

g. ACC NITROGEN ISO SI-855: **shut** [CA12X or CA22X] ______

NOTE: SI-855 will shut if either train of phase A isolation actuates (relay CA12X or relay CA22X energized causes valve to shut).

h. PW TO CV ISO RC-519A: **open** [CA10X] ______

i. PW TO CV ISO RC-519B: **shut** [CA20X] ______

j. RCP SPRINKLER ISOLATION VALVE FP-256: **open** [CA13X] ______

k. ELECT PENETRATION CV ISOLATION FP-248: **open** [CA13X] ______

l. RCP SPRINKLER ISOLATION VALVE FP-258: **shut** [CA23X] ______

m. ELECT PENETRATION CV ISOLATION FP-249: **shut** [CA23X] ______

2. CONTAINMENT ISOLATION PHASE A status panel lights indicate as follows:

a. LTDN ORIFICE VA 200A SHUT **not lit** [CA10X] ______

b. LTDN ORIFICE VA 200B SHUT **lit** [CA20X] ______

c. LTDN ORIFICE VA 200C SHUT **not lit** [CA10X] ______

d. PRT TO ANALYZ VA 553 SHUT **not lit** [516 - CA20X & CA21X; 553 - CA10X & CA11X] ______

e. PRT TO ANALYZ VA 516 SHUT **lit** ______

Phase A Isolation Signal Failure Test (5.14.4)

f. PRT N_2 SUPPLY VA 550 SHUT **not lit** [CA11X] ______

g. EXCESS LTDN HX VA 739 (OUT) SHUT **lit** [CA10X or CA20X] ______

h. SAMPLE SYS VALVES 956A, C, E & G SHUT **not lit** [956A/C/E/G - CA11X; 956B/D/F/H - CA12X] ______

i. SAMPLE SYS VALVES 956B, D, F & H SHUT **lit** ______

j. SG1 BLOWDOWN FCV-1930A&B/FCV-1933A&B SHUT **lit** [CA12X or CA22X] ______

k. SG-2 BLOWDOWN FCV-1931A-B & SPL VA FCV-1934A&B SHUT **lit** [CA12X or CA22X] ______

l. SG3 BLOWDOWN FCV-1932A&B FCV-1935A&B SHUT **lit** [CA12X or CA22X] ______

m. LTDN LINE ISOL VA 204A SHUT **not lit** [CA11X] ______

n. LTDN LINE ISOL VA 204B SHUT **lit** [CA21X] ______

o. PRIMARY WTR. TO CONT VA 519A&B SHUT **not lit** [519A - CA10X; 519B - CA20X] ______

p. FP-248,256 CLOSED **not lit** [FP-248 and FP-256 - CA13X; FP-249 and FP-258 - CA23X] ______

q. FP-249 & 258 CLOSED **lit** ______

r. ACC N_2 SUPPLY VA 855 SHUT **lit** [CA12X or CA22X] ______

s. WDS: VA1721,28,86&94 SHUT **not lit** [WD-1721 (CA10X); WD-1722 (CA20X); WD-1723 (CA12X); WD-1728 (CA11X); CD-1786 (CA10X); WD-1787 (CA20X); WD-1789 (CA20X or CA21X); WD-1794 (CA20X or CA21X)] ______

t. WDS: VA1722,23,87&89 SHUT **lit** ______

u. INST AIR VALVE TO CONT PCV-1716 SHUT **lit** [CA12X or CA22X] ______

v. IVSW VA PCV-1922A OPEN **not lit** [CA12X] ______

w. IVSW VA PCV-1922B OPEN **lit** [CA22X] ______

Phase A Isolation Signal Failure Test (5.14.4)

3. Verify actuation of CV ventilation isolation (with damper status panel indication, not CONTAINMENT VENTILATION ISOLATION status lights):

   a. CV PURGE INLET V12-6: **shut** [V1 or V2] ______

   b. CV PURGE INLET V12-7: **shut** [V1 or V2] ______

   c. CV PURGE OUTLET V12-8: **shut** [V1 or V2] ______

   d. CV PURGE OUTLET V12-9: **shut** [V1 or V2] ______

   e. CV VAC RELIEF V12-12: **shut** [V1 or V2] ______

   f. CV VAC RELIEF V12-13: **shut** [V1 or V2] ______

   g. CV PRESS RELIEF V12-10: **shut** [V1 or V2] ______

   h. CV PRESS RELIEF V12-11: **shut** [V1 or V2] ______

   i. Yellow CV VENTILATION ISOLATION SIGNAL RELAY V-1 light: **not lit** [V1] ______

   j. Yellow CV VENTILATION ISOLATION SIGNAL RELAY V-1 light: **lit** [V2] ______

4. CONTAINMENT VENTILATION ISOLATION status panel lights indicate as follows:

   a. RAD MONITORS R-11&12 VALVES RMS 1-2-3-4 SHUT **lit** ______

   b. PURGE SUPPLY VA V12-6 SHUT: **lit** [V1 or V2] ______

   c. PURGE SUPPLY VA V12-7 SHUT: **lit** [V1 or V2] ______

   d. PRESS. REL. OUTSIDE CONT. VA V12-11 SHUT: **lit** [V1 or V2] ______

   e. PRESS. REL. INSIDE CONT. VA V12-10 SHUT: **lit** [V1 or V2] ______

   f. CTLRM MAKEUP L-19 SHUT: **not lit** [SI12X] ______

   g. PURGE EXHAUST VA V12-9 SHUT: **lit** [V1 or V2] ______

h. PURGE EXHAUST VA V12-8 SHUT: **lit** [V1 or V2] ______

i. VAC RELIEF VALVE INSIDE CONT V-12-13 SHUT: **lit** [V1 or V2] ______

j. VAC REL. OUTSIDE CONT. VA V12-12 SHUT: **lit** [V1 or V2] ______

k. CLT RM FILTER BYP DAMPER SHUT: **not lit** [SI12X] ______

l. CLT RM FILTER ISOL DAMPER OPEN: **not lit** [SI12X] ______

G. For each of the following valves, position the valve control switch to CLOSE and verify that the valve travels fully CLOSED:

1. LTDN LINE ISO CVC-204A ______
2. LTDN ORIFICE CVC-200A ______
3. LTDN ORIFICE CVC-200C ______
4. RC-519A (Position PW TO CV ISO RC-519A/B common control switch to CLOSE) ______
5. RCP SPRINKLER ISOLATION VALVE FP-256 ______
6. ELECT PENETRATION CV ISOLATION FP-248 ______

VI. **FAILURE OF TRAIN B PHASE A ISOLATION TO ACTUATE**

A. Initialize the simulator to IC-3 (Hot Shutdown, BOL). ______

B. Ensure recording of required data points is established as indicated on Appendix 1. ______

C. Fail train B containment phase A isolation [MAL MSC4B ACT 2]. ______

NOTE: This malfunction simulates failure of the train B containment phase A isolation relay CA-2 to energize.

Phase A Isolation Signal Failure Test (5.14.4)

D. Perform the following:

1. Open all letdown orifice isolation valves:

   a. LTDN ORIFICE CVC-200A ______

   b. LTDN ORIFICE CVC-200B ______

   c. LTDN ORIFICE CVC-200C ______

2. Open PW TO CV ISO RC-519A&B. ______

3. Using the local operator action function [LOA], open the following valves:

   a. PS-956A thru PS-956H (VALVES TO NUCLEAR SAMPLING HEAT EXCHANGERS) [LOA MSC 1 (one LOA for all valves)] ______

   b. RC-516 and RC-553 (PRT TO GAS ANALYZER RC 516 & RC 553) [LOA PRS T] ______

   c. RC-550 (N2 SUPPLY TO PRT RC 550) [LOA PRS] ______

   d. WD-1721 (WASTE DISP VLV 1721 OPEN SW. MOMENTARY) [LOA MSC T] ______

   e. WD-1786 (WASTE DISP VLV 1786 OPEN SW. MOMENTARY) [LOA MSC T] ______

4. Verify that no lights are lit on the CONTAINMENT ISOLATION PHASE A status light panel. ______

5. Verify that RAD MONITORS R-11 & 12 VALVES RMS 1-2-3-4 SHUT is not lit on the CONTAINMENT VENTILATION ISOLATION status light panel. ______

6. Open CV VAC RELIEF/V12-12 & V12-13 ______

7. Open CV PRESS RELIEF/V12-10 & V12-11 ______

Phase A Isolation Signal Failure Test (5.14.4)

8. Start CV PURGE FAN HVE-1A and verify the following: ______

   a. V12-6 OPEN and V12-7 OPEN status lights light ______

   b. V12-8 OPEN and V12-9 OPEN status lights light ______

   c. CV INTAKE DAMPER indicates OPEN ______

E. Manually actuate containment phase A isolation by depressing either CONTAINMENT ISOLATION INITIATE pushbutton. ______

F. Verify the following:

1. Valve positions at the valve control switches indicate as follows:

   a. LTDN LINE ISO CVC-204A: **shut** ______

   b. LTDN LINE ISO CVC-204B: **open** ______

   c. CCW FROM EXCESS LTDN HX CC-739: **shut** ______

   d. LTDN ORIFICE CVC-200A: **shut** ______

   e. LTDN ORIFICE CVC-200B: **open** ______

   f. LTDN ORIFICE CVC-200C: **shut** ______

   g. ACC NITROGEN ISO SI-855: **shut** ______

   h. PW TO CV ISO RC-519A: **shut** ______

   i. PW TO CV ISO RC-519B: **open** ______

   j. RCP SPRINKLER ISOLATION VALVE FP-256: **shut** ______

   k. ELECT PENETRATION CV ISOLATION FP-248: **shut** ______

   l. RCP SPRINKLER ISOLATION VALVE FP-258: **open** ______

   m. ELECT PENETRATION CV ISOLATION FP-249: **open** ______

Phase A Isolation Signal Failure Test (5.14.4)

2. CONTAINMENT ISOLATION PHASE A status panel lights indicate as follows:

a. LTDN ORIFICE VA 200A SHUT **lit** ______

b. LTDN ORIFICE VA 200B SHUT **not lit** ______

c. LTDN ORIFICE VA 200C SHUT **lit** ______

d. PRT TO ANALYZ VA 516 SHUT **not lit** ______

e. PRT TO ANALYZ VA 553 SHUT **lit** ______

f. PRT N_2 SUPPLY VA 550 SHUT **lit** ______

g. EXCESS LTDN HX VA 739 (OUT) SHUT **lit** ______

h. SAMPLE SYS VALVES 956B, D F&H SHUT **not lit** ______

i. SAMPLE SYS VALVES 956A, C, E&G SHUT **lit** ______

j. SG1 BLOWDOWN FCV-1930A&B/FCV-1933A&B SHUT **lit** ______

k. SG-2 BLOWDOWN FCV-1931A-B & SPL VA FCV-1934A&B SHUT **lit** ______

l. SG3 BLOWDOWN FCV-1932A&B FCV-1935A&B SHUT **lit** ______

m. LTDN LINE ISOL VA 204A SHUT **lit** ______

n. LTDN LINE ISOL VA 204B SHUT **not lit** ______

o. PRIMARY WTR. TO CONT VA 519A&B SHUT **not lit** ______

p. FP-249&258 CLOSED **not lit** ______

q. FP-248&256 CLOSED **lit** ______

r. ACC N_2 SUPPLY VA 855 SHUT **lit** ______

s. WDS: VA1722,23,87&89 SHUT **not lit** ______

t. WDS: VA1721,28,86&94 SHUT **lit** ______

u. INST AIR VALVE TO CONT PCV-1716 SHUT **lit** ______

v. IVSW VA PCV-1922A OPEN **lit** ______

w. IVSW VA PCV-1922B OPEN **not lit** ______

3. Verify actuation of CV ventilation isolation (with damper status panel indication, not CONTAINMENT VENTILATION ISOLATION status lights):

   a. CV PURGE INLET V12-6: **shut** [V1 or V2] ______

   b. CV PURGE INLET V12-7: **shut** [V1 or V2] ______

   c. CV PURGE OUTLET V12-8: **shut** [V1 or V2] ______

   d. CV PURGE OUTLET V12-9: **shut** [V1 or V2] ______

   e. CV VAC RELIEF V12-12: **shut** [V1 or V2] ______

   f. CV VAC RELIEF V12-13: **shut** [V1 or V2] ______

   g. CV PRESS RELIEF V12-10: **shut** [V1 or V2] ______

   h. CV PRESS RELIEF V12-11: **shut** [V1 or V2] ______

   i. Yellow CV VENTILATION ISOLATION SIGNAL RELAY V-1 light: **lit** [V1] ______

   j. Yellow CV VENTILATION ISOLATION SIGNAL RELAY V-1 light: **not lit** [V2] ______

4. CONTAINMENT VENTILATION ISOLATION status panel lights indicate as follows:

   a. RAD MONITORS R-11&12 VALVES RMS 1-2-3-4 SHUT **lit** ______

   b. PURGE SUPPLY VA V12-6 SHUT: **lit** [V1 or V2] ______

   c. PURGE SUPPLY VA V12-7 SHUT: **lit** [V1 or V2] ______

   d. PRESS. REL. OUTSIDE CONT. VA V12-11 SHUT: **lit** [V1 or V2] ______

   e. PRESS. REL. INSIDE CONT. VA V12-10 SHUT: **lit** [V1 or V2] ______

   f. CTLRM MAKEUP L-19 SHUT: **not lit** [SI12X] ______

   g. PURGE EXHAUST VA V12-9 SHUT: **lit** [V1 or V2] ______

Phase A Isolation Signal Failure Test (5.14.4)

h. PURGE EXHAUST VA V12-8 SHUT: **lit** [V1 or V2] ______

i. VAC RELIEF VALVE INSIDE CONT V-12-13 SHUT: **lit** [V1 or V2] ______

j. VAC REL. OUTSIDE CONT. VA V12-12 SHUT: **lit** [V1 or V2] ______

k. CLT RM FILTER BYP DAMPER SHUT: **not lit** [SI12X] ______

l. CLT RM FILTER ISOL DAMPER OPEN: **not lit** [SI12X] ______

G. For each of the following valves, position the valve control switch to CLOSE and verify that the valve travels fully CLOSED:

1. LTDN LINE ISO CVC-204B ______

2. LTDN ORIFICE CVC-200B ______

3. RC-519B (Position PW TO CV ISO RC-519A/B common control switch to CLOSE) ______

4. RCP SPRINKLER ISOLATION VALVE FP-258 ______

5. ELECT PENETRATION CV ISOLATION FP-249 ______

VII. **INADVERTENT ACTUATION OF TRAIN A PHASE A ISOLATION**

A. Initialize the simulator to IC-3 (Hot Shutdown, BOL). ______

B. Ensure recording of required data points is established as indicated on Appendix 1. ______

C. Perform the following:

1. Open all letdown orifice isolation valves:

a. LTDN ORIFICE CVC-200A ______

b. LTDN ORIFICE CVC-200B ______

c. LTDN ORIFICE CVC-200C ______

2. Open PW TO CV ISO RC-519A&B. ______

Phase A Isolation Signal Failure Test (5.14.4)

3. Using the local operator action function [LOA], open the following valves:

   a. PS-956A thru PS-956H (VALVES TO NUCLEAR SAMPLING HEAT EXCHANGERS) [LOA MSC 1 (one LOA for all valves)] ______

   b. RC-516 and RC-553 (PRT TO GAS ANALYZER RC 516 & RC 553) [LOA PRS T] ______

   c. RC-550 (N2 SUPPLY TO PRT RC 550) [LOA PRS] ______

   d. WD-1721 (WASTE DISP VLV 1721 OPEN SW. MOMENTARY) [LOA MSC T] ______

   e. WD-1786 (WASTE DISP VLV 1786 OPEN SW. MOMENTARY) [LOA MSC T] ______

D. Actuate train A containment isolation phase A [MAL CNS4A ACT,1].

NOTE: This malfunction simulates inadvertent energization of the train A containment phase A isolation relay C-A1.

E. Verify the following:

1. Valve positions at the valve control switches indicate as follows:

   a. LTDN LINE ISO CVC-204A: **shut** ______

   b. LTDN LINE ISO CVC-204B: **open** ______

   c. CCW FROM EXCESS LTDN HX CC-739: **shut** ______

   d. LTDN ORIFICE CVC-200A: **shut** ______

   e. LTDN ORIFICE CVC-200B: **open** ______

   f. LTDN ORIFICE CVC-200C: **shut** ______

   g. ACC NITROGEN ISO SI-855: **shut** ______

   h. PW TO CV ISO RC-519A: **shut** ______

   i. PW TO CV ISO RC-519B: **open** ______

   j. RCP SPRINKLER ISOLATION VALVE FP-256: **shut** ______

Phase A Isolation Signal Failure Test (5.14.4)

k. ELECT PENETRATION CV ISOLATION FP-248: **shut** ______

l. RCP SPRINKLER ISOLATION VALVE FP-258: **open** ______

m. ELECT PENETRATION CV ISOLATION FP-249: **open** ______

2. CONTAINMENT ISOLATION PHASE A status panel lights indicate as follows:

a. LTDN ORIFICE VA 200A SHUT **lit** ______

b. LTDN ORIFICE VA 200B SHUT **not lit** ______

c. LTDN ORIFICE VA 200C SHUT **lit** ______

d. PRT TO ANALYZ VA 516 SHUT **not lit** ______

e. PRT TO ANALYZ VA 553 SHUT **lit** ______

f. PRT N_2 SUPPLY VA 550 SHUT **lit** ______

g. EXCESS LTDN HX VA 739 (OUT) SHUT **lit** ______

h. SAMPLE SYS VALVES 956B,D,F&H SHUT **not lit** ______

i. SAMPLE SYS VALVES 956A,C,E&G SHUT **lit** ______

j. SG1 BLOWDOWN FCV-1930A&B/FCV-1933A&B SHUT **lit** ______

k. SG-2 BLOWDOWN FCV-1931A-B & SPL VA FCV-1934A&B SHUT **lit** ______

l. SG3 BLOWDOWN FCV-1932A&B FCV-1935A&B SHUT **lit** ______

m. LTDN LINE ISOL VA 204A SHUT **lit** ______

n. LTDN LINE ISOL VA 204B SHUT **not lit** ______

o. PRIMARY WTR. TO CONT VA 519A&B SHUT **not lit** ______

p. FP-249&258 CLOSED **not lit** ______

q. FP-248&256 CLOSED **lit** ______

r. ACC N_2 SUPPLY VA 855 SHUT **lit** ______

s. WDS: VA1722,23,87&89 SHUT **not lit** ______

t. WDS: VA1721,28,86&94 SHUT **lit** ______

u. INST AIR VALVE TO CONT PCV-1716 SHUT **lit** ______

v. IVSW VA PCV-1922A OPEN **lit** ______

w. IVSW VA PCV-1922B OPEN **not lit** ______

3. CONTAINMENT VENTILATION ISOLATION status panel lights indicate as follows:

   RAD MONITORS R-11&12 VALVES RMS 1-2-3-4 SHUT **lit** ______

F. For each of the following valves, position the valve control switch to OPEN and verify that the valve status **does not** change:

1. RCP SPRINKLER ISOLATION VALVE FP-256 ______

2. ELECT PENETRATION CV ISOLATION FP-248 ______

NOTE: Valves checked in the preceding steps have a contact in the valve control circuit that opens on a phase A isolation, preventing energization of the valve motor opening [42(o)] coil.

VIII. **INADVERTENT ACTUATION OF TRAIN B PHASE A ISOLATION**

A. Initialize the simulator to IC-3 (Hot Shutdown, BOL). ______

B. Ensure recording of required data points is established as indicated on Appendix 1. ______

C. Perform the following:

1. Open all letdown orifice isolation valves:

   a. LTDN ORIFICE CVC-200A ______

   b. LTDN ORIFICE CVC-200B ______

   c. LTDN ORIFICE CVC-200C ______

2. Open PW TO CV ISO RC-519A&B. ______

Phase A Isolation Signal Failure Test (5.14.4)

3. Using the local operator action function [LOA], open the following valves:

    a. PS-956A thru PS-956H (VALVES TO NUCLEAR SAMPLING HEAT EXCHANGERS) [LOA MSC 1 (one LOA for all valves)] ______

    b. RC-516 and RC-553 (PRT TO GAS ANALYZER RC 516 & RC 553) [LOA PRS T] ______

    c. RC-550 (N2 SUPPLY TO PRT RC 550) [LOA PRS] ______

    d. WD-1721 (WASTE DISP VLV 1721 OPEN SW. MOMENTARY) [LOA MSC T] ______

    e. WD-1786 (WASTE DISP VLV 1786 OPEN SW. MOMENTARY) [LOA MSC T] ______

D. Actuate train B containment isolation phase A [MAL CNS4B ACT,1].

NOTE: This malfunction simulates inadvertent energization of the train B containment phase A isolation relay C-A2.

E. Verify the following:

1. Valve positions at the valve control switches indicate as follows:

    a. LTDN LINE ISO CVC-204A: **open** ______

    b. LTDN LINE ISO CVC-204B: **shut** ______

    c. CCW FROM EXCESS LTDN HX CC-739: **shut** ______

    d. LTDN ORIFICE CVC-200A: **open** ______

    e. LTDN ORIFICE CVC-200B: **shut** ______

    f. LTDN ORIFICE CVC-200C: **open** ______

    g. ACC NITROGEN ISO SI-855: **shut** ______

    h. PW TO CV ISO RC-519A: **open** ______

    i. PW TO CV ISO RC-519B: **shut** ______

    j. RCP SPRINKLER ISOLATION VALVE FP-256: **open** ______

Phase A Isolation Signal Failure Test (5.14.4)

k. ELECT PENETRATION CV ISOLATION FP-248: **open** ______

l. RCP SPRINKLER ISOLATION VALVE FP-258: **shut** ______

m. ELECT PENETRATION CV ISOLATION FP-249: **shut** ______

2. CONTAINMENT ISOLATION PHASE A status panel lights indicate as follows:

a. LTDN ORIFICE VA 200A SHUT **not lit** ______

b. LTDN ORIFICE VA 200B SHUT **lit** ______

c. LTDN ORIFICE VA 200C SHUT **not lit** ______

d. PRT TO ANALYZ VA 553 SHUT **not lit** ______

e. PRT TO ANALYZ VA 516 SHUT **lit** ______

f. PRT N_2 SUPPLY VA 550 SHUT **not lit** ______

g. EXCESS LTDN HX VA 739 (OUT) SHUT **lit** ______

h. SAMPLE SYS VALVES 956A,C,E&G SHUT **not lit** ______

i. SAMPLE SYS VALVES 956B,D,F&H SHUT **lit** ______

j. SG1 BLOWDOWN FCV-1930A&B/FCV-1933A&B SHUT **lit** ______

k. SG-2 BLOWDOWN FCV-1931A-B & SPL VA FCV-1934A&B SHUT **lit** ______

l. SG3 BLOWDOWN FCV-1932A&B FCV-1935A&B SHUT **lit** ______

m. LTDN LINE ISOL VA 204A SHUT **not lit** ______

n. LTDN LINE ISOL VA 204B SHUT **lit** ______

o. PRIMARY WTR. TO CONT VA 519A&B SHUT **not lit** ______

p. FP-248&256 CLOSED **not lit** ______

q. FP-249&258 CLOSED **lit** ______

r. ACC N_2 SUPPLY VA 855 SHUT **lit** ______

s. WDS: VA1721,28,86&94 SHUT **not lit** ______

t. WDS: VA1722,23,87&89 SHUT **lit** ______

u. INST AIR VALVE TO CONT PCV-1716 SHUT **lit** ______

v. IVSW VA PCV-1922A OPEN **not lit** ______

w. IVSW VA PCV-1922B OPEN **lit** ______

3. CONTAINMENT VENTILATION ISOLATION status panel lights indicate as follows:

   RAD MONITORS R-11&12 VALVES RMS 1-2-3-4 SHUT **lit** ______

F. For each of the following valves, position the valve control switch to OPEN and verify that the valve status **does not** change:

1. RCP SPRINKLER ISOLATION VALVE FP-258 ______

2. ELECT PENETRATION CV ISOLATION FP-249 ______

NOTE: Valves checked in the preceding steps have a contact in the valve control circuit that opens on a phase A isolation, preventing energization of the valve motor opening [42(o)] coil.

Phase A Isolation Signal Failure Test (5.14.4)

TEST RESULTS

I. **TEST COMPLETED SATISFACTORILY WITH NO DEFICIENCIES**

Signature ______________________ Date __________

II. **TEST COMPLETED SATISFACTORILY WITH DEFICIENCIES LISTED BELOW, PARTIAL RETEST ACCEPTABLE**

Signature ______________________ Date __________

Test Item No.	Section Requiring Retest	Comments	SSR No.	Retest Complete

RETEST: Signature ______________________ Date __________

RETEST: Signature ______________________ Date __________

III. **TEST COMPLETED UNSATISFACTORILY, COMPLETE RETEST REQUIRED**

Signature ______________________ Date __________

SSR No.: __________________

Phase A Isolation Signal Failure Test (5.14.4)

TEST REMARKS

Phase A Isolation Signal Failure Test (5.14.4)

APPENDIX 1
DATA POINTS

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE

Required Data Points: None.

Supplementary Data Points: None.

Phase A Isolation Signal Failure Test (5.14.4)

APPENDIX 2
SIMULATOR DATA COLLECTED DURING TEST

ITEMIZE ATTACHED DATA[1]:

[1]strip charts, ERFIS tape identification, completed operating procedures, ERFIS/computer curves or tables)

Phase A Isolation Signal Failure Test (5.14.4)

ATTACHMENT 1
BENCHMARK DATA

CONTAINMENT PHASE A ACTUATED VALVES

DERIVED FROM SAFEGUARD SYSTEM PRINTS AND CONTROL WIRING DIAGRAMS
(Actuation Relay(s) Provided in Parentheses)

TRAIN A ACTUATED	TRAIN B ACTUATED	TRAIN A or TRAIN B ACTUATED
RC-553 (CA10X/CA11X)	RC-516 (CA20X/CA21X)	CC-739 (CA10X/CA20X)
RC-519A (CA10X)	RC-519B (CA20X)	PCV-1716 (CA12X/CA22X)
WD-1786 (CA10X)	WD-1787 (CA20X)	FCV-1930A/B (CA12X/22X)
WD-1794 (CA10X/CA13X)	WD-1789 (CA20X/CA21X)	FCV-1931A/B (CA12X/22X)
WD-1721 (CA10X)	WD-1722 (CA20X)	FCV-1932A/B (CA12X/22X)
CVC-200A (CA10X)	CVC-200B (CA20X)	FCV-1933A/B (CA12X/22X)
CVC-200C (CA10X)		FCV-1934A/B (CA12X/22X)
CVC-204A (CA11X)	CVC-204B (CA21X)	FCV-1935A/B (CA12X/22X)
PS-956A,C,E,G (CA11X)	PS-956B,D,F,H (CA21X)	FCV-4204A/B/C (CA12X/ CA22X via SGB-69X1)
WD-1728 (CA11X)	WD-1723 (CA21X)	RMS-1/2/3/4 (CA12X/22X)
RC-550 (CA11X)		SI-855 (CA12X/CA22X)
PCV-1922A (CA12X)	PCV-1922B (CA22X)	
FP-248 (CA13X)	FP-249 (CA23X)	
FP-256 (CA13X)	FP-258 (CA23X)	

Phase A Isolation Signal Failure Test (5.14.4)

ATTACHMENT 2
BENCHMARK DATA

CONTAINMENT ISOLATION PHASE A STATUS LIGHT PANEL

LTDN ORIFICE Train A VA 200A SHUT	BLANK
LTDN ORIFICE Train B VA 200B SHUT	LTDN LINE ISOL Train A VA 204A SHUT
LTDN ORIFICE Train A VA 200C SHUT	LTDN LINE ISOL Train B VA 204B SHUT
PRT TO ANALYZ Train A: 553 VA 516 & 553 Train B: 516 SHUT +	PRIMARY WTR. TO CONT + VA 519A & B Train A: 519A SHUT Train B: 519B
PRT N_2 SUPPLY Train A VA 550 SHUT	FP-248,249 Train A: 248,256 256,258 Train B: 249,258 CLOSED +
EXCESS LTDN HX Train A or B VA 739 (OUT SHUT	ACC N_2 SUPPLY Train A or B VA 855 SHUT
SAMPLE SYS VALVES + 956A THRU H Train A: A,C,E,G SHUT Train B: B,D,F,H	WDS: VA1721,22,23 + 28,86,87,89 & 94 SHUT Train A: 21,28,86,94 Train B: 22,23,87,89
SG1 BLOWDOWN Train A or B FCV-1930A & B FCV-1933A & B SHUT	INST AIR VALVE TO CONT PCV-1716 Train A or B SHUT
SG-2 BLOWDOWN VALVES A or B FCV-1931A&B & SPL VA FCV-1934A&B SHUT	IVSW Train A VA PCV-1922A OPEN
SG3 BLOWDOWN Train A or B FCV-1932A&B FCV-1935A&B SHUT	IVSW Train B VA PCV-1922B OPEN

\+ - indicates that both trains of Phase A Isolation must actuate to light the status light.

SIMULATOR PERFORMANCE TEST

TEST No.: 5.15.2.1 **Rev. No.:** 3

TEST TITLE: DBA Steam Break Outside CV Test

TEST CATEGORY: Malfunction Test

TEST APPROVAL:

REVIEWED: William M Blaisdell DATE: 3-6-91

APPROVED: Alson C Sanders DATE: 3/6/91

FINAL TEST RESULTS:

_____ Test Completed Satisfactorily
_____ Test Completed Satisfactorily With Deficiencies
_____ Test Unsatisfactory

SUBMITTED: ____________________ DATE: ________

REVIEWED: ____________________ DATE: ________
Manager - Simulator

CMS ENTRY MADE: ______

DBA Steam Break Outside CV Test (5.15.2.1)

NOTES

1. This simulator performance test is a revision of Acceptance Test Procedure (ATP) 14.5.15.2.
2. The SLOW TIME, FREEZE, BACKTRACK, and REPLAY features of the simulator may be used as desired to aid testing.
3. The simulator instructor facility's graphic trending capabilities, the 8-pen recorder, the ERFIS computer, or any other data collection device may be used to aid the verifications required by this test.
4. Simulator response to this event shall be as specified within this Simulator Performance Test including initial parameter response, alarm response, and protective system action.
5. The procedural flowpath for the Emergency Operating Procedures for this event shall be as specified within this Simulator Performance Test.
6. Each step of the Emergency Operating Procedures shall be completed to the fullest extent possible and in a timely manner to ensure the most realistic simulator response to operator action is obtained.
7. If power level or time-in-core-life or both are not critical to the outcome of a test, a simulator initial condition (IC) other than that specified may be used. Indicate on the test record if a different IC is used.
8. The complete verification of the simulator's responses to the following protective system actions are verified within other Simulator Performance Tests:
    a. Reactor Trip - 4.1, Manual Reactor Trip Transient Test
    b. Turbine Trip - 4.1, Manual Reactor Trip Transient Test
    c. Feedwater Isolation - 3.5, Engineered Safeguards Tests
    d. Containment Isolation Phase A - 3.5, Engineered Safeguards Tests
    e. Containment Ventilation Isolation - 3.5, Engineered Safeguards Tests
    f. Control Room Intake Duct Isolation - 3.5, Engineered Safeguards Tests

DBA Steam Break Outside CV Test (5.15.2.1)

I. TEST PURPOSE

This simulator performance test verifies the Malfunction MSS2A can cause a steamline break outside containment (downstream of the MSIV) which will result in a reactor trip, turbine trip, and safety injection. Initial parameter response is verified prior to the reactor trip/safety injection. Following the reactor trip/safety injection, simulator response will be verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable and safe condition is attained which can be continued to Cold shutdown conditions, or until simulator operating limits are reached.

II. REFERENCES

A. ANSI/ANS-3.5-1985
B. Path-1, Rev.7
C. Emergency Response Guidelines, Westinghouse Owners Group, LP-Rev.1
D. Loss of Reactor or Secondary Coolant, Westinghouse Owners Group
E. Updated FSAR, H.B. Robinson Steam Electric Plant Unit No.2, Chapter 15
F. Emergency Operating Procedures Transition Documents, HBR EOP-WOG ERG
G. EPP-7, Rev.6

III. SIMULATOR FUNCTIONS VERIFIED BY TEST 5.15.2.1

A. MAL MSS2A, Steamline Break Outside Containment (Downstream of MSIV)

IV. PREREQUISITE TESTS: None.

DBA Steam Break Outside CV Test (5.15.2.1)

V. **TEST DESCRIPTION**

A. Initialize the simulator to IC-5 (100% Power, BOL, Equilibrium Xenon). ______

B. Ensure recording of required data points is established as indicated on Appendix 1. ______

C. Insert a 1E7 lbm/hr steam line break outside containment (Down stream of MSIV) (Between MSIV and check valve) on "A" steam generator (MAL MSS2A, ACT, IE7, 5). ______

D. Verify response of parameters for the first several seconds per Table 1.1, Initial Parameter Response Verification. ______

E. Verify the following annunciators alarm:

1. S.G. 1 ACTUAL - S.P. LVL DEV. ______
2. S.G. 2 ACTUAL - S.P. LVL DEV. ______
3. S.G. 3 ACTUAL - S.P. LVL DEV. ______
4. S.G. 1 Flow ≠ STM > FW ______
5. STM LN LO PRESS ______
6. T_{avg} - T_{ref} DEVIATION ______
7. PRZ CONTROL HI/LO ______
8. PRZ CONTROL HI/LO PRESS ______
9. STM LN HI ΔP ______
10. S.G. 1 STM LN HI FLOW ______
11. S.G. 1 NAR. RGE LO/LO - LO/LVL ______

F. Verify the following bistable status lights illuminate:

1. OPΔT ROD STOP, TC412B2 ______
2. OPΔT ROD STOP, TC422B2 ______
3. OPΔT ROD STOP, TC432B2 ______

4. OPΔT LOOP 1, TC412B1 ______
5. LOOP 1 PH-P1 HI, PC474B ______
6. LOOP 1 PH-P1 HI, PC475 ______
7. LOOP 1 PH-P1 HI, PC476 ______
8. LOOP 1 HI STM FLOW, FC474 ______
9. LOOP 1 HI STM FLOW, FC475 ______
10. LOOP 1 LO STM PRESS, PC474A ______
11. SG NO 1 STM - FW FLO DEV, FC478B1 ______
12. SG NO 1 STM - FW FLO DEV, FC478A2 ______
13. SG NO 1 LO LEVEL, LC474B1 ______
14. SG NO 1 LO LEVEL, LC475B1 ______

G. Verify the following occurs:

1. Reactor Trip ______
2. Turbine Trip ______
3. Safety Injection ______
4. Feedwater Isolation ______
5. Containment Isolation Phase A ______
6. Containment Ventilation Isolation ______
7. Control Room Intake Duct Isolation ______

NOTE: The following steps utilize the Emergency Operating Procedure (EOP) Network to verify simulator response to this event. The EOPs shall be performed in their entirety until a stable, controllable, and safe condition is attained which can be continued to cold shutdown conditions, or until the simulator operating limits are reached. If simulator operating limits are reached during the performance of this test, it shall be documented within this test record.

DBA Steam Break Outside CV Test (5.15.2.1)

NOTE: A copy of the latest revision of the EOPs which will illustrate the procedural flowpath utilized for this event shall be appended and annotated as part of Appendix 2 of this Simulator Performance Test. The test performer's initials shall be placed next to each step as it is completed to provide an illustration of procedural flowpath. Notes and comments may be placed next to the steps in the appended procedures to clarify decision made based on simulator parameter observation (Example: Procedural Step, "RCS PRESS GREATER THAN 1520 psig", Comment, "1620 psig ↑").

NOTE: The procedural steps of the EOPs shall be performed in the exact sequence as stated in the procedures. No operator action shall be taken prior to the action being called for in the procedures. No operator action shall be taken that is not specified within the procedural steps.

NOTE: For procedural steps requiring the use of simulator local operator actions (LOAs) the test performer should designate next the procedural step "LOA " along with the equipment/system identifier (Example: "LOA CFW").

H. Implement Path-1 (E-0) at step "REACTOR TRIP OR SAFETY INJECTION". ______

I. Verify the procedural flowpath used on the simulator for this event is as follows:

1. Down through Column 1 of Path-1 (E-0) to step "AUTOMATIC STEAM LINE ISOLATION INITIATED". ______

2. "No" answer for step "AUTOMATIC STEAM LINE ISOLATION INITIATED". ______

3. "No" answer for step "AUTOMATIC STEAM LINE ISOLATION REQUIRED". ______

4. Continue down through Column 1 of Path-1 (E-0) to step "RCS TEMPERATURE STABLE AT OR TRENDING TO 547°F". ______

5. "No" answers for step "RCS TEMPERATURE STABLE AT OR TRENDING TO 547°F. ______

6. "No" answer for step "RCS TEMPERATURE GREATER THAN 547°F". ______

7. Isolate steam flow from steam generator 'A' in steps "ATTEMPT TO LIMIT COOLDOWN" and "IF RCS COOLDOWN CONTINUES AND IS NOT DUE TO SI FLOW, CLOSE MSIVs AND MSIV BYPASSES". ______

8. Continue down through Column 1 of Path-1 (E-0) to step "ANY S/G COMPLETELY DEPRESSURIZED". ______

9. Up to top of column 2 of Path-1 (E-0) to step "R-19A, R-19B, R-19C, and R-15 RAD MONITORS NORMAL". ______

10. Down through Column 2 of Path-1 (E-0) to step "RCS PRESS GREATER THAN 1520 PSIG". ______

11. If RCS pressure is greater than 1520 psig <u>and</u> PZR level is greater than 10% at this point "N/A" the following substeps and proceed to step 12 for continuation of procedural flowpath.

    a. Continue down through Column 2 of Path-1 (E-0) through all step with a return to Column 1 of Path-1 (E-0) above step "PLACE STEAM DUMP MODE SWITCH TO STEAM PRESS". ______

    b. Down through Column 1 of Path-1 (E-0) to step "ANY S/G COMPLETELY DEPRESSURIZED". ______

    c. Up to top of column 2 of Path-1 (E-0) to step "R-19A, R-19B, R-19C and R-15 RAD MONITORS NORMAL". ______

    d. Down through Column 2 of Path-1 (E-0) to step "RCS PRESSURE GREATER THAN 1520 PSIG". ______

    e. If RCS pressure has not recovered to greater than 1520 psig return to step 11.a. above for procedural flowpath verification or if RCS pressure is greater than 1520 psig continue to next step. ______

    f. If PZR level has not recovered to greater than 10% return to step 11.a above for procedural flowpath verification or if PZR level has increased to greater than 10% proceed to next step. ______

12. Transition is made to EPP-7 (ES-1.1) step 1. ______

13. Complete EPP-7 (ES-1.1). ______

J. Terminate testing at last step of EPP-7 (ES-1.1) when conditions are met to "Go to GP-007, PLANT COOLDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN". ______

DBA Steam Break Outside CV Test (5.15.2.1)

TABLE 1.1

INITIAL PARAMETER RESPONSE VERIFICATION

	Parameter	Expected Response	Verified (Init.)
1.	NI-41 Percent Full Power	Increase	________
2.	NI-42 Percent Full Power	Increase	________
3.	NI-43 Percent Full Power	Increase	________
4.	NI-44 Percent Full Power	Increase	________
5.	TR-408 T_{avg}	Decrease	________
6.	PI-444 PRZR Press	Decrease	________
7.	LI-459A PRZR Level	Decrease	________
8.	TI-454 PRZR Vapor Temp	Decrease	________
9.	TI-453 PRZR Liquid Temp	Decrease	________
10.	FI-474 SG 1 Steam Flow	Increase (Note 1)	________
11.	FI-484 SG 2 Steam Flow	Increase	________
12.	FI-494 SG 3 Steam Flow	Increase	________
13.	FI-476 SG 1 Feedwater Flow	Increase (Note 1)	________
14.	FI-486 SG 2 Feedwater Flow	Increase	________
15.	FI-496 SG 3 Feedwater Flow	Increase	________
16.	TI-413 Loop 1 Hot Leg Temp	Decrease (Note 1)	________
17.	TI-410 Loop 1 Cold Leg Temp	Decrease (Note 1)	________
18.	TI-423 Loop 2 Hot Leg Temp	Decrease	________
19.	TI-420 Loop 2 Cold Leg Temp	Decrease	________
20.	TI-433 Loop 3 Hot Leg Temp	Decrease	________

DBA Steam Break Outside CV Test (5.15.2.1)

	Parameter	Expected Response	Verified (Init.)
21.	TI-430 Loop 3 Cold Leg Temp	Decrease	________
22.	PI-474 SG 1 Steam Press	Decrease (Note 1)	________
23.	PI-484 SG 2 Steam Press	Decrease	________
24.	PI-494 SG 3 Steam Press	Decrease	________
25.	LI-474 SG 1 Nar Range Level	Increase (Note 1&2)	________
26.	LI-484 SG 2 Nar Range Level	Increase (Note 2)	________
27.	LI-494 SG 3 Nar Range Level	Increase (Note 2)	________
28.	TI-412D Loop #1 Protection T_{avg}	Decrease (Note 1)	________
29.	TI-422D Loop #2 Protection T_{avg}	Decrease	________
30.	TI-432D Loop #3 Protection T_{avg}	Decrease	________
31.	PI-402 RCS Wide Range Press	Decrease	________
32.	PI-1301 Main Steam Header Press	Decrease	________
33.	PI-464 Steam Header Press	Decrease	________
34.	TI-412A Loop #1 Protection Delta-T	Increase (Note 1)	________
35.	TI-422A Loop #2 Protection Delta-T	Increase	________
36.	TI-432A Loop #3 Protection Delta-T	Increase	________
37.	LR-477 SG "A" Wide Range Level	Increase (Note 1&2)	________

DBA Steam Break Outside CV Test (5.15.2.1)

	Parameter	Expected Response	Verified (Init.)
38.	LR-477 SG "B" Wide Range Level	Increase (Note 2)	________
39.	LR-477 SG "C" Wide Range Level	Increase (Note 2)	________
40.	TI-412C Loop #1 OTΔT Setpoint	Increase (Note 1)	________
41.	TI-412B Loop #1 OPΔT Setpoint	Decrease (Note 1)	________
42.	TI-422C Loop #2 OTΔT Setpoint	Increase	________
43.	TI-422B Loop #2 OPΔT Setpoint	Decrease	________
44.	TI-432C Loop #3 OTΔT Setpoint	Increase	________
45.	TI-432B Loop #3 OPΔT Setpoint	Decrease	________

<u>NOTE 1</u>: Also verify that Loop #1 parameters change to a greater extent in the specified direction than equivalent Loop #2 and Loop #3 parameters.

<u>NOTE 2</u>: Also verify S/G levels decrease after the initial swell with the fastest decrease on SG 1.

DBA Steam Break Outside CV Test (5.15.2.1)

TEST RESULTS

I. **TEST COMPLETED SATISFACTORILY WITH NO DEFICIENCIES**

Signature ______________________ Date __________

II. **TEST COMPLETED SATISFACTORILY WITH DEFICIENCIES LISTED BELOW, PARTIAL RETEST ACCEPTABLE**

Signature ______________________ Date __________

Test Item No.	Section Requiring Retest	Comments	SSR No.	Retest Complete

RETEST: ______________________ Signature __________ Date

RETEST: ______________________ Signature __________ Date

III. **TEST COMPLETED UNSATISFACTORILY, COMPLETE RETEST REQUIRED**

Signature ______________________ Date __________

SSR No.: __________________

DBA Steam Break Outside CV Test (5.15.2.1)

TEST REMARKS

DBA Steam Break Outside CV Test (5.15.2.1)

APPENDIX 1
DATA POINTS

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE
Required Data Points:			
NI-41 Percent Full Power	FNISPR(1)	NIN0041A	0-120
NI-42 Percent Full Power	FNISPR(2)	NIN0042A	0-120
NI-43 Percent Full Power	FNISPR(3)	NIN0043A	0-120
NI-44 Percent Full Power	FNISPR(4)	NIN0044A	0-120
Median T_{avg} (TR-408)	TPCSTAAV	RCT0461A	540-615
CH I PRZR Press (PI-444)	PT:444	RCP0483A	1700-2500
CH I PRZR Level (LI-459A)	LT:459A	RCL0480A	0-100
PRZR Vapor Temp (TI-454)	TT:454	RCT0481A	100-700
PRZR Liquid Temp (TI-453)	TT:453	RCT0480A	100-700
CH I SG 1 Steam Flow (FI-474)	FT:474	MSF0405A	0-4E6
CH I SG 2 Steam Flow (FI-484)	FT:484	MSF0425A	0-4E6
CH I SG 3 Steam Flow (FI-494)	FT:494	MSF0445A	0-4E6
CH I SG 1 Feedwater Flow (FI-476)	FT:476	FWF0403A	0-4E6
CH I SG 2 Feedwater Flow (FI-486)	FT:486	FWF0423A	0-4E6
CH I SG 3 Feedwater Flow (FI-496)	FT:496	FWF0443A	0-4E6
Loop 1 Hot Leg Temp (TI-413)	TT:413	RCT0419A	0-700
Loop 1 Cold Leg Temp (TI-410)	TT:410	RCT0406A	0-700
Loop 2 Hot Leg Temp (TI-423)	TT:423	RCT0439A	0-700
Loop 2 Cold Leg Temp (TI-420)	TT:420	RCT0426A	0-700
Loop 3 Hot Leg Temp (TI-433)	TT:433	RCT0459A	0-700

DBA Steam Break Outside CV Test (5.15.2.1)

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE
Loop 3 Cold Leg Temp (TI-430)	TT:430	RCT0446A	0-700
CH I SG 1 Steam Press (PI-474)	PT:474	MSP0400A	0-1400
CH I SG 2 Steam Press (PI-484)	PT:484	MSP0420A	0-1400
CH I SG 3 Steam Press (PI-494)	PT:494	MSP0440A	0-1400
CH I SG 1 Nar Range Level (LI-474)	LT:474	FWL0400A	0-100
CH I SG 2 Nar Range Level (LI-484)	LT:484	FWL0420A	0-100
CH I SG 3 Nar Range Level (LI-494)	LT:494	FWL0440A	0-100
Loop #1 Protection T_{avg} (TI-412D)	TT:412D	RCT0400A	540-615
Loop #2 Protection T_{avg} (TI-422D)	TT:422D	RCT0420A	540-615
Loop #3 Protection T_{avg} (TI-432D)	TT:432D	RCT0440A	540-615
RCS Wide Range Press (PI-402)	PT:402	RCP0499A	0-3000
Main Steam Header Press (PI-1301)	PT:1301	MSP0492A	0-1500
CH I Steam Header Press (PI-464)	PT:464	MSP0496A	0-1400
Loop #1 Protection Delta-T (TI-412A)	TT:412A	RCT0403A	0-75
Loop #2 Protection Delta-T (TI-422A)	TT:422A	RCT0423A	0-75
Loop #3 Protection Delta-T (TI-432A)	TT:432A	RCT0443A	0-75
SG "A" Wide Range Level (LT-477)	LT:477	FWL0403A	0-100

DBA Steam Break Outside CV Test (5.15.2.1)

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE
SG "B" Wide Range Level (LT-487)	LT:487	FWL0423A	0-100
SG "C" Wide Range Level (LT-497)	LT:497	FWL0443A	0-100
Loop #1 Over Temp Delta-T Set Point (TI-412C)	TT:412C	RCT0403D	0-75
Loop #1 Over Power Delta-T Set Point (TI-412B)	TT:412B	RCT0400D	0-75
Loop #2 Over Temp Delta-T Set Point (TI-422C)	TT:422C	RCT0423D	0-75
Loop #2 Over Power Delta-T Set Point (TI-422B)	TT:422B	RCT0420D	0-75
Loop #3 Over Temp Delta-T Set Point (TI-432C)	TT:432C	RCT0443D	0-75
Loop #3 Over Power Delta-T Set Point (TT:432B)	TT:432B	RCT0440D	0-75

Supplementary Data Points: None.

DBA Steam Break Outside CV Test (5.15.2.1)

APPENDIX 2
SIMULATOR DATA COLLECTED DURING TEST

ITEMIZE ATTACHED DATA[1]:

[1]strip charts, ERFIS tape identification, completed operating procedures, ERFIS/computer curves or tables)

DBA Steam Break Outside CV Test (5.15.2.1)

ATTACHMENT 1
BENCHMARK DATA

SIMULATOR PERFORMANCE TEST

TEST No.: 6.1 **Rev. No.:** 1

TEST TITLE: Closure of One MSIV at Full Power Test

TEST CATEGORY: Special Test

TEST APPROVAL:

REVIEWED: for William M Blaisdell DATE: 3-6-91

APPROVED: Alson C Sanders DATE: 3/6/91

FINAL TEST RESULTS:

_____ Test Completed Satisfactorily
_____ Test Completed Satisfactorily With Deficiencies
_____ Test Unsatisfactory

SUBMITTED: ______________________ DATE: __________

REVIEWED: ______________________ DATE: __________
Manager - Simulator

CMS ENTRY MADE: ________

Closure of One MSIV at Full Power Test (6.1)

NOTES

1. The SLOW TIME, FREEZE, BACKTRACK, and REPLAY features of the simulator may be used as desired to aid testing.
2. The simulator instructor facility's graphic trending capabilities, the 8-pen recorder, the ERFIS computer, or any other data collection device may be used to aid the verifications required by this test.
3. Apply a ± 2% (of full scale) tolerance to parameter values when making verifications using control panel meters to account for allowed simulator instrument error.
4. Setpoint verifications:
   a. The simulator's parameter monitoring feature may be used to verify setpoints, in which case, a ± 0% tolerance should be applied.
   b. Setpoints provided in brackets [] or parentheses () are provided as information aids to the person conducting the simulator performance test and need not be verified.
5. If power level or time-in-core-life or both are not critical to the outcome of a test, a simulator initial condition (IC) other than that specified may be used. Indicate on the test record if a different IC is used.

Closure of One MSIV at Full Power Test (6.1)

I. TEST PURPOSE

This simulator performance test verifies the integrated plant response indicative of a single MSIV failing closed at 100% Power OPS.

II. REFERENCES

A. SD-025, Rev.7
B. APP-004, Rev.3
C. APP-003, Rev.9
D. APP-006, Rev.9

III. SIMULATOR FUNCTIONS VERIFIED BY TEST 6.1

None

IV. PREREQUISITE TESTS: None.

Closure of One MSIV at Full Power Test (6.1)

V. **TEST DESCRIPTION**

A. Initialize the simulator to IC-5. ______

B. Ensure recording of required data points is established as indicated on Appendix 1. ______

C. Enter Malfunction MSS3A to Failure Mode 1 (MAL MSS3A, ACT, 1). ______

D. Verify the following on 'A' Steam Generator:

1. MSIV, VA V1-3A, indicates closed. ______
2. Steam Flow decreases (FI-474). ______
3. Steam Pressure increases (PI-474). ______
4. Level decreases (shrink) (LI-474). ______
5. The S.G. 1 Flow ≠ FW > STM annunciator alarms. ______
6. The S.G. 1 ACTUAL - S.P. LVL DEV. annunciator alarms. ______
7. RV1-1 indicates open (S/G A Steam Relief). ______
8. The S.G. 1 NAR RGE LO/LO-LO/LVL annunciator alarms. ______

E. Verify the following on the Balance of Plant:

1. The R.C. LOOPS ΔT DEVIATION annunciator alarms. ______
2. The R.C. LOOPS T_{AVG} DEVIATION annunciator alarms. ______
3. The R.C. SYSTEM HI/LO T_{AVG} annunciator alarms. ______
4. The T_{AVG} - T_{REF} DEVIATION annunciator alarms. ______
5. Steam Flow increases on Steam Generator B (FI-484). ______
6. Steam Flow increases on Steam Generator C (FI-494). ______
7. Level increases, due to swell, Steam Generator B (LI-474). ______

Closure of One MSIV at Full Power Test (6.1)

8. Level increases, due to swell, Steam Generator C (LI-494). ______

9. Steam Pressure decreases on Steam Generator B (PI-484). ______

10. Steam Pressure decreases on Steam Generator C (PI-494). ______

11. Main Steam Header Pressure decreases (PI-1301). ______

F. The FIRST OUT SG 1 LO-LO LEVEL TRIP annunciator alarms. ______

1. The Reactor trips. ______

2. The Turbine trips. ______

Closure of One MSIV at Full Power Test (6.1)

TEST RESULTS

I. **TEST COMPLETED SATISFACTORILY WITH NO DEFICIENCIES**

______________________________ ____________
Signature Date

II. **TEST COMPLETED SATISFACTORILY WITH DEFICIENCIES LISTED BELOW, PARTIAL RETEST ACCEPTABLE**

______________________________ ____________
Signature Date

Test Item No.	Section Requiring Retest	Comments	SSR No.	SSR Cleared

RETEST: ______________________________ ____________
Signature Date

RETEST: ______________________________ ____________
Signature Date

III. **TEST COMPLETED UNSATISFACTORILY, COMPLETE RETEST REQUIRED**

______________________________ ____________
Signature Date

SSR No.: ________________

Closure of One MSIV at Full Power Test (6.1)

TEST REMARKS

Closure of One MSIV at Full Power Test (6.1)

APPENDIX 1
DATA POINTS

PLANT PARAMETER	DATA POOL VARIABLE	ERFIS POINT	RECORDING RANGE
Required Data Points:			
S/G A Steam Flow	FT:474	MSF0405A	0-4E6
S/G B Steam Flow	FT:484	MSF0425A	0-4E6
S/G C Steam Flow	FT:494	MSF0445A	0-4E6
S/G A Steam Pressure	PT:474	MSP0400A	0-1400
S/G B Steam Pressure	PT:484	MSP0420A	0-1400
S/G C Steam Pressure	PT:494	MSP0440A	0-1400
S/G A Level	LT:474	FWL0400A	0-100
S/G B Level	LT:484	FWL0420A	0-100
S/G C Level	LT:494	FWL0440A	0-100
Main Steam Header Pressure	PT:1301	MSP0492A	0-1500

Supplementary Data Points: None.

Closure of One MSIV at Full Power Test (6.1)

APPENDIX 2
SIMULATOR DATA COLLECTED DURING TEST

<u>ITEMIZE ATTACHED DATA</u>[1]:

[1]strip charts, ERFIS tape identification, completed operating procedures, ERFIS/computer curves or tables)

Closure of One MSIV at Full Power Test (6.1)

ATTACHMENT 1
BENCHMARK DATA

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
91-0011 The wall between the entrance area and control board area is not installed in the simulator.	12/31/91
91-0012 Shift Foreman's area is not located in the same physical location nor is it the same size.	12/31/91
91-0013 Distance between the II (Incore) Panel and the LP (Line) Panel is approximately 13 inches larger in the simulator.	12/31/91
91-0014 The RVLIS/CM Panel is approximately 9 inches shorter in width on the simulator.	12/31/91
91-0015 The Fire Protection Panel is not located in the same physical position as the reference plant.	12/31/91
90-0656 The AO control board panel has the following differences: 1. Five annunciator windows are labeled incorrectly. 2. One meter labeled incorrectly. 3. One recorder scale different. 4. Containment Spray & Isolation, Feedwater Isolation buttons are different color. 5. One controller is missing a label. 6. One controller has label in wrong position. 7. Boric acid pump A&B label missing velcro. 8. Cover plates different.	12/31/91

APPENDIX J

CERTIFICATION TEST INDEX

CERTIFICATION TEST INDEX

Test No.	Test Title
1.0	Real Time Simulation Verification
2.0.1	Full Power Simulator Stability Test
2.0.2	Full Power Steady State Comparison Test
2.0.3	Interim Power Steady State Comparison Tests
2.1	Plant Startup Test - Cold SD to Hot Stby
2.2	Reactor Startup Test
2.3.1	Unit Startup and Synchronization Test
2.3.2	Power Ascent to Full Power Test
2.4	Reactor Trip Followed By Recovery Test
2.5	Hot Shutdown Operations Tests
2.8	Unit Shutdown From Rated Power Test
2.9.1	Heat Balance Test
2.9.2	Determination of Shutdown Margin Boron Conc Test
2.10.001	Composite NIS Test (OST-001 thru OST-005)
2.10.006	SR/IR NIS Test (OST-006)
2.10.007	NIS Comparator Channel Test (OST-007)
2.10.008	NIS Startup Rate Channel Test (OST-008)
2.10.009	NIS Audio Count Rate Channel Test (OST-009)
2.10.011	Control Rod Exercise & RPI Test (OST-011)
2.10.051	RCS Daily Leakage Evaluation Test (OST-051)
2.10.054	Core Cooling Monitor Channel Check OST-054)
2.10.055	RVLIS Test (OST-055)
2.10.107	Boric Acid Blender Test (OST-107)
2.10.109	VCT Outlet Check Valve Back-Leakage Test
2.10.161	Accumulator Isolation and Check Valve Test
2.10.255	RHR and SI System Check Valve Test
2.10.401	Emergency Diesels Test (OST-401)
2.10.501	Main Steam Isolation Valve Test (OST-501)
2.10.551	Turbine Valve Testing (OST-551)
2.10.553	Turbine Mechanical Overspeed Trip Test (OST-553)
2.10.905	Radiation Monitoring System Test (OST-905)
4.1	Manual Reactor Trip Transient Test
4.2	Simultaneous Trip of MFW Pumps Transient Test
4.3	Simultaneous Closure of MSIVs Transient Test
4.4	Simultaneous Trip of All RCPs Transient Test
4.5	Single RCP Trip Transient Test
4.6	Turbine Trip From 9% Power Transient Test
4.7	Maximum Rate Power Ramp Transient Test
4.8	DBA LOCA w. Loss of Offsite Power Transient Test
4.9	DBA Main Steam Line Break Transient Test
4.10	PZR PORV Stuck Open Without SI Transient Test
5.1.1	Complete Loss of Instrument Air Test
5.1.2	Instrument Air Compressor Trip Test
5.2.1	CCW Pump Trip Test
5.2.2	Loss of CCW to RHR Heat Exchanger Test
5.2.3	CCW-to-SW Leak Through Heat Exchanger Test

CERTIFICATION TEST INDEX

Test No.	Test Title
5.2.4	Total Loss of CCW to RCPs Test
5.2.6	CCW Line Break Inside CV Test
5.2.7	RCP Bearing Oil Cooler CCW Leak Test
5.2.8	TCV-144 Failure Test
5.3.1	AFW Pumps Trip Test
5.3.3	TD AFW Pump Steam Supply Break Test
5.3.4	AFW Line Rupture Outside CV Test
5.3.5	AFW Line Rupture Inside CV Test
5.3.6	Motor-Driven AFW Isolation Valve Failure Test
5.3.7	FW Bypass Valve Failure Test
5.3.8	TD AFW Flow Control Valve Failure Test
5.3.9	Condensate Pump Trip Test
5.3.10	FW Isolation Valve Failure Test
5.3.12	Heater Drain Pump Trip Test
5.3.13	HP FW Heater 6 Tube Leak Test
5.3.14.1	LP FW Heater 1A Tube Rupture
5.3.14.2	LP FW Heater 3A Tube Rupture
5.3.16	MFW Pump Recirc. Valve Failure Test
5.3.17	FW Control Valve Failures Test
5.3.18	FW Break Inside CV Test
5.3.19	Total Loss of Feed Water Test
5.3.20	Inadvertent FW Isolation Test
5.3.21	SG High Level Trip Failure Test
5.3.24	FW Break In MFW Header Test
5.3.26	MFW Pump Discharge Break Test
5.3.28	Loss of MFW Pump Lube Oil Test
5.3.29	Condensate Storage Tank Leak Test
5.4.2	Condenser Air-Inleakage Test
5.4.3	Condenser Vacuum Pump Trip Test
5.4.4	Vacuum Pump Shaft Break Test
5.4.5	Hotwell Level Controller Failure Test
5.5.1	False CV Spray Actuation Test
5.5.2	CV Spray Pump Failure Test
5.5.3	CV Spray Header Leak Test
5.6.1	Power Cabinet Urgent Failure Test
5.6.2	Failure of Control Rods to Move Test
5.6.3	Dropped Control Rod Test
5.6.4	Stuck Control Rod Test
5.6.5	Ejected Control Rod Test
5.6.6	Uncontrolled Rod Motion Tests
5.6.7	Auto Rod Speed Controller Failure Test
5.6.8	Rod Control T-ref Failure Test
5.6.10	IRPI Coil Failures Test
5.6.11	Control Bank Overlap Failure Tests
5.6.12	Step Counter Failures Test
5.6.13	Rod Speed Deadband Controller Failure Test

CERTIFICATION TEST INDEX

Test No.	Test Title
5.6.16	Loss of Rod Drive MG Sets Test
5.6.17	Loss of Power to Power Cabinets Test
5.6.18	Bent Control Rod Shaft Test
5.7.1	Letdown Isolation Valves Failures Test
5.7.2	CVC-LCV-115C Failures Test
5.7.3	Letdown Line Leak Inside CV Test
5.7.4	Letdown Line Leak Outside CV Test
5.7.5	Charging Pump Trip Test
5.7.6	Primary Water Pump Trip Test
5.7.7	PCV-145 Controller Failure Test
5.7.8	Inadvertent Low PZR Level Bistable Actuation
5.7.9	LC-112 Failure Test
5.7.11	Non-Regen. Heat Exchanger Tube Leak Test
5.7.12	Seal Water Heat Exchanger Tube Leak Test
5.7.13	Plugged Boric Acid Filter Test
5.7.14	Plugged RCS Filter Test
5.7.15	Chg Pump Speed Controller Failure Test
5.7.16	Orifice Isolation Valve Failures Test
5.7.17	LTDN Leak Before Orifice Isolation Valves Test
5.7.18	Auxiliary Spray Valve Failure Test
5.7.19	Normal & Alternate Charging Valve Failures Test
5.7.21	CVC-LCV-115B Failure Test
5.7.22	Boric Acid Pump Trip Test
5.7.23	Plugged Seal Water Return Filter Test
5.7.24	Charging Line Leaks Test
5.7.25	Makeup Selector Switch Failure Test
5.8.1.1	Circulating Water Pump Trip Test
5.8.1.2	Loss of Circulating Water Pumps Test
5.9.1	EDG Failures Test
5.9.4	EDG Load Sequencer Tests
5.10.2	Loss of Instrument Buses Test
5.10.3	Loss of 125V DC Buses
5.10.4	Loss of 4160V Buses Test
5.10.5	E1/E2 Feeder Breakers Trip Test
5.10.7	Auxiliary Transformer Failure Test
5.10.8	Loss of 480V Buses Test
5.10.9	Degraded Grid Voltage Test
5.10.13	Loss of Start-Up Transformer Test
5.12.2	Turbine Trip On Gen Trip Failure Test
5.12.3	Generator Output Breaker Failures Test
5.12.5	Load Rejection Test
5.12.6	Generator Trips Test
5.13.1	CV Fan Cooler Trip Test
5.16.16	NI51/NI52 Loss of High Voltage Power Supply Test
5.14.4	Phase A Isolation Signal Failure Test
5.14.5	Phase B Isolation Signal Failure Test

CERTIFICATION TEST INDEX

Test No.	Test Title
5.15.2.1	DBA Steam Break Outside CV Test
5.15.3	MSIV Fails Open Test
5.15.4	SG PORV Failures Test
5.15.5	SD Controller Modulation Failure Test
5.15.6	Steam Dump Failure Test
5.15.9	Main Steam Header Leak Test
5.16.2	SR NI Pulse Height Discriminator Failure
5.16.3	SR NI High Volts Cutoff Failure Test
5.16.4	SR NI High Volts Failure Test
5.16.6	IR NI Gamma Compensation Failure Test
5.16.7	PR NI Detector Failures Test
5.16.9	Incore Drive Unit Failure Test
5.16.10	SR NI Fuse Failures Test
5.16.11	IR NI Fuse Failures Test
5.16.12	PR NI Fuse Failures Test
5.16.13	Noisy SR NI Channel Test
5.16.14	Failure of SR NI Block Test
5.16.15	Failure of SR NI to Reenergize Test
5.17.1	Pressurizer Steam Space Leak Test
5.17.2	Pressurizer Spray Valve Failure Test
5.17.3	Pressurizer PORV Failure Test
5.17.4	Pressurizer Safety Valve Failure Test
5.17.5	PZR Backup Heater Group Failures Test
5.17.6	PZR Pressure Control Band Shift Test
5.17.7	PZR Level Control Band Shift Test
5.18.1	DBA RCS Hot Leg LOCA Test
5.18.3	RCP Locked Rotor Test
5.18.5	Variable Boron Concentration Function Test
5.18.9.1	RCS Small Leak Test
5.18.9.2	RCS Small LOCA Test
5.18.12	RCP Thermal Barrier Leak Test
5.18.13	RCP #1 Seal Failure Test
5.18.14	RCP #2 Seal Failure Test
5.18.15	RCP #3 Seal Failure Test
5.18.17	RCP Seal Package Failure Test
5.18.16	RCP Vibration Test
5.19.1	RHR Pump Trip Test
5.19.2	RHR-FCV-758 Failure Test
5.19.3	RHR-FCV-605 Failure Test
5.19.4	HCV-142 Failure Test
5.19.5	RHR Leak Test
5.19.6	RHR Sump Valve Failures Test
5.19.7	RHR Heat Exchanger Tube Leak Test
5.19.8	RHR Relief Valve Failure Test
5.21.1.1	Reactor Trip Breaker Failure Test
5.21.1.2	ATWS Test

CERTIFICATION TEST INDEX

Test No.	Test Title
5.21.2	AMSAC Failures Test
5.15.7	Steam Dump Permissive Failure Test
5.23.1	SG Safety Valve Failure Test
5.23.2.1	SG Tube Leak Test
5.23.2.2	SG Tube Rupture Test
5.23.3	SG Level Program Failure Test
5.24.1	SI Initiation Failure Test
5.24.2	Accumulator Liquid Leak Test
5.24.3	Accumulator Nitrogen Leak Test
5.24.4	SI Pump Failure Test
5.24.6	Failure of SI Trains To Reset Test
5.14.1	RWST Leak Test
5.25.1	Service Water Pump Trip Test
5.25.2	SW Leak on CV Fan Cooler Test
5.25.4	SW Header Leak Test
5.25.6	SW Booster Pump Suction Line Leak Test
5.25.8	SW To EDG TCV Failure Test
5.26.2	Turbine Trip Failures Test
5.26.4	Turbine Bearing Failure Test
5.26.5	Turbine Governor Valve Failure Test
5.26.11	Turbine Lube Oil Pumps Trip Test
5.26.12	Loss of EH Oil Pumps Test
5.26.13	Turning Gear Failure Test
5.26.14	Turbine Main Lube Oil Leak Test
5.26.16	Loss of Gland Seal Steam Test
5.26.18	EH Reservoir Leak Test
5.26.19	Turbine Bearing Lift Oil Pump Trip Test
5.26.20	Runback Time Delay Relays Failure Test
5.26.21	Turbine Runback Failure Test
5.26.22	EH High Pressure Fluid Leak Test
5.28.1	High RCS Activity Test
5.29.1	FW Flow Transmitter Failure Test
5.29.3	PT-145 Failure Test
5.29.4	LT-459A Failure Test
5.29.5	PT-444 Failure Test
5.29.6	Controlling SG Press Transmitter Failure
5.29.7	SG Press Transmitter To PORV Failure Test
5.30.1	ESF Passive Failures Test
6.1	Closure of One MSIV at Full Power Test
6.6	Valve Stroke Test
6.7	Physical Fidelity Comparison Test

APPENDIX K

CROSS-REFERENCE OF ANSI 3.5 TO SIMULATOR TESTS

CROSS-REFERENCE OF ANSI-3.5 TO SIMULATOR TESTS

ANSI/ANS-3.5 SECTION	SIMULATOR PERFORMANCE TEST NUMBER	SIMULATOR PERFORMANCE TEST TITLE
3.1.1 (1)&(5)	2.1	Plant Startup Test - Cold SD to Hot Stby
3.1.1 (2)	2.2	Reactor Startup Test
3.1.1 (2)	2.3.2	Power Ascent to Full Power Test
3.1.1 (2)&(3)	2.3.1	Unit Startup and Synchronization Test
3.1.1 (4)	2.4	Reactor Trip Followed By Recovery Test
3.1.1 (5)	2.5	Hot Shutdown Operations Tests
3.1.1 (6)	4.7/2.8	Maximum Rate Power Ramp Transient Test
3.1.1 (8)&(5)	2.8	Unit Shutdown From Rated Power Test
3.1.1 (9)	2.9.1	Heat Balance Test
3.1.1 (9)	2.9.2	Determination of Shutdown Margin Boron Conc Test
3.1.1(10)	2.10.001	Composite NIS Test (OST-001 thru OST-005)
3.1.1(10)	2.10.006	SR/IR NIS Test (OST-006)
3.1.1(10)	2.10.007	NIS Comparator Channel Test (OST-007)
3.1.1(10)	2.10.008	NIS Startup Rate Channel Test (OST-008)
3.1.1(10)	2.10.009	NIS Audio Count Rate Channel Test (OST-009)
3.1.1(10)	2.10.011	Control Rod Exercise & RPI Test (OST-011)
3.1.1(10)	2.10.051	RCS Daily Leakage Evaluation Test (OST-051)
3.1.1(10)	2.10.054	Core Cooling Monitor Channel Check OST-054)
3.1.1(10)	2.10.055	RVLIS Test (OST-055)
3.1.1(10)	2.10.107	Boric Acid Blender Test (OST-107)
3.1.1(10)	2.10.109	VCT Outlet Check Valve Back-Leakage Test
3.1.1(10)	2.10.161	Accumulator Isolation and Check Valve Test
3.1.1(10)	2.10.255	RHR and SI System Check Valve Test
3.1.1(10)	2.10.401	Emergency Diesels Test (OST-401)
3.1.1(10)	2.10.501	Main Steam Isolation Valve Test (OST-501)
3.1.1(10)	2.10.551	Turbine Valve Testing (OST-551)
3.1.1(10)	2.10.553	Turbine Mechanical Overspeed Trip Test (OST-553)
3.1.1(10)	2.10.905	Radiation Monitoring System Test (OST-905)
3.1.1(10)	6.6	Valve Stroke Test
3.1.2	1.0	Real Time Simulation Verification
3.1.2 (1)(a)	5.23.2.1	SG Tube Leak Test
3.1.2 (1)(a)	5.23.2.2	SG Tube Rupture Test
3.1.2 (1)(b&c)	5.7.24	Charging Line Leaks Test
3.1.2 (1)(b&c)	4.8	DBA LOCA With Loss of Offsite Power Test
3.1.2 (1)(b&c)	5.18.1	DBA RCS Hot Leg LOCA Test
3.1.2 (1)(b&c)	5.18.9.1	RCS Small Leak Test
3.1.2 (1)(b&c)	5.18.9.2	RCS Small LOCA Test
3.1.2 (1)(b&c)	5.24.2	Accumulator Liquid Leak Test
3.1.2 (1)(b&c)	5.14.1	RWST Leak Test
3.1.2 (1)(b&c)&(18	5.7.3	Letdown Line Leak Inside CV Test
3.1.2 (1)(b&c)&(18	5.7.4	Letdown Line Leak Outside CV Test
3.1.2 (1)(b&c)&(18	5.7.11	Non-Regen. Heat Exchanger Tube Leak Test
3.1.2 (1)(b&c)&(18	5.7.12	Seal Water Heat Exchanger Tube Leak Test
3.1.2 (1)(b&c)&(18	5.7.17	LTDN Leak Before Orifice Isolation Valves Test
3.1.2 (1)(b&c)&(18	5.17.1	Pressurizer Steam Space Leak Test
3.1.2 (1)(b&c)&(8)	5.18.12	RCP Thermal Barrier Leak Test
3.1.2 (1)(c&d)&(18	5.17.3	Pressurizer PORV Failure Test
3.1.2 (1)(c&d)&(18	5.17.4	Pressurizer Safety Valve Failure Test

CROSS-REFERENCE OF ANSI-3.5 TO SIMULATOR TESTS

ANSI/ANS-3.5 SECTION	SIMULATOR PERFORMANCE TEST NUMBER	SIMULATOR PERFORMANCE TEST TITLE
3.1.2 (2)	5.1.1	Complete Loss of Instrument Air Test
3.1.2 (2)	5.1.2	Instrument Air Compressor Trip Test
3.1.2 (3)	5.9.1	EDG Failures Test
3.1.2 (3)	5.10.2	Loss of Instrument Buses Test
3.1.2 (3)	5.10.3	Loss of 125V DC Buses
3.1.2 (3)	5.10.4	Loss of 4160V Buses Test
3.1.2 (3)	5.10.5	E1/E2 Feeder Breakers Trip Test
3.1.2 (3)	5.10.7	Auxiliary Transformer Failure Test
3.1.2 (3)	5.10.8	Loss of 480V Buses Test
3.1.2 (3)	5.10.9	Degraded Grid Voltage Test
3.1.2 (3)	5.10.13	Loss of Start-Up Transformer Test
3.1.2 (3)	5.12.3	Generator Output Breaker Failures Test
3.1.2 (3)	5.12.5	Load Rejection Test
3.1.2 (3)&(12)	5.6.17	Loss of Power to Power Cabinets Test
3.1.2 (4)	4.4	Simultaneous Trip of All RCPs Transient Test
3.1.2 (4)	5.18.3	RCP Locked Rotor Test
3.1.2 (4)	5.18.16	RCP Vibration Test
3.1.2 (4)&(1)(b&c)	5.18.13	RCP #1 Seal Failure Test
3.1.2 (4)&(1)(b&c)	5.18.14	RCP #2 Seal Failure Test
3.1.2 (4)&(1)(b&c)	5.18.15	RCP #3 Seal Failure Test
3.1.2 (4)&(1)(b&c)	5.18.17	RCP Seal Package Failure Test
3.1.2 (5)	5.4.3	Condenser Vacuum Pump Trip Test
3.1.2 (5)	5.4.4	Vacuum Pump Shaft Break Test
3.1.2 (5)	5.8.1.1	Circulating Water Pump Trip Test
3.1.2 (5)	5.8.1.2	Loss of Circulating Water Pumps Test
3.1.2 (5)	5.26.16	Loss of Gland Seal Steam Test
3.1.2 (5)&(15)	5.4.2	Condenser Air-Inleakage Test
3.1.2 (5)&(22)	5.4.5	Hotwell Level Controller Failure Test
3.1.2 (6)	5.25.1	Service Water Pump Trip Test
3.1.2 (6)	5.25.2	SW Leak on CV Fan Cooler Test
3.1.2 (6)	5.25.4	SW Header Leak Test
3.1.2 (6)	5.25.6	SW Booster Pump Suction Line Leak Test
3.1.2 (6)	5.25.8	SW To EDG TCV Failure Test
3.1.2 (7)	5.3.1	AFW Pumps Trip Test
3.1.2 (7)	5.19.1	RHR Pump Trip Test
3.1.2 (7)	5.19.2	RHR-FCV-758 Failure Test
3.1.2 (7)	5.19.3	RHR-FCV-605 Failure Test
3.1.2 (7)	5.19.4	HCV-142 Failure Test
3.1.2 (7)	5.19.6	RHR Sump Valve Failures Test
3.1.2 (7)&(1)(b&c)	5.19.5	RHR Leak Test
3.1.2 (7)&(1)(b&c)	5.19.7	RHR Heat Exchanger Tube Leak Test
3.1.2 (7)&(1)(b&c)	5.19.8	RHR Relief Valve Failure Test
3.1.2 (7)&(8)	5.2.2	Loss of CCW to RHR Heat Exchanger Test
3.1.2 (8)	5.2.1	CCW Pump Trip Test
3.1.2 (8)	5.2.3	CCW-to-SW Leak Through Heat Exchanger Test
3.1.2 (8)	5.2.6	CCW Line Break Inside CV Test
3.1.2 (8)&(18)	5.2.8	TCV-144 Failure Test
3.1.2 (8)&(4)	5.2.7	RCP Bearing Oil Cooler CCW Leak Test

CROSS-REFERENCE OF ANSI-3.5 TO SIMULATOR TESTS

ANSI/ANS-3.5 SECTION	SIMULATOR PERFORMANCE TEST NUMBER	SIMULATOR PERFORMANCE TEST TITLE
3.1.2 (8),(4)&(19)	5.2.4	Total Loss of CCW to RCPs Test
3.1.2 (9)	5.3.7	FW Bypass Valve Failure Test
3.1.2 (9)	5.3.9	Condensate Pump Trip Test
3.1.2 (9)	5.3.10	FW Isolation Valve Failure Test
3.1.2 (9)	5.3.12	Heater Drain Pump Trip Test
3.1.2 (9)	5.3.16	MFW Pump Recirc. Valve Failure Test
3.1.2 (9)	5.3.28	Loss of MFW Pump Lube Oil Test
3.1.2 (9)	5.3.29	Condensate Storage Tank Leak Test
3.1.2 (9)&(19)	4.2	Simultaneous Trip of MFW Pumps Transient Test
3.1.2 (9)&(19)	5.3.17	FW Control Valve Failures Test
3.1.2 (9)(19)&(11)	5.3.20	Inadvertent FW Isolation Test
3.1.2(10)&(19)	5.3.19	Total Loss of Feed Water Test
3.1.2(11)	5.3.21	SG High Level Trip Failure Test
3.1.2(11)	5.5.1	False CV Spray Actuation Test
3.1.2(11)	5.12.2	Turbine Trip On Gen Trip Failure Test
3.1.2(12)	5.6.3	Dropped Control Rod Test
3.1.2(12)	5.6.4	Stuck Control Rod Test
3.1.2(12)	5.6.10	IRPI Coil Failures Test
3.1.2(12)	5.6.12	Step Counter Failures Test
3.1.2(12)	5.6.18	Bent Control Rod Shaft Test
3.1.2(12)&(1)(ab)	5.6.5	Ejected Control Rod Test
3.1.2(12)&(3)	5.6.16	Loss of Rod Drive MG Sets Test
3.1.2(13)	5.6.1	Power Cabinet Urgent Failure Test
3.1.2(13)	5.6.2	Failure of Control Rods to Move Test
3.1.2(14)	5.28.1	High RCS Activity Test
3.1.2(15)	4.6	Turbine Trip From 9% Power Transient Test
3.1.2(15)	5.26.4	Turbine Bearing Failure Test
3.1.2(15)	5.26.11	Turbine Lube Oil Pumps Trip Test
3.1.2(15)	5.26.12	Loss of EH Oil Pumps Test
3.1.2(15)	5.26.14	Turbine Main Lube Oil Leak Test
3.1.2(15)	5.26.18	EH Reservoir Leak Test
3.1.2(15)	5.26.22	EH High Pressure Fluid Leak Test
3.1.2(15)&(11)	5.26.2	Turbine Trip Failures Test
3.1.2(16)	5.12.6	Generator Trips Test
3.1.2(17)	5.18.5	Variable Boron Concentration Function Test
3.1.2(17)	5.26.5	Turbine Governor Valve Failure Test
3.1.2(17)	5.26.20	Runback Time Delay Relays Failure Test
3.1.2(17)&(11)	5.26.21	Turbine Runback Failure Test
3.1.2(17)&(11)	5.6.3	Dropped Control Rod Test
3.1.2(17)&(12)	5.6.6	Uncontrolled Rod Motion Tests
3.1.2(17)&(12)	5.6.7	Auto Rod Speed Controller Failure Test
3.1.2(17)&(12)	5.6.8	Rod Control T-ref Failure Test
3.1.2(17)&(12)	5.6.11	Control Bank Overlap Failure Tests
3.1.2(17)&(12)	5.6.13	Rod Speed Deadband Controller Failure Test
3.1.2(17)&(18)	5.7.13	Plugged Boric Acid Filter Test
3.1.2(17)&(18)	5.7.22	Boric Acid Pump Trip Test
3.1.2(18)	5.7.1	Letdown Isolation Valves Failures Test
3.1.2(18)	5.7.2	CVC-LCV-115C Failures Test

ANSI/ANS-3.5 SECTION	SIMULATOR PERFORMANCE TEST NUMBER	SIMULATOR PERFORMANCE TEST TITLE
3.1.2(18)	5.7.5	Charging Pump Trip Test
3.1.2(18)	5.7.6	Primary Water Pump Trip Test
3.1.2(18)	5.7.14	Plugged RCS Filter Test
3.1.2(18)	5.7.16	Orifice Isolation Valve Failures Test
3.1.2(18)	5.7.18	Auxiliary Spray Valve Failure Test
3.1.2(18)	5.7.19	Normal & Alternate Charging Valve Failures Test
3.1.2(18)	5.7.21	CVC-LCV-115B Failure Test
3.1.2(18)	5.7.23	Plugged Seal Water Return Filter Test
3.1.2(18)	5.7.25	Makeup Selector Switch Failure Test
3.1.2(18)	5.17.5	PZR Backup Heater Group Failures Test
3.1.2(18)	5.29.3	PT-145 Failure Test
3.1.2(18)&(11)	5.7.8	Inadvertent Low PZR Level Bistable Actuation
3.1.2(18)&(19)	5.17.2	Pressurizer Spray Valve Failure Test
3.1.2(18)&(22)	5.7.7	PCV-145 Controller Failure Test
3.1.2(18)&(22)	5.7.9	LC-112 Failure Test
3.1.2(18)&(22)	5.7.15	Chg Pump Speed Controller Failure Test
3.1.2(18)&(23)	5.7.9	LC-112 Failure Test
3.1.2(19)	5.21.1.2	ATWS Test
3.1.2(20)	5.3.3	TD AFW Pump Steam Supply Break Test
3.1.2(20)	5.3.4	AFW Line Rupture Outside CV Test
3.1.2(20)	5.3.5	AFW Line Rupture Inside CV Test
3.1.2(20)	5.3.13	HP FW Heater 6 Tube Leak Test
3.1.2(20)	5.3.14.1	LP FW Heater 1A Tube Rupture
3.1.2(20)	5.3.14.2	LP FW Heater 3A Tube Rupture
3.1.2(20)	5.3.18	FW Break Inside CV Test
3.1.2(20)	5.3.24	FW Break In MFW Header Test
3.1.2(20)	5.3.26	MFW Pump Discharge Break Test
3.1.2(20)	4.9	DBA Main Steam Line Break Transient Test
3.1.2(20)	5.15.2.1	DBA Steam Break Outside CV Test
3.1.2(20)	5.15.9	Main Steam Header Leak Test
3.1.2(20)	5.23.1	SG Safety Valve Failure Test
3.1.2(20)&(17)	5.15.4	SG PORV Failures Test
3.1.2(20)&(17)	5.15.6	Steam Dump Failure Test
3.1.2(21)	5.16.16	NI51/NI52 Loss of High Voltage Power Supply Test
3.1.2(21)	5.16.2	SR NI Pulse Height Discriminator Failure
3.1.2(21)	5.16.3	SR NI High Volts Cutoff Failure Test
3.1.2(21)	5.16.4	SR NI High Volts Failure Test
3.1.2(21)	5.16.6	IR NI Gamma Compensation Failure Test
3.1.2(21)	5.16.7	PR NI Detector Failures Test
3.1.2(21)	5.16.9	Incore Drive Unit Failure Test
3.1.2(21)	5.16.10	SR NI Fuse Failures Test
3.1.2(21)	5.16.11	IR NI Fuse Failures Test
3.1.2(21)	5.16.12	PR NI Fuse Failures Test
3.1.2(21)	5.16.13	Noisy SR NI Channel Test
3.1.2(21)&(11)	5.16.14	Failure of SR NI Block Test
3.1.2(21)&(11)	5.16.15	Failure of SR NI to Reenergize Test
3.1.2(22)	5.3.8	TD AFW Flow Control Valve Failure Test
3.1.2(22)&(17)	5.15.5	SD Controller Modulation Failure Test

CROSS-REFERENCE OF ANSI-3.5 TO SIMULATOR TESTS

ANSI/ANS-3.5 SECTION	SIMULATOR PERFORMANCE TEST NUMBER	SIMULATOR PERFORMANCE TEST TITLE
3.1.2(22)&(17)	5.15.7	Steam Dump Permissive Failure Test
3.1.2(22)&(17)	5.23.3	SG Level Program Failure Test
3.1.2(22)&(17)	5.3.21	SG High Level Trip Failure (SG Level Fails Low)
3.1.2(22)&(18)	5.17.6	PZR Pressure Control Band Shift Test
3.1.2(22)&(18)	5.17.7	PZR Level Control Band Shift Test
3.1.2(22)&(18)	5.29.4	LT-459A Failure Test
3.1.2(22)&(18)	5.29.5	PT-444 Failure Test
3.1.2(22)&(20)	5.29.7	SG Press Transmitter To PORV Failure Test
3.1.2(22)&(9)&(19	5.29.1	FW Flow Transmitter Failure Test
3.1.2(22)&(9)&(19	5.29.6	Controlling SG Press Transmitter Failure
3.1.2(23)	5.3.6	Motor-Driven AFW Isolation Valve Failure Test
3.1.2(23)	5.5.2	CV Spray Pump Failure Test
3.1.2(23)	5.9.4	EDG Load Sequencer Tests
3.1.2(23)	5.13.1	CV Fan Cooler Trip Test
3.1.2(23)	5.15.3	MSIV Fails Open Test
3.1.2(23)	5.24.1	SI Initiation Failure Test
3.1.2(23)	5.24.3	Accumulator Nitrogen Leak Test
3.1.2(23)	5.24.4	SI Pump Failure Test
3.1.2(23)	5.24.6	Failure of SI Trains To Reset Test
3.1.2(23)	5.30.1	ESF Passive Failures Test
3.1.2(23)&(11)	5.14.4	Phase A Isolation Signal Failure Test
3.1.2(23)&(11)	5.14.5	Phase B Isolation Signal Failure Test
3.1.2(24)	5.21.1.1	Reactor Trip Breaker Failure Test
3.1.2(24)&(19)	5.21.2	AMSAC Failures Test
3.2	6.7	Physical Fidelity Comparison Test
4.1/B2.1	2.0.1	Full Power Simulator Stability Test
4.1/B2.1	2.0.2	Full Power Steady State Comparison Test
4.1/B2.1	2.0.3	Interim Power Steady State Comparison Tests
5.4.2	6.1	Closure of One MSIV at Full Power Test
5.4.2	4.4/6.2	Natural Circulation Demonstration
APP.B B2.2(1)	4.1	Manual Reactor Trip Transient Test
APP.B B2.2(10)	4.10	PZR PORV Stuck Open Without SI Transient Test
APP.B B2.2(2)	4.2	Simultaneous Trip of MFW Pumps Transient Test
APP.B B2.2(3)	4.3	Simultaneous Closure of MSIVs Transient Test
APP.B B2.2(4)	4.4	Simultaneous Trip of All RCPs Transient Test
APP.B B2.2(5)	4.5	Single RCP Trip Transient Test
APP.B B2.2(6)	4.6	Turbine Trip From 9% Power Transient Test
APP.B B2.2(7)3.1.1	4.7	Maximum Rate Power Ramp Transient Test
APP.B B2.2(8)	4.8	DBA LOCA w. Loss of Offsite Power Transient Test
APP.B B2.2(9)	4.9	DBA Main Steam Line Break Transient Test
NONE	5.5.3	CV Spray Header Leak Test
NONE	5.26.13	Turning Gear Failure Test
NONE	5.26.19	Turbine Bearing Lift Oil Pump Trip Test

APPENDIX L

ANNUAL TEST LISTING

SIMULATOR PERFORMANCE TEST
ANNUAL TEST LISTING

Test No.	Test Title
1.0	Real Time Simulation Verification
2.0.1	Full Power Simulator Stability Test
2.0.2	Full Power Steady State Comparison Test
2.0.3	Interim Power Steady State Comparison Tests
2.1	Plant Startup Test - Cold SD to Hot Stby
2.2	Reactor Startup Test
2.3.1	Unit Startup and Synchronization Test
2.3.2	Power Ascent to Full Power Test
2.4	Reactor Trip Followed By Recovery Test
2.5	Hot Shutdown Operations Tests
2.8	Unit Shutdown From Rated Power Test
2.9.1	Heat Balance Test
2.9.2	Determination of Shutdown Margin Boron Conc Test
2.10.001	Composite NIS Test (OST-001 thru OST-005)
2.10.006	SR/IR NIS Test (OST-006)
2.10.007	NIS Comparator Channel Test (OST-007)
2.10.008	NIS Startup Rate Channel Test (OST-008)
2.10.009	NIS Audio Count Rate Channel Test (OST-009)
2.10.011	Control Rod Exercise & RPI Test (OST-011)
2.10.051	RCS Daily Leakage Evaluation Test (OST-051)
2.10.054	Core Cooling Monitor Channel Check OST-054)
2.10.055	RVLIS Test (OST-055)
2.10.107	Boric Acid Blender Test (OST-107)
2.10.109	VCT Outlet Check Valve Back-Leakage Test
2.10.161	Accumulator Isolation and Check Valve Test
2.10.255	RHR and SI System Check Valve Test
2.10.401	Emergency Diesels Test (OST-401)
2.10.501	Main Steam Isolation Valve Test (OST-501)
2.10.551	Turbine Valve Testing (OST-551)
2.10.553	Turbine Mechanical Overspeed Trip Test (OST-553)
2.10.905	Radiation Monitoring System Test (OST-905)
4.1	Manual Reactor Trip Transient Test
4.2	Simultaneous Trip of MFW Pumps Transient Test
4.3	Simultaneous Closure of MSIVs Transient Test
4.4	Simultaneous Trip of All RCPs Transient Test
4.5	Single RCP Trip Transient Test
4.6	Turbine Trip From 9% Power Transient Test
4.7	Maximum Rate Power Ramp Transient Test
4.8	DBA LOCA w. Loss of Offsite Power Transient Test
4.9	DBA Main Steam Line Break Transient Test
4.10	PZR PORV Stuck Open Without SI Transient Test
6.1	Closure of One MSIV at Full Power Test
6.6	Valve Stroke Test
6.7	Physical Fidelity Comparison Test

APPENDIX M

25% MALFUNCTION TEST LISTING
(1991 - 1994)

SIMULATOR PERFORMANCE TEST
25% MALFUNCTION TEST LISTING FOR 1991

Test No.	Test Title
5.2.1	CCW Pump Trip Test
5.2.2	Loss of CCW to RHR Heat Exchanger Test
5.2.3	CCW-to-SW Leak Through Heat Exchanger Test
5.2.4	Total Loss of CCW to RCPs Test
5.2.6	CCW Line Break Inside CV Test
5.2.7	RCP Bearing Oil Cooler CCW Leak Test
5.2.8	TCV-144 Failure Test
5.3.1	AFW Pumps Trip Test
5.3.3	TD AFW Pump Steam Supply Break Test
5.3.4	AFW Line Rupture Outside CV Test
5.3.5	AFW Line Rupture Inside CV Test
5.3.6	Motor-Driven AFW Isolation Valve Failure Test
5.3.7	FW Bypass Valve Failure Test
5.3.8	TD AFW Flow Control Valve Failure Test
5.3.9	Condensate Pump Trip Test
5.3.10	FW Isolation Valve Failure Test
5.3.12	Heater Drain Pump Trip Test
5.3.13	HP FW Heater 6 Tube Leak Test
5.3.14.1	LP FW Heater 1A Tube Rupture
5.3.14.2	LP FW Heater 3A Tube Rupture
5.3.16	MFW Pump Recirc. Valve Failure Test
5.3.17	FW Control Valve Failures Test
5.3.18	FW Break Inside CV Test
5.3.19	Total Loss of Feed Water Test
5.3.20	Inadvertent FW Isolation Test
5.3.21	SG High Level Trip Failure Test
5.3.24	FW Break In MFW Header Test
5.3.26	MFW Pump Discharge Break Test
5.3.28	Loss of MFW Pump Lube Oil Test
5.3.29	Condensate Storage Tank Leak Test
5.8.1.1	Circulating Water Pump Trip Test
5.8.1.2	Loss of Circulating Water Pumps Test
5.13.1	CV Fan Cooler Trip Test
5.25.1	Service Water Pump Trip Test
5.25.2	SW Leak on CV Fan Cooler Test
5.25.4	SW Header Leak Test
5.25.6	SW Booster Pump Suction Line Leak Test
5.25.8	SW To EDG TCV Failure Test
5.29.1	FW Flow Transmitter Failure Test
5.29.3	PT-145 Failure Test
5.29.4	LT-459A Failure Test
5.29.5	PT-444 Failure Test
5.29.6	Controlling SG Press Transmitter Failure
5.29.7	SG Press Transmitter To PORV Failure Test
5.30.1	ESF Passive Failures Test

SIMULATOR PERFORMANCE TEST
25% MALFUNCTION TEST LISTING FOR 1992

Test No.	Test Title
5.1.1	Complete Loss of Instrument Air Test
5.1.2	Instrument Air Compressor Trip Test
5.4.2	Condenser Air-Inleakage Test
5.4.3	Condenser Vacuum Pump Trip Test
5.4.4	Vacuum Pump Shaft Break Test
5.4.5	Hotwell Level Controller Failure Test
5.6.1	Power Cabinet Urgent Failure Test
5.6.2	Failure of Control Rods to Move Test
5.6.3	Dropped Control Rod Test
5.6.4	Stuck Control Rod Test
5.6.5	Ejected Control Rod Test
5.6.6	Uncontrolled Rod Motion Tests
5.6.7	Auto Rod Speed Controller Failure Test
5.6.8	Rod Control T-ref Failure Test
5.6.10	IRPI Coil Failures Test
5.6.11	Control Bank Overlap Failure Tests
5.6.12	Step Counter Failures Test
5.6.13	Rod Speed Deadband Controller Failure Test
5.6.16	Loss of Rod Drive MG Sets Test
5.6.17	Loss of Power to Power Cabinets Test
5.6.18	Bent Control Rod Shaft Test
5.15.2.1	DBA Steam Break Outside CV Test
5.15.3	MSIV Fails Open Test
5.15.4	SG PORV Failures Test
5.15.5	SD Controller Modulation Failure Test
5.15.6	Steam Dump Failure Test
5.15.9	Main Steam Header Leak Test
5.23.1	SG Safety Valve Failure Test
5.23.2.1	SG Tube Leak Test
5.23.2.2	SG Tube Rupture Test
5.23.3	SG Level Program Failure Test
5.26.2	Turbine Trip Failures Test
5.26.4	Turbine Bearing Failure Test
5.26.5	Turbine Governor Valve Failure Test
5.26.11	Turbine Lube Oil Pumps Trip Test
5.26.12	Loss of EH Oil Pumps Test
5.26.13	Turning Gear Failure Test
5.26.14	Turbine Main Lube Oil Leak Test
5.26.16	Loss of Gland Seal Steam Test
5.26.18	EH Reservoir Leak Test
5.26.19	Turbine Bearing Lift Oil Pump Trip Test
5.26.20	Runback Time Delay Relays Failure Test
5.26.21	Turbine Runback Failure Test
5.26.22	EH High Pressure Fluid Leak Test
5.28.1	High RCS Activity Test

SIMULATOR PERFORMANCE TEST
25% MALFUNCTION TEST LISTING FOR 1993

Test No.	Test Title
5.7.4	Letdown Line Leak Outside CV Test
5.7.5	Charging Pump Trip Test
5.7.6	Primary Water Pump Trip Test
5.7.7	PCV-145 Controller Failure Test
5.7.8	Inadvertent Low PZR Level Bistable Actuation
5.7.9	LC-112 Failure Test
5.7.11	Non-Regen. Heat Exchanger Tube Leak Test
5.7.12	Seal Water Heat Exchanger Tube Leak Test
5.7.13	Plugged Boric Acid Filter Test
5.7.14	Plugged RCS Filter Test
5.7.15	Chg Pump Speed Controller Failure Test
5.7.16	Orifice Isolation Valve Failures Test
5.7.17	LTDN Leak Before Orifice Isolation Valves Test
5.7.18	Auxiliary Spray Valve Failure Test
5.7.19	Normal & Alternate Charging Valve Failures Test
5.7.21	CVC-LCV-115B Failure Test
5.7.22	Boric Acid Pump Trip Test
5.7.23	Plugged Seal Water Return Filter Test
5.7.24	Charging Line Leaks Test
5.7.25	Makeup Selector Switch Failure Test
5.9.1	EDG Failures Test
5.9.4	EDG Load Sequencer Tests
5.10.2	Loss of Instrument Buses Test
5.10.3	Loss of 125V DC Buses
5.10.4	Loss of 4160V Buses Test
5.10.5	E1/E2 Feeder Breakers Trip Test
5.10.7	Auxiliary Transformer Failure Test
5.10.8	Loss of 480V Buses Test
5.10.9	Degraded Grid Voltage Test
5.10.13	Loss of Start-Up Transformer Test
5.12.2	Turbine Trip On Gen Trip Failure Test
5.12.3	Generator Output Breaker Failures Test
5.12.5	Load Rejection Test
5.12.6	Generator Trips Test
5.16.2	SR NI Pulse Height Discriminator Failure
5.16.3	SR NI High Volts Cutoff Failure Test
5.16.4	SR NI High Volts Failure Test
5.16.6	IR NI Gamma Compensation Failure Test
5.16.7	PR NI Detector Failures Test
5.16.9	Incore Drive Unit Failure Test
5.16.10	SR NI Fuse Failures Test
5.16.11	IR NI Fuse Failures Test
5.16.12	PR NI Fuse Failures Test
5.16.13	Noisy SR NI Channel Test
5.16.14	Failure of SR NI Block Test
5.16.15	Failure of SR NI to Reenergize Test

SIMULATOR PERFORMANCE TEST
25% MALFUNCTION TEST LISTING FOR 1994

Test No.	Test Title
5.5.1	False CV Spray Actuation Test
5.5.2	CV Spray Pump Failure Test
5.5.3	CV Spray Header Leak Test
5.7.1	Letdown Isolation Valves Failures Test
5.7.2	CVC-LCV-115C Failures Test
5.7.3	Letdown Line Leak Inside CV Test
5.16.16	NI51/NI52 Loss of High Voltage Power Supply Test
5.14.4	Phase A Isolation Signal Failure Test
5.14.5	Phase B Isolation Signal Failure Test
5.17.1	Pressurizer Steam Space Leak Test
5.17.2	Pressurizer Spray Valve Failure Test
5.17.3	Pressurizer PORV Failure Test
5.17.4	Pressurizer Safety Valve Failure Test
5.17.5	PZR Backup Heater Group Failures Test
5.17.6	PZR Pressure Control Band Shift Test
5.17.7	PZR Level Control Band Shift Test
5.18.1	DBA RCS Hot Leg LOCA Test
5.18.3	RCP Locked Rotor Test
5.18.5	Variable Boron Concentration Function Test
5.18.9.1	RCS Small Leak Test
5.18.9.2	RCS Small LOCA Test
5.18.12	RCP Thermal Barrier Leak Test
5.18.13	RCP #1 Seal Failure Test
5.18.14	RCP #2 Seal Failure Test
5.18.15	RCP #3 Seal Failure Test
5.18.17	RCP Seal Package Failure Test
5.18.16	RCP Vibration Test
5.19.1	RHR Pump Trip Test
5.19.2	RHR-FCV-758 Failure Test
5.19.3	RHR-FCV-605 Failure Test
5.19.4	HCV-142 Failure Test
5.19.5	RHR Leak Test
5.19.6	RHR Sump Valve Failures Test
5.19.7	RHR Heat Exchanger Tube Leak Test
5.19.8	RHR Relief Valve Failure Test
5.21.1.1	Reactor Trip Breaker Failure Test
5.21.1.2	ATWS Test
5.21.2	AMSAC Failures Test
5.15.7	Steam Dump Permissive Failure Test
5.24.1	SI Initiation Failure Test
5.24.2	Accumulator Liquid Leak Test
5.24.3	Accumulator Nitrogen Leak Test
5.24.4	SI Pump Failure Test
5.24.6	Failure of SI Trains To Reset Test
5.14.1	RWST Leak Test

APPENDIX N

SIMULATOR PERFORMANCE TEST ABSTRACTS

SIMULATOR PERFORMANCE TEST
ABSTRACT
1.0

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Real Time Simulation Verification

1.2 ANSI/ANS 3.5, 1985, 3.1.2

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies the simulator's simulation of dynamic performance is in the same time base relationships, sequences, durations, rates and accelerations as the reference plant. This test verifies real time simulation during steady state operation, reactor power maneuvers , and multiple malfunction entry including reactor coolant system LOCA, steam generator tube rupture, main steam line break, and loss of offsite power. Verification of real time simulation is accomplished by monitoring the number of times the simulator math model programs run and comparing those values against simulator design.

6.0 BASELINE DATA/REFERENCES

6.1 ANS/ANSI 3.5, 1985

6.2 Design Basis and Model Documentation, Carolina Power & Light Company, H.B. Robinson Nuclear Training Simulator, Westinghouse Simulator Department, Nuclear Services Integration Division.

7.0 DATE PERFORMED/TEST RESULTS 1/19/91 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

REAL TIME

SIMULATOR PERFORMANCE TEST
ABSTRACT
1.0

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.0.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Full Power Simulator Stability Test

1.2 ANSI/ANS 3.5, 1985, 4.1 & B2.1

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies the simulator is capable of operating at 100% power for a period of one hour while maintaining within a +/-2% deviation on certain critical and noncritical parameters.

6.0 BASELINE DATA/REFERENCES

6.1 ANSI/ANS 3.5, 1985

6.2 Regulatory Guide 1.149

7.0 DATE PERFORMED/TEST RESULTS 10/23/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.0.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Full Power - Steady State Comparison Test

1.2 ANSI/ANS 3.5, 1985, 4.1 & B2.1

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power

5.0 TEST DESCRIPTION

This simulator performance test verifies the simulator's accuracy related to full power values for which valid reference plant information is available. Simulator computed value accuracy is verified to be within +/- 2% for critical parameters and +/- 10% for noncritical parameters of the reference plant, with an additional 2% (of full scale) tolerance to account for reference plant instrument error. Also, the simulator indicated values are verified to be within +/- 2% for critical parameters and noncritical parameters of the simulator computed values.

6.0 BASELINE DATA/REFERENCES

6.1 MMM-006, Maintenance Management Manual

6.2 OMM-001, Operations Management Manual

7.0 DATE PERFORMED/TEST RESULTS **11/16/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.0.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
91-0008 Simulator computed value for Main Generator Megawatts is too high for full power conditions.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.0.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Interim Power - Steady State Comparison Test

1.2 ANSI/ANS 3.5, 1985, 4.1 & B2.1

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

4.1 60% Power (EOL)

4.2 29% Power (BOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies the simulator's accuracy related to interim power levels of approximately 25% and 75% of full power for which valid reference plant information is available. Simulator computed value accuracy is verified to be within +/- 2% for critical parameters and +/- 10% for noncritical parameters of the reference plant, with an additional 2% (of full scale) tolerance to account for reference plant instrument error. Also, the simulator indicated values are verified to be within +/- 2% for critical parameters and noncritical parameters of the simulator computed values.

6.0 BASELINE DATA/REFERENCES

6.1 MMM-006, Maintenance Management Manual

6.2 OMM-001, Operations Management Manual

7.0 DATE PERFORMED/TEST RESULTS 1/7/91 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Plant Startup Test - Cold Shutdown to Hot Standby

1.2 ANSI/ANS 3.5, 1985, 3.1.1(1)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Cold Shutdown (BOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies the ability of simulating continuously, and in real time a plant heatup from cold shutdown (<200 deg. F) with the pressurizer solid to hot standby (hot, subcritical at no load Tavg). The simulator's ability to calculate plant system parameters corresponding to this evolution, displaying these parameters on the appropriate instrumentation, and providing proper alarm or protective system action, or both, are verified.

6.0 BASELINE DATA/REFERENCES

6.1 GP-001, General Procedure

6.2 GP-002, General Procedure

6.3 GP-010, General Procedure

6.4 OP-006, Operating Procedure

6.5 OP-101, Operating Procedure

6.6 OP-201, Operating Procedure

6.7 OP-301, Operating Procedure

6.8 OP-402, Operating Procedure

6.9 OP-505, Operating Procedure

6.10 OP-506, Operating Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.1

7.0 DATE PERFORMED/TEST RESULTS 10/18/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Startup Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(2)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Hot Subcritical at No Load Tavg

5.0 TEST DESCRIPTION

This simulator performance test verifies the ability of simulating continuously, and in real time, a reactor startup from hot subcritical at no load Tavg (547 deg. F) to 10^{-8} amps reactor power. The ability to calculate plant system parameters corresponding to this evolution, displaying these parameters on the appropriate instrumentation, and providing alarms or protective system action, or both, are verified.

6.0 BASELINE DATA/REFERENCES

6.1 GP-003, General Procedure

6.2 GP-002, General Procedure

6.3 OP-002, Operating Procedure

6.4 OP-603, Operating Procedure

6.5 Plant Data Package #6, Power Ascension, Cold Shutdown to 100% Power - 12/18/89 to 12/28/89

7.0 DATE PERFORMED/TEST RESULTS **09/14/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.3.1

1.0 **PROCEDURE TITLE/ANSI 3.5 REFERENCE**

1.1 Unit Startup and Synchronization Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(2), 3.1.1(3)

2.0 **AVAILABLE OPTIONS**

Not Applicable

3.0 **TESTED OPTIONS**

Not Applicable

4.0 **INITIAL CONDITIONS**

Reactor at 10^{-8} Amps, Xe Free, BOL

5.0 **TEST DESCRIPTION**

A plant startup is performed per General Procedure GP-005 from reactor critical at 10^{-8} amps to closure of the Main Generator Output Breakers and the ability to simulate continuously and in real time during the performance of this evolution is verified. The ability to calculate plant system parameters corresponding to this evolution, displaying these parameters on the appropriate instrumentation and providing alarms and appropriate protective system action is verified.

6.0 **BASELINE DATA/REFERENCES**

6.1 Plant Data Package 6 - H.B. Robinson on Power Ascension

6.2 GP-003, General Plant Procedure

6.3 GP-005, General Plant Procedure

6.4 OP-407, Operating Procedure

6.5 OP-408, Operating Procedure

6.6 OP-501, Operating Procedure

6.7 OP-502, Operating Procedure

6.8 OP-503, Operating Procedure

6.9 OP-504, Operating Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.3.1

6.10 OP-505, Operating Procedure

6.11 OP-006, Operating Procedure

6.12 OP-507, Operating Procedure

6.13 OP-509, Operating Procedure

6.14 OP-904, Operating Procedure

6.15 OP-916, Operating Procedure

6.16 OP-917, Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/14/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.3.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Power Ascent to Full Power Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(2)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Generator Breaker Closed, BOL

5.0 TEST DESCRIPTION

A plant startup is performed per General Procedure GP-005 from Generator Breaker Closure to 100% power. The ability to simulate continuously and in real time during the performance of this evolution is verified. The ability to calculate plant system parameters corresponding to this evolution, displaying these parameters on the appropriate instrumentation, and providing proper alarm and appropriate protective action is verified.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 6 - H.B. Robinson Power Ascension

6.2 GP-005, General Plant Procedure

6.3 OP-401, Operating Procedure

6.4 OP-406, Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/14/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Trip Followed By Recovery Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(4)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The Reactor is manually tripped from 100% power. Appropriate Emergency Plant Procedures are completed and when the plant is stable, General Plant Procedures GP-003 and GP-005 are used to return the plant to 100% power. The simulator's ability to calculate plant system parameters corresponding to this evolution, displaying these parameters on the appropriate instrumentation and providing proper alarm and appropriate protective action is verified.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 8 - H.B. Robinson Reactor Trip from 100% power

6.2 Plant Data Package 6 - H.B. Robinson Power Ascension to 100% power

6.3 EPP-4, Emergency Plant Procedures

6.4 GP-003, General Plant Procedure

6.5 GP-005, General Plant Procedure

6.6 PATH 1 Emergency Operating Procedure

6.7 CSFST Critical Safety Function Status Free

7.0 DATE PERFORMED/TEST RESULTS **09/18/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Hot Shutdown Operations Tests

1.2 ANSI/ANS 3.5, 1985, 3.1.1(5)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Hot Shutdown, Xe Free

5.0 TEST DESCRIPTION

The response of the Pressurizer Pressure Control System, Level Control System, and the alarms, stability, and control of these systems is verified. Pressurizer Spray and Heater effectiveness is also verified. The simulator ability to calculate plant parameters corresponding to these evolutions, displaying these parameters corresponding to these evolutions, displaying these parameters on the appropriate instrumentation and providing proper alarm is verified.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 34 - Pressure response to opening of one Pressurizer Spray Valve; Pressurizer response to actuation of Pressurizer Control Heaters - H.B. Robinson Unit 2 Startup Test.

6.2 SD-059, System Description

6.3 Precautions, Limitations, and Setpoints Document

6.4 MMM-006, Maintenance Management Manual Procedure

6.5 5379-3436, Block Diagram

6.6 5379-3439, Block Diagram

6.7 APP-003, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS **11/08/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.5

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Unit Shutdown From Rated Power Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(8)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

A shutdown from 100% power to Hot Shutdown is performed utilizing General Plant Procedure GP-006. The shutdown is then continued to Cold Shutdown utilizing General Plant Procedure GP-007. The ability of simulating continuously and in real time a unit shutdown from rated power to Cold Shutdown is verified. The simulator's ability to calculate plant system parameters corresponding to this evolution, displaying these parameters on the appropriate instrumentation, and providing proper alarm and appropriate protective action is verified.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 3 - H.B. Robinson, Normal Shutdown, 100% Power to Cold Shutdown

6.2 GP-006, General Procedure

6.3 GP-007, General Procedure

6.4 OP-003, Operating Procedure

6.5 OP-006, Operating Procedure

6.6 OP-201, Operating Procedure

6.7 OP-301, Operating Procedure

6.8 OP-306, Operating Procedure

6.9 OP-401, Operating Procedure

6.10 OP-406, Operating Procedure

6.11 OP-502, Operating Procedure

6.12 OP-509, Operating Procedure

6.13 OP-603, Operating Procedure

6.14 OP-918, Operating Procedure

6.15 FMP-005, Fuel Management Procedure

6.16 FMP-009, Fuel Management Procedure

7.0 DATE PERFORMED/TEST RESULTS 10/18/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.9.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Heat Balance Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(9)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test Procedure - 10(OST-10), Power Range Calorimetric During Power Operation, is completed. This test verifies the simulator's ability to calculate and display the parameters required to perform a Power Range Calorimetric.

6.0 BASELINE DATA/REFERENCES

6.1 OST-010, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS **10/17/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.9.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Determination of Shutdown Margin Boron Concentration Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(9)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Fuel Management Procedure 12 (FMP-12), Manual Determination of Shutdown Margin Boron Concentration, is completed. This test verifies the simulator's ability to calculate and display the parameters required to perform a manual determination of Shutdown Margin Boron Concentration.

6.0 BASELINE DATA/REFERENCES

6.1 FMP-012, Fuel Management Procedure

6.2 Technical Specification 3.10.8

6.3 H.B. Robinson Curve Book

7.0 DATE PERFORMED/TEST RESULTS **11/05/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.001

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Composite Nuclear Instrumentation System Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Hot Shutdown, EOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 1, (OST-001) Nuclear Instrumentation Source Range, Intermediate Range, Power Range Weekly is completed. This test verifies the simulator's ability to calculate and display the parameters required to perform OST-1, 2, 3, 4, and 5.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OSTs-1, 2, 3, 4, and 5 performed by plant.

7.0 DATE PERFORMED/TEST RESULTS **09/06/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	**TO BE CLEARED BY**
90-432, N-35 P-6 Setpoint out of tolerance N-36 P-6 Setpoint out of tolerance N-41 P-10 Setpoint out of tolerance N-41 Overpower trip low range setpoint out of tolerance	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.006

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Source/Intermediate Range Nuclear Instrumentation System Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

13% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test Procedure 6 (OST-006), Nuclear Instrumentation Source Range and Intermediate Range Bi-weekly (Power above P-6) Prior to Scheduled Shutdown Interval, is completed. This test verifies the simulator's ability to calculate and display the parameters required to perform OST-006.

6.0 BASELINE DATA/REFERENCES

6.1 OST-006, Operations Surveillance Test

6.2 OST-001, Operations Surveillance Test

6.3 Plant Data Package 33-OST-006 performed by plant

7.0 DATE PERFORMED/TEST RESULTS 10/15/90 **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.007

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Nuclear Instrumentation Comparator Channel Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 7 (OST-007), Nuclear Instrumentation Comparator, is completed. This test verifies the simulator's ability to calculate and display the parameters required to perform OST-007.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33-OST-007 performed by plant

6.2 OST-007, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS 09/06/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.008

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Nuclear Instrumentation Startup Rate Channel Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 8 (OST-008), Nuclear Instrumentation Startup Rate Channel is completed. This test verifies the simulator's ability to calculate and display the parameters required to complete OST-008.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OST-008 completed by plant.

6.2 OST-008, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS 09/04/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.009

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Nuclear Instrumentation Audio Count Rate Channel Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 9 (OST-009), Nuclear Instrumentation Audio Count Rate Channel, is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-009.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OST-009, Completed by plant

6.2 OST-009, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS **09/04/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.011

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Rod Cluster Control Exercise and Rod Position Indication Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 11, (OST-11), Rod Cluster Control and Rod Position Indication bi-weekly interval is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-11.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OST-11, Performed by plant

6.2 OST-11, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS 09/04/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.051

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 RCS Daily Leakage Evaluation Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 51, (OST-51) Reactor Coolant System Leakage Evaluation is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-51.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33-OST-51, Performed by plant

6.2 OST-51, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS **09/07/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.054

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Core Cooling Monitor Channel Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 54 (OST-54) Core Cooling Monitor Channel Check is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-54.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OST-54, Performed by plant.

7.0 DATE PERFORMED/TEST RESULTS 09/04/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.055

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Vessel Level Instrumentation System Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 55, (OST-55), Reactor Vessel Level Instrumentation System, is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-55.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OST-55 performed by plant.

6.2 OST-55, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS **09/05/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.107

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Boric Acid Blender Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 107, (OST-107), Boric Acid Blender Control, Valve and Pump Operation is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-107.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OST-107, Performed by plant.

6.2 OST-107, Operation Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS **09/04/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.109

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Volume Control Tank Outlet Check Valve Back Leakage Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Cold Shutdown, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 109, (OST-109), Chemical and Volume Control System Check Valve CVC-266 Back Leakage Test is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-109.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33-OST-109, Performed by plant

6.2 OST-109, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS **10/15/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.161

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Accumulator Isolation and Check Valve Operability Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

RCS at approximately 342°F and 348 PSI ready to go on RHR, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test, 161 (OST-161), Accumulator Isolation and Check Valve Operability Test is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-161.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OST-161, performed by plant

6.2 OST-161, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS **09/05/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.255

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 R.H.R. and SI System Check Valve Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Cold Shutdown, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 255, (OST-255), RHR and SI System Check Valve Test is completed. This test verifies the simulators ability to calculate and display the parameters required to complete OST-255.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33 - OST-255 performed by plant

6.2 OST-255, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS 12/08/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.401

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Emergency Diesels Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The ability of simulating continuously, and in real time, a test of the Emergency Diesel Generators is verified. This test is based on OST-401, Emergency Diesels Operation Surveillance Test. Some steps have been removed due to Local Operator Actions not vital to Control Room indication, and additional steps were added to provide qualitative check of simulator responses. The "A" Diesel Generator is started, synchronized, loaded, unloaded, and shutdown using LOA's for actions outside the Control Room and normal controls in the RTGB. The test is repeated for "B" Emergency Diesel.

6.0 BASELINE DATA/REFERENCES

6.1 OST-401, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS 09/04/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.401

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0412, Failed to receive the EMERG GEN A/B AUTO TRIP annunciators when the associated breaker was opened locally	12/31/91
90-0413, Diesels shutdown with local stop/start switch with the Remote/Local switch in "REMOTE".	12/31/91
90-0414, Emergency Diesel Amperage is not effected by changes in power factor	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.501

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Main Steam Isolation Valve Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Cold Shutdown, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 501 (OST-501) Main Steam Isolation Valves (Refueling), is completed. This test verifies the simulator's ability to calculate and display the parameters required to complete OST-501.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33-OST-501 performed by plant

6.2 OST-501, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS 09/05/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.551

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Valve Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

68% Power, MOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 551, (OST-551) Turbine Valve and Trip Functional Test is completed. This test verifies the simulator's ability to calculate and display the parameters required to complete OST-551.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33-OST-551 performed by plant

6.2 OST-551, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS 09/05/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.553

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Mechanical Overspeed Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

20% Power, EOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 553, (OST-553), Turbine Mechanical Overspeed Trip Test is completed. This test verifies the simulator's ability to calculate and display the parameters required to complete OST-553.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33-OST-553 performed by plant

6.2 OST-553, Operations Surveillance Test

7.0 DATE PERFORMED/TEST RESULTS 09/04/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
2.10.905

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Radiation Monitoring System Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The current revision of Operations Surveillance Test 905, (OST-905), Radiation Monitoring Systems, is completed. This test verifies the simulator's ability to calculate and display the parameters required to complete OST-905.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 33-OST-905 performed by plant

7.0 DATE PERFORMED/TEST RESULTS **09/04/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Manual Reactor Trip Transient Test

1.2 ANSI/ANS 3.5, 1985, APP.B B2.2(1)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Manual Reactor Trip Transient Test

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The manual reactor trip malfunction is entered with the simulator at a stable 100% power. The transient test is allowed to run for a minimum of 30 minutes. The appropriate parameter response per the ANSI guidelines were verified. The following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.1

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 8, Reactor Trip from 100% power - 2 Power Range NI's in test

6.2 Plant Startup Test Report, Section 43

6.3 Plant Data Package 20, Post Trip Report Reactor Trip from 98.5% power

6.4 Plant Data Package 38, Ginna Comparison of Simulator to Plant Trip

6.5 Updated FSAR - H.B. Robinson Steam Electric Station Unit No. 2

6.6 EPRI NP-6701

7.0 DATE PERFORMED/TEST RESULTS 09/18/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Simultaneous Trip of MFW Pumps

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(2)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Simultaneous Trip of MFW Pumps

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction to trip both MFW Pumps simultaneously is entered with the reactor stable at 100% power. The transient test is allowed to continue for a minimum of 30 minutes. The appropriate parameter responses per the ANSI guideline were verified. The following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did not occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Transient Data, Volume 71, Post Trip Report 2

6.2 MDTA-LP-8, Lesson Plan - Mitigating Core Damage

6.3 Updated FSAR, H.B. Robinson Steam Electric Station Unit No. 2

6.4 EPRI NP-6701

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.2

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Simultaneous Closure of MSIV's

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(3)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Simultaneous Closure of MSIV's

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction to simultaneously close all MSIV's are entered with the reactor stable at 100% Power. The transient test is allowed to continue for a minimum of 30 minutes. The appropriate parameter response per the ANSI guideline were verified. The following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.3

6.0 **BASELINE DATA/REFERENCES**

6.1 Plant Data Package 42, Transient Analysis for H.B. Robinson Simulator Project, WCAP-11202, Section C

6.2 Plant Data Package 39, Ginna Comparison of Simulator to Engineering Data for MSIV closure.

6.3 Updated FSAR, H.B. Robinson Steam Electric Station, Unit No. 2.

6.4 EPRI NP-6701

7.0 **DATE PERFORMED/TEST RESULTS** 10/12/90 SAT UNSAT

8.0 **DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES**

None

9.0 **EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION**

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Simultaneous Trip of all RCP's Transient Test

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(4)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Simultaneous Trip of all RCP's

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunctions for Simultaneous Trip of all RCP's are entered with the reactor stable at 100% power. The transient test is allowed to continue until the natural circulation criteria for Emergency Plant Procedure -4(EPP-4) is verified. The following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.4

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 42, Transient Analysis for H.B. Robinson Simulator Project, WCAP-11202, Section D

6.2 Plant Data Package 16, Post Trip Report, Loss of Offsite Power - 80.7%

6.3 Lesson Plan MDTA-LP-3, Mitigating Core Damage

6.4 EPP-4, Emergency Plant Procedure

6.5 Updated FSAR, H.B. Robinson Steam Electric Station, Unit No. 2

6.6 EPRI NP-6701

7.0 DATE PERFORMED/TEST RESULTS 10/16/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Single Reactor Coolant Pump Trip Transient Test

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(5)

2.0 AVAILABLE OPTIONS

Any one of the three Reactor Coolant Pumps can be tripped.

3.0 TESTED OPTIONS

"A" Reactor Coolant Pump was tripped.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, the "A" Reactor Coolant Pump was tripped. This transient test was allowed to run a minimum of 30 minutes. The appropriate parameter responses, per the ANSI guidelines, were verified. Additionally, the following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.5

6.0 BASELINE DATA/REFERENCES

6.1 Updated FSAR for H.B. Robinson

6.2 AOP-018, Abnormal Operating Procedure

6.3 WCAP-11202, Section E - Transient Analysis for H.B. Robinson - Plant Data Package 42

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Trip From 9% Power Transient Test

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(6)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Turbine Trip From 9% Power

4.0 INITIAL CONDITIONS

9% Power

5.0 TEST DESCRIPTION

With the Simulator at stable 9% power condition, the Turbine was tripped. This is the maximum power level (< 10%) at which a turbine trip does not result in a direct reactor trip. This transient test was allowed to run a minimum of 30 minutes. The appropriate parameter responses, per the ANSI Guidelines were verified. Additionally, the following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-007, Abnormal Operating Procedure

6.2 WCAP-11202, Section F, Plant Data Package 42

7.0 DATE PERFORMED/TEST RESULTS 10/18/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.6

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Maximum Rate Power Ramp Transient Test

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(7)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Maximum Rate Power Ramp Transient

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, power was reduced to 75% and then returned to 100% at a 5%/min rate. Once the simulator was returned to 100% power, the appropriate parameters were verified, per the ANSI guidelines. Additionally, the following conditions were verified.

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

e. Alarms and automatic actions which should not have occurred did not occur.

f. System interactions provided a total system integrated response.

6.0 BASELINE DATA/REFERENCES

6.1 Updated FSAR for H. B. Robinson

6.2 Ginna Comparison of Simulator to Engineering Data for Maximum Rate Power Ramp - Plant Data Package 40.

7.0 DATE PERFORMED/TEST RESULTS 09/26/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.7

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 DBA LOCA With Loss of Offsite Power Transient Test

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(8)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

DBA LOCA With Loss of Offsite Power

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, the DBA LOCA in coincidence with a loss of offsite power was inserted. This transient test was allowed to run a minimum of 30 minutes. The appropriate parameter responses, per the ANSI guidelines were verified. Additionally, the following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

6.0 BASELINE DATA/REFERENCES

6.1 WCAP-11202, Section G, Transient Analysis for H.B. Robinson

6.2 Ginna Comparison of Simulator to Engineering Data for LOCA

6.3 Less MDTA, Mitigating Core Damage

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.8

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.9

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 DBA Main Steam Line Break Transient Test

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(9)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

DBA Main Steam Line Break with a $1E^7$ leak and a 5 second ramp

4.0 INITIAL CONDITIONS

100% Power

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, the malfunction to cause a DBA Main Steam Line Break was entered. This transient test was allowed to run for a minimum of 30 minutes. The appropriate parameter response per the ANSI Guidelines, were verified. Additionally, the following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

6.0 BASELINE DATA/REFERENCES

6.1 Updated FSAR for H.B. Robinson

6.2 WCAP-11202, Section H - Transient Analysis for H.B. Robinson Simulator Project

7.0 DATE PERFORMED/TEST RESULTS **12/02/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.9

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.10

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Pressurizer PORV Stuck Open Without SI Transient Test

1.2 ANSI/ANS 3.5, 1985, APP. B B2.2(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Pressurizer PORV Stuck Open Without SI

4.0 INITIAL CONDITIONS

100% Power (BOL) Safety Injection Pumps Racked Out

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, the Pressurizer PORV was failed open. This transient test was allowed to run for a minimum of 60 minutes. The appropriate parameter responses, per the ANSI Guidelines were verified. Additionally, the following conditions were verified:

a. Parameter changes were in the proper direction.

b. Physical laws of nature were not violated.

c. Alarms and automatic actions which should have occurred did occur.

d. Alarms and automatic actions which should not have occurred did not occur.

e. System interactions provided a total system integrated response.

6.0 BASELINE DATA/REFERENCES

6.1 Updated FSAR for H.B. Robinson

6.2 WCAP-11202 - Transient Analysis for H.B. Robinson Simulator Project, Section I

7.0 DATE PERFORMED/TEST RESULTS 12/12/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
4.10

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.1.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Complete Loss of Instrument Air Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(2)

2.0 AVAILABLE OPTIONS

Allows selection of rupture in Air Header supplying up to three buildings with a variable leak rate of 0-1000 SCFM and ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 AIR1A Loss of Instrument Air to Containment Header, 1000 SCFM, 0 ramp time

3.2 AIR1B Loss of Instrument Air to Auxiliary Building Header, 1000 SCFM, 0 ramp time

3.3 AIR1C Loss of Instrument Air to Turbine Building Header, 1000 SCFM, 0 ramp time

4.0 INITIAL CONDITIONS

100% Power, BOL
Hot Zero Power, BOL
Heatup in Progress, Bubble in Pressurizer

5.0 TEST DESCRIPTION

The three Air Headers are failed simultaneously in three sections of the test (different status of plant) to permit testing of components/parameters response under conditions most favorable to verify the loss of air response. Proper response of components/parameters is verified either during the reduction in instrument air pressure or following the complete loss of pressure. When possible attempts are made to change the status of components to verify failed status.

6.0 BASELINE DATA/REFERENCES

6.1 SD-017, System Description

6.2 AOP-017, Abnormal Operating Procedure

6.3 SP-833, Special Procedure for Testing of Pneumatically Controlled Components

7.0 DATE PERFORMED/TEST RESULTS 09/18/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.1.1

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.1.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Instrument Air Compressor Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(2)

2.0 AVAILABLE OPTIONS

Allows any combination up to five Air Compressors to be tripped due to overheating.

3.0 TESTED OPTIONS

3.1 AIR2A Loss of Instrument Air Compressor "A"

3.2 AIR2B Loss of Instrument Air Compressor "B"

3.3 AIR2C Loss of Instrument Air Compressor "C"

3.4 AIR2D Loss of Primary Air Compressor

3.5 AIR2E Loss of Station Air Compressor

4.0 INITIAL CONDITIONS

100% BOL

5.0 TEST DESCRIPTION

Proper parameter response of the simulator is verified for normal operation and abnormal operation (trip) of each air compressor which supplies the Instrument and Station Air Headers. Cross connect capability between the Instrument Air System and Station Air System is also verified. Local Operation Action (LOA's) are used to align the Compressors and Air Header Cross Connect Valves for the various evolutions in this test.

6.0 BASELINE DATA/REFERENCES

6.1 SD-017, System Description

6.2 AOP-017, Abnormal Operating Procedure

6.3 G-190200, Series Flow Diagrams

7.0 DATE PERFORMED/TEST RESULTS 12/08/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.1.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Component Cooling Water (CCW) Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(8)

2.0 AVAILABLE OPTIONS

Allows the trip of any combination of up to three CCW pumps simultaneously.

3.0 TESTED OPTIONS

3.1 CCW-1A Loss of CCW Pump A

3.2 CCW-1B Loss of CCW Pump B

3.3 CCW-1C Loss of CCW Pump C

4.0 INITIAL CONDITIONS

100% Power, BOL and; Cold Shutdown on RHR.

5.0 TEST DESCRIPTION

Each CCW pump is placed in service as the only running pump with the other pumps in standby. The appropriate malfunction is inserted to trip the running pump. Automatic start of the standby pumps and correct response of the plant is verified.

Plant response to a total loss of CCW flow is tested with the plant at 100% power and with the plant in cold shutdown on RHR.

Proper alarms, indicating lights and flow indications are verified for the pump trips. After total loss of CCW at power, a CCW pump is restarted to verify alarms will clear.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.1

6.0 BASELINE DATA/REFERENCES

6.1 AOP-014, Abnormal Operating Procedure

6.2 APP-001, Annunciator Procedure

6.3 5379-376 Series Flow Diagrams

6.4 5379-685 Series Flow Diagrams

6.5 SD-013 Systems Description

6.10 B-190628 Series Control Wiring Diagrams

7.0 DATE PERFORMED/TEST RESULTS 9/19/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of Component Cooling Water (CCW) to Residual Heat Exchanger Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(7) & 3.1.2(8)

2.0 AVAILABLE OPTIONS

Allows the closure of either or both of Component Cooling Water Outlet Valve for either or both Residual Heat Exchangers with a ramp time of 0-3600 seconds; and closure from 0-100%.

3.0 TESTED OPTIONS

3.1 CCW-2A, Loss of CCW to A - RHR Heat Exchanger

3.2 CCW-2B, Loss of CCW to B - RHR Heat Exchanger

4.0 INITIAL CONDITIONS

Reactor Coolant System at 339 psig and T_{avg} at 343°F.

5.0 TEST DESCRIPTION

With the primary system in Cooldown, both malfunctions are entered with a ramp time of 10 seconds, isolating Component Cooling Water to both RHR Heat Exchangers. Integrated plant response is verified.

The malfunctions are cleared and "A" CCW Outlet Valve is opened to reestablish Cooldown. The "B" Outlet Valve is then opened and "A" Outlet Valve is closed to verify the malfunctions have cleared and Cooldown of the primary system continues.

6.0 BASELINE DATA/REFERENCES

6.1 SD-013, System Description

6.2 5379-376, Series Flow Diagrams

6.3 BS/CCW-LP-1, Lesson Plan

6.4 AOP-20, Abnormal Operating Procedure

6.5 AOP-14, Abnormal Operating Procedure

6.6 OP-306, Operating Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.2

7.0 DATE PERFORMED/TEST RESULTS 08/19/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Component Cooling Water (CCW) to Service Water Leak through Heat Exchanger Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(8)

2.0 AVAILABLE OPTIONS

Allows selection of either CCW Heat Exchanger "A" or "B" with a variable leak rate of 0-1000 gpm and a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 CCW-3A, CCW Heat Exchanger A - Leak Rate 1000 gpm - ramp time 90 seconds

3.2 CCW-3B, CCW Heat Exchanger B - Leak Rate 1000 gpm - ramp time 90 seconds

4.0 INITIAL CONDITIONS

Reactor at 100% Power

5.0 TEST DESCRIPTION

The malfunction is first inserted for "A" CCW Heat Exchanger and allowed to continue until 0% level is reached in the CCW Surge Tank, at which time all pumps are stopped. The pumps remain off until complete integrated plant response is verified. The initial conditions are then reestablished and the entire test is repeated for "B" CCW Heat Exchanger.

6.0 BASELINE DATA/REFERENCES

6.1 SD-013, System Description

6.2 5379-376, Series Flow Diagram

6.3 BS/CCW-LP-1, Lesson Plan

6.4 AOP-20, Abnormal Operating Procedure

6.5 AOP-14, Abnormal Operating Procedure

6.6 OP-306, Operating Procedure

6.7 APP-001, Annunciator Procedure

6.8 APP-002, Annunciator Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.3

7.0 DATE PERFORMED/TEST RESULTS 08/19/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Total Loss of Component Cooling Water (CCW) to Reactor Coolant Pumps Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(8), 3.1.2(4), & 3.1.2(19)

2.0 AVAILABLE OPTIONS

Allows either CCW Inlet Isolation Valve to the Reactor Coolant Pump to be failed closed (0-100%) with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1	CCW-4A, CC-716A	Failed Closed (30 seconds)
3.2	CCW-4B, CC-716B	Failed Closed (30 seconds)

4.0 INITIAL CONDITIONS

Reactor at 100% Power

5.0 TEST DESCRIPTION

Component Cooling Water to all Reactor Coolant Pumps is isolated by entering Malfunction CCW-4A. All flows, temperatures, and alarms associated with CCW and Reactor Coolant Pumps are verified to be correct. CCW is then reestablished and it is verified that flows, temperature, and alarms return to normal.

Malfunction CCW-4B is entered and the same verifications are repeated. Initial Conditions are reestablished and Malfunction CCW-4B is entered a second time until Reactor Coolant Pump bearing temperatures increase and the pumps are tripped. It is then verified that the Reactor Coolant Pumps upper and lower motor bearings trend toward Containment Vessel Ambient Air Temperature.

6.0 BASELINE DATA/REFERENCES

6.1 SD-013, System Description

6.2 5379-376, Series Flow Diagrams

6.3 BS/CCW-LP-1, Lesson Plan

6.4 AOP-20, Abnormal Operating Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.4

6.5 AOP-14, Abnormal Operating Procedure

6.6 OP-306, Operating Procedure

6.7 APP-001, Annunciator Procedure

6.8 Plant Data Package 11 - H. B. Robinson Plant Operating Experience Report
Reactor Trip - Safety Injection - All
Reactor Coolant Pumps Stopped Due to Seal Flows.

7.0 DATE PERFORMED/TEST RESULTS 09/10/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Component Cooling Water (CCW) Line Break Inside Containment Vessel Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2.8

2.0 AVAILABLE OPTIONS

Selection of leak size (0-2000 gpm) and ramp time (0-3600 seconds)

3.0 TESTED OPTIONS

3.1 CCW-6, CCW leak at 2000 gpm with a ramp time of 90 seconds

4.0 INITIAL CONDITIONS

Reactor at 100% Power

5.0 TEST DESCRIPTION

A 2000 gpm leak is introduced inside the Containment Vessel and allowed to continue until the CCW Surge Tank Level reaches 0% and the CCW Pumps are stopped.

Integrated plant response is verified to be correct including alarms, flows, temperatures, levels, and valves repositioning.

The malfunction is removed and auto makeup is established to restore the CCW Surge Tank Level. A CCW Pump is restarted and integrated plant response is verified to be correct as CCW flow is reestablished.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.6

6.0 BASELINE DATA/REFERENCES

6.1 SD-013, System Description

6.2 5379-376, Series Flow Diagram

6.3 BS/CCW-LP-1, Lesson Plan

6.4 AOP-14, Abnormal Operating Procedure

6.5 AOP-20, Abnormal Operating Procedure

6.6 APP-001, Annunciator Procedure

6.7 APP-002, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS **08/19/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Coolant Pump Bearing Oil Cooler Component Cooling Water Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(8)

2.0 AVAILABLE OPTIONS

Allows selection of leak in either upper or lower bearing oil cooler for Reactor Coolant Pump. Any combination of up to six coolers simultaneously may be selected with a leak rate variable 0-50 gpm and ramp rate 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 CCW-7A RCP "A" Upper Oil Cooler leak of 50 gpm with ramp time of 30 seconds

3.2 CCW-7B RCP "A" Lower Oil Cooler leak of 50 gpm with ramp time of 30 seconds

3.3 CCW-7C RCP "B" Upper Oil Cooler leak of 50 gpm with ramp time of 30 seconds

3.4 CCW-7D RCP "B" Lower Oil Cooler leak of 50 gpm with ramp time of 30 seconds

3.5 CCW-7E RCP "C" Upper Oil Cooler leak of 50 gpm with ramp time of 30 seconds

3.6 CCW-7F RCP "C" Lower Oil Cooler leak of 50 gpm with ramp time of 30 seconds

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

This test verifies that Malfunction CCW-7 produces the integrated plant response indicative of a Component Cooling Water leak into the Reactor Coolant Pump Bearing Oil Coolers. In addition LOA's are entered to isolate the Inlet Isolation Valves to each RCP to verify back flow occurs. All RCP Bearing Oil Coolers are tested individually.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.7

6.0 BASELINE DATA/REFERENCES

6.1 SD-013, System Description

6.2 5379-376, Flow Diagram

6.3 BS/CCW-LP-1, Lesson Plan

6.4 AOP-20, Abnormal Operating Procedure

6.5 AOP-14, Abnormal Operating Procedure

6.6 APP-001, Annunciator Procedure

6.7 APP-005, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS **10/12/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-534, RCP Oil Reservoir Hi/Lo clears when malfunction is cleared	12/31/91
90-535, Did not receive cooling water low flow alarm	12/31/91
90-536, "B" RCP vibration decreased, should have increased	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 TCV-144, Controller Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(8) & 3.1.2(18)

2.0 AVAILABLE OPTIONS

The controller may be selected to fail 0-100% closed with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

CCW-8, TC-144 Automatic Control Signal failed to 100% closed

4.0 INITIAL CONDITIONS

Plant at 100% Power, BOL

5.0 TEST DESCRIPTION

TC-144 Automatic Signal is failed to the fully closed value, isolating CCW to the Letdown Heat Exchanger. Temperatures, alarms, and valve position for the Demineralizer Diversion Valve are verified to be correct. The Valve Controller is placed in manual and opened to reestablish CCW flow to the Letdown Heat Exchanger and it is verified that temperatures decrease and the diversion valve returns to normal position.

6.0 BASELINE DATA/REFERENCES

6.1 OP-301, Operating Procedure

6.2 APP-001, Annunciator Procedure

6.3 APP-003, Annunciator Procedure

6.4 5379-376, Series Flow Diagrams

6.5 5379-685, Series Flow Diagrams

6.6 SD-013, System Description

6.7 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS **06/05/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.2.8

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 AFW Pumps Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(7)

2.0 AVAILABLE OPTIONS

Any one or combination of three pumps may be selected to trip.

3.0 TESTED OPTIONS

3.1 CFW1A AFW Pump A Trip

3.2 CFW1B AFW Pump B Trip

3.3 CFW1C Turbine Driven AFW Pump Trip

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL

5.0 TEST DESCRIPTION

This test commences with a Main Feedwater Pump in service and a malfunction inserted for "A" AFW Pump. The Main Feedwater Pump is tripped and it is verified that "A" AFW Pump will not start and "B" AFW Pump does start automatically. The malfunction is inserted for "B" AFW Pump and the trip is verified. The Turbine Driven AFW Pump is started and the malfunction for this pump is inserted and the trip verified. The malfunctions are then cleared and normal start for all AFW Pumps is verified. Correct alarms, flow, and level indications are verified for all actions.

The final section of this test reestablishes initial conditions, inserts the malfunction for "A" Pump, actuates Safety Injection, and verifies correct alarms and response for the pumps.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.1

6.0 BASELINE DATA/REFERENCES

6.1 APP-005, Annunciator Procedure

6.2 APP-006, Annunciator Procedure

6.3 G-190196, Series Flow Diagram

6.4 G-190197, Series Flow Diagram

6.5 SD-027, System Description

6.6 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Driven AFW Pump Steam Supply Break Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2.20

2.0 AVAILABLE OPTIONS

Any one or combinations of three lines may be selected with a 0-10^5 lbm/hr leak rate and a 0-3600 second ramp rate.

3.0 TESTED OPTIONS

3.1	CFW-3A	Steam Line A with a $1E^5$ lbm/hr leak rate and 10 second ramp time
3.2	CFW-3B	Steam Line B with a $1E^5$ lbm/hr leak rate and 10 second ramp time
3.3	CFW-3C	Steam Line C with a $1E^5$ lbm/hr leak rate and 10 second ramp time

4.0 INITIAL CONDITIONS

Reactor at 10^{-8} amps, no load T_{avg} and 2235 psig during normal startup from Cold Shutdown

5.0 TEST DESCRIPTION

The malfunction is entered for "A" Steam Line with the "A" Steam Line supplying the Steam Driven AFW Pump. Correct plant response is verified until the steam line isolates and the Steam Driven AFW Pump Discharge Pressure goes to zero.

The test is repeated for each steam line with the Steam Driven Pump being supplied from the line with the break.

6.0 BASELINE DATA/REFERENCES

6.1 SD-027, System Description

6.2 G-190197, Series Flow Diagram

6.3 G-190196, Series Flow Diagram

6.4 APP-007, Annunciator Procedure

6.5 OP-403, Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/10/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.3

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 AFW Line Rupture Outside CV Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20)

2.0 AVAILABLE OPTIONS

May select any combination of three Feedwater Lines with a variable leak rate of 0-900 gpm and a ramp rate of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 CFW-4A AFW Line to S/G A - 600 gpm with a ramp time of 10 seconds

3.2 CFW-4B AFW Line to S/G B - 600 gpm with a ramp time of 10 seconds

3.3 CFW-4C AFW Line to S/G C - 600 gpm with a ramp time of 10 seconds

4.0 INITIAL CONDITIONS

Reactor at 10^{-8} amps - normal operating pressure and temperature

5.0 TEST DESCRIPTION

The malfunction is first entered for the AFW Line to "A" S/G. Correct response of all S/G flows and levels is verified. The Feedwater to "A" S/G is then isolated and the same parameters are verified to be correct. The same test is performed for "B" and "C" S/G lines after reinitializing for each test.

6.0 BASELINE DATA/REFERENCES

6.1 SD-027, System Description

6.2 G-190197, Series Flow Diagrams

6.3 5379-3440, Block Diagram

6.4 OP-403, Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS **11/06/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 AFW Line Rupture Inside CV Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20)

2.0 AVAILABLE OPTIONS

May select any combination of three Feedwater Lines with a variable leak rate of 0-900 gpm and a ramp rate of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 CFW-5A AFW Line to S/G "A" - 600 gpm leak with ramp time of 10 seconds

3.2 CFW-5B AFW Line to S/G "B" - 600 gpm leak with ramp time of 10 seconds

3.3 CFW-5C AFW Line to S/G "C" - 600 gpm leak with ramp time of 10 seconds

4.0 INITIAL CONDITIONS

Reactor at 10^{-8} amps - normal operating pressure and temperature

5.0 TEST DESCRIPTION

The malfunction is first entered for the AFW Line to "A" S/G. Correct response of all S/G flows and levels is verified. AFW Discharge Pressure and Containment Sump Level is also verified to respond correctly. The Feedwater to "A" S/G is then isolated and the same parameters are verified to be correct. The same test is performed for B and C S/G lines after reinitializing for each test.

6.0 BASELINE DATA/REFERENCES

6.1 SD-027, System Description

6.2 G-190197, Series Flow Diagram

6.3 5379-3440, Block Diagram

6.4 OP-403, Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/10/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.5

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Motor Driven AFW Pump Isolation Valves Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

May select any combination of three control valves simultaneously - 0-100 percent closed with a 0-3600 second ramp time.

3.0 TESTED OPTIONS

3.1 CFW6A — AFW Isolation Valve to "A" S/G - 0% open - ramp time 0 seconds. Also 100% open - ramp time 0 seconds

3.2 CFW6B — AFW Isolation Valve to "B" S/G - 0% open - ramp time 0 seconds

3.3 CFW6C — AFW Isolation Valve to "C" S/G - 0% open - ramp time 0 seconds. Also 100% open - ramp time 0 seconds

4.0 INITIAL CONDITIONS

RX at 25% Power, BOL

5.0 TEST DESCRIPTION

A malfunction is entered to close the AFW Isolation Valve to "A" S/G. Safety Injection is then manually initiated and AFW System Operation is monitored to verify that the valve remains closed and cannot be opened manually. S/G levels and AFW flows are verified to be correct. An attempt is made to close the AFW isolation valve to "B" S/G and then Safety Injection is reset and it is verified that the "B" valve will close. The AFW valve to "C" S/G is failed open by entering a malfunction and it is verified that it cannot be closed with the malfunction entered.

The simulator is reinitialized and a malfunction is entered to close the AFW isolation valve to "B" S/G. The Reactor is tripped to establish S/G Lo Level and the same verifications are made for applicable flows, levels, and valves. In this test the AFW valve to "A" S/G is failed 100% open and it is verified that it will not close with the malfunction entered.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.6

6.0 BASELINE DATA/REFERENCES

6.1 G-190197, Flow Diagram

6.2 SD-027, System Description

6.3 B-190628, Series Control Diagram

6.4 CP-380-5379-3238, Safeguards Print

7.0 DATE PERFORMED/TEST RESULTS 09/10/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Feedwater Bypass Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9)

2.0 AVAILABLE OPTIONS

Any combination of three valves may be failed 0-100% closed with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 CFW7A "A" MFW Bypass Valve failed fully closed with ramp time of 10 seconds. Failed fully open with a ramp time of 10 seconds.

3.2 CFW7B "B" MFW Bypass Valve failed fully closed with a ramp time of 10 seconds.

3.3 CFW7C "C" MFW Bypass Valve failed fully open with a ramp time of 10 seconds.

4.0 INITIAL CONDITIONS

Turbine at 1800 rpm BOL and 100% Power, BOL

5.0 TEST DESCRIPTION

With the turbine at 1800 rpm and S/G levels being maintained by the Bypass Valve malfunctions are entered to fail "A" Bypass Valve closed, "B" Bypass Valve closed, and "C" Bypass Valve open. Verifications are made after entering each malfunction for correct indication of Feedwater Flow, S/G levels, and controller indication. It is also verified that the controller cannot position the valve with the malfunction entered and that LOA CFW will close the isolation valve for S/G "C" Bypass Valve.

The simulator is reinitialized to 100% BOL and "A" Feedwater Bypass Valve is failed fully open. Correct response of valve controllers, alarms, flows, levels, and Main Feedwater Regulating Valve is verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.7

6.0 BASELINE DATA/REFERENCES

6.1 SD-027, System Description

6.2 APP-006, Annunciator Procedure

6.3 B-190628, Series Control Diagrams

6.4 G-190197, Series Flow Diagrams

7.0 DATE PERFORMED/TEST RESULTS **09/10/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Driven AFW Flow Control Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17) and 3.1.2(22)

2.0 AVAILABLE OPTIONS

The Flow Control Valve can be failed to any position between open and closed with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

CFW8 Turbine Driven Auxiliary Feedwater Pump Flow Indicating Controllers failed to closed position with a ramp time of 30 seconds. Also failed to the full open position with a ramp time of 30 seconds.

4.0 INITIAL CONDITIONS

Reactor critical at 10^{-8} amps - normal operating pressure and temperature

5.0 TEST DESCRIPTION

The Steam Driven Auxiliary Feedwater Pump is placed in service and the malfunction is entered to fail the Flow Control Valve fully closed and then fully open. After each failure, correct response is verified for flows, pressures, indicating lights, and S/G level. In each case, the controller is placed in manual and it is verified that valve position cannot be changed with the malfunction entered.

6.0 BASELINE DATA/REFERENCES

6.1 SP-027, System Description

6.2 G-190197, Series Flow Diagram

6.3 5379-3440, Block Diagram

6.4 APP-006, Annunciator Procedure

6.5 OP-403, Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS **11/01/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.8

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.9

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Condensate Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9)

2.0 AVAILABLE OPTIONS

Fail one or both condensate simultaneously

3.0 TESTED OPTIONS

3.1 CFW9A Condensate Pump "A" Trip

3.2 CFW9B Condensate Pump "B" Trip

4.0 INITIAL CONDITIONS

24% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered to trip Condensate Pump A with one MFW Pump running. Correct plant response is verified including automatic start of "B" Condensate Pump and that the running MFW pump does not trip. The simulator is reinitialized with two MFW Pumps running and "B" Condensate Pump is tripped by entering malfunction. Correct plant response is verified including trip of "B" MFW Pump, Reactor Trip, flows, pressures, levels, and alarms.

It is also verified that "B" Condensate Pump will not start with the malfunction entered.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-010, Abnormal Operating Procedure

6.2 SD-026, System Description

6.3 AOP-006, Abnormal Operating Procedure

6.4 AOP-007, Abnormal Operating Procedure

6.5 B-190628, Series Control Diagram

6.6 MMM-006-B, Calibration Sheets

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.9

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.10

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Feedwater Isolation Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9)

2.0 AVAILABLE OPTIONS

Ability to select any combination of three valves to fail to selected positions from full open to full closed with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 CWF10A Feedwater Isolation Valve 6A failure to fully open with a ramp time of 0 seconds

3.2 CWF10B Feedwater Isolation Valve 6B failure to fully open with a ramp time of 0 seconds

3.3 CWF10C Feedwater Isolation Valve 6C failure to fully close with a ramp time of 30 seconds - also failed to fully open with a ramp time of 0 seconds

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The Feedwater Isolation Valve for S/G C is failed to full closed by entering the malfunction. Correct response is verified for indicating lights and flows to all S/G's. An attempt is made to open the failed valve and then the Bypass Valve is opened and correct indications verified. Feedwater flows, S/G levels, alarms, and Reactor Protection System Status Lights are verified correct through Reactor Trip and start of AFW Pumps.

The simulator is reinitialized and all three Feedwater Isolation Valves are failed open. A manual safety injection is initiated and it is verified that the valves remain open and cannot be closed by their control switches.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.10

6.0 BASELINE DATA/REFERENCES

6.1 AOP-010, Abnormal Operating Procedure

6.2 SD-027, System Description

6.3 APP-004, Abnormal Operating Procedure

6.4 APP-006, Abnormal Operating Procedure

6.5 APP-007, Abnormal Operating Procedure

6.6 B-190628, Series Control Diagram

6.7 PLS-1, Precautions, Limits, and Setpoints

6.8 Plant Data Package 27 - H. B. Robinson Post Trip Report - 100% Power FRV Failed Closed

6.9 Plant Data Package 10. Transient Data for H. B. Robinson Reactor Trip from 100% Power caused by F.R.V. failed closed

7.0 DATE PERFORMED/TEST RESULTS 09/10/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.12

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Heater Drain Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9)

2.0 AVAILABLE OPTIONS

Allows one or both Heater Drain Pumps to trip simultaneously.

3.0 TESTED OPTIONS

CFW-12A Heater Drain Pump "A" trip

4.0 INITIAL CONDITIONS

100% Power, BOL
68% Power, MOL

5.0 TEST DESCRIPTION

The malfunction to trip Heater Drain "A" is entered and results in a trip of the Heater Drain Pump. Realistic integrated plant response is verified. It is also verified that a low-low level in the Heater Drain Tank will trip both pumps, a low discharge pressure will trip the associated Heater Drain Pump and that a high Heater Drain Tank level is required to start either Heater Drain Pump. LOACFW for LCV-1530A Bypass Valve and XMT for PT-1582 are utilized for this test.

6.0 BASELINE DATA/REFERENCES

6.1 B-190628, Series Control Drawings

6.2 APP-007, Annunciator Procedure

6.3 SD-028, System Description

7.0 DATE PERFORMED/TEST RESULTS 09/27/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.12

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0492, Heater Drain Pumps started before level increased above the High Level Switch	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.13

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 High Pressure Feedwater Heater 6 Tube Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20), 3.1.2(9)

2.0 AVAILABLE OPTIONS

Allows selection of a leak, variable 0-10^6 lbm/hr in Feedwater 6A, 6B, or both heaters simultaneously

3.0 TESTED OPTIONS

CWF13A High Pressure Feedwater Heater 6A, leak rate of 10^6 lbm/hr with ramp time of 5 seconds

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and correct response is verified for levels, temperature, pressure, controller actions and alarms associated with heater, MSR Drain Tank and Heater Drain Tank.

6.0 BASELINE DATA/REFERENCES

6.1 SD-028, System Description

6.2 OP-407, Operating Procedure

6.3 APP-007, Annunciator Procedure

6.4 APP-008, Annunciator Procedure

6.5 G-190196, Flow Diagram

6.6 G-190197, Flow Diagram

6.7 G-190198, Series Flow Diagram

6.8 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS **10/05/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.13

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0512, Not receiving proper alarms on H.D. Tank. Normal and High Level Control Valves for H.D. Tank not programmed correctly. Need data on High High Level Controller for H.D. Tank	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.14.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Low Pressure Feedwater Heater 1A Tube Rupture Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20), 3.1.2(9)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of LP FW Heaters up to 10 for a tube break with a variable leak rate of 0-10^6 lbm/hr and ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

CFW-14A Low Pressure Feedwater Heater 1A with a leak of 10^6 lbm/hr and ramp time of 1800 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and correct response is verified for heater level, pressure, temperature, controller actions, and alarms. The effect on 2A heater is also verified.

6.0 BASELINE DATA/REFERENCES

6.1 SD-028, System Description

6.2 OP-407, Operating Procedure

6.3 APP-007, Annunciator Procedure

6.4 G-190196, Flow Diagrams

6.5 G-190197, Flow Diagrams

6.6 G-190198, Flow Diagrams

6.7 B-190628, Series Control Diagram

7.0 DATE PERFORMED/TEST RESULTS **10/05/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.14.1

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0511, Temperature response to flooded heater incorrect	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.14.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Low Pressure Feedwater Heater 3A Tube Rupture Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20), 3.1.2(9)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of LP Feedwater Heaters up to 10 for a tube break with a variable leak rate of 0-10^6 lbm/hr and ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

CFW-14E Low Pressure Feedwater Heater Tube leak of 10^6 lbm/hr and ramp time of 900 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and correct response is verified for heater level, pressure, temperature, controller actions, and alarms. The effect on 4A heater is also verified.

6.0 BASELINE DATA/REFERENCES

6.1 SD-028, System Description

6.2 OP-407, Operating Procedure

6.3 APP-007, Annunciator Procedure

6.4 G-190196, Flow Diagram

6.5 G-190198, Flow Diagram

6.6 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS **10/05/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.14.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0510, Temperature response to flooded heater incorrect	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.16

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Main Feedwater Pump Recirculation Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9)

2.0 AVAILABLE OPTIONS

Allows selection of one or both Feedwater Pump Recirculation Valves to fail to a selected position 0-100% open with ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 CFW16A Main Feedwater Pump "A" Recirculation Valve failed to closed position with ramp time of 10 seconds: also to 100% open.

3.2 CFW16B Main Feedwater Pump "B" Recirculation Valve failed to closed position with ramp time of 10 seconds: also to 100% open.

4.0 INITIAL CONDITIONS

Reactor Critical at 10^{-8} amps, Xenon Free
100% Power, BOL

5.0 TEST DESCRIPTION

The failed closed malfunction is entered with the "A" Main Feedwater Pump in service and the recirculation valve open. Correct flow response and valve position is verified. The automatic start of "B" Main Feedwater Pump and both Motor Driven Auxiliary Pumps is verified and the same test is repeated for "B" pump.

With the reactor at 100% power, the failed open malfunction is entered for "A" pump. Correct response is verified for flow to Steam Generators and recirculation flow. The Isolation Valve is closed by LOA. The simulator is reinitialized and the test repeated for "B" pump.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.16

6.0 BASELINE DATA/REFERENCES

6.1 APP-007, Annunciator Procedure

6.2 SD-027, System Description

6.3 G-190197, Series Flow Diagram

6.4 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS 10/02/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0502, Standby Pump start interlock not functional for pump trip from failure of recirculation valve.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.17

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Feedwater Control Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9)

2.0 AVAILABLE OPTIONS

Ability to select failure of any combination of three Feedwater Control Valves to positions 0-100% closed with a 0-3600 second ramp time.

3.0 TESTED OPTIONS

CFW-17 Feedwater Control Valve to S/G "A" failed to full open position with a ramp time of 10 seconds. Also to the full closed position with a ramp time of 5 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered to fail open S/G A Feedwater Control Valve. The valve is placed in manual and S/G level is stabilized after correct integrated plant response is verified. The malfunction is then cleared.

After the plant has stabilized the malfunction is entered to close S/G A Feedwater Control Valve and the valve is placed in automatic to verify the malfunction functional and correct integrated plant response is verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.17

6.0 BASELINE DATA/REFERENCES

6.1 APP-006, Annunciator Procedure

6.2 AOP-010, Abnormal Operating Procedure

6.3 B-190628, Sheet 642, Control Drawing

6.4 H. B. Robinson Updated FSAR

6.5 Plant Data Package 10 - H. B. Robinson Transient Data for Reactor Trip from 100% Power caused by F.R.V. failed closed.

6.6 Plant Data Package 27 - Post Trip Report - H. B. Robinson trip from 100% Power caused by F.R.V. failed closed.

6.7 Plant Data Package 23 - Post Trip Report - H. B. Robinson Reactor Trip from 99.6% Power caused by F.R.V. failed open.

7.0 DATE PERFORMED/TEST RESULTS 09/11/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.18

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Feedwater Break Inside Containment Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20)

2.0 AVAILABLE OPTIONS

Ability to select any combination of three feedwater lines inside Containment with a variable leak rate of 0-1.2 X 10^7 lb/hr and a ramp rate of 0-3600 seconds.

3.0 TESTED OPTIONS

CFW18C "C" Feedwater Line Break with a leak rate of 6 X 10^6 lb/hr and ramp time of 10 seconds

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and causes a feedline break inside Containment, which results in a Reactor Trip, Turbine Trip, and Safety Injection. Initial parameter response is verified prior to Reactor Trip/Safety Injection. Following Reactor Trip/Safety Injection, simulator response is verified by following the appropriate Emergency Operating Procedures until a stable condition is attained with Reactor Coolant System pressure stable. Plant parameters, alarms, and Reactor Protection System Bistable Status Lights are verified to be correct.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.18

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Procedure

6.2 Emergency Response Guidelines, Westinghouse Owners Group, Lesson Plan

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.4 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.5 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.6 EPP-7, Emergency Plant Procedure

6.7 EPP-11, Emergency Plant Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/24/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.19

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Total Loss of Feedwater Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(10), 3.1.2(19)

2.0 AVAILABLE OPTIONS

Only the tested option is available for this malfunction.

3.0 TESTED OPTIONS

CFW19 Trip or failure to start of both Main Feedwater Pumps, both Motor Driven AFW Pumps, and the Turbine Driven AFW Pump.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is inserted and results in a reactor trip, turbine trip, and a Red Path on the Heat Sink Critical Function. Initial parameter response is verified prior to the reactor trip. Following the trip, the simulator's response is verified by completion of the appropriate Emergency Operating Procedures until a stable condition is attained.

6.0 BASELINE DATA/REFERENCES

6.1 Path 1, Emergency Operating Procedure

6.2 EPP-4, Emergency Plant Procedure

6.3 EPP-7, Emergency Plant Procedure

6.4 FRP-H.1, Functional Restoration Procedure

6.5 Emergency Response Guidelines, Westinghouse Owners Group, Lesson Plan

6.6 H. B. Robinson Updated F.S.A.R

6.7 Emergency Operating Procedure Transition Documents, HBR EOP - WOG ERG

7.0 DATE PERFORMED/TEST RESULTS **10/04/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.19

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.20

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Inadvertent Feedwater Isolation Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9), 3.1.2(11), 3.1.2(19)

2.0 AVAILABLE OPTIONS

Any combination of Steam Generators can be selected individually or simultaneously.

3.0 TESTED OPTIONS

Steam Generator 'A'

4.0 INITIAL CONDITIONS

25% Power, All Auxiliary Feedwater Pumps disabled

5.0 TEST DESCRIPTION

With the Simulator at a stable 25% power condition, an Inadvertent Feedwater Isolation signal to the 'A' Steam Generator was initiated. All appropriate plant responses including alarms, interlocks, and indications were verified. Additionally, the effect of depressing the Feedwater Isolation Reset Pushbuttons for the affected and unaffected Steam Generators was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-004, APP-006, APP-008, Annunciator Procedures

6.2 Control Wiring Drawings

6.3 Logic Drawings

6.4 Misc. Relay Rack Drawings

6.5 SD-006 and SD-027, System Descriptions

7.0 DATE PERFORMED/TEST RESULTS **12/03/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.20

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0633, Improper Feedpump response when affected Steam Generator Feedwater Isolation Reset Pushbutton depressed.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.21

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 SG High Level Trip Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(11)

2.0 AVAILABLE OPTIONS

Only the tested option available

3.0 TESTED OPTIONS

CFW21 Steam Generator High Level Trip, failure of all "AND" gates in the trip circuit.

4.0 INITIAL CONDITIONS

100% BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail automatic turbine trip and feedwater isolation on high-high steam generator (SG) level using MALFUNCTION CFW21.

VERIFICATION No. 1: SG 1 High-High Level Condition

With the plant initially at 100% power and with the high-high SG level trip signal failed, the SG 1 feedwater regulating valve is shifted to manual and SG 1 level raised above the setpoint for high-high level bistable actuation. Following bistable actuation, it is verified that the turbine fails to trip, the main feedwater (MFW) pumps fail to trip, and the feedwater regulating and bypass valves fail to close.

VERIFICATION No. 2: SG 2 High-High Level Condition

With the plant initially at 100% power and with the high-high SG level trip signal failed, the SG 2 controlling level transmitter is failed low using the transmitter override function. In response to the low level signal, automatic SG water level control increases MFW flow. SG 2 level increases and the high-high level bistables on the two unaffected SG level channels trip. Following bistable actuation, it is verified that the turbine fails to trip, the main feedwater (MFW) pumps fail to trip, and the feedwater regulating and bypass valves fail to close.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.21

VERIFICATION No. 3: SG 3 High-High Level Condition

With the plant initially at 100% power and with the high-high SG level trip signal failed, two of the three SG 3 high-high level bistables are tripped using the Local Operator Action function. Following bistable actuation, it is verified that the turbine fails to trip, the Main Feedwater (MFW) Pumps fail to trip, and the Feedwater Regulating and Bypass Valves fail to close. Safety Injection is then manually actuated and it is verified that the malfunction does not affect SI initiated Feedwater Isolation, including turbine trip and MFW pump trip.

6.0 BASELINE DATA/REFERENCES

6.1 SD-006, System Description

6.2 SD-027, System Description

6.3 APP-004, Annunciator Procedure

6.4 APP-006, Annunciator Procedure

6.5 B-190197, Flow Diagram

6.6 CP-380-5379-3224, Safeguard Drawing

6.7 CP-380-5379-3236, Safeguard Drawing

6.8 CP-320-5379-3486, Hagen Drawing

6.9 CP-320-5379-3513-3518, Hagen Drawing

6.10 B-190628, Series Control Drawing

6.11 PLS-1, Precautions, Limitations, and Setpoints

6.12 MMM-006-1, Calibration Sheets

7.0 DATE PERFORMED/TEST RESULTS **07/06/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.21

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-553, SG Narrow Range level did not alarm when 1/3 channels greater than 75%	12/31/91
SG 2 Narrow Range Hi level did not alarm when 1/3 channels greater than 75%	
SG 3 Narrow Range Hi level did not alarm when Bistables were tripped	

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.24

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Feedwater Break in Main Feedwater Header Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20)

2.0 AVAILABLE OPTIONS

Variable leak rate 0-1.2 X 10^7 lb/hr with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

CFW-24 Feedwater Break in Main Feedwater Header with a leak rate of 1.2 X 10^7 lb/hr and ramp time of 10 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and initial parameter response is verified prior to reactor trip. Following reactor trip correct integrated plant response is verified including annunciator reflash capability.

6.0 BASELINE DATA/REFERENCES

6.1 APP-006, Annunciator Procedure

6.2 APP-007, Annunciator Procedure

6.3 AOP-010, Abnormal Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS **10/04/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.26

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Feed Line Break in Discharge of Main Feedwater Pump Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20)

2.0 AVAILABLE OPTIONS

Allows selection of leak in the discharge of the Main Feedwater Pump before check valve either or both pumps simultaneously with leak variable 0 - 1.2 X 10^7 lbm/hr with 0-3600 second ramp time.

3.0 TESTED OPTIONS

3.1	CFW26A	Main Feedwater Pump "A" with leak rate of 1.2 X 10^7 lbm/hr with ramp time of 10 seconds. Also leak of 1 X 10^5 lbm/hr.
3.2	CFW26B	Main Feedwater Pump "B" with leak rate of 1.2 X 10^7 lbm/hr with ramp time of 10 seconds. Also leak of 1 X 10^5 lbm/hr.

4.0 INITIAL CONDITIONS

100% Power, BOL
50% Power, Equilibrium Xenon

5.0 TEST DESCRIPTION

The malfunction is entered for Main Feedwater Pump "A" and integrated plant response is verified. The test is repeated for Main Feedwater Pump "B".

The simulator is reinitialized to 50% power and a leak of 1 X 10^5 lbm/hr is entered for MFW Pump A. Flow out of the break is verified and then LOA is used to close the MFW Pump A Suction Isolation Valve. Verification of flow going to 0 is made and the test repeated for MFW Pump "B".

6.0 BASELINE DATA/REFERENCES

6.1 AOP-010, Abnormal Operating Procedure

6.2 G-190197, Flow Diagram

7.0 DATE PERFORMED/TEST RESULTS 10/05/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.26

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0513, Did not receive proper indication of break flow	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.28

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of MFW Pump Lube Oil Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9)

2.0 AVAILABLE OPTIONS

Ability to select one or both feed pumps with a variable leak rate of 0-20 gpm and ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 CFW28A Loss of Lube Oil on Main Feedwater Pump A - 5 gpm - ramp time 0 seconds

3.2 CFW28B Loss of Lube Oil on Main Feedwater Pump B - 5 gpm - ramp time 0 seconds

4.0 INITIAL CONDITIONS

50% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for MFW Pump A with "B" MFP off. Correct response of the Auxiliary Oil Pump is verified. Automatic start of "B" MFP is verified when "A" MFW Pump trips. Automatic start of both Motor Driven AFW Pumps, Indicating Lights, and Annunciators are verified to be correct. The test is repeated with "B" MFW Pump in service and the malfunction for "B" entered.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-010, Abnormal Operating Procedure

6.2 SD-027, System Description

6.3 APP-006, Annunciator Procedure

6.4 APP-007, Annunciator Procedure

6.5 B-190628, Series Control Diagrams

6.6 MMM-006-B, Calibration Sheets

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.28

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.3.29

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Condensate Storage Tank (CST) Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9)

2.0 AVAILABLE OPTIONS

Ability to select leak rate of 0-10,000 gpm with ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

CFW29 Condensate Storage Tank leak of 10,000 gpm with ramp time of 0 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and it is verified that a leak near the bottom of the Condensate Storage Tank results. Alarm functions and integrated plant response are verified including high and low CST level alarms, loss of makeup capability to the Condenser Hotwell, ability to makeup to the CST and loss of Auxiliary Feedwater suction capability from the CST.

6.0 BASELINE DATA/REFERENCES

6.1 G-190197, Flow Diagram

6.2 G-190202, Flow Diagram

6.3 Condensate Storage Tank Curve 8.4 (Plant Data Package 35)

7.0 DATE PERFORMED/TEST RESULTS **10/12/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.4.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Condenser Air Inleakage Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(5), 3.1.2(15)

2.0 AVAILABLE OPTIONS

Ability to select a variable leak rate of 0 to 1000 SCFM with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

CND-2 Air Leakage into the Condenser at 500 SCFM and a ramp time of 90 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is inserted and plant response is verified loss of vacuum, auto start of the standby Condenser Vacuum Pump, Generator Load, Reactor Power, Alarms, Turbine Trip, and Reactor Trip.

6.0 BASELINE DATA/REFERENCES

6.1 G-190197, Flow Diagram

6.2 APP-008, Annunciator Procedure

6.3 AOP-12, Abnormal Operating Procedure

6.4 SD-26, System Description

6.5 SD-33, System Description

6.6 OP-504, Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS **10/08/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.4.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Condenser Vacuum Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(5)

2.0 AVAILABLE OPTIONS

Ability to select any combination of the vacuum pumps to trip.

3.0 TESTED OPTIONS

3.1 CND3A Condenser Vacuum Pump "A" Trip

3.2 CND3B Condenser Vacuum Pump "B" Trip

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for "A" Vacuum Pump and it is verified that Vacuum Pump "B" automatically starts when "A" trips and that proper breaker indication and alarms are received. The malfunction is then entered for Vacuum Pump "B". After verifying correct indications and responses for the breakers, both malfunctions are removed and their Control Switches are placed in "STOP". Verification is made that the pumps will not automatically start on low vacuum with their switches in "STOP".

6.0 BASELINE DATA/REFERENCES

6.1 B-190628, Series Flow Diagram

6.2 OP-504, Operating Procedure

6.3 APP-008, Annunciator Procedure

6.4 AOP-12, Abnormal Operating Procedure

6.5 SD-26, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/02/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.4.3

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.4.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Vacuum Pump Shaft Break Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(5)

2.0 AVAILABLE OPTIONS

Ability to select one or both pumps simultaneously.

3.0 TESTED OPTIONS

CND4A - Condenser Vacuum Pump A Shaft Break

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for Condenser Vacuum Pump A and correct plant response is verified including Condenser Vacuum, Breaker Indication, Generator Load, and automatic start of Condenser Vacuum Pump B.

6.0 BASELINE DATA/REFERENCES

6.1 B-190628, Series Flow Diagram

6.2 OP-504, Operating Procedure

6.3 AOP-12, Abnormal Operating Procedure

6.4 SD-26, System Description

7.0 DATE PERFORMED/TEST RESULTS **11/26/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.4.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Hotwell Level Control Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(5), 3.1.2(22)

2.0 AVAILABLE OPTIONS

Ability to select variable level between 0 and 100% with a ramp time 0-3600 seconds.

3.0 TESTED OPTIONS

CND-5 Hotwell Level Controller failed to 26 inches with ramp time of 0 and to 56 inches with ramp time of 0.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The Condensate Reject to Condensate Storage Tank Isolation Valve is opened with local operator function and the malfunction is entered to cause the Controller to lower Hotwell level. Correct responses for alarms, actual Hotwell level, and Condensate Storage Tank level are verified. The simulator is reinitialized and the isolation valve for makeup is opened with local operator function. The malfunction is entered to cause the Controller to raise Hotwell level. Correct response for the same parameters are verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-007, Annunciator Procedure

6.2 OP-504, Operating Procedure

6.3 AOP-12, Abnormal Operating Procedure

6.4 SD-26, System Description

6.5 G-190197, Flow Diagram

7.0 DATE PERFORMED/TEST RESULTS **10/08/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.4.5

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.5.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 False CV Spray Actuation Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(11)

2.0 AVAILABLE OPTIONS

Allows selection of one or both trains of Containment Spray for false actuation.

3.0 TESTED OPTIONS

3.1	CNS1A	Containment Spray Train "A", false actuation
3.2	CNS1B	Containment Spray Train "B", false actuation
3.3	EPS-13	Loss of Startup Transformer

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL

5.0 TEST DESCRIPTION

The malfunction is inserted for Train A and it is verified that spurious spray actuation occurs. The simulator is reinitialized and the malfunction is entered for Train B along with Malfunction EPS13, Loss of Startup Transformer. Verification of inadvertent spray is made. It is also verified that the train's Component Cooling Water Pump is tripped when that train's Emergency Diesel Generator is supplying its emergency bus, and both a Safety Injection Signal and Containment Spray Signal for that train exist at the same time.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.5.1

6.0 BASELINE DATA/REFERENCES

6.1 SD-006, System Description

6.2 CP-300-5379-2759, Logic Drawing

6.3 CP-300-5379-3368, Hagen Drawing

6.4 CP-380-5379-3235, Safeguard Drawing

6.5 CP-380-5379-3238, Safeguard Drawing

6.6 5379-1082, Flow Diagram

6.7 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS 07/07/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0311, Both CV Spray Pumps start with either malfunction entered RWST Level does not decrease during spray operation	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.5.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 CV Spray Pump Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

Ability to select one or both Containment Spray Pumps to fail.

3.0 TESTED OPTIONS

3.1 CNS2A Containment Spray Pump A failure

3.2 CNS2B Containment Spray Pump B failure

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for "B" Containment Spray Pump and containment spray is manually actuated for both trains. Correct response is verified for the failed pump and for the running pump. The malfunction is then entered for "A" pump and verification is made that the pump trips and that proper indications and alarms are received. Restart is attempted for both pumps with the malfunction active.

6.0 BASELINE DATA/REFERENCES

6.1 SD-006, System Description

6.2 CP-300-5379-2759, Logic Diagram

6.3 CP-380-5379-3235, Safeguards System Diagram

6.4 CP-380-5379-3236, Safeguards System Diagram

6.5 5379-1082, Flow Diagram

6.6 B-190628 Series, Control Drawing

7.0 DATE PERFORMED/TEST RESULTS 9/20/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.5.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0458 Spray Pump B did not attempt restart and then trip when control switch placed to stop.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.5.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 CV Spray Header Leak Test

1.2 ANSI/ANS 3.5, 1985, None

2.0 AVAILABLE OPTIONS

Allows selection of a leak in containment spray line for either train A or train or both simultaneously. Variable leak rate of 0-1800 gpm with a 0-3600 second ramp time.

3.0 TESTED OPTIONS

CNS3A   Containment spray line, train A, 1000 gpm leak, 30 second ramp time.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With train B containment spray pump and associated discharge valves inoperable, a containment spray signal is manually actuated from the main control board. Proper alarm and containment spray system response is verified following the actuation. The leak malfunction is then entered for train A containment spray line and response of the system to the leak is verified. Also, the containment spray pump is stopped in train A for verification of leak stoppage.

6.0 BASELINE DATA/REFERENCES

6.1 SD-002, System Description

6.2 OP-202, Operating Procedure

6.3 Piping and Instrumentation Diagrams

7.0 DATE PERFORMED/TEST RESULTS   10/04/90   SAT   UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.5.3

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0520 Refueling water storage tank level, CV spray flow, and CV pump amperage responses to CV spray actuation and header leak were not as expected. Did not receive waste disposal alarm indicative of a leak in the auxiliary building.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Power Cabinet Urgent Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(13)

2.0 AVAILABLE OPTIONS

Ability to select any combination of up to four cabinets simultaneously.

3.0 TESTED OPTIONS

3.1 CRF1 Act, 1 - Urgent Failure on Rod Drive Power Cabinet 1AC

3.2 CRF1 Act, 2 - Urgent Failure on Rod Drive Power Cabinet 2AC

3.3 CRF1 Act, 3 - Urgent Failure on Rod Drive Power Cabinet 1BD

3.4 CRF1 Act, 4 - Urgent Failure on Rod Drive Power Cabinet 2BD

4.0 INITIAL CONDITIONS

50% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for Power Cabinet 1AC and the urgent failure alarm is confirmed. The Rod Group Selector is positioned to each Shutdown Bank and Control Bank, and rods are driven it to verify that rods powered from 1AC Power Cabinet do not move and that unaffected rods do move. It is then verified that not any rods will move with the Rod Group Selector Switch in Manual or Automatic. The test is repeated for a malfunction entered for each of the other three Power Cabinets.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.1

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control System, Volumes 1, 2, and 3

6.2 CP-320-5379-3545, Hagen Wiring Diagram

6.3 CP-320-5379-3441, Hagen Wiring Diagram

6.4 APP-005, Annunciator Procedure

6.5 OP-003, Operating Procedure

6.6 SD-007, System Description

7.0 DATE PERFORMED/TEST RESULTS 06/19/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Failure of Control Rods to Move Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(13)

2.0 AVAILABLE OPTIONS

Failure in the Logic Cabinet Oscillator which generates an urgent failure alarm.

3.0 TESTED OPTIONS

CRF2 Failure in the Logic Cabinet Oscillator which generates an urgent failure alarm.

4.0 INITIAL CONDITIONS

50% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and the urgent failure alarm is verified. Each position on the Rod Group Selector Switch is sequentially selected and rod motion, in and out, is attempted in each position by use of the IN-HOLD-OUT lever. It is also verified that the rods will not move in automatic by reducing turbine load until an in demand signal is generated.

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control System, Volumes 1, 2, & 3

6.2 CP-320-5379-3545, Hagen Wiring Diagram

6.3 CP-320-5379-3441, Hagen Wiring Diagram

6.4 APP-005, Annunciator Procedure

6.5 AOP-001, Abnormal Operating Procedure

6.6 OP-003, Operating Procedure

6.7 SD-007, System Description

7.0 DATE PERFORMED/TEST RESULTS 06/16/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Dropped Control Rod Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12), 3.1.2(11), 3.1.2(17)

2.0 AVAILABLE OPTIONS

Any combination of up to four control rods can be dropped due to failure of the stationary gripper circuit.

3.0 TESTED OPTIONS

Control Bank C, Control Rod F12 dropped.

4.0 INITIAL CONDITIONS

100% Power (EOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies that a control rod can be dropped into the core using the associated dropped rod malfunction. Realistic integrated plant response following the rod drop and subsequent recovery is verified, except that automatic turbine runback is inhibited to limit observed effects to the rod drop itself.

6.0 BASELINE DATA/REFERENCES

6.1 SD-007, System Description

6.2 OP-003, Operating Procedure

6.3 AOP-001, Abnormal Operating Procedure

6.4 APP-005, Annunciator Procedure

6.5 FSAR Section 15.4

6.6 Technical Specifications

7.0 DATE PERFORMED/TEST RESULTS **12/03/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.3

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0599 Power Range Nuclear Instrumentation response to rod recovery was not as expected.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Stuck Control Rod Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12)

2.0 AVAILABLE OPTIONS

Ability to select any combination of up to four rods simultaneously that will not move and are either trippable or untrippable.

3.0 TESTED OPTIONS

3.1	CRF4A ACT2,D8	Control Rod D-8 selected to not move and be untrippable
3.2	CRF4A ACT1,D8	Control Rod D-8 selected to not move and be trippable

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for Control Rod D-8. A power reduction is initiated to cause Control Bank D to insert. When it is verified that D-8 is not moving, the Bank Selector is placed in manual, and D Bank inserted 5 steps then withdrawn 5 steps verifying D-8 will not move. An attempt is made with all Control Bank D Rods, except D-8, lift coils disconnected. The lift coils disconnect switches are closed and the reactor is manually tripped to verify D8 Rod does not trip.

The simulator is backtracked to just before the trip and the malfunction is changed to make D-8 Rod Trippable. The Reactor is tripped to verify D-8 will trip.

6.0 BASELINE DATA/REFERENCES

6.1 SD-007, System Description

6.2 AOP-001, Abnormal Operating Procedure

6.3 RDCHT-LP-3, Lesson Plan

7.0 DATE PERFORMED/TEST RESULTS   10/04/90   SAT   UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Ejected Control Rod Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12), 3.1.2(1B&C)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to four rods simultaneously for shear of CRDM housing and resulting small LOCA and rod ejection. Leak rate is variable 0-2000 gpm.

3.0 TESTED OPTIONS

CRF5A Control Rod H-8, Rod Ejection with leak rate of 2000 gpm

4.0 INITIAL CONDITIONS

Reactor Critical at 10^{-8} amps, Xenon free

5.0 TEST DESCRIPTION

The malfunction is entered and verification is made for correct response of Power and Intermediate Range Nuclear Instrumentation, Rod Position Indicating Lights, Alarms, and Indications of a LOCA.

6.0 BASELINE DATA/REFERENCES

6.1 Updated FSAR, H. B. Robinson Steam Electric Station, Unit No. 2

6.2 AOP-016, Abnormal Operating Procedure

6.3 APP-005, Annunciator Procedure

6.4 SD-007, System Description

6.5 RPS-LP-2, Lesson Plan

7.0 DATE PERFORMED/TEST RESULTS **10/04/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.5

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0509, Radiation Monitors R-2, R-11, and R-12 did not respond	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Uncontrolled Rod Motion

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12), 3.1.2(17)

2.0 AVAILABLE OPTIONS

Ability to select Rod Speed Controller failing (AUTO-IN) or the IN-HOLD-OUT Switch failing (MANUAL), or both failing simultaneously.

3.0 TESTED OPTIONS

3.1 CRF6A Uncontrolled Rod Motion (AUTO-IN) at 8 steps/min.

3.2 CRF6B Uncontrolled Rod Motion IN or OUT dependent on whether Manual IN or OUT is energized first.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction for uncontrolled automatic rod insertion is entered and then a malfunction is entered to fail T_{ref} 0.6°F low. As rods continue to step in and T_{avg} decreases. A malfunction is entered to fail rod speed to 24 steps/min. The Rod Group Selector Switch is placed in Manual to stop rod motion . The simulator is reinitialized and the malfunction is entered for uncontrolled rod motion in manual. The IN-HOLD-OUT Switch is placed to IN. Rod insertion is verified with the switch in HOLD and also in OUT. The Rod Group Selector is shifted to all positions to verify continued insertion in all except AUTO in which rod motion is verified to stop.

The simulator is reinitialized and the malfunction for manual uncontrolled rod motion reentered. The IN-HOLD-OUT lever is positioned to OUT and it is verified rod out motion continues when the lever is released and continues until the Group Selector Switch is placed in AUTO.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.6

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control System, Volumes 1, 2, &3

6.2 CP-320-5379-3545, Hagen Wiring Diagram

6.3 CP-320-5379-3441, Hagen Wiring Diagram

6.4 APP-005, Abnormal Operating Procedure

6.5 SD-007, System Description

6.6 OP-003, Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS 06/16/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Auto Rod Speed Controller Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12), 3.1.2(17)

2.0 AVAILABLE OPTIONS

Ability to fail rod speed function generator to a selected value of 1 to 72 steps/min.

3.0 TESTED OPTIONS

CRF7 Auto Rod Speed Controller failed to 60 steps/min.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The Rod Speed Signal is failed to 60 steps/min by entering the malfunction and realistic Rod Control System response is verified. It is also verified that placing Rod Control in manual allows normal speed control and that the malfunction remains when placed back in auto.

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control, Volume 1, 2, & 3

6.2 CP-320-5379-3545, Hagen Wiring Diagram

6.3 CP-320-5379-3441, Hagen Wiring Diagram

6.4 APP-005, Annunciator Procedure

6.5 OP-003, Operating Procedure

6.6 SD-007, System Description

7.0 DATE PERFORMED/TEST RESULTS 06/17/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.7

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Rod Control T_{ref} Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12), 3.1.2(17)

2.0 AVAILABLE OPTIONS

Ability to select failure of the T_{ref} signal processor to any value 547° to 575° with a ramp rate of 0-3600 seconds.

3.0 TESTED OPTIONS

CRF8 T_{ref} failure to 565°F with a ramp rate of 0 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

With the plant initially at full power and rod control in automatic, reference temperature derived from first stage turbine pressure (T_{ref}) was failed to 565°F using MALFUNCTION CRF8. Automatic inward rod motion occurred as a result of the failure until T_{avg} was reduced to the new T_{ref} value. Proper lag compensation from the T_{ref} module to the rod control system was also verified.

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control, Volume 1, 2, & 3

6.2 CP-320-5379-3545, Hagen Wiring Diagram

6.3 CP-320-5379-3441, Hagen Wiring Diagram

6.4 APP-003, Annunciator Procedure

6.5 APP-005, Annunciator Procedure

6.6 OP-003, Operating Procedure

6.7 SD-007, System Description

7.0 DATE PERFORMED/TEST RESULTS 06/16/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.8

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.10

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 IRPI Coil Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12)

2.0 AVAILABLE OPTIONS

Any combination of up to four rods may be used with a shorted or open primary or secondary coil.

3.0 TESTED OPTIONS

CRF10A ACT1, H8	Primary coil failed open on Rod H8 (all combinations for coil failure on Rod H8 are tested).

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

All combinations of this malfunction are individually entered for Control Rod H-8 with the simulator initialized before insertion of each malfunction. In all cases except secondary coil shorted and primary and secondary shorted the rod is dropped and cause a turbine runback to 70%. Correct indications and alarms are verified.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-001, Abnormal Operating Procedure

6.2 APP-005, Annunciator Procedure

6.3 SD-007, System Description

6.4 RDCNT-LP-1, Lesson Plan

6.5 300-5379-2760, Series Logic Drawings

6.6 300-5379-2755, Series Logic Drawings

7.0 DATE PERFORMED/TEST RESULTS 10/11/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.10

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.11

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Control Bank Overlap Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12)&(17)

2.0 AVAILABLE OPTIONS

Allows selection of control bank overlap failure between control bank A and B; B and C; C and D or all simultaneously.

3.0 TESTED OPTIONS

CRF11A	Improper bank overlap between bank A and B
CRF11B	Improper bank overlap between bank B and C
CRF11C	Improper bank overlap between bank C and D

4.0 INITIAL CONDITIONS

Hot Shutdown (BOL)

5.0 TEST DESCRIPTION

Each of the three overlap failure malfunctions is tested individually to verify that the malfunction will reset the overlap settings. Rod positions and correct alarm response are verified for each malfunction.

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control System, Volume 1, 2 and 3

6.2 Rod Position Indicating System Technical Manual

6.3 OP-003, Operating Procedure

6.4 APP-005, Annunciator Procedure

6.5 PLS-001, Precautions, Limitations and Setpoints Documentation

7.0 DATE PERFORMED/TEST RESULTS 12/30/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.11

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0457 Step counters for bank C did not move as expected during overlap failure.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.12

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Step Counter Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12)

2.0 AVAILABLE OPTIONS

Ability to select any Control Bank Group Step Counter to fail.

3.0 TESTED OPTIONS

CRF12 Control Bank Rod Position Step Counter failure (verification A1, A2, B1, B2, C1, C2, D1, and D2).

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL

5.0 TEST DESCRIPTION

Each Step Counter is failed in turn. It is verified that the malfunction only affects the Step Counters and does not impact actual rod movement or the Rod Bank position indication available from the ERFIS computer.

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control, Volumes 1, 2, & 3

6.2 Rod Position Indication System Technical Manual

6.3 OP-003, Operating Procedure

6.4 SD-007, System Description

7.0 DATE PERFORMED/TEST RESULTS 07/01/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.13

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Rod Speed Deadband Controller Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12), 3.1.2(17)

2.0 AVAILABLE OPTIONS

Ability to fail rod speed program to have deadband value of 0-10°F.

3.0 TESTED OPTIONS

CRF13 Rod speed program deadband is failed to a value of 10°F.

4.0 INITIAL CONDITIONS

100% BOL

5.0 TEST DESCRIPTION

The malfunction is entered and it is verified that rod control operates with a deadband selected by the malfunction.

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control System, Volumes 1, 2, & 3

6.2 CP-320-5379-3545, Hagen Wiring Diagram

6.3 CP-320-5379-3441, Hagen Wiring Diagram

6.4 AP-005, Annunciator Procedure

6.5 OP-003, Operating Procedure

6.6 SD-007, System Description

7.0 DATE PERFORMED/TEST RESULTS 06/17/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.16

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of Rod Drive MG Sets Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3), 3.1.2(12)

2.0 AVAILABLE OPTIONS

Ability to trip one or both MG's simultaneously.

3.0 TESTED OPTIONS

3.1 CRF16A Loss of Rod Drive A MG Set

3.2 CRF16B Loss of Rod Drive B MG Set

4.0 INITIAL CONDITIONS

100% BOL

5.0 TEST DESCRIPTION

Proper Control Rod Drive System resposne is verified following sequential tripping of the two Rod Drive Motor-generator (MG) sets. It is verified that, when the second MG set is tripped, Control Rods drop in but Reactor Trip Breakers do not open and the turbine does not trip.

6.0 BASELINE DATA/REFERENCES

6.1 OP-003, Operating Procedure

6.2 SD-007, System Description

6.3 SD-016, Ssytem Description

6.4 CP-300-5379-2753, Hagen Wiring Diagram

6.5 APP-004, Annunciator Procedure

6.6 APP-005, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.16

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.17

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of Power to Power Cabinets Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3), 3.1.2(12)

2.0 AVAILABLE OPTIONS

Allows the selection of Loss of Power to any combination of Control Rod Drive Power Cabinets.

3.0 TESTED OPTIONS

CRF17D Loss of Power to Power Cabinet 2BD

4.0 INITIAL CONDITIONS

10^{-8} Amps, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for Power Cabinet 2BD and verification is made for correct rods dropped, power decrease, and alarms. The Rod Group Selector is then sequentially positioned to each bank and manual insertion is made to verify correct rods move in.

6.0 BASELINE DATA/REFERENCES

6.1 Westinghouse Technical Manual, Full Length Rod Control System, Volumes 1, 2, and 3

6.2 APP-005, Annunciator Procedure

6.3 OP-003, Operating Procedure

6.4 SD-007, System Description

7.0 DATE PERFORMED/TEST RESULTS 06/17/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.17

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-292, Rod urgent failure did not inhibit rod motion demand for the Group 2 rods of the affected cabinet	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.6.18

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Bent Control Rod Shaft Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(12)

2.0 AVAILABLE OPTIONS

Ability to select any combination of up to four rods with a stuck location of 0-228 steps.

3.0 TESTED OPTIONS

CRF18A Control Rod Shaft Bent-Rod H-12 stick at 160 steps

4.0 INITIAL CONDITIONS

100% Power BOL

5.0 TEST DESCRIPTION

The malfunction is inserted and verification is made that Rod H-12 will not insert past 160 steps manually, automatically or upon Reactor Trip. The ability to withdraw the rod is verified.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-001, Abnormal Operating Procedure

6.2 RDCNT-LP-3, Lesson Plan

6.3 RPI-LP-1, Lesson Plan

6.4 SD-007, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/04/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Letdown Isolation Valves Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

2.1 Valve Selection

a. 460 A
b. 460 B

2.2 Failed Position Selection

a. 0% = Full Closed
to
b. 100% = Full Open

2.3 Ramp Time Selection

a. 0 seconds
to
b. 3600 seconds

3.0 TESTED OPTIONS

3.1 460A 100% with a 0 second ramp

3.2 460B 100% with a 0 second ramp

3.3 460A 0% with a 0 second ramp

3.4 460B 0% with a 0 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

The malfunction was entered to cause both letdown isolation valves to fail open. The main control board common control switch for these valves was positioned to CLOSE and it was verified that the valves remained open. With the common control switch returned to AUTO, it was verified that the letdown valves remained open when an automatic closure signal from low pressurizer level was present. This signal was developed by failing pressurizer level transmitter LT-460 to less than 14.4% using its transmitter override.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.1

Additionally, the malfunction was entered to cause both letdown isolation valves to fail closed in independent verifications. Integrated plant response to loss of letdown was completely verified following LCV-CVC-460B closure.

In both cases, appropriate system responses including alarms, levels, pressure, temperatures, interlocks, and control functions were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 Control Wiring Drawings

6.4 OP-301, Operating Procedure

6.5 Piping and Instrument Drawings

6.6 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 CVC-LCV-115C Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

Allows selection of Volume Control Tank Outlet Isolation Valve to fail to selected position 0-100% open with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

CVC2 LCV-115C failed to 100% open with ramp time of 0 seconds: Failed closed with a ramp time of 5 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail the Volume Control Tank (VCT) Outlet Valve (CVC-LCV-115C) both fully open and fully closed using MALFUNCTION CVC2 with the plant at 100% power.

With CVC-LCV-115C failed open, it is verified that the valve cannot be shut by either its control switch or via the low VCT level interlock. The low VCT level signal is developed by failing the two level transmitters (LT-112 and LT-115) using their transmitter overrides (LT-112 is failed to 20 percent and LT-115 is failed to 12 inches).

With CVC-LCV-115C failed closed, it is verified that CVC-LCV-115C cannot be opened with its control switch and that the emergency makeup valve (CVC-LCV-115B) automatically opens on interlock. Boration from the refueling water storage tank through CVC-LCV-115B is verified by observing an RCS temperature change.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.2

6.0 BASELINE DATA/REFERENCES

6.1 OP-301, Operating Instruction

6.2 APP-001, Annunciator Procedure

6.3 APP-003, Annunciator Procedure

6.4 5379-685, Series Flow Diagrams

6.5 5379-686, Series Flow Diagrams

6.6 SD-021, System Description

6.7 B-190628, Control Drawings

7.0 DATE PERFORMED/TEST RESULTS **10/05/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0508, LCV-115C did not close after malfunction was removed	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Letdown Line Leak Inside CV Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(18)

2.0 AVAILABLE OPTIONS

This malfunction has a selectable leak rate of 0 to 165 gpm with a 0-3600 second ramp time.

3.0 TESTED OPTIONS

3.1 10 gpm with a 0 second ramp

3.2 165 gpm with a 0 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered for two different leak rates 10 gpm and 165 gpm. In both cases, all appropriate system responses including alarms, levels, pressures, temperatures, and indication were verified. Additionally, the ability of the Radiation Monitoring System to respond to different sizes of leaks in containment was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-002, Annunciator Procedure

6.3 APP-003, Annunciator Procedure

6.4 AOP-16, Abnormal Operating Procedure

6.5 OP-301, Operating Procedure

6.6 OST-051, Operations Surveillance Test

6.7 OST-901, Operations Surveillance Test

6.8 Piping and Instrument Drawings

6.9 Plant Curve Book

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.3

6.9.1 SD-021, System Description

6.9.2 Technical Specifications

7.0 DATE PERFORMED/TEST RESULTS **12/08/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Letdown Line Leak Outside CV Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(18)

2.0 AVAILABLE OPTIONS

This malfunction has a selectable leak rate of 0 to 165 gpm with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

60 gpm with a 0 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered with a 60 gpm leak and a 0 second ramp to the Letdown Line outside Containment. Appropriate system responses including flows, levels, pressures, temperatures, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-002, Annunciator Procedure

6.3 APP-003, Annunciator Procedure

6.4 AOP-016, Abnormal Operating Procedure

6.5 OP-301, Operating Procedure

6.6 OST-051, Operations Surveillance Test

6.7 OST-901, Operations Surveillance Test

6.8 Piping and Instrument Drawings

6.9 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS **09/20/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Charging Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

2.1 Pump Selection

a. Charging Pump A
b. Charging Pump B
c. Charging Pump C

3.0 TESTED OPTIONS

All

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

The malfunction was entered to each running charging pump sequentially. All indications and alarms associated with a charging pump trip were verified. Additionally, integrated plant response to a loss of all charging flow was verified on the trip of the "C" Charging Pump.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 Control Wiring Drawings

6.4 OP-301, Operating Procedure

6.5 Piping and Instrument Drawings

6.6 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/04/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.5

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Primary Water Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17), 3.1.2(18)

2.0 AVAILABLE OPTIONS

This malfunction is selectable for the A,B, or both pumps simultaneously.

3.0 TESTED OPTIONS

Primary Water Pump A

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered when the Primary Water Pump A was supplying the system. Appropriate system responses including alarms, flows, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-003, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 PCV-145 Controller Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18), 3.1.2(22)

2.0 AVAILABLE OPTIONS

This malfunction is selectable from 0%, full open, to 100%, full closed, with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

85% with a 0 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered to the 85% closed variation, with a 0 second ramp. Appropriate system responses including alarms, flows, pressures, temperatures, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Inadvertent Low Pressurizer Level Bistable Actuation Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(11), 3.1.2(18)

2.0 AVAILABLE OPTIONS

Loss of normal letdown due to blown fuse.

3.0 TESTED OPTIONS

Loss of normal letdown due to blown fuse.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered when all Pressurizer Heaters were energized, resulting in the automatic tripping of all heaters and the isolation of letdown. Appropriate system responses, including alarms, flows, interlocks, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 Control Wiring Drawings

6.4 OP-301, Operating Procedure

6.5 Piping and Instrument Drawings

6.6 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.9

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 LCV-112 Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18), 3.1.2(22)

2.0 AVAILABLE OPTIONS

Allows failure of Volume Control Tank Divert Valve Controller in the auto mode to selected position 0-100% with a ramp rate 0-3600 seconds.

3.0 TESTED OPTIONS

CVC9 VCT Divert Valve (LCV-115A) Controller failure to 100% with 5 seconds ramp time; failure to 0% with 30 seconds ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail the letdown divert valve (CVC-LCV-115A) controller (LC-112) high and low using MALFUNCTION CVC9.

VERIFICATION No. 1: LC-112 failed high

With the plant at 100 percent power, the LC-112 automatic control signal is failed high resulting in full diversion of CVC-LCV-115A to the holdup tank (HUT). It is then verified that CVC-LCV-115A can be positioned using the valve's control switch and by taking manual control of LC-112.

VERIFICATION No. 2: LC-112 failed low

With the plant at 100 percent power, VCT level transmitter LT-112 (which provides the LC-112 level signal) is failed high to cause CVC-LCV-115A to fully divert to the HUT. The LC-112 automatic control signal is then failed low causing CVC-LCV-115A to reposition to the VCT. VCT level transmitter LT-115 is then failed high, causing CVC-LCV-115A to position back to the HUT (LT-115 high level overrides the LC-112 signal). It is then verified that CVC-LCV-115A can be positioned using the valve's control switch and by taking manual control of LC-112.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.9

6.0 BASELINE DATA/REFERENCES

6.1 OP-301, Operating Procedure

6.2 APP-001, Annunciator Procedure

6.3 APP-003, Annunciator Procedure

6.4 5379-685, Series Flow Diagram

6.5 SD-021, System Description

6.6 B-190628, Control Drawings

6.7 PLS-3, Precautions, Limitations, and Setpoints Document

7.0 DATE PERFORMED/TEST RESULTS 06/23/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0288, LCV-115A did not fully position to the holdup tank	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.11

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Non-Regenerative Heat Exchanger Tube Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(18)

2.0 AVAILABLE OPTIONS

This malfunction has a selectable leak rate of 0 to 300 gpm with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

165 gpm leak with a 5 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered with a 165 gpm leak rate and a 5 second ramp time. Appropriate system responses including alarms, flows, pressures, temperatures, and control/interlock functions were verified. Additionally, the use of Local Operator Actions and Remote Operator Actions to isolate the leak were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-002, Annunciator Procedure

6.3 APP-003, Annunciator Procedure

6.4 AOP-016, Abnormal Operating Procedure

6.5 OP-301, Operating Procedure

6.6 OST-051, Operations Surveillance Test

6.7 Piping and Instrument Drawings

6.8 Plant Curve Book

6.9 SD-013, System Description

6.9.1 SD-021, System Description

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.11

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.12

1.0 **PROCEDURE TITLE/ANSI 3.5 REFERENCE**

1.1 Seal Water Heat Exchanger Tube Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(8), 3.1.2(18)

2.0 **AVAILABLE OPTIONS**

This malfunction has a selectable leak rate of 0-100% with a 0 to 3600 second ramp time.

3.0 **TESTED OPTIONS**

200 gpm leak with a 0 second ramp

4.0 **INITIAL CONDITIONS**

100% Power (BOL)

5.0 **TEST DESCRIPTION**

This malfunction was entered with a 200 gpm leak and a 0 second ramp time. Appropriate system responses including alarms, flows, levels, and indications were verified. Additionally, the use of Local Operator Actions to isolate the Seal Water Heat Exchanger were verified.

6.0 **BASELINE DATA/REFERENCES**

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 Plant Curve Book

6.6 SD-013, System Description

6.7 SD-021, System Description

7.0 **DATE PERFORMED/TEST RESULTS** 07/01/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.12

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.13

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Plugged Boric Acid Filter Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17), 3.1.2(18)

2.0 AVAILABLE OPTIONS

This malfunction is selectable from 0% to 100% blockage with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

100% Blockage with a 10 second ramp time

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered to the 100% Blockage variation with a 10 second ramp, while a normal Boration was in progress. Appropriate system responses including flows, alarms, interlocks, and indications were verified. Additionally, the use of a Local Operator Action to bypass the Boric Acid Filter and reestablish normal system parameters was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 Control Wiring Drawings

6.4 OP-301, Operating Procedure

6.5 OWP-005, Operational Work Procedure

6.6 Piping and Instrument Drawings

6.7 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS **05/25/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.13

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.14

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Plugged RCS Filter Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

This malfunction is selectable from 0% to 100% blockage with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

100% blockage with a 60 second ramp time.

4.0 INITIAL CONDITIONS

Hot Shutdown

5.0 TEST DESCRIPTION

This malfunction was entered to the 100% plugged option with a 60 second ramp time. Appropriate System Parameters including flows, levels, pressure, and indication were verified. Additionally, the use of a Local Operator Action to bypass the filter and reestablish normal system parameters was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 07/08/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.15

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Charging Pump Speed Controller Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18), 3.1.2(22)

2.0 AVAILABLE OPTIONS

2.1 Select Pump Speed Controller

a. Charging Pump A
b. Charging Pump B
c. Charging Pump C

2.2 Select Failed Position

a. 0 = 20 gpm
to
b. 100 = 77 gpm

2.3

a. 0 seconds
to
b. 3600 seconds

3.0 TESTED OPTIONS

3.1 Charging Pump A failed to 0% with a 10 second ramp

3.2 Charging Pump B failed to 0% with a 10 second ramp

3.3 Charging Pump C failed to 100% with a 10 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the plant at 100% power and with the effected charging pump's controller in automatic, the Speed Control Signals to Charging Pump A and Charging Pump B were failed to 0% in separate verifications. All indications and alarms associated with each of these failures occurred as required. It was further verified that the malfunction prevented manual control of charging pump speed.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.15

With the plant at 100% power and with its controller in automatic, the Charging Pump C Speed Control Signal was failed to 100%. Pump speed increased as indicated by the Speed Signal Meter and Charging Flow Rate. Due to the increased Charging Flow Rate through the Regenerative Heat Exchanger, Charging Temperature, and Letdown Outlet Temperature decreased. Due to the higher Charging Flow Rate Volume Control Tank (VCT) level and pressurizer level increased. All alarms, indications, and control actions occurred as required.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 07/08/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.16

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Orifice Isolation Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

2.1 Select Failed Valve

a. 200A
b. 200B
c. 200C

2.2 Select Failed Position

a. 0% Full Closed
to
b. 100% Full Open

2.3 Select Ramp Time

a. 0
to
b. 3600 seconds

3.0 TESTED OPTIONS

3.1 200B Failed Full Open with a 5 second ramp

3.2 200C Failed Full Open with a 5 second ramp

3.3 200A Failed Full Closed with a 5 second ramp

3.4 200B Failed Full Closed with a 5 second ramp

3.5 200C Failed Full Closed with a 5 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL) 45 gpm orifice in service

5.0 TEST DESCRIPTION

The malfunction was entered to cause the two 60 gpm Orifice Isolation Valves to fail open. All indications, alarms, and interlock/control functions were verified. Additionally, the malfunction was entered causing all three Orifice Isolation Valves to fail closed. Appropriate system responses were verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.16

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.17

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Letdown Leak Before Orifice Isolation Valves Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(18)

2.0 AVAILABLE OPTIONS

Allows selection of leak in letdown line inside Containment between valve 460B and the Regenerative Heat Exchanger with a leak rate variable 0-500 gpm and 0-3600 second ramp time.

3.0 TESTED OPTIONS

CVC17 Letdown leak inside Containment upstream of Orifice Isolation Valve with leak rate of 500 gpm.

4.0 INITIAL CONDITIONS

24% Power, BOL

5.0 TEST DESCRIPTION

This test verifies that MALFUNCTION CVC17 causes a leak in the letdown line between letdown isolation valve CVC-LCV-460B and the regenerative heat exchanger inside containment.

With the plant at 25% power and with a 45 gpm letdown orifice in service, a 500 gpm leak is initiated on the letdown line inside containment. Following leak initiation, indicated letdown flow rate decreases to zero gpm and letdown pressure decreases markedly. Regenerative heat exchanger temperatures change in a manner that verifies proper leak location. Volume Control Tank (VCT) level and pressurizer level decrease at a rate consistent with the leak size. Also, containment pressure and sump levels increase at a rate consistent with the leak size.

When pressurizer level decreases to 14.4% letdown automatically isolates, isolating the leak. VCT level and pressurizer level stop decreasing and containment sump level stops increasing. All indications, alarms, and control actions associated with a leak at this location are verified.

6.0 BASELINE DATA/REFERENCES

6.1 OP-301, Operating Procedure

6.2 APP-001, Annunciator Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.17

6.3 APP-002, Annunciator Procedure

6.4 APP-003, Annunciator Procedure

6.5 5379-685, Series Flow Diagrams

6.6 SD-021, System Description

6.7 AOP-016, Abnormal Operating Procedure

6.8 OST-051, Operations Surveillance Procedure

6.9 OST-901, Operations Surveillance Procedure

6.10 Updated FSAR, H. B. Robinson Steam Electric Station Unit No. 2

6.11 Curve Book Curve 7.2

6.12 PLS-1, Precautions, Limitations, and Setpoint Document

6.13 H. B. Robinson Unit No. 2 Technical Specifications

7.0 DATE PERFORMED/TEST RESULTS **07/06/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
88-034, Radiation Monitors did not increase or alarm	12/31/91
90-0314, Improper R-11, R-12, & R-2 response to leak Improper Pressurizer Heater Alarm Response	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.18

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Auxiliary Spray Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

This malfunction is selectable from 0% (full closed) to 100% (full open) with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

100% and 0% with a 1 second ramp time

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered for two separate failures of the Auxiliary Spray Valve, full open and full closed. In both cases appropriate pressurizer system responses were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.19

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Normal and Alternate Charging Valves Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

2.1 This malfunction causes a failure of the normal (310A) and/or alternate charging valve (310B). The malfunction is selectable from 0% (full closed) to 100% (full open), with a ramp time of 0 to 3600 seconds.

3.0 TESTED OPTIONS

Both the normal and alternate fails were failed full open and full closed with a 2 second ramp time.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This malfunction was entered to fail the normal charging valve, open and then closed. It was subsequently entered. To fail the alternate charging valve open and closed. In all cases, appropriate system responses including alarms, flows, pressures, and interlocks, were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 05/25/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.19

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.21

1.0 **PROCEDURE TITLE/ANSI 3.5 REFERENCE**

1.1 CVC-LCV-115B Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 **AVAILABLE OPTIONS**

2.1 This malfunction initiates a failure of LCV-115B, the Charging Pump suction from the Refueling Water Storage Tank. It is selectable from 0% to 100% (full closed to full open) with a 0 to 3600 second ramp time.

3.0 **TESTED OPTIONS**

Full open and full closed with a 5 second ramp time.

4.0 **INITIAL CONDITIONS**

100% Power (BOL)

5.0 **TEST DESCRIPTION**

This malfunction was entered to cause two separate failures of LCV-115B (Full open and full closed). In both cases, the ability of the malfunction to inhibit automatic and manual control of LCV-115B and interlock functions were verified.

6.0 **BASELINE DATA/REFERENCES**

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 Control Wiring Drawings

6.4 OP-301, Operating Procedure

6.5 Piping and Instrument Drawings

6.6 SD-021, System Description

7.0 **DATE PERFORMED/TEST RESULTS** 06/23/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.21

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.22

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Boric Acid Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17), 3.1.2(18)

2.0 AVAILABLE OPTIONS

2.1 This malfunction can cause a failure of one, A or B, or both Boric Acid Pumps.

3.0 TESTED OPTIONS

All

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With a boration in progress, the malfunction was entered to cause a trip of the inservice Boric Acid Pump. Proper alarm, flow, and interlock functions were verified. The Standby Boric Acid Pump was then placed in service by the use of Local Operator Actions, and the Boration reinitiated. This pump was also tripped by the use of the malfunction and appropriate parameter verifications rechecked.

6.0 BASELINE DATA/REFERENCES

6.1 APP-003, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/03/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.23

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Plugged Seal Water Return Filter Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

2.1 This malfunction is selectable from 0% to 100% blockage of the Seal Water Return Filter, with a 0 to 3600 second ramp.

3.0 TESTED OPTIONS

100% blockage with a 180 second ramp time

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the plant at 100% Power, the Seal Return Filter was completely plugged by the insertion of this malfunction. Seal Water Return Flow from each RCP decreased until the Seal Water Return Line Relief Valve lifted. Seal Water Return Flow then fluctuated as the Relief Valve lifted and reseated. Proper alarms, flows, and levels were verified. Additionally, the use of a Local Operator Action to open the Bypass Valve around the Seal Return Filter and establish normal operating parameters was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 Plant Curve Book

6.6 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS **07/01/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.23

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.24

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Charging Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1), 3.1.2(B &C), 3.1.2(18)

2.0 AVAILABLE OPTIONS

2.1 This malfunction can be inserted in five separate locations within the charging system.

2.2 The leak rate is selectable from 0 to 200 gpm

2.3 The selected leak rate can be ramped in from 0-3600 seconds

3.0 TESTED OPTIONS

All five leak locations were tested at the maximum leak rate of 200 gpm with a 10 second ramp.

4.0 INITIAL CONDITIONS

Hot Shutdown

5.0 TEST DESCRIPTION

This malfunction was entered at five separate locations within the charging system. The charging systems response to these leaks was verified. This verification consisted of proper flow, pressure, temperature, level, and alarm actuation. Additionally, the ability to isolate the leak was verified where appropriate.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.24

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-002, Annunciator Procedure

6.3 APP-003, Annunciator Procedure

6.4 AOP-016, Abnormal Operating Procedure

6.5 OP-301, Operating Procedure

6.6 Plant Curve Book

6.7 Piping and Instrument Drawings

6.8 PLS-1, Plant Limitations and Setpoints

6.9 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS **07/08/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.7.25

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Makeup Selector Switch Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

This malfunction fails the Makeup Selector Switch.

3.0 TESTED OPTIONS

N/A (no options)

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

The RCS Makeup Mode Selector Switch was failed by the use of this malfunction. It was then verified that Automatic Boration, Dilution, Alternate Dilution, and Blended Makeup would not initiate. The ability to manually makeup by operation of the individual components is additionally verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-003, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 Plant Curve Book

6.6 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS **05/25/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.8.1.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Circulating Water Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(5)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to three Circulating Water Pumps to trip simultaneously.

3.0 TESTED OPTIONS

CWS1A Circulating Water Pump "A" trip

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and verification is made for initial integrated plant response indicative of a loss of a single Circulating Water Pump.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-011, Abnormal Operating Procedure

6.2 APP-008, Annunciator Procedure

6.3 SD-057, System Description

6.4 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS **10/16/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0543, Circulating Water return temperature decreased when CWP Discharge Valve closed. It should increase.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.8.1.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of Circulating Water Pumps Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(5)

2.0 AVAILABLE OPTIONS

Any combination of up to three pumps may be simultaneously selected.

2.1 Circulating Water Pump A

2.2 Circulating Water Pump B

2.3 Circulating Water Pump C

3.0 TESTED OPTIONS

All

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

The malfunctions were sequentially entered for each Circulating Water Pump. When the third Circulating Water Pump was tripped, alarm and interlock functions verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-008, Annunciator Procedure

6.2 AOP-011, Abnormal Operating Procedure

6.3 Logic Drawings

6.4 SD-025, System Description

6.5 SD-057, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/08/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.8.1.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.9.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Diesel Generator Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

Ability to select any combination of up to three Diesel Generators to fail to start or trip due to a mechanical failure of the Fuel Rack Control Mechanism.

3.0 TESTED OPTIONS

3.1 MAL EDG1A, Diesel Generator A Failure

3.2 MAL EDG1B, Diesel Generator B Failure

3.3 MAL EDG1C, Diesel Generator DS Failure

3.4 MAL SIS1A, Safety Injection Failure Train A

3.5 MAL SIS1B, Safety Injection Failure Train B

3.6 MAL EPS5A, Loss of 480V Emergency Bus E1 Feed Breaker 52-18B

3.7 MAL EPS5B, Loss of 480V Emergency Bus E2 Feed Breaker 52-28B

3.8 LOA EPS for DS Bus Normal Feed Breaker 52/32A

3.9 LOA EPS for DS Diesel Supply Breaker 52/32B (Sync)

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

Each of the three Diesel Generators is tested separately to verify the malfunction will cause a shutdown of the diesel if running or a failure to start, manually or automatically if a start is attempted. The simulator is reinitialized for each trip or fail to start test.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.9.1

6.0 BASELINE DATA/REFERENCES

6.1 B-190628, Series Control Drawings

6.2 APP-010, Annunciator Procedure

6.3 APP-021, Annunciator Procedure

6.4 APP-025, Annunciator Procedure

6.5 SD-005, System Description

6.6 SD-056, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/09/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0521, Emergency Diesel Generator "B" to Bus E2 Breaker opened with Bus E2 Feeder Breaker open and malfunction in for "B" diesel	12/31/91
Emergency Diesel Generator "A" to Bus E1 Breaker opened with Bus E1 Feeder Breaker open and malfunction in for "A" diesel	
90-0522, Malfunction EDG1C has no effect	12/31/91

EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.9.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Emergency Diesel Generator Load Sequencer Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

This malfunction simulates a failure of the Emergency Diesel Generator Load Sequencer to complete loading of selected blocks, or individual, or both trains.

2.1 Block Selection:

a. Block 2
b. Block 3
c. Block 4
d. Block 5
e. Block 6
f. Block 7
g. Block 8
h. Block 9

2.2 Train Selector:

a. Train A
b. Train B
c. Both A and B Trains

3.0 TESTED OPTIONS

ALL

4.0 INITIAL CONDITIONS

Hot Shutdown

5.0 TEST DESCRIPTION

The malfunction was entered for Individual Blocks or Separate Trains. The equipment this malfunction prevents from loading was STOPPED, if previously running. A Manual Safeguards Signal was then inserted, which would have started the individual components. Proper component responses were verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.9.4

6.0 BASELINE DATA/REFERENCES

6.1 Logic Drawings

6.2 Safeguards System Drawings

6.3 SD-006, System Description

7.0 DATE PERFORMED/TEST RESULTS 11/13/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of Instrument Buses Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

Ability to select any combination of up to nine 120 VAC Buses simultaneously for a fault causing deenergizing of the bus.

3.0 TESTED OPTIONS

3.1	EPS2A	Loss of 120 VAC Bus 1
3.2	EPS2B	Loss of 120 VAC Bus 2
3.3	EPS2C	Loss of 120 VAC Bus 3
3.4	EPS2D	Loss of 120 VAC Bus 4
3.5	EPS2E	Loss of 120 VAC Bus 5
3.6	EPS2F	Loss of 120 VAC Bus 6
3.7	EPS2G	Loss of 120 VAC Bus 7
3.8	EPS2H	Loss of 120 VAC Bus 8
3.9	EPS2I	Loss of 120 VAC Bus 9

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction for each of the nine 120 VAC instrument buses is entered individually. Verification is made that indicators, recorders, transmitters, and monitors powered from the bus deenergize. Additionally, the LOA's to reenergize instrument buses 6, 7, 8, and 9 are verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.2

6.0 BASELINE DATA/REFERENCES

6.1 AOP-24, Abnormal Operating Procedure

6.2 EOP-008, Emergency Operating Procedure

6.3 SD-016, System Description

6.4 Corporate Nuclear Safety Assessment of 125 VDC

6.5 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS **11/09/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0601, 6 recorders did not deenergize when appropriate instrument bus deenergized	12/31/91
7 recorders had pens that did not fail in proper direction	
"Channel on Test" lights did not go out when power lost for N31, N32, N35, N36, N41, and N42	
3 indicating lights for AFW valve status did not go out when appropriate power was lost	
Level Indicator for Spray Additive Tank did not fail when appropriate power was lost	
PI-957, Channel 2 Containment Pressure on ICCM Panel did not deenergize when appropriate power lost	

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of 125V DC Buses Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

Allows a failure of DC Bus for any combination of up to three buses simultaneously. The fault load is variable 1 to 1000 times normal bus current.

3.0 TESTED OPTIONS

3.1	EPS-3A	Failure of 125V DC MCC "A" with a ground fault of 100 times normal bus current.
3.2	EPS-3B	Failure of 125V DC MCC "B" with a ground fault of 100 times normal bus current.
3.3	EPS-3C	Failure of 125V DC MCC "C" with a ground fault of 100 times normal bus current.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for MCC "A" and integrated plant response is verified. All indications, alarms, and equipment actions or failures are verified. The test is then repeated for MCC "B" and MCC "C" individually.

6.0 BASELINE DATA/REFERENCES

6.1 SD-016, System Description

6.2 Corporate Nuclear Assessment of 125V DC System

6.3 OP-601, Operating Procedure

6.4 OP-603, Operating Procedure

6.5 EDP-001, Electrical Distribution Procedure

6.6 EDP-002, Electrical Distribution Procedure

6.7 EDP-004, Electrical Distribution Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.3

6.8 EDP-005, Electrical Distribution Procedure

6.9 EDP-006, Electrical Distribution Procedure

6.10 EDP-007, Electrical Distribution Procedure

6.11 AC-HO-1, Training Handout

6.12 GEN-HO-1, Training Handout

6.13 DC-HO-1, Training Handout

6.14 300-5379-3695, Logic Drawings

6.15 300-5379-4642, Logic Drawings

6.16 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS 12/08/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of 4160V Buses Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to four 4160V buses to deenergize by tripping incoming breakers.

3.0 TESTED OPTIONS

3.1	EPS4A	Loss of 4160V Bus 1
3.2	EPS4B	Loss of 4160V Bus 2
3.3	EPS4C	Loss of 4160V Bus 3
3.4	EPS4D	Loss of 4160V Bus 4

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for each 4160V bus individually. Verification is made for correct breaker operation, alarms, 4160V equipment lost, Diesel Generator starts and voltage indications. Use of LOA's to reenergize the Electrical Distribution System verifies their function.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.4

6.0 BASELINE DATA/REFERENCES

6.1 OP-603, Operating Procedure

6.2 SD-016, System Description

6.3 EDP-001, Electrical Distribution Procedures

6.4 EDP-002, Electrical Distribution Procedures

6.5 APP-003, Annunciator Procedure

6.6 APP-004, Annunciator Procedure

6.7 300-5379-2756, Logic Drawings

6.8 300-5379-4642, Logic Drawings

6.9 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS   11/08/90   SAT   UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-603, Bus No. 1 Breaker response to loss of power incorrect	12/31/91
90-604, Bus No. 2 Breaker response to loss of power incorrect	12/31/91
90-605, Bus No. 3 Breaker response to loss of power incorrect	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 E-1 and E-2 Feeder Breaker Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

Either or both Feeder Breakers to 480V Buses E-1 or E-2 can be failed.

3.0 TESTED OPTIONS

Both Feeder Breakers were individually caused to fail.

4.0 INITIAL CONDITIONS

100% Power

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, the Feeder Breakers to the 480 Volt Emergency Buses E-1 and E-2 were failed in separate verifications. All appropriate responses including alarms, interlocks, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, APP-002, and APP-008, Annunciator Procedure

6.2 EDP-002 and EDP-003, Electrical Distribution Procedure

6.3 OP-603, Operating Procedure

6.4 SD-016, System Description

7.0 DATE PERFORMED/TEST RESULTS **12/01/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Auxiliary Transformer Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

This malfunction simulates the loss of the Auxiliary Transformer

3.0 TESTED OPTIONS

N/A (no options)

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

The Auxiliary Transformer normally supplies the majority of the Electrical Distribution System when the plant is at 100% Power. The malfunction was entered and loss of appropriate portion of the Electrical Distribution System verified. Additionally, alarm and breaker Automatic Transfer/Interlocks were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-009, Annunciator Procedure

6.2 EOP-002, Emergency Operating Procedure

6.3 Logic Drawings

6.4 OP-603, Operating Procedures

6.5 SD-016, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/09/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of 480V Buses Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to five 480V buses to deenergize caused by bus fault.

3.0 TESTED OPTIONS

3.1	EPS8A	480V Bus 1 failure
3.2	EPS8B	480V Bus 2A failure
3.3	EPS8C	480V Bus 2B failure
3.4	EPS8D	480V Bus 3 failure
3.5	EPS8E	480V Bus 4 failure

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for each 480V bus individually. Verification is made for correct breaker operation, voltage indication, alarm, and 480V equipment lost.

6.0 BASELINE DATA/REFERENCES

6.1 OP-603, Operating Procedure

6.2 EDP-002, Electrical Distribution Procedure

6.3 EDP-003, Electrical Distribution Procedure

6.4 EDP-006, Electrical Distribution Procedure

6.5 EDP-007, Electrical Distribution Procedure

6.6 SD-016, System Description

6.7 APP-005, Annunciator Procedure

6.8 APP-009, Annunciator Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.8

7.0 DATE PERFORMED/TEST RESULTS 11/07/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-615, 480V Bus 3 - Electrical Fire Pump was operable after power lost to bus	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.9

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Degraded Grid Voltage Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

Grid Voltage may be selected to a value 180KV to 230KV with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

EPS-9 Degraded Grid Voltage 210KV with 60 second ramp time

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and all plant connections to the grid are monitored to verify voltage and current respond in correct direction. Generator megavars, frequency and field amps are also verified.

6.0 BASELINE DATA/REFERENCES

6.1 OP-603, Operating Procedure

6.2 SD-016, System Description

6.3 APP-009, Annunciator Procedure

6.4 AC-HO-1, Lesson Handout

6.5 EDP-002, Electrical Distribution Procedure

6.6 GEN. HO-1, Lesson Handout

6.7 AOP-27, Abnormal Operating Procedure

6.8 EDP-001, Electrical Distribution Procedure

7.0 DATE PERFORMED/TEST RESULTS **10/19/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.9

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0554, Grid Voltage did not change	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.13

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of Start-up Transformer Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

This malfunction simulates a loss of the Start-up Transformer

3.0 TESTED OPTIONS

N/A (no options)

4.0 INITIAL CONDITIONS

Hot Shutdown and 100% Power

5.0 TEST DESCRIPTION

This test verifies proper plant response to a loss of the Start-up Transformer under two different Electrical Distribution System Line-ups. When the plant is in a Hot Shutdown condition, the Start-up Transformer supplies the entire Electrical Distribution System. The malfunction was entered and loss of the Electrical Distribution System verified. The Emergency Diesel Generators started and closed on to their respective buses.

When the plant is at 100% Power, the Start-up Transformer normally supplies only a portion of the Electrical Distribution System. The malfunction was entered and loss of the appropriate portion of the Electrical Distribution System verified. The Associated Emergency Diesel Generator started and closed on to its Associated Bus.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.10.13

6.0 BASELINE DATA/REFERENCES

6.1 AC-HO-1, AC Electrical System Handout

6.2 APP-009, Annunciator Procedure

6.3 EDP-001, Electrical Distribution Procedure

6.4 EDP-002, Electrical Distribution Procedure

6.5 EDP-003, Electrical Distribution Procedure

6.6 Logic Drawings

6.7 OP-603, Operating Procedure

6.8 SD-016, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/17/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.12.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Trip on Generator Trip Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(11)

2.0 AVAILABLE OPTIONS

Turbine Trip Failure on Generator Initiated Trip

3.0 TESTED OPTIONS

Turbine Trip Failure on Generator Ground Lockout

4.0 INITIAL CONDITIONS

50% Power (BOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies that this malfunction can prevent a turbine trip following a main generator ground lockout trip. Proper integrated plant response is verified including operation of the turbine overspeed protection controller.

6.0 BASELINE DATA/REFERENCES

6.1 Control Wire Diagrams B-190628 Series
6.2 Logic Drawings
6.3 APP-008, Annunciator Procedure
6.4 APP-009, Annunciator Procedure
6.5 SD-016, System Description
6.6 GP-005, General Procedure

7.0 DATE PERFORMED/TEST RESULTS **11/14/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.12.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0430 Overspeed Protection Control light failed to illuminate during overspeed condition.	12/31/91
90-0631 Load Drop Anticipator circuit did not actuate during overspeed condition.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.12.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Generator Output Breaker Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 AVAILABLE OPTIONS

Allows selection of one or both Generator Breakers to fail to trip or to inadvertently trip.

3.0 TESTED OPTIONS

3.1 GEN3A Generator Breaker 52-8, fail to trip

3.2 GEN3B Generator Breaker 52-9, fail to trip

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for each breaker individually. The Reactor is manually tripped and it is verified that the breaker with malfunction entered does not trip. Verification is also made that correct indications occur for the turbine, generator, and other associated breaker.

6.0 BASELINE DATA/REFERENCES

6.1 APP-009, Annunciator Procedure

6.2 CP-300-5379-3695, Logic Diagram

7.0 DATE PERFORMED/TEST RESULTS **10/09/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0523, Generator Line Voltage status light does not go out when OCB 52/17 opens	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.12.5

1.0 **PROCEDURE TITLE/ANSI 3.5 REFERENCE**

1.1 Load Rejection Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(3)

2.0 **AVAILABLE OPTIONS**

This malfunction can be activated for a 0% to 100% Load Rejection.

3.0 **TESTED OPTIONS**

Load Rejection of 25%

4.0 **INITIAL CONDITIONS**

100% Power (BOL)

5.0 **TEST DESCRIPTION**

Entered at 25% Load Rejection from a stable 100% BOL condition. The integrated plant response was verified. Additional parameters verified after initiating event stabilized. No Operator Actions were taken during the course of this test.

6.0 **BASELINE DATA/REFERENCES**

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 APP-006, Annunciator Procedure

6.4 AOP-015, Abnormal Operating Procedure

6.5 Westinghouse Technical Manual

7.0 **DATE PERFORMED/TEST RESULTS** **12/01/90** **SAT** **UNSAT**

8.0 **DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES**

None

9.0 **EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION**

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.12.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Generator Trips Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(16)

2.0 AVAILABLE OPTIONS

2.1 Cause Selection

a. Generator Differential
b. Generator Ground
c. Main Transformer Fault Pressure
d. Exhaust Hood High Temperature
e. Unit Auxiliary Differential
f. Unit Auxiliary Fault Pressure
g. Unit Differential
h. Negative Sequence

2.2 Phase selection available for causes: Phase A, B, C, or none

e. Unit Auxiliary Differential
g. Unit Differential
h. Negative Sequence

3.0 TESTED OPTIONS

a. Generator Differential
b. Generator Ground
c. Main Transformer Fault Pressure
d. Exhaust Hood High Temperature
e. Unit Auxiliary Differential Phase A
f. Unit Auxiliary Fault Pressure
g. Unit Differential Phase B
h. Negative Sequence

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This Simulator Performance Test verifies that a Main Generator Trip, from each of the tested options, produces the integrated plant response associated with a loss of the Main Generator from 100% Power. Proper alarm/relay and system indications were verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.12.6

6.0 BASELINE DATA/REFERENCES

6.1 Control Wire Drawings B-190628 Series

6.2 Logic Drawings

6.3 Piping and Instrument Drawings

6.4 APP-008, Annunciator Procedure

6.5 APP-009, Annunciator Procedure

6.6 SD-016, System Description

6.7 GP-005, General Procedure

7.0 DATE PERFORMED/TEST RESULTS **11/05/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.13.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Containment Fan Cooler Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to four Containment Fan Cooler Units to trip from overcurrent relay actuation.

3.0 TESTED OPTIONS

3.1 HVA1A Containment Fan Cooler Unit HVH1 Trip

3.2 HVA1B Containment Fan Cooler Unit HVH2 Trip

3.3 HVA1C Containment Fan Cooler Unit HVH3 Trip

3.4 HVA1D Containment Fan Cooler Unit HVH4 Trip

4.0 INITIAL CONDITIONS

100% Power, BOL
Hot Standby, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for each Fan Cooler Unit with the unit in operation and verification is made for all associated indications and alarms. Reset of alarm for High Vibration is also verified.

The simulator is initialized to Hot Standby and Safety Injection is manually initiated with the malfunction entered for Fan Cooler Units 1, 2, & 3. Verification is made that these units attempt to start and then immediately trip. Verification of correct indications and alarms. The malfunction is then entered for Fan Cooler Unit 4 and the same verifications are made.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.13.1

6.0 BASELINE DATA/REFERENCES

6.1 SD-036, System Description

6.2 B-190628, Series Control Drawing

6.3 G-190304, Flow Diagram

6.4 APP-002, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/18/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0456, Alarm for CV Fan High Vibration clears before reset pushbutton is depressed.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.14.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Refueling Water Storage Tank RWST Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23), 3.1.2(1B&C)

2.0 AVAILABLE OPTIONS

Ability to select leak rate at the bottom of the RWST from 0 to 10,000 gpm with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

SIS8 Refueling Water Storage Tank leak at 10,000 gpm

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

Makeup to the RWST capability is tested utilizing local operator function - a 10,000 gpm leak malfunction is entered and integrated plant response is verified including alarm function, RWST level response, and loss of ECCS pump suction capability.

6.0 BASELINE DATA/REFERENCES

6.1 5379-1082, Series Flow Diagram

6.2 OP-301, Operating Procedure

6.3 Plant Data Package 35 - RWST, Gallons in tank VS indicated level curve

7.0 DATE PERFORMED/TEST RESULTS **09/12/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.14.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Phase A Isolation Signal Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23) & (11)

2.0 AVAILABLE OPTIONS

2.1 Inadvertent Containment Isolation Phase A (Train A)

2.2 Inadvertent Containment Isolation Phase A (Train B)

2.3 Containment Phase A (Train A) failure to actuate

2.4 Containment Phase A (Train B) failure to actuate

3.0 TESTED OPTIONS

All options listed above.

4.0 INITIAL CONDITIONS

Hot Shutdown (BOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies each train of containment phase A isolation can be failed, either preventing actuation or causing inadvertent actuation of the selected train. The valves associated with each train of containment isolation are verified to be in the proper position following each malfunction entry.

6.0 BASELINE DATA/REFERENCES

6.1 Control Wire Diagram, B-190628 Series

6.2 SD-006, System Description

6.3 Logic Diagrams

6.4 Safeguards System Diagrams

7.0 DATE PERFORMED/TEST RESULTS 01/03/91 **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.14.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.14.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Phase "B" Isolation Signal Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23), 3.1.2(11)

2.0 AVAILABLE OPTIONS

Allows selection of either Train A, Train B, or both Containment Phase B Isolation to either inadvertently actuate or fail to actuate.

3.0 TESTED OPTIONS

3.1 MSC5A Containment Phase B Isolation, failure of Train A to actuate and inadvertent actuation.

3.2 MSC5B Containment Phase B Isolation, failure of Train B to actuate and inadvertent actuation.

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL

5.0 TEST DESCRIPTION

The malfunctions are entered for each train individually. After entering the malfunction for failure to actuate, Phase B Isolation is initiated by manually actuating both trains of CV spray for A Train malfunction and LOA action to trip Containment hi hi pressure bistables for B Train malfunction. Correct valve position, alarms, and Containment Spray Status Panel lights are verified. After entering the malfunction for inadvertent operation the same verifications are made. In addition, attempt is made to open the valves with and without the Containment Phase B Reset pushbutton depressed to verify correct Valve Control response.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.14.5

6.0 BASELINE DATA/REFERENCES

6.1 SD-006, System Description

6.2 CP-380-5379-3235, Safeguard Drawing

6.3 CP-380-5379-3236, Safeguard Drawing

6.4 CP-300-5379-376, Series Flow Diagram

6.5 CP-300-5379-685, Series Flow Diagram

6.6 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS **09/12/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-436, Various valves do not attempt to open in manual when malfunction active	12/31/90

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.2.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 DBA Steam Break Outside C.V. Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20)

2.0 AVAILABLE OPTIONS

Ability to select an isolated steamline break outside Containment in any one of three steamlines with a variable leak rate of 0-10^7 lbm/hr and a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

MSS2A Steam break outside Containment, between MSIV and Check Valve on "A" Steam Generator with initial break flow of 10^7 lbm/hr and 5 seconds ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The steam line break malfunction is inserted and initial parameter response is verified prior to the Reactor Trip/Safety Injection. Following the reactor trip/safety injection, simulator response is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained which can be continued to Cold Shutdown.

6.0 BASELINE DATA/REFERENCES

6.1 PATH-1, Emergency Operating Procedure

6.2 Emergency Response Guidelines, Westinghouse Owners Group LP-1

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.4 Updated FSAR - H. B. Robinson Steam Electric Plant Unit 2

6.5 Emergency Operating Procedures Transition Documents, HBR-EOP-WOG ERG

6.6 EPP-7, Emergency Plant Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.2.1

7.0 DATE PERFORMED/TEST RESULTS 10/02/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 MSIV Fails Open Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

Ability to fail any combination up to three MSIVs simultaneous open or closed.

3.0 TESTED OPTIONS

3.1 MSS3A MSIV "A" Failure to Close

3.2 MSS3B MSIV "B" Failure to Close

3.3 MSS3C MSIV "C" Failure to Close

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for MSIV "A" failure to close and Local Operator Action is used to trip a High Steam Flow Bistable in another loop while a steam break malfunction is entered for the third loop. Integrated plant response is verified to be indicative of a Main Steam Isolation Valve failing to close when required. The test is repeated for the malfunction of each of the other Steam Line MSIVs.

6.0 BASELINE DATA/REFERENCES

6.1 CP-300-5379-2756, Series Flow Diagrams

6.2 SD-025, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/09/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Steam Generator PORV Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17), 3.1.2(20)

2.0 AVAILABLE OPTIONS

Ability to select any combination of up to three S/G PORVs simultaneously with a failed position of 0 to 100% open and ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1	MSS4A	Steam Generator "A" PORV failed to full open and full closed
3.2	MSS4B	Steam Generator "B" PORV failed to full open and full closed
3.3	MSS4C	Steam Generator "C" PORV failed to full open and full closed

4.0 INITIAL CONDITIONS

50% Power, BOL

5.0 TEST DESCRIPTION

Both open and closed failures of all three Steam Generator PORVs are verified by entering malfunctions MSS4A, MSS4B, and MSS4C in both positions. Valve response is verified on all three steam generators, while integrated plant response to a failed open PORV is only verified on "A" Steam Generator since response should be similar for the other two PORV failures.

6.0 BASELINE DATA/REFERENCES

6.1 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.2 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.3 Plant Data Package 29. H. B. Robinson Incident Report - 100% Power, S/G PORV opened

7.0 DATE PERFORMED/TEST RESULTS 11/05/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Steam Dump Controller Modulation Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17), 3.1.2(22)

2.0 AVAILABLE OPTIONS

Ability to select failed position of Steam Dump Valves 0-100% open when armed.

3.0 TESTED OPTIONS

MSS5 Condenser Steam Dump Controller failed to 100% open position

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for the Condenser Steam Dump Controller to fail to the 100% open position. Malfunction RPS1A is then entered for inadvertent Reactor Trip. Parameters are verified to be indicative of the Condenser Steam Dumps failing to modulate as the valves stay 100% open until the Low T_{avg} Bistable is energized at which time the valves close until T_{avg} increases to deenergize the bistable and the valve again opens to 100%.

6.0 BASELINE DATA/REFERENCES

6.1 SD-033, System Description

6.2 CP-300-5379-2756, Series Logic Drawings

6.3 CP-300-5379-2758, Series Logic Drawings

6.4 CP-300-5379-2759, Series Logic Drawings

6.5 CP-300-5379-3692, Series Logic Drawings

7.0 DATE PERFORMED/TEST RESULTS 10/09/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.5

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Steam Dump Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17), 3.1.2(20)

2.0 AVAILABLE OPTIONS

Ability to select any combination of up to five Condenser Steam Dump Valves stuck 0-100% closed.

3.0 TESTED OPTIONS

3.1	MSS6A	Condenser Steam Dump PRV-1324A1 failed to a stuck position of 50% open
3.2	MSS6B	Condenser Steam Dump PRV-1324A2 failed to a stuck position of 50% open
3.3	MSS6C	Condenser Steam Dump PRV-1324B1 failed to a stuck position of 50% open
3.4	MSS6D	Condenser Steam Dump PRV-1324B2 failed to a stuck position of 50% open
3.5	MSS6E	Condenser Steam Dump PRV-1324B3 failed to a stuck position of 50% open

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction for each Condenser Steam Dump Valve is entered along with a malfunction (MSS5) to fail the Steam Dump Controller to 100% open and malfunction RPS1A for inadvertent trip of Reactor. Integrated plant response indicative of a Condenser Steam Dump Valve failing to a predetermined position is verified. The test is repeated for each of the five valves.

6.0 BASELINE DATA/REFERENCES

6.1 SD-033, System Description

6.2 CP-300-5379-2756, Logic Drawing

6.3 CP-300-5379-3692, Logic Drawing

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.6

7.0 DATE PERFORMED/TEST RESULTS 10/29/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Steam Dump Permissive Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17), 3.1.2(22)

2.0 AVAILABLE OPTIONS

Ability to select either a false Low T_{avg} signal which blocks steam dump operations when required or blocks Low T_{avg} signal which allows Steam Dump Valves to remain open.

3.0 TESTED OPTIONS

3.1 RPS3 (Mode 1) False Low T_{avg} signal which blocks steam dump operation

3.2 RPS3 (Mode 2) Blocks Low T_{avg} signal causing potential uncontrolled cooldown

4.0 INITIAL CONDITIONS

100% Power, EOL

5.0 TEST DESCRIPTION

The malfunction (Mode 1) is entered in addition to the malfunction for inadvertent Reactor Trip. Integrated plant response indicative of a false Low T_{avg} signal being generated to the Steam Dump Control System is verified.

The simulator is reinitialized and the malfunction (Mode 2) is entered with the inadvertent Reactor Trip. Integrated plant response of the Steam Dump Control System failing to receive a Low T_{avg} signal is verified.

Correct response of the Steam Dump Control System is verified in all modes of operation.

6.0 BASELINE DATA/REFERENCES

6.1 SD-25, System Description

6.2 CP-300-5379-2756, Series Logic Drawings

6.3 CP-300-5379-3692, Series Logic Drawings

7.0 DATE PERFORMED/TEST RESULTS 10/11/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.7

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.9

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Main Steam Header Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20)

2.0 AVAILABLE OPTIONS

Ability to select an Isolable leak in Main Steam Header variable 0-10^7 lbm/hr with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

MSS9 Isolable leak in the Main Steam Header with 10^7 lbm/hr and 5 seconds ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and results in a Reactor Trip, Turbine Trip, Safety Injection, and Main Steam Isolation. Initial parameter response is verified prior to the Reactor Trip/Safety Injection. Following the Reactor Trip/Safety Injection, simulator response is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained.

6.0 BASELINE DATA/REFERENCES

6.1 PATH I, Emergency Operating Procedure

6.2 EPP-7, Emergency Plant Procedure

6.3 Emergency Response Guideline, Westinghouse Owners Group LP

6.4 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.5 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.6 Emergency Operating Procedures Transition Documents, HBR EOP-WOG ERG

7.0 DATE PERFORMED/TEST RESULTS **09/27/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.15.9

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Source Range Pulse Height Discriminator Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Ability to select either or both Source Range Channels with reference bias variable 0-1000 and ramp time 2-3600 seconds.

3.0 TESTED OPTIONS

3.1	NIS2A	Source Range Channel 31, Pulse Height Discriminator failure of reference bias to 0 with ramp time of 5 seconds
3.2	NIS2B	Source Range Channel 32, Pulse Height Discriminator failure of reference bias to 500 with ramp time of 5 seconds

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL Reactor Trip Breakers Shut

5.0 TEST DESCRIPTION

The Source Range Nuclear Instrument Pulse Height Discriminator is failed, using malfunction NIS2, in both the low and high direction. Correct indications, bistable action, alarms, and trip actions are verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.2

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 LP-703, Loop Calibration Procedure

6.3 SD-006, System Description

6.4 PLS-1, Precautions, Limits, and Setpoints Document

6.5 PLS-6, Precautions, Limits, and Setpoints Document

6.6 APP-004, Annunciator Procedure

6.7 APP-005, Annunciator Procedure

6.8 CP-300-5379-2754, Logic Drawing

6.9 CP-300-5379-3243, Logic Drawing

7.0 DATE PERFORMED/TEST RESULTS **05/23/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 SR NI High Volt Cutoff Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Ability to select either or both Source Range Channels for the malfunction which causes voltage to remain on after the block switches are activated.

3.0 TESTED OPTIONS

NIS3B Source Range Channel 32, High Voltage fails to disconnect.

4.0 INITIAL CONDITIONS

10^{-8} AMPS, BOL

5.0 TEST DESCRIPTION

The reactor is initially critical at 10^{-8} amps in the Intermediate Range. Proper automatic re-energization of both SR NI channels is verified by manually inserting control rods to reduce reactor power to approximately 5 X 10^{-11} amps. With both SR NIs re-energized, MALFUNCTION NIS2 is inserted to fail the SR NI Channel NI-32 high voltage cutoff circuit.

Control Rods are subsequently withdrawn to raise power above the P-6 interlock and the pushbuttons that block the SR high flux trip and provide SR detector high volts cutoff are depressed. SR NI Channel NI-31 de-energizes, but Channel NI-32 fails to de-energize due to the malfunction.

Reactor power is then increased until the NI-32 high flux trip bistable actuates at 10^5 CPS. The reactor does not trip when this bistable is tripped, demonstrating that MALFUNCTION NIS2 only affects the NI-32 high voltage cutoff function and not the high flux trip blocking function.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.3

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 GP-003, General Procedure

6.3 SD-006, System Description

6.4 SD-010, System Description]

6.5 PLS-1, Precaution, Limits, and Setpoint Document

6.6 PLS-6, Precaution, Limits, and Setpoint Document

6.7 APP-004, Annunciator Procedure

6.8 CP-300-5379-2754, Logic Drawing

6.9 CP-300-5379-2755, Logic Drawing

6.10 CP-300-5379-3243, Reactor Protection Drawing

6.11 CP-300-5379-3250, Reactor Protection Drawing

7.0 DATE PERFORMED/TEST RESULTS **05/19/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 SR NI High Volts Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Ability to select either or both Source Range Channels to fail high voltage power supply to a selected voltage 300 to 2500 volts.

3.0 TESTED OPTIONS

3.1 NIS4A — Source Range Channel 31 High Voltage failure to 1700 volts

3.2 NIS4B — Source Range Channel 32 High Voltage failure to 2500 volts

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL with Reactor Trip Breakers shut

5.0 TEST DESCRIPTION

This test verifies the ability to fail the Source Range (SR) Nuclear Instrument (NI) detector voltage using MALFUNCTION NIS4.

VERIFICATION No. 1: Detector voltage failed to 1700 volts

With the plant initially shutdown at no-load temperature, SR NI Channel NI-31 detector voltage is failed to 1700 volts. Indicated flux level for this channel decreases from approximately 60 counts per second (CPS) to approximately 8 CPS and the loss of detector voltage alarm is actuated.

VERIFICATION No. 2: Detector voltage failed to 2500 volts

With the plant initially shutdown at no-load temperature and with one bank of shutdown control rods withdrawn, SR NI Channel NI-32 detector voltage is failed to 2500 volts. Indicated flux level for this channel increases from approximately 60 CPS to a full-scale reading of 10^6 CPS, actuating the SR HIGH FLUX AT SHUTDOWN alarm and generating a SR high flux reactor trip.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.4

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 LP-703, Lesson Plan

6.3 SD-006, System Description

6.4 SD-010, System Description

6.5 PLS-1, Precautions, Limits, and Setpoint Document

6.6 PLS-6, Precautions, Limits, and Setpoint Document

6.7 APP-004, Annunciator Procedure

6.8 APP-005, Annunciator Procedure

6.9 CP-300-5379-2754, Logic Drawing

6.10 CP-300-5379-3243, Reactor Protection Drawing

7.0 DATE PERFORMED/TEST RESULTS 05/19/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 IR NI Gamma Compensation Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Ability to select either or both Channels N-35 and N-36 simultaneously with additive current values of -10^{-11} to -10^{-5} or $+10^{-11}$ to $+10^{-5}$ amps and a ramp time variable from 0-3600 seconds.

3.0 TESTED OPTIONS

NIS6A Channel 35 Gamma Undercompensation failure with output 7 X 10^{-8} amps higher than actual.

4.0 INITIAL CONDITIONS

20% Power, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail the Intermediate Range (IR) Nuclear Instrument (NI) compensating voltage using MALFUNCTION NIS6.

With the plant initially at 20 percent power, the IR NI Channel NI-35 compensating voltage is failed to add 7 X 10^{-8} amps to the normal channel output (under-compensation). The reactor is then tripped and the IR NI Channels monitored.

The affected channel indicates higher than the non-affected (NI-36) channel during the neutron flux decrease following the reactor trip and then levels off at approximately 7 X 10^{-8} amps. The non-affected channel's output continues to decrease in the normal fashion to minimum indication (10^{-11} amps).

Source Range (SR) NIs does not automatically re-energize, since both IR NI Channels must indicate less than approximately 5 X 10^{-10} amps for this function to occur. Both SR NIs re-energize when the appropriate manual pushbuttons are depressed.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.6

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrumentation System Technical Manual

6.2 SD-10, System Description

6.3 LP-704, Lesson Plan

7.0 DATE PERFORMED/TEST RESULTS **05/19/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 PR NI Detector Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Ability to select any combination up to eight Power Range Detectors simultaneously to fail from 0-70% power with ramp time 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 NIS7A Power Range Channel 41 Detector "A" failure to 0 with ramp time of 0

3.2 NIS7H Power Range Channel 44 Detector "B" failure to 0 with ramp time of 0

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail a Power Range (PR) Nuclear Instrument (NI) detector using MALFUNCTION NIS7.

With the plant initially at 100 percent power, the PR NI Channel NI-44 lower detector output is failed to 0 microamps (μA). The sudden drop in NI-44 Channel output (summed value of the upper and lower detectors) results in a PR NI dropped rod (i.e., negative rate) turbine runback and, appropriate PR NI Channel indications and alarms. The turbine runback is monitored through completion (70% power) to verify proper integrated plant response. The ability to remove NI-44 from service is then demonstrated.

To further verify proper modelling of the PR NI Dropped Rod Turbine Runback Circuit, the PR NI Channel NI-41 upper detector is failed to 0μA and it is verified that a second turbine runback does not initiate.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.7

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 SD-006, System Description

6.3 SD-010, System Description

6.4 PLS-1, Precautions, Limits, and Setpoints

6.5 PLS-6, Precautions, Limits, and Setpoints

6.6 APP-005, Annunciator Procedure

6.7 CP-300-5379-2754, Logic Drawing

6.8 CP-380-5379-3243, Reactor Protection Drawing

7.0 DATE PERFORMED/TEST RESULTS 11/23/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.9

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Incore Detector Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Ability to select any two incore detectors with a variable of 0 to 5 times the detector output.

3.0 TESTED OPTIONS

NIS9A Incore Detector "A" failed to read 20% of the actual detector signal

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

Incore Detector "A" is inserted into the core with a flux map being recorded. The malfunction is entered and it is verified that the recorded flux map during detector withdrawal is approximately 20% of the values recorded during the insertion.

6.0 BASELINE DATA/REFERENCES

6.1 WCAP-7453, Westinghouse Technical Manual for Miniature Detector Flux Mapping System, Volumes 1 and 2

6.2 FMP-008, Flux Mapping Procedure

7.0 DATE PERFORMED/TEST RESULTS **09/12/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.10

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 SR NI Fuse Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Allows the selection of either or both Service Range Channels to fail either the Instrument or Control Fuse.

3.0 TESTED OPTIONS

3.1 NIS10AI Source Range Channel 31 Instrument Power Fuse Blown

3.2 NIS10AC Source Range Channel 31 Control Power Fuse Blown

3.3 NIS10BI Source Range Channel 32 Instrument Power Fuse Blown

3.4 NIS10BC Source Range Channel 32 Control Power Fuse Blown

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL, Reactor Trip Breakers shut

5.0 TEST DESCRIPTION

This test verifies the ability to fail a Source Range (SR) Nuclear Instrument (NI) instrument power and control power fuses using MALFUNCTION NIS10.

VERIFICATION No. 1: SR NI Instrument Power Fuse Failure

With the plant initially shutdown at no-load temperature and with one bank of Shutdown Control Rods withdrawn, the Instrument Power Fuses of each of the two SR NI Channels (NI-31 and NI-32) are failed in independent verifications. Source range indication for each channel fails to minimum (10^0 CPS) and all alarms and automatic functions associated with the fail-safe nature of the NI bistables occur, including actuation of a SR High Flux Trip.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.10

VERIFICATION No. 2: SR NI Control Power Fuse Failure

With the plant initially shutdown at no-load temperature and with one bank of Shutdown Control Rods withdrawn, the Control Power Fuses of each of the two SR NI Channels (NI-31 and NI-32) are failed in independent verifications. Source range indication for each channel is not lost, but all alarms and automatic functions associated with the fail-safe nature of the NI bistables occur, including actuation of a SR High Flux Trip. The dependence of the High Flux Trip Bypass and the NIS CHANNEL TEST alarm on control power availability are tested.

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 OWP-011, Operations Work Procedure

6.3 OP-002, Operating Procedure

6.4 SD-006, System Description

6.5 SD-010, System Description

6.6 PLS-1, Precautions, Limits, and Setpoints

6.7 PLS-6, Precautions, Limits, and Setpoints

6.8 APP-004, Annunciator Procedure

6.9 APP-005, Annunciator Procedure

6.10 CP-300-5379-2754, Logic Drawing

6.11 CP-300-5379-3243, Reactor Protection Drawing

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.11

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 IR NI Fuse Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Allows the selection of either or both Intermediate Range Channels to fail either the instrument or control fuses.

3.0 TESTED OPTIONS

3.1 NIS11AI Intermediate Range Channel 35 Instrument Power Fuse blown

3.2 NIS11AC Intermediate Range Channel 35 Control Power Fuse blown

3.3 NIS11BI Intermediate Range Channel 36 Instrument Power Fuse blown

3.4 NIS11BC Intermediate Range Channel 36 Control Power Fuse blown

4.0 INITIAL CONDITIONS

10^{-8} AMPs, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail Intermediate Range (IR) Nuclear Instrument (NI) instrument power and control power fuses using MALFUNCTION NIS11.

VERIFICATION No. 1: IR NI Instrument Power Fuse Failure

With the plant initially critical at 10^{-8} amps in the IR and with one bank of shutdown control rods withdrawn, the instrument power fuses of each of the two IR NI channels (NI-35 and NI-36) are failed in independent verifications. IR indication for each channel fails to minimum (10^{-11} amps) and all alarms and automatic functions associated with the fail-safe nature of the IR NI bistables occur, including actuation of a IR high flux trip.

VERIFICATION No. 2: IR NI Control Power Fuse Failure

With the plant initially critical at 10^{-8} amps in the IR and with one bank of shutdown control rods withdrawn, the

control power fuses of each of the two IR NI channels (NI-35 and NI-36) are failed in independent verifications. IR indication for each channel is not lost, but all alarms and automatic functions associated with the fail-safe nature of the IR NI bistables occur, including actuation of a IR high flux trip. The dependence of the high flux trip bypass and the NIS CHANNEL TEST alarm on control power availability are tested.

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 OWP-011, Operations Work Procedure

6.3 OP-002, Operating Procedure

6.4 SD-006, System Description

6.5 SD-010, System Description

6.6 PLS-1, Precautions, Limits, and Setpoints

6.7 PLS-6, Precautions, Limits, and Setpoints

6.8 APP-004, Annunciator Procedure

6.9 APP-005, Annunciator Procedure

6.10 CP-300-5379-2754, Logic Drawing

6.11 CP-300-5379-2755, Logic Drawing

6.12 CP-300-5379-2760, Logic Drawing

6.13 CP-300-5379-3243, Reactor Protection Drawing

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.12

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 PR NI Fuse Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of four Power Range Channels to have indication of blown fuse. Instrument or Control Fuse may be selected.

3.0 TESTED OPTIONS

3.1 NIS12A Power Range Channel 41 Fuse Blown

3.2 NIS12B Power Range Channel 42 Fuse Blown

3.3 NIS12C Power Range Channel 43 Fuse Blown

3.4 NIS12D Power Range Channel 44 Fuse Blown

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail a Power Range (PR) Nuclear Instrument (NI) instrument power and control power fuses using MALFUNCTION NIS12.

VERIFICATION No. 1: PR NI Instrument Power Fuse Failure

With the plant initially at 100 percent power, the instrument power fuses of two of the four PR NI channels (NI-41 and NI-44) are failed in independent verifications. PR indication for each channel fails to minimum and all alarms and automatic functions associated with the fail-safe nature of the PR NI bistables are verified, including rod stops (control rod out-motion inhibit) and actuation of a PR NI dropped rod (negative rate) turbine runback. The effects of the NI-44 failure on the automatic rod control system response are also verified (NI-44 is the only PR NI with input to automatic rod control). Additionally, the ability to remove NI-41 from service is tested, including the ability to bypass the dropped rod runback signal.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.12

VERIFICATION No. 2: PR NI Control Power Fuse Failure

With the plant initially at 100 percent power, the control power fuses of two of the four PR NI channels (NI-42 and NI-43) are failed in independent verifications. PR indication for each channel is not lost and, all alarms and automatic functions associated with the fail-safe nature of the PR NI bistables is verified, including rod stop action and turbine runback. The dependence of the NI dropped rod turbine runback bypass on control power availability is also tested.

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 OWP-011, Operations Work Procedure

6.3 OP-002, Operating Procedure

6.4 SD-006, System Description

6.5 SD-010, System Description

6.6 PLS-1, Precautions, Limitations, and Setpoint Document

6.7 PLS-6, Precautions, Limitations, and Setpoint Document

6.8 APP-004, Annunciator Procedure

6.9 APP-005, Annunciator Procedure

6.10 CP-300-5379-2754, Logic Diagrams

6.10 CP-300-5379-2755, Logic Diagrams

6.11 CP-300-5379-2760, Logic Diagrams

6.12 CP-320-5379-3441, Block Diagrams

6.13 CP-320-5379-3548, Hagan Drawings

6.14 CP-380-5379-3243, Reactor Protection Drawing

6.15 CP-380-5379-3248, Reactor Protection Drawing

6.16 CP-380-5379-3250, Reactor Protection Drawing

6.17 LP-705, Lesson Plan

7.0 DATE PERFORMED/TEST RESULTS **01/03/91** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.12

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.13

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Noisy SR NI Channel Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Allows the selection of either or both Source Range Channels and applies noise to the existing signal variable 0-100% of indicated value with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

NIS13A100 Noise applied to NI-31, Source Range Channel, with a noise to signal ratio of 100.

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to increase the Source Range (SR) Nuclear Instrument (NI) noise-to-signal ratio using MALFUNCTION NIS13.

With the plant initially shutdown at no-load temperature and with one bank of shutdown control rods withdrawn, the noise-to-signal ratio of SR NI channel NI-31 is increased to 100. Indicated SR NI channel NI-31 count rate on all indications behaves erratically and NI-31 startup rate shows large positive and negative swings.

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 SD-010, System Description

6.3 APP-004, Annunciator Procedure

6.4 APP-005, Annunciator Procedure

6.5 CP-300-5379-2754, Logic Drawing

7.0 DATE PERFORMED/TEST RESULTS 05/19/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.13

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.14

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Failure of SR NI Block Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21), 3.1.2(11)

2.0 AVAILABLE OPTIONS

Allows selection of either Train A or Train B for failure to block when entering Intermediate Range due to faulty switch contact.

3.0 TESTED OPTIONS

NIS14A Failure of Source Range Channel to block - Train A

4.0 INITIAL CONDITIONS

10^{-8} Amps, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail a Source Range (SR) Nuclear Instrument (NI) high flux trip block defeat pushbutton using MALFUNCTION NIS14.

The reactor is initially critical at 10^{-8} amps in the Intermediate Range. Proper automatic re-energization of both SR NI Channels (NI-31 and NI-32) is verified by inserting control rods to reduce reactor power to approximately 5 X 10^{-11} amps. With both SR NIs re-energized, MALFUNCTION NIS14 is inserted to fail the TRAIN A (NI-31) SOURCE RANGE LOGIC TRIP DEFEAT pushbutton.

Control Rods are subsequently withdrawn to raise power above the P-6 interlock. First the TRAIN B (NI-32) SOURCE RANGE LOGIC TRIP DEFEAT pushbutton is depressed and then the TRAIN B pushbutton is depressed. Neither NI-31 or NI-32 deenergized, since both pushbuttons must operate to remove SR NI high voltage.

The NI-32 output is then increased to the high flux trip bistable setpoint (10^5 CPS) using MALFUNCTION NIS1. The reactor should not trip at this point, since the unaffected (TRAIN B) DEFEAT pushbutton should block the TRAIN B SR high flux trip; the NI-31 output is then increased to the high flux trip bistable setpoint (10^5 CPS) using MALFUNCTION NIS1. The reactor trips since Train A is not blocked.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.14

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrumentation System Technical Manual

6.2 GP-003, General Plant Procedure

6.3 SD-006, System Description

6.4 SD-010, System Description

6.5 PLS-1, Precautions, Limitations, and Setpoints Document

6.6 PLS-6, Precautions, Limitations, and Setpoints Document

6.7 APP-004, Annunciator Procedure

6.8 CP-300-5379-2754, Logic Drawing

6.9 CP-300-5379-2755, Logic Drawing

6.10 CP-380-5379-3243, Reactor Protection Drawings

6.11 CP-380-5379-3245, Reactor Protection Drawings

6.12 B-190628, Series Control Drawings

7.0 DATE PERFORMED/TEST RESULTS **05/19/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0466, Source Range Trip blocked Permissive light did not light	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.15

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Failure of SR NI to Reenergize Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(11), 3.1.2(21)

2.0 AVAILABLE OPTIONS

Allows selection of either or both Source Range Channels to fail to automatically reenergize following a reactor trip.

3.0 TESTED OPTIONS

NIS15B Failure of Source Range Channel 32 to reenergize after reactor trip.

4.0 INITIAL CONDITIONS

10^{-8} AMPs, BOL

5.0 TEST DESCRIPTION

This test verifies the ability to fail automatic and manual re-energization of a Source Range (SR) Nuclear Instrument (NI) channel using MALFUNCTION NIS15.

With the reactor initially critical at 10-8 amps in the Intermediate Range (IR), re-energization of SR NI channel NI-32 is failed. The reactor is then tripped. As neutron flux decays to less than approximately 5 X 10^{-11} amps, the IR bistables that cause automatic re-energization of the SR actuate normally; SR NI channel NI-31 re-energizes but channel NI-32 does not re-energize due to the malfunction. Actions are taken to manually re-energize NI-32, but these actions are unsuccessful due to the malfunction.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.15

6.0 BASELINE DATA/REFERENCES

6.1 Excore Nuclear Instrument System Technical Manual

6.2 GP-003, General Procedure

6.3 SD-006, System Description

6.4 SD-010, System Description

6.5 PLS-1, Precautions, Limits, and Setpoints

6.6 PLS-6, Precautions, Limits, and Setpoints

6.7 APP-004, Annunciator Procedure

6.8 CP-300-5379-2754, Logic Drawing

6.9 CP-300-5379-2755, Logic Drawing

6.10 CP-380-5379-3243, Reactor Protection Drawing

6.11 CP-380-5379-3250, Reactor Protection Drawing

7.0 DATE PERFORMED/TEST RESULTS **05/19/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.16

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 NI51/NI52 Loss of High Voltage Power Supply

1.2 ANSI/ANS 3.5, 1985, 3.1.2(21)

2.0 AVAILABLE OPTIONS

Allows the selection of either or both N51 and N52, Full Range Neutron Detectors, for loss of high voltage with a delay time variable 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 MSC3N51 Full Range Neutron Detector, N51, high voltage failure

3.2 MSC3N52 Full Range Neutron Detector, N52, high voltage failure

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for Full Range Neutron Detector N51 and correct indication and alarms are verified. The malfunction is cleared and it is verified that indications and alarms return to normal. The malfunction is entered again and the reactor is tripped to verify correct response of Source Range Count Rate indication. The test is repeated for Full Range Neutron Detector N52.

6.0 BASELINE DATA/REFERENCES

6.1 SD-010, System Description

6.2 OP-002, Operating Procedure

6.3 APP-036, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/27/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.16.16

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Pressurizer Steam Space Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(18)

2.0 AVAILABLE OPTIONS

Allows the introduction of a leak on flange of Pressurizer Safety Valve with a leak rate variable 0-4 X 10^6 lbm/hr and a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

PRS1 Pressurizer Steam space leak of 4500 lbm/hr with a ramp time of 30 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and correct integrated plant response is verified. Correct response is verified for pressurizer level and temperature, containment temperature, and pressure, area radiation monitors, process radiation monitors, and the Chemical and Volume Control System. The malfunction is removed and it is verified that parameters return to normal.

6.0 BASELINE DATA/REFERENCES

6.1 SD-59, System Description

6.2 APP-002, Annunciator Procedure

6.3 5379-3235, Safeguard System Drawing

6.4 OMM-014, Operations Management Manual

6.5 AOP-005, Abnormal Operating Procedure

6.6 OP-920, Operating Procedure

6.7 SD-19, System Description

6.8 AOP-16, Abnormal Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS 12/01/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.1

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Pressurizer Spray Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18),(19) & (22)

2.0 AVAILABLE OPTIONS

Allows selection of one or both pressurizer spray valves to fail to selected position (0-100% open) with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

PRS2A — Pressurizer spray valve, PCV-455A, failed to closed position with a ramp time of 5 seconds; also failed open.

PRS2B — Pressurizer spray valve, PCV-455B, failed to closed position with a ramp time of 5 seconds; also failed open.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies the proper response of the pressurizer pressure control system to both a failed closed and failed open pressurizer spray valve. The response of the pressurizer pressure controller, pressurizer heaters, non-affected spray valve and associated instrumentation and alarms are verified in each case. Included in this test is a verification that pressurizer spray flow can be minimized by stopping the reactor coolant pump in the reactor coolant loop with the failed open spray valve.

6.0 BASELINE DATA/REFERENCES

6.1 SD-059, System Description

6.2 Block Diagrams

6.3 AOP-019, Abnormal Operating Procedure

6.4 Flow Diagrams

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.2

7.0 DATE PERFORMED/TEST RESULTS 01/07/91 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Pressurizer PORV Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1C&D), 3.1.2(18)

2.0 AVAILABLE OPTIONS

Ability to fail one or both Pressurizer PORV's simultaneously with or without the 2000 psig interlock functional. Allows failure to position of 0-100% open with ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1	PRS3A	Pressurizer PORV-456 failure to full open with 2000 psig interlock functional
3.2	PRS3C	Pressurizer PORV-456 failure to full open with 2000 psig interlock not functional

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered with the 2000 psig interlock functional and it is verified the PORV will cycle open and closed above the interlock pressure.

The simulator is reinitialized and the malfunction is entered without the 2000 psig interlock functional. For this malfunction, initial parameter response is verified prior to the reactor trip/safety injection. Following the reactor trip/safety injection, simulator response is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.3

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Procedure

6.2 Emergency Response Guidelines, Westinghouse Owners Group, LP

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners' Group

6.4 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.5 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.6 EPP-7, Emergency Plant Procedure

7.0 DATE PERFORMED/TEST RESULTS **12/08/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Pressurizer Safety Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1C&D), 3.1.2(18)

2.0 AVAILABLE OPTIONS

Allows any combination of up to three Pressurizer Safety Valves to be failed to selected position 0-100% open with a 0-3600 second ramp time.

3.0 TESTED OPTIONS

PRS4A Safety Valve 551A failed to 100% open position with a 5 second ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

Pressurizer Safety Valve 551A fails open and results in a depressurization of the Reactor Coolant System, Turbine Runback, Reactor Trip, Turbine Trip, Safety Injection, and rupture of the Pressurizer Relief Tank Rupture Disk with resultant flow to the Containment. Correct parameter response is verified for the event along with alarm and protective system action. Following the reactor trip/safety injection, simulator response is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.4

6.0 BASELINE DATA/REFERENCES

6.1 Path I, Emergency Operating Procedures

6.2 Emergency Response Guideline, Westinghouse Owner Group, LP

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.4 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.5 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.6 EPP-8, Emergency Plant Procedures

7.0 DATE PERFORMED/TEST RESULTS **10/19/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0555, Area Radiation Monitor R-2, no response Area Radiation Monitor R-7, no response No area Radiation Monitor Hi Rad Alarm	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Pressurizer Backup Heater Group Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

Allows selection of Backup Heater Group A or B or both to fail simultaneously.

3.0 TESTED OPTIONS

3.1 PRS5A Failure of Backup Heater Group A

3.2 PRS5B Failure of Backup Heater Group B

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for both groups of backup heaters and pressurizer spray is activated to reduce pressurizer pressure. The failure of both groups to energize is verified after which the malfunctions are cleared to verify the heaters will energize with the malfunction removed.

Pressurizer level is increased with the malfunction entered for both backup heaters to verify that they will not energize from high level. The malfunctions are removed to verify the heaters will energize on high level with the malfunctions removed. The same verifications are made for the manual selector switches.

6.0 BASELINE DATA/REFERENCES

6.1 SD-059, System Description

6.2 5379-3436, Block Diagrams

6.3 5379-3439, Block Diagrams

6.4 CP-300-5379-3693, Logic Diagram

6.5 CP-300-5379-3694, Logic Diagram

7.0 DATE PERFORMED/TEST RESULTS 10/15/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.5

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Pressurizer Pressure Control Band Shift Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18), 3.1.2(22)

2.0 AVAILABLE OPTIONS

Allows shift of Pressurizer Pressure Controller band to be shifted -550 to +250 PSIA with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

PRS-6 Pressurizer Pressure Controller shift of +25 psia and -25 psia

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered to first cause the controller to control 25 psia high and then to cause the controller to control 25 psia low. Correct pressurizer control actions and indications are verified in each case.

6.0 BASELINE DATA/REFERENCES

6.1 APP-003, Abnormal Operating Procedure

6.2 B-190628, Flow Diagram

6.3 5379-3436, Block Diagram

6.4 5379-3439, Block Diagram

6.5 SD-59, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/10/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.17.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Pressurizer Level Control Band Shift Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(22) & (18)

2.0 AVAILABLE OPTIONS

Pressurizer level control reference no-load Tavg shift with selection between 547 - 575.4 deg. F and selectable ramp time of 0 to 3600 seconds

3.0 TESTED OPTIONS

Pressurizer level control band shift, with a misalignment to 575.4 deg. F and a ramp time of 10 seconds.

4.0 INITIAL CONDITIONS

50% Power (BOL)

5.0 TEST DESCRIPTION

This simulator performance test verifies that a pressurizer control band shift will result when the malfunction is entered. In this test, the no-load Tave value is failed to 574.5 deg. F. which causes the pressurizer reference level to fail to a minimum value. Pressurizer level control system and associated instrumentation response to this control band shift is verified. Also, this test verifies recovery of the pressurizer level control system to normal after the malfunction is removed.

6.0 BASELINE DATA/REFERENCES

6.1 SD-059, System Description

6.2 5379-3436, Block Diagram

6.3 APP-003, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS **12/24/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 DBA RCS Hot Leg LOCA Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C)

2.0 AVAILABLE OPTIONS

Allows selection of any combination up to three leaks simultaneously from any hot leg or cold leg. Leak size is variable from 0 to 100% of DBA flow with ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

RCS1D RCS Loop 2 Hot Leg 100% DBA flow with 100 second ramp time

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and results in a reactor trip, turbine trip, safety injection, and containment spray. Correct parameter response is verified during the performance of this test. Following the reactor trip/safety injection, simulator response is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained.

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Procedure

6.2 Emergency Response Guidelines, Westinghouse Owners Group, LP

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.4 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.5 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.1

6.6 EPP-9, Emergency Plant Procedure

6.7 EPP-10, Emergency Plant Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/25/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
89-0337, Incore thermocouple incorrectly spikes to high temperature when switching to cold leg recirculation.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Coolant Pump (RCP) Locked Rotor Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(4)

2.0 AVAILABLE OPTIONS

Allows the selection of any combination of RCP's up to three pumps simultaneously to have a locked rotor and vibration of 0-30 mils

3.0 TESTED OPTIONS

RCS3C Reactor Coolant Pump C Locked Rotor

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

Malfunction RCS3C is entered and causes a locked rotor on Reactor Coolant Pump "C" with subsequent reactor trip and turbine trip. Initial parameter response is verified for this event. Subsequent to the trip, verification is made by using the appropriate Emergency Operating Procedures until a stable, controllable, and safe conditions is attained.

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Instructions

6.2 Emergency Response Guidelines, Westinghouse Owner's Group, LP

6.3 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.4 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.5 EPP-4, Emergency Plant Procedure

7.0 DATE PERFORMED/TEST RESULTS **10/01/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.3

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Variable Boron Concentration Function Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17)

2.0 AVAILABLE OPTIONS

Allows changing Boron Concentration in the Reactor Coolant System at a selectable rate with final concentration variable 0-3000 ppm and ramp time 0-3600 seconds.

3.0 TESTED OPTIONS

RCS5 Reactor Coolant System Boron Concentration to 640 ppm with a 300 second ramp time - also, to 740 ppm with 300 second ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is first entered to decrease Reactor Coolant System Boron Concentration and then entered to increase Boron Concentration. In both cases correct integrated plant response is verified including Boron Concentration, T_{avg}, Reactor Power, Pressurizer Level, Charging Pump Speed, and Control Rod response.

6.0 BASELINE DATA/REFERENCES

6.1 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/19/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.9.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 RCS Small Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of RCS leak up to three leaks simultaneously. Leaks may be selected from either Hot or Cold Leg with a variable rate of 0-1000 gpm and ramp time 0-3600 seconds.

3.0 TESTED OPTIONS

RCS9B Reactor Coolant System, Loop 1 Hot Leg 50 gpm leak, 0 ramp time

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and results in pressurizer level cycling as letdown flow secures and initiates. Realistic integrated plant response is verified including Chemical Volume Control Systems Operation, Containment Atmospheric Conditions, Controller Actions, and Annunciators/Alarms received.

6.0 BASELINE DATA/REFERENCES

6.1 CP-300-5379, Series Flow Diagram

6.2 SD-001, System Description

6.3 AOP-016, Abnormal Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS 10/18/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.9.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 RCS Small LOCA Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C)

2.0 AVAILABLE OPTIONS

Allows selection of any combination up to three leaks simultaneously from any hot leg or cold leg. Leak size is variable from 0 to 100% of DBA flow with ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

RCS9C RCS Loop 2, Cold Leg, 1000 gpm leak with 100 second ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and results in a reactor trip, turbine trip, and safety injection. Initial parameter response is verified prior to the reactor trip/safety injection. Following the reactor trip/safety injection simulator response is verified by completion of the appropriate operating procedures until a stable, controllable, and safe condition is attained.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.9.2

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Procedure

6.2 Emergency Response Guidelines, Westinghouse Owners Group, LP

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.4 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.5 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.6 EPP-9, Emergency Plant Procedure

6.7 EPP-10, Emergency Plant Procedure

7.0 DATE PERFORMED/TEST RESULTS **10/02/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0498, Containment Pressure response not correct	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.12

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Coolant Pump Thermal Barrier Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(8)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to three Reactor Coolant Pumps with Thermal Barrier Leaks of 0-400 gpm with ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 RCS-12A Reactor Coolant Pump A Thermal Barrier leak rate of 400 gpm with ramp time of 30 seconds

3.2 RCS-12B Reactor Coolant Pump B Thermal Barrier leak rate of 400 gpm with ramp time of 30 seconds

3.3 RCS-12C Reactor Coolant Pump C Thermal Barrier leak rate of 400 gpm with ramp time of 30 seconds

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for Reactor Coolant Pump A and correct plant response is verified. Verifications include Thermal Barrier Indications and alarms, Component Cooling Water Surge Tank Level, Automatic Valve actuation, and Safety Injection Status Lights. The test is repeated for RCPB and RCPC.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.12

6.0 BASELINE DATA/REFERENCES

6.1 AOP-18, Abnormal Operating Procedure

6.2 APP-001, Annunciator Procedure

6.3 BS/RCS-LP-1, Lesson Plan

6.4 5379-376, Flow Diagram

6.5 5379-685, Flow Diagram

6.6 5379-1971, Flow Diagram

6.7 B-190628, Control Diagram

6.8 SD-001, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/10/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.13

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Coolant Pump #1 Seal Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(4)

2.0 AVAILABLE OPTIONS

Allows number one seal failure to be entered for any combination of up to three Reactor Coolant Pumps with a variable leak rate of 0-400 gpm and ramp time 0-3600 seconds.

3.0 TESTED OPTIONS

RCS-13A Reactor Coolant Pump A, #1 seal failure with leak rate of 10 gpm and ramp time of 30 seconds

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for RCP "A" and correct response is verified for all seal leakoff indications and alarms. Chemical and Volume Control System Response is also verified to be correct.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-18, Abnormal Operating Procedure

6.2 APP-001, Annunciator Procedure

6.3 BS/RCS-LP-1, Lesson Plan

6.4 SD-021, System Description

6.5 5379-376, Flow Diagram

6.6 5379-685, Flow Diagram

6.7 5379-1971, Flow Diagram

7.0 DATE PERFORMED/TEST RESULTS 10/30/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.13

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.14

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Coolant Pump A No. 2 Seal Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(4), 3.1.2(1B&C)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to three pumps for No. 2 seal failure with leak rate variable 0-400 gpm and 0-3600 second ramp time.

3.0 TESTED OPTIONS

RCS14A Reactor Coolant Pump A, No. 2 seal failure with a 3 gpm leak rate and 30 second ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and verification is made for correct response for leak off flows, Reactor Coolant Drain Tank level and alarms.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-018, Abnormal Operating Procedure

6.2 APP-001, Annunciator Procedure

6.3 APP-005, Annunciator Procedure

6.4 BS/RCS-LP-1, Lesson Plan

6.5 SD-001, System Description

6.6 CP-300-5379-376, Flow Diagram

6.7 CP-300-5379-1971, Flow Diagram

6.8 CP-300-5379-685, Flow Diagram

7.0 DATE PERFORMED/TEST RESULTS **10/29/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.14

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0569, RCP Standpipe Hi/Lo/Lv did not alarm RCP 1 Standpipe Hi Permissive Status did not light	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.15

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Coolant Pump #3 Seal Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(4)

2.0 AVAILABLE OPTIONS

Allows #3 seal failure to be entered for any combination of up to three Reactor Coolant Pumps with a variable leak rate of 0-400 gpm and ramp time 0-3600 seconds.

3.0 TESTED OPTIONS

RCS15A Reactor Coolant Pump "A", #3 seal failure with leak rate of 10 gpm and ramp time of 0 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and verification is made for correct response of standpipe indication and alarm. Increase in Containment Vessel Sump Level is also verified.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-18, Abnormal Operating Procedure

6.2 APP-005, Annunciator Procedure

6.3 BS/RCS-LP-1, Lesson Plan

6.4 SD-001, System Description

6.5 5379-376, Flow Diagram

6.6 5379-685, Flow Diagram

6.7 5379-1971, Flow Diagram

7.0 DATE PERFORMED/TEST RESULTS **10/11/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.15

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.16

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Coolant Pump Vibration Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(4)

2.0 AVAILABLE OPTIONS

2.1 Pump Selection

a. RCP "A"
b. RCP "B"
c. RCP "C"

2.2 Final Value of Vibration Selection

a. 0 to 30 mils

2.3 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

All three RCP's at 25 mils and a 30 second ramp

4.0 INITIAL CONDITIONS

Hot Shutdown

5.0 TEST DESCRIPTION

With the simulator in a Hot Shutdown condition, the vibration of each Reactor Coolant Pump Shaft was increased in separate verifications. All appropriate alarms and indications were verified including the effect of High RCP Shaft vibration upon the RCP Frame. Additionally, the RCP's were tripped to verify proper response during their coastdown period.

6.0 BASELINE DATA/REFERENCES

6.1 APP-005, Annunciator Procedure

6.2 AOP-018, Abnormal Operating Procedure

6.3 OP-101, Operating Procedure

6.4 SD-001, System Description

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.16

7.0 DATE PERFORMED/TEST RESULTS **10/12/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0537, Vibration not reaching selected value	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.17

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 RCP Seal Package Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(4)

2.0 AVAILABLE OPTIONS

Allows failure of #1, #2, and #3 seal to be entered for any combination of up to three Reactor Coolant Pumps with variable leak rate of 0-400 gpm and ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 RCS13A RCP "A" - #1 seal failure, 400 gpm - 30 seconds

3.2 RCS14A RCP "A" - #2 seal failure, 400 gpm - 30 seconds

3.3 RCS15A RCP "A" - #3 seal failure, 400 gpm - 30 seconds

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The three malfunctions are entered simultaneously to cause a complete failure of "A" Reactor Coolant Pump seal package. This results in a loss of reactor coolant to Containment, reactor trip, turbine trip, and safety injection actuation. Initial parameters response is verified prior to the reactor trip/safety injection. Continued simulator response is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.18.17

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Procedures

6.2 Emergency Response Guidelines, Westinghouse Owners Group, LP-R

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners' Group

6.4 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.5 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.6 EPP-8, Emergency Plant Procedure

7.0 DATE PERFORMED/TEST RESULTS 11/08/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Residual Heat Removal Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(7)

2.0 AVAILABLE OPTIONS

Either or both pumps

3.0 TESTED OPTIONS

Both

4.0 INITIAL CONDITIONS

Cold Shutdown, RHR in Service, Pressurizer Solid

5.0 TEST DESCRIPTION

With the simulator in a Cold Shutdown condition, the single RHR Pump that was in service was tripped. All appropriate system parameters were verified. The standby RHR Pump was then placed in service and parameters verified to stabilize. After stability was achieved, the remaining inservice RHR Pump was tripped and appropriate parameters verified. Additionally, the response of the RCS to a complete loss of RHR while solid was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 AOP-020, Abnormal Operating Procedure

6.3 Control Wiring Drawings

6.4 OP-201, Operating Procedure

6.5 Piping and Instrument Drawings

6.6 SD-003, System Description

6.7 SD-021, System Description

6.8 SD-059, System Description

7.0 DATE PERFORMED/TEST RESULTS **09/27/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.1

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0490, Tripped RHR Pump did not attempt to restart after malfunction cleared while Safety Injection actuation signal present	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Residual Heat Removal, HCV-758 Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(7)

2.0 AVAILABLE OPTIONS

Allows the failure of HCV-758 to any position 0-100% open with ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

RHR2 HCV-758 failed full closed and full open positions with a ramp time of 30 seconds.

4.0 INITIAL CONDITIONS

RCS in Cold Shutdown on RHR and RCS Heatup in progress, solid on RHR

5.0 TEST DESCRIPTION

The malfunction to fail HCV-758 closed is entered with the RCS in Cold Shutdown on RHR. Correct response of RHR, Component Cooling Water, and Reactor Coolant is verified. Local Operator Action is entered to open the Bypass Valve around HCV-758 and correct response is verified.

The simulator is reinitialized to place the RCS in a heatup on RHR in progress and the malfunction is entered to fail HCV-758 open.

The RHR, Component Cooling and Reactor Coolant parameters are verified to respond correctly.

6.0 BASELINE DATA/REFERENCES

6.1 OP-201, Operating Procedure

6.2 5379-1484, Flow Diagram

6.3 SD-003, System Description

6.4 AOP-020, Abnormal Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS **11/05/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Residual Heat Removal, FCV-605, Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(7)

2.0 AVAILABLE OPTIONS

2.1 Failed Position Selection

a. 0 to 100% (0 = Full Closed & 100% = Full Open)

2.2 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

Failed closed (0) and failed full open (100%) with a 30 second ramp

4.0 INITIAL CONDITIONS

Heatup in progress, RHR in service

5.0 TEST DESCRIPTION

With a heatup in progress and the RHR System in service, the RHR Heat Exchanger Bypass Flow Control Valve, FCV-605, was failed closed and then open in independent verifications. The appropriate integrated system responses to these failures of FCV-605, were verified for both cases.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-020, Abnormal Operating Procedure

6.2 OP-201, Operating Procedure

6.3 Piping and Instrument Drawings

6.4 SD-003, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/16/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.3

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0548, CCW Temperature increased when FCV-605 was failed open	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Hand Control Valve 142 Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(7), 3.1.2(18)

2.0 AVAILABLE OPTIONS

Allows failures of HCV-142 to selected positions 0-100% open with ramp time 0-3600 seconds.

3.0 TESTED OPTIONS

RHR-4 HCV-142 failed to closed position with ramp time of 30 seconds; also, to full open position with ramp time of 30 seconds.

4.0 INITIAL CONDITIONS

RCS Heatup in progress, solid on RHR

5.0 TEST DESCRIPTION

The malfunction is entered to fail HCV-142 closed and verification is made for correct response of letdown flow, pressure, temperature, and controller action. Reactor Coolant System Pressure is verified to increase.

The simulator is reinitialized to the same condition and the malfunction to fail open. HCV-142 is entered. Correct response of the same parameter is verified and LOA is used to close RHR-760 manual valve. Correct response to closure of RHR-760 is verified.

6.0 BASELINE DATA/REFERENCES

6.1 OP-201, Operating Procedure

6.2 5379-1484, Flow Diagram

6.3 SD-003, System Description

6.4 AOP-020, Abnormal Operating Procedure

6.5 5379-685, Flow Diagram

7.0 DATE PERFORMED/TEST RESULTS **10/16/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Residual Heat Removal Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(7), 3.1.2(1B&C)

2.0 AVAILABLE OPTIONS

2.1 Train Selection

a. RHR Train "A"
b. RHR Train "B"

2.2 Leak Rate Selection

a. 0 to 3500 gpm

2.3 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

RHR Train "A" with a 3500 gpm leak and a 10 second ramp.
RHR Train "B" with a 3500 gpm leak and a 10 second ramp.

4.0 INITIAL CONDITIONS

Heat-up in progress, RHR in service

5.0 TEST DESCRIPTION

With a heat-up in progress and the RHR System in service, a 3500 gpm leak was ramped in to each RHR Pump Discharge Line in separate verifications. The integrated system response was verified. Additionally, the use of Local Operator Actions to isolate the leak was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-002, Annunciator Procedure

6.2 AOP-020, Abnormal Operating Procedure

6.3 OP-201, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-003, System Description

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.5

7.0 DATE PERFORMED/TEST RESULTS **10/16/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0544, Pressurizer level initially decreased but then increased prior to leak being isolated.	12/31/91
90-0545, Waste Disposal Alarm not received	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Residual Heat Removal Sump Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(7)

2.0 AVAILABLE OPTIONS

Allows failure of any combination up to four RHR Sump Valves to selected position 0-100% open with ramp time 0-3600 seconds

3.0 TESTED OPTIONS

3.1 RHR6A RHR-Valve 861A Sump Valve failed to open with 0 ramp time

3.2 RHR6B RHR-Valve 861B Sump Valve failed to open with 0 ramp time

3.3 RHR6C RHR-Valve 860A Sump Valve failed to 10% open with 0 ramp time

3.4 RHR6D RHR-Valve 860B Sump Valve failed to 10% open with 0 ramp time

4.0 INITIAL CONDITIONS

Cold Shutdown on RHR
100% Power, BOL - RHR aligned for Low Head Safety Injection

5.0 TEST DESCRIPTION

The malfunction is entered for Valve 861A with the RCS in Cold Shutdown on RHR. It is verified that the valve cannot be closed and then the malfunction is entered for Valve 860A. Flow from the RCS to the sump and inability to close Valve 860A is verified. Valve 860A is closed to verify conditions return to normal. The same test is repeated for Valves 861B and 860B.

The simulator is reinitialized to 100% power with RHR aligned for low head safety injection and the same tests are repeated for both sets of valves to verify the flow path from the RWST to the Containment Vessel Sump.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.6

6.0 BASELINE DATA/REFERENCES

6.1 OP-201, Operating Procedure

6.2 5379-1484, Flow Diagram

6.3 5379-1082, Flow Diagram

6.4 SD-003, System Description

6.5 AOP-20, Abnormal Operating Procedure

6.6 B-190628, Series Control Diagrams

7.0 DATE PERFORMED/TEST RESULTS 11/05/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Residual Heat Removal Heat Exchanger Tube Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(7)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of the two RHR Heat Exchangers for a variable leak of 0-1000 gpm and ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1	RHR7A	RHR Heat Exchanger "A" with a leak of 1000 gpm and ramp time of 30 seconds
3.2	RHR7B	RHR Heat Exchanger "B" with a leak of 1000 gpm and ramp time of 30 seconds

4.0 INITIAL CONDITIONS

RCS Heatup in progress, solid on RHR

5.0 TEST DESCRIPTION

The malfunction is entered for RHR Heat Exchanger "A". Correct response is verified for the Reactor Coolant System, the Component Cooling Water System, and the RHR System. LOARHR-757 is entered to isolate the Heat Exchanger and verification is made that parameters trend in the normal direction. The test is repeated for RHR Heat Exchanger "B".

6.0 BASELINE DATA/REFERENCES

6.1 OP-201, Operating Procedure

6.2 5379-1484, Flow Diagram

6.3 5379-376, Flow Diagram

6.4 SD-003, System Description

6.5 AOP-20, Abnormal Operating Procedure

6.6 APP-001, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS 11/05/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.7

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.19.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Residual Heat Removal Relief Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C), 3.1.2(7)

2.0 AVAILABLE OPTIONS

Allows the failure of RHR Relief Valve, RHR-706, to selected positions from 0 to 100% open, with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

RHR8 RHR Relief Valve, RHR-706, failed 100% open with ramp time of 0 seconds

4.0 INITIAL CONDITIONS

RCS in Heatup on RHR

5.0 TEST DESCRIPTION

The malfunction is entered and verification is made for proper response of the Reactor Coolant System and the Pressurizer Relief Tank. Parameters monitored include pressure, temperature, level, and alarms.

6.0 BASELINE DATA/REFERENCES

6.1 OP-201, Operating Procedure

6.2 5379-1484, Flow Diagram

6.3 5379-1971, Flow Diagram

6.4 SD-003, System Description

6.5 SD-059, System Description

6.6 APP-003, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS **10/16/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTINGAND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.21.1.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Reactor Trip Breaker Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(24)

2.0 AVAILABLE OPTIONS

Ability to cause Reactor Trip Breakers to fail to open or open from spurious signal. May select up to four breakers simultaneously.

3.0 TESTED OPTIONS

3.1 RPS1A Reactor Trip Breaker "A" failure inadvertent opening

3.2 RPS1B Reactor Trip Breaker "B" failure inadvertent opening

3.3 RPS1C Reactor Trip Bypass Breaker failure inadvertent opening

3.4 RPS1D Reactor Trip Bypass Breaker failure inadvertent opening

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

Each Reactor Trip Breaker and Reactor Trip Bypass Breaker is tested individually within this test by entering the appropriate malfunction. Local Operator Actions (LOA) are used to rack in, close, and return the Bypass Breakers to normal.

6.0 BASELINE DATA/REFERENCES

6.1 CP-300-5379-2753, Logic Diagram

6.2 APP-001, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS **09/28/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.21.1.1

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.21.1.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 ATWS Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(24)

2.0 AVAILABLE OPTIONS

This test enters Malfunction RPS1A and RPS1B which causes the Reactor Trip Breakers to fail to open from manual or automatic trip signal.

3.0 TESTED OPTIONS

3.1 RPS1A Reactor Trip Breaker "A" failure to open from automatic or manual trip signal.

3.2 RPS1B Reactor Trip Breaker "B" failure to open from automatic or manual trip signal.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunctions are entered to prevent the Reactor Trip Breakers from opening. LOA is used to generate a reactor trip signal by overriding 2 of the 3 RCS Loop Flow Transmitters. Verification is made that the reactor is not tripped and manual reactor trip is attempted. Verification is made that the reactor is not tripped. The reactor is then tripped by LOA for tripping the two rod drive MG Set Breakers. Simulator response to this event is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.21.1.2

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Procedure

6.2 Emergency Response Guidelines, Westinghouse Owners Group, LP

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.4 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.5 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.6 EPP-8, Emergency Plant Procedure

7.0 DATE PERFORMED/TEST RESULTS 09/28/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.21.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 AMSAC Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(19), 3.1.2(24)

2.0 AVAILABLE OPTIONS

Allows selection of AMSAC to fail to actuate or inadvertent trip

3.0 TESTED OPTIONS

3.1 RPS2A AMSAC Inadvertent Trip

3.2 RPS2B AMSAC failure to trip

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

This test verifies that Malfunction RPS2A causes an inadvertent actuation of AMSAC which will result in a Turbine Trip, Auxiliary Feedwater Startup, and Steam Generator Isolation. This test also verifies that Malfunction RPS2B results in a failure of AMSAC to actuate when Steam Generator levels are less than 11% and Turbine Power is greater than 40%. The AMSAC alarm from deviation between the two first stage pressure transmitters is verified. Normal operation of AMSAC is verified by override of two Steam Generator Level Transmitters to 11%.

6.0 BASELINE DATA/REFERENCES

6.1 PM-429, AMSAC System Test

6.2 B-190628, Series Control Diagram

6.3 CP-300-5379-2762, Logic Diagram

6.4 CP-300-5379-3695, Logic Diagram

7.0 DATE PERFORMED/TEST RESULTS **11/05/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.21.2

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.23.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Steam Generator Safety Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(20)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to twelve safety valves simultaneously with a failed position of 0-100% open and ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 SGN1A Steam Generator Safety Valve 1A failed 100% open with ramp time of 0 seconds

3.2 SGN1B Steam Generator Safety Valve 1B failed 100% open with ramp time of 0 seconds

3.3 SGN1C Steam Generator Safety Valve 1C failed 100% open with ramp time of 0 seconds

3.4 SGN1D Steam Generator Safety Valve 1D failed 100% open with ramp time of 0 seconds

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunctions are entered simultaneously for all four safety valves on Steam Generator A. This results in an unisolable steam release to atmosphere, a reactor trip, a turbine trip, and a safety injection actuation. Initial parameter response is verified prior to the reactor trip/safety injection. Following the reactor trip/safety injection, simulator response is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.23.1

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Procedure

6.2 Emergency Response Guidelines, Westinghouse Owners Group, LP-Rev.1

6.3 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.4 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.5 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.6 EPP-7, Emergency Plant Procedure

6.7 EPP-11, Emergency Plant Procedure

7.0 DATE PERFORMED/TEST RESULTS 10/02/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.23.2.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 SG Tube Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1A)

2.0 AVAILABLE OPTIONS

Allows selection of up to three Steam Generator Tube Leaks variable 0-600 gpm with ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

SGN2A Steam Generator "A" Tube Leak of 240 gpm with 10 second ramp time

4.0 INITIAL CONDITIONS

Hot Shutdown, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and integrated plant response is verified. Correct parameter response is verified for the Reactor Coolant System, the Chemical and Volume Control System, Radiation Monitoring System, and the Steam Generator Blowdown System. Correct status lights and alarms are also verified.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-016, Abnormal Operating Procedure

6.2 AOP-005, Abnormal Operating Procedure

7.0 DATE PERFORMED/TEST RESULTS **11/06/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.23.2.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Steam Generator Tube Rupture Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1A)

2.0 AVAILABLE OPTIONS

Allows selection of up to three Steam Generator Tube Leaks variable 0-600 gpm with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

SGN2B Steam Generator "B" tube rupture of 600 gpm with a 10 second ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and results in a reactor trip, turbine trip, and safety injection. Initial plant parameter response is verified prior to the reactor trip/safety injection. Following the reactor trip/safety injection, simulator response is verified by completion of the appropriate Emergency Operating Procedures until a stable, controllable, and safe condition is attained.

6.0 BASELINE DATA/REFERENCES

6.1 Path-1, Emergency Operating Procedure

6.2 Path-2, Emergency Operating Procedure

6.3 Emergency Response Guidelines, Westinghouse Owners Group, LP

6.4 Loss of Reactor or Secondary Coolant, Westinghouse Owners Group

6.5 Updated FSAR, H. B. Robinson Steam Electric Plant Unit No. 2, Chapter 15

6.6 Emergency Operating Procedures Transition Documents, HBR EOP - WOG ERG

6.7 EPP-8, Emergency Plant Procedure

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.23.2.2

7.0 DATE PERFORMED/TEST RESULTS 10/03/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.23.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Steam Generator Level Program Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17), 3.1.2(22)

2.0 AVAILABLE OPTIONS

Allows selection of any combination of up to three Steam Generator Level Controllers in automatic to develop an erroneous signal variable 0-100% with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 SGN3A — Steam Generator Level Controller "A" failure to selected level of 100% with a 60 second ramp time. Also, to selected level of 0% and a 60 second ramp time.

3.2 SGN3B — Steam Generator Level Controller "B" failure to selected level of 100% with a 60 second ramp time. Also, to selected level of 0% and a 60 second ramp time.

3.3 SGN3C — Steam Generator Level Controller "C" failure to selected level of 0% with a 60 second ramp time. Also, to selected level of 0% and a 60 second ramp time.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction for failed high is first entered for Steam Generator A. After Feedwater Flow increases to "A" S/G the controller is placed in manual to verify that manual control is operable and then returned to automatic. S/G A level increases to cause a turbine trip/reactor trip at 75% power. Parameter indications, alarms, bistable lights, and automatic equipment actions are verified to be correct during the transient and after the trip.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.23.3

The simulator is reinitialized and the malfunction for failed low is entered for Steam Generator A. Correct parameter indications, alarms, and bistable status are verified until the reactor/turbine trip on low low level in Steam Generator A. The test is repeated for both failed high and failed low for Steam Generator B and C level controllers.

6.0 BASELINE DATA/REFERENCES

6.1 APP-006, Annunciator Procedure

6.2 SD-060, System Description

6.3 AOP-10, Abnormal Operating Procedure

6.4 SG-LCS-LP-1, Lesson Plan

6.5 CP-300-5379, Series Logic Diagrams

7.0 DATE PERFORMED/TEST RESULTS **11/06/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.24.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Safety Injection Initiation Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

2.1 Train Selection

a. Safety Injection Train 'A'
b. Safety Injection Train 'B'

2.2 Type of Failure Selection

a. Inadvertent Initiation
b. Failure to Initiate

3.0 TESTED OPTIONS

Safety Injection Train 'A' fails to initiate and Safety Injection Train 'A' inadvertent actuation.

4.0 INITIAL CONDITIONS

25% Power, various components were taken to their non-safety injection positions.

5.0 TEST DESCRIPTION

With the simulator in a stable 25% power condition, various components were placed in their non-safety injection positions. This was to verify their response to an Inadvertent Safety Injection Signal. Once the Inadvertent Safety Injection Signal was activated, the appropriate alarms, components, and indications for Train 'A' were verified. Additionally, the appropriate Train 'B' alarms, components, and indications were verified as not actuating.

The simulator was then reinitialized to 25% power and the same components placed in their non-safety injection positions. The failure to initiate for Train 'A' was activated.

A manual Safety Injection was initiated. The appropriate Train 'A' alarms, components, and indications were verified to have not actuated. Additionally, the appropriate Train 'B' alarms, components, and indications were verified as activated.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.24.1

6.0 BASELINE DATA/REFERENCES

6.1 APP-002, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 Reactor Protection Drawings

6.4 Safeguards System Drawings

6.5 SD-006, System Description

7.0 DATE PERFORMED/TEST RESULTS 09/25/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.24.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Accumulator Liquid Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(1B&C)

2.0 AVAILABLE OPTIONS

Allows selection of up to three accumulators sample valve leaks variable 0-50 gpm, with a ramp time of 0-3600 seconds.

3.0 TESTED OPTIONS

SIS2A Loop 1 Accumulator 1, liquid leak of 50 gpm with ramp time of 30 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and correct response is verified for accumulator, pressure, level, and associated alarms. The malfunction is cleared and the accumulator is refilled using the operating procedure. Reset of alarms is verified as the accumulator is refilled.

6.0 BASELINE DATA/REFERENCES

6.1 SD-002, System Description

6.2 OP-202, Operating Procedure

6.3 APP-002, Annunciator Procedure

6.4 5379-1082, Flow Diagram

7.0 DATE PERFORMED/TEST RESULTS **10/10/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.24.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Accumulator Nitrogen Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

Allows selection of any combination up to three accumulators for a nitrogen leak in the vent line downstream of the Isolation Valve. Leak is variable 0-100 ft^3/min with 0-3600 second ramp time.

3.0 TESTED OPTIONS

SIS3A Loop 1 Accumulator, Nitrogen leak of 25 ft^3 with 0 ramp time

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered and correct response is verified for accumulator pressure and alarm. The malfunction is then removed and the accumulator is pressurized using plant operating procedure. Alarm reflash and clear is verified.

6.0 BASELINE DATA/REFERENCES

6.1 OP-202, Operating Procedure

6.2 APP-002, Annunciator Procedure

6.3 SD-002, System Description

6.4 5379-1082, Logic Drawing

7.0 DATE PERFORMED/TEST RESULTS **10/10/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.24.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Safety Injection Pump Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

Any combination of up to all three safety injection pumps can be tripped.

3.0 TESTED OPTIONS

Each safety injection pump is tripped in turn.

4.0 INITIAL CONDITIONS

100% Power (BOL) and a RCS hot leg LOCA to cause auto initiation of safety injection.

5.0 TEST DESCRIPTION

This simulator performance test verifies that a trip of a running safety injection pump results in realistic integrated plant response. The ability to trip all three safety injection pumps is verified including both power supplies for safety injection pump B. Additionally, the use of local operator actions to rack out the tripped safety injection pump breaker to verify proper alarm response and control board indication is performed.

6.0 BASELINE DATA/REFERENCES

6.1 APP-002, Annunciator Procedure

6.2 APP-010, Annunciator Procedure

6.3 Control Wire Diagrams

6.4 SD-002, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/19/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.24.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0556 Improper breaker status light indication when racking out and then racking in a tripped safety injection pump breaker.	12/31/91
90-0557 Safety injection pump motor overload alarm not clearing when breaker is racked out.	12/31/91
90-0558 Improper breaker status light indication for safety injection pump B when tripped. Light indicates breaker is closed but safety injection flow goes to zero.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.24.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Failure of SI Trains to Reset Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

This malfunction provides a failure of the safety injection (SI) timer to cycle out (train A or B, or both simultaneously), which will prevent a reset of the SI signal on the affected train.

3.0 TESTED OPTIONS

SIS6A	Failure of SI timer to cycle out (train A)
SIS6B	Failure of SI timer to cycle out (train B)

4.0 INITIAL CONDITIONS

25% Power (BOL)

5.0 TEST DESCRIPTION

The failure of the SI timer to cycle out is entered and then a manual SI signal is generated. After two minutes, which is the normal time period for the SI agastat timer to cycle out and allow SI reset, the response of pumps and valves in both trains to the failure is verified. This verification is performed prior to and after the SI reset pushbutton is depressed. The SI timer failure associated with each train (A and B) is tested separately and verification of proper reset capability of both the affected train and unaffected train is made.

6.0 BASELINE DATA/REFERENCES

6.1 SD-006, System Description

6.2 Safeguards System Diagrams

6.3 Reactor Protection System Diagrams

7.0 DATE PERFORMED/TEST RESULTS 12/29/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.24.6

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
91-0003 With only one train of SI reset, neither reactor trip breaker should have closure capability. The reactor trip breaker in the reset train could be closed.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Service Water Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(6)

2.0 AVAILABLE OPTIONS

Any combination of the four Service Water Pumps can be tripped.

3.0 TESTED OPTIONS

All four Service Water Pumps were sequentially tripped.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the simulator in a stable 100% power condition, the Service Water Pumps were sequentially tripped to cause a total loss of service water. The integrated plant response to a total loss of service water was verified.

6.0 BASELINE DATA/REFERENCES

6.1 a. APP-001, Annunciator Procedure
b. APP-002, Annunciator Procedure
c. APP-006, Annunciator Procedure
d. APP-008, Annunciator Procedure
e. APP-009, Annunciator Procedure
f. APP-010, Annunciator Procedure

6.2 AOP-022, Abnormal Operating Procedure

6.3 Control Wiring Drawings

6.4 SD-004, System Description

7.0 DATE PERFORMED/TEST RESULTS 11/06/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.1

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0606, Five temperature related alarms not received	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Service Water Leak on Containment Vessel Fan Cooler Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(6)

2.0 AVAILABLE OPTIONS

2.1 HVH Cooler Rejection

a. HVH A
b. HVH B
c. HVH C
d. HVH D

2.2 Leak Rate Selection

a. 0 to 400 gpm

2.3 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

All HVH Coolers were tested with a 400 gpm leak and a 5 second ramp.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the plant in a stable 100% power condition, the malfunction to cause a leak on each HVH cooler was entered. All appropriate system responses including alarms, flows, and indications were verified. Additionally, the ability to isolate the leak using system valves controlled from the Main Control Board and reestablish normal system parameters was verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.2

6.0 BASELINE DATA/REFERENCES

6.1 APP-002, Annunciator Procedure

6.2 AOP-022, Abnormal Operating Procedure

6.3 BS/SW-LP-1, Basic System Lesson Plan

6.4 OP-903, Operating Procedures

6.5 Piping and Instrument Drawings

6.6 SD-004, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/02/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0504, System Flow response when faulted HVH cooler isolated incorrect	12/31/91
88-0075, Lo Flow alarm setpoint set at wrong value	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Service Water Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(6)

2.0 AVAILABLE OPTIONS

Allows selection of a leak in either or both Service Water Headers with a variable leak rate of 0-20,000 gpm and ramp time 0-3600 seconds.

3.0 TESTED OPTIONS

3.1 SWS4A Service Water North Header with a 20,000 gpm leak and ramp rate of 25 seconds.

3.2 SWS4B Service Water South Header with a 20,000 gpm leak and ramp rate of 25 seconds.

4.0 INITIAL CONDITIONS

100% Power, BOL

5.0 TEST DESCRIPTION

The malfunction is entered for the North Service Water Header. Verification is made for correct indications and alarms on both headers. The North Header is then isolated and verification is made for correct indications and alarms clearing. The simulator is reinitialized and the test repeated for a leak in the South Service Water Header.

6.0 BASELINE DATA/REFERENCES

6.1 OP-903, Operating Procedure

6.2 AOP-22, Abnormal Operating Procedure

6.3 G-190191, Flow Diagram

6.4 APP-008, Annunciator Procedure

6.5 SD-004, System Description

6.6 BS/SW-LP-1, Lesson Plan

7.0 DATE PERFORMED/TEST RESULTS 11/07/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.4

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Service Water Booster Pump Suction Line Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(6)

2.0 AVAILABLE OPTIONS

2.1 Leak Location Selection

a. Service Water Booster Pump A Suction
b. Service Water Booster Pump B Suction

2.2 Leak Rate Selection

a. 0 to 4000 gpm

2.3 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

Both leak locations were verified with a 4000 gpm leak rate and a 10 second ramp.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the simulator in a stable 100% power condition, the malfunction to cause a suction line leak to the in service, Service Water Booster Pump was entered. The integrated system response to a leak in the suction line of the in service, Service Water Booster Pump, was thoroughly verified. Additionally, the use of Local Operator Actions to isolate the leak and reestablish normal plant parameters was verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.6

6.0 BASELINE DATA/REFERENCES

6.1 APP-002, Annunciator Procedure

6.2 APP-008, Annunciator Procedure

6.3 AOP-022, Abnormal Operating Procedure

6.4 BS/SW-LP-1, Basic Systems Lesson Plan

6.5 OP-903, Operating Procedure

6.6 Piping and Instrument Drawings

6.7 SD-004, System Description

7.0 DATE PERFORMED/TEST RESULTS **09/21/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0463, HVH Lo Flow Alarms not received	12/31/91
90-0464, Waste Disposal Panel Alarm not received	12/31/90

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.8

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Service Water to Emergency Diesel Generator Temperature Control Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(6)

2.0 AVAILABLE OPTIONS

2.1 Valve Selection

a. Temperature Control Valve for A Diesel Generator
b. Temperature Control Valve for B Diesel Generator

2.2 Failed Position Selection

a. 0% = full closed
to
b. 100% = full open

2.3 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

Both the A and B Diesel Generators Temperature Control Valves were failed closed with a 5 second ramp.

4.0 INITIAL CONDITIONS

Hot Shutdown with the Diesel Generators supplying their respective buses.

5.0 TEST DESCRIPTION

With the associated Diesel Generator supplying its respective bus, the malfunction was entered to fail closed the Diesel's Temperature Control Valve. The associated Diesel Temperature Alarms were verified along with their interlock functions. Additionally, the use of a Local Operator Action to bypass the closed Temperature Control Valve and reestablish normal operating parameters was verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.25.8

6.0 BASELINE DATA/REFERENCES

6.1 APP-010, Annunciator Procedure

6.2 AOP-22, Abnormal Operating Procedure

6.3 BS/SW-LP-1, Lesson Plan

6.4 OP-903, Operating Procedure

6.5 Piping and Instrument Drawings

6.6 SD-004, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/02/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.2

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Trip Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)&(11)

2.0 AVAILABLE OPTIONS

TUR2A — This malfunction will prevent the turbine from tripping when called for by a mechanical (local) trip function. In this case the turbine may be tripped by a loss of electro-hydraulic oil pressure from any remote signal that actuates the 20ET turbine trip solenoid or via a loss of auto stop oil pressure that causes the interface valve to reposition.

TUR2B — This malfunction will prevent the turbine from tripping on remote trip logic devices. In this case the 20AST and 20ET turbine trip solenoids have open circuits preventing their operation. Only mechanical trips such as loss of condenser vacuum are functional.

3.0 TESTED OPTIONS

Both malfunctions as stated above.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

Both options of the turbine trip failure are tested in conjunction with other malfunctions and plant conditions, which create a local or remote turbine trip signal, including generator trips, circulating water pump trip, reactor trip, manual turbine trip, steam generator high level trip, loss of condenser vacuum trip, loss of electro-hydraulic oil pressure and main turbine lube oil leak. Under each condition the response of the turbine, along with associated plant parameters and alarms, are verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.2

6.0 BASELINE DATA/REFERENCES

6.1 Logic Diagrams

6.2 OST-553, Operations Surveillance Test

6.3 APP-008, Annunciator Procedure

7.0 DATE PERFORMED/TEST RESULTS 12/29/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	**TO BE CLEARED BY**
91-0004 With the remote turbine trip failure malfunction entered, the reactor was manually tripped. This should have resulted in a main generator negative sequence trip and 86/BU generator lockout relay actuation. These responses did not occur as expected.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Bearing Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)

2.0 AVAILABLE OPTIONS

Any combination of up to all nine Turbine Bearings may be selected to fail from 0 to 30 mils with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

4.5 mils with a 0 second ramp to Bearing #5.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, the malfunction was entered to cause Turbine Bearing #5 vibration to increase. Once Turbine Bearing #5 vibration reached the alarm setpoint, the adjacent bearings response was verified. Additionally, when the turbine was tripped and coasting down, the bearings vibration was verified to decrease.

6.0 BASELINE DATA/REFERENCES

6.1 APP-008, Annunciator Procedure

6.2 AOP-006, Abnormal Operating Procedure

6.3 SD-033, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/10/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Governor Valve Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17)

2.0 AVAILABLE OPTIONS

2.1 Valve Selection

a. Stop Valve #1
b. Stop Valve #2
c. Governor Valve 1
d. Governor Valve #2
e. Governor Valve #3
f. Governor Valve #4

2.2 Failed Position Selection

a. 0% = Full Closed
to
b. 100% = Full Open

2.3 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

3.1 Governor Valve 1 0% with a 60 second ramp

3.2 Governor Valve 2 100% with a 60 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, the malfunction was entered to cause Governor Valve #1 to fail closed over 60 seconds. Integrated System Response to this failure including the Governor Valve Control Program and indications were verified. Additionally, Governor Valve #2 was failed full open and the appropriate responses verified.

6.0 BASELINE DATA/REFERENCES

6.1 SD-033, System Description

6.2 Plant Data Package #7

7.0 DATE PERFORMED/TEST RESULTS **11/02/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.5

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.11

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Lube Oil Pumps Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)

2.0 AVAILABLE OPTIONS

Either the AC, DC, or both Bearing Lube Oil Pumps may be tripped.

3.0 TESTED OPTIONS

All

4.0 INITIAL CONDITIONS

Reactor Critical, Turbine at 1800 RPM and Hot Shutdown, Turbine on Turning Gear.

5.0 TEST DESCRIPTION

This Simulator Performance Test verified that both the AC and DC Turbine Lube Oil Pumps could be failed either while the pump is in service or prior to receiving an auto start signal. In all cases, the appropriate system responses including alarms, interlocks, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-008, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 MMM-006, Calibration Sheets

6.4 OST-551, Operations Surveillance Test

6.5 Piping and Instrument Drawings

6.6 SD-033, System Descriptions

6.7 Westinghouse Technical Manuals

7.0 DATE PERFORMED/TEST RESULTS **09/28/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.11

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0440, When the DC Pump is not running, the malfunction should not cause a loss of status lights until the pump tries to start.	12/31/91
90-0494, When the AC Pump is not running, the malfunction should not cause a loss of status lights until the pump tries to start.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.12

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of EH Oil Pumps Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)

2.0 AVAILABLE OPTIONS

Either one or both pumps may be failed.

3.0 TESTED OPTIONS

All

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the plant initially at full power and with EH Pump B running and EH Pump A in standby, EH Pump B was tripped using the malfunction. EH fluid pressure decreased causing actuation of the low EH Oil Pressure Alarm followed by an automatic start of EH Pump A which restored EH Oil Pressure.

EH Pump A was then tripped using the malfunction. Decreasing EH Oil Pressure resulted in eventual closure of the turbine valves as insufficient EH Pressure was available to hold the valves open. Closure of Turbine Stop Valves initiated a reactor trip and a main generator lockout one minute later.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.12

6.0 BASELINE DATA/REFERENCES

6.1 APP-004, Annunciator Procedure

6.2 APP-008, Annunciator Procedure

6.3 AOP-007, Abnormal Operating Procedure

6.4 Control Wiring Drawings

6.5 GP-005, General Procedure

6.6 Logic Drawings

6.7 Piping and Instrument Drawings

6.8 SD-033, System Description

6.9 Westinghouse Technical Manual

7.0 DATE PERFORMED/TEST RESULTS 10/26/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.13

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Turning Gear Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)

2.0 AVAILABLE OPTIONS

Malfunction is either a trip of a inservice Turning Gear Motor or a failure to start.

3.0 TESTED OPTIONS

All

4.0 INITIAL CONDITIONS

Hot Shutdown, Turbine on Turning Gear

5.0 TEST DESCRIPTION

This Simulator Performance Test verified the system response to a failure of the Turbine Turning Gear Motor in two different system configurations. The first case where the Turbine is on Turning Gear and the second case where the unit is coasting down to go on Turning Gear. In both cases all appropriate system responses including alarms, interlocks, and indications were verified. Additionally the normal operation of the Turning Gear was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-008, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 Piping and Instrument Drawings

6.4 SD-033, System Description

7.0 DATE PERFORMED/TEST RESULTS 11/01/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.13

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0575, Turning Gear Motor Alarm not received in one verification	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.14

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Main Lube Oil Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)

2.0 AVAILABLE OPTIONS

Leak Rate selectable from 0 to 100 gpm with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

100 gpm leak with a 120 second ramp

4.0 INITIAL CONDITIONS

Reactor critical, Turbine at 1800 RPM

5.0 TEST DESCRIPTION

With the turbine at 1800 RPM, the malfunction to cause a 100 gpm leak in the Turbine Main Lube Oil Discharge Line was entered. All appropriate system responses to this loss of pressure/level including alarms, interlocks, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-008, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 MMM-006, Calibration Sheets

6.4 OST-551, Operations Surveillance Test

6.5 Piping and Instrument Drawings

6.6 SD-033, System Description

6.7 Westinghouse Technical Manual

7.0 DATE PERFORMED/TEST RESULTS **11/02/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.14

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0584,	
a) Turbine Lube Oil Discharge Temperature response incorrect	12/31/91
b) Turbine vibration did not reach appropriate magnitude	
c) Turbine coast down duration inappropriate	

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.16

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Loss of Gland Seal Steam Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(5)

2.0 AVAILABLE OPTIONS

Malfunction causes loss of Gland Seal Steam with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

Loss of Gland Seal Steam with a 60 second ramp.

4.0 INITIAL CONDITIONS

13% Power and 100% Power

5.0 TEST DESCRIPTION

The simulators response to this malfunction was verified for two different plant configuration. In the first verification, with the simulator at a stable 13% power condition, the Gland Sealing Steam System supplies the Main Turbine Gland Seals. The malfunction was entered to cause a loss of Gland Sealing Steam, and the appropriate system responses verified.

In the second verification, with the simulator at a stable 100% power condition, the Main Turbine supplies its own gland seals. The malfunction was entered to verify that this malfunction would have no effect on the system.

In both verifications all appropriate alarms, interlocks, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-008, Annunciator Procedure

6.2 Piping and Instrument Drawings

6.3 OP-502, Operating Procedure

6.4 SD-033, System Description

7.0 DATE PERFORMED/TEST RESULTS 10/10/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.16

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0526, With Gland Sealing Steam supplying the Main Turbine Gland Seals - vacuum did not degrade to point of Turbine Trip.	12/31/91
90-0533, Data pool variable for Gland Sealing Steam Flow not responding.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.18

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 EH Reservoir Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)

2.0 AVAILABLE OPTIONS

Malfunction has a selectable leak rate of 0 to 100 gpm with a ramp time of 0 to 3600 seconds.

3.0 TESTED OPTIONS

20 gpm leak with a 0 second ramp time

4.0 INITIAL CONDITIONS

9% Power, Main Generator OCB's closed.

5.0 TEST DESCRIPTION

With the simulator at a stable 9% power condition, and the Main Generator Output Breakers closed, the malfunction to cause a 20 gpm leak from the EH Fluid Reservoir was entered. The EH, Turbine, and Main Generators integrated plant response to this condition including alarms, relay actuation, interlocks, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-004, Annunciator Procedure

6.2 APP-008, Annunciator Procedure

6.3 APP-009, Annunciator Procedure

6.4 AOP-007, Abnormal Operating Procedure

6.5 Control Wiring Drawings

6.6 GP-005, General Procedure

6.7 Logic Drawings

6.8 MMM-006, Calibration Sheets

6.9 SD-033, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/26/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.18

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0607, "Generator Motoring Trip" Alarm not being received	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.19

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Bearing Lift Oil Pump Trip Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)

2.0 AVAILABLE OPTIONS

Malfunction can be entered to either a pump in service (running) or in standby (not running).

3.0 TESTED OPTIONS

ALL

4.0 INITIAL CONDITIONS

a.) Reactor critical turbine at 1800 RPM
b.) Hot Shutdown - turbine on turning gear

5.0 TEST DESCRIPTION

This malfunction was entered to the same pump in two different system/plant configurations. In the first condition, the Turbine Bearing Lift Oil Pump was in standby (not running) when the malfunction was entered. In the second condition, the Turbine Bearing Lift Oil Pump was in service. In both conditions, the system response including alarms and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-008, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 Piping and Instrument Drawings

6.4 SD-033, System Description

6.5 Westinghouse Technical Manual

7.0 DATE PERFORMED/TEST RESULTS 11/02/90 SAT UNSAT

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.19

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0583, Breaker Tripped when pump not running	12/31/90

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.20

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Rod Drop Runback Time Delay Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(17)

2.0 AVAILABLE OPTIONS

2.1 Runback Selection

a. Rod Drop Runback
b. ΔT Runback

2.2 Time Delay Selection

a. 0 to 15 seconds

2.3 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

3.1 Rod Drop Runback with a 3 second time delay and a 0 second ramp.

3.2 ΔT Runback with a 5 second time delay and a 0 second ramp.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the plant initially at 100% power and with the turbine reference runback failed with MALFUNCTION TUR21A, the turbine load limit time delay relay was failed to 3 seconds (normally 9 second). A power range (PR) nuclear instrument (NI) dropped rod runback (5%/5 sec.) signal was then generated by failing one of the PR excore NI detectors low with MALFUNCTION NIS7. A turbine load limit runback occurred as a result, with the duration of the runback being 3 seconds due to the malfunction.

Additionally, the turbine load reference runback time delay relay was failed to 5 seconds (normally 1.5 seconds). A reference runback signal was then generated by tripping two over-temperature delta-T bistables with their local operator action function. The duration of the turbine load reference runback that resulted was 5 seconds due to the malfunction.

In both cases, all appropriate alarms, bistable actuations, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-005, Annunciator Procedure

6.2 Control Wiring Drawings

6.3 Logic Drawings

6.4 Reactor Protection Drawings

6.5 Precautions, Limits, and Setpoints

6.6 SD-006, System Description

7.0 DATE PERFORMED/TEST RESULTS 09/20/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.21

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Turbine Runback Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(11), 3.1.2(17)

2.0 AVAILABLE OPTIONS

2.1 Runback Selection

a. Load Limit Runback
b. Load Reference Runback

2.2 Mode Selection

a. Erroneous runback
b. Failure to runback

3.0 TESTED OPTIONS

All

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the simulator at a stable 100% power condition, the turbine was subjected to erroneous runback signals, in both the load limit and Load Reference Runback Circuits. All appropriate integrated system responses including alarms, interlocks, and indications were verified. Additionally, the malfunction to prevent the turbine from running back from a valid load limit or Load Reference Signal was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-009, Annunciator Procedure

6.2 Logic Drawings

6.3 OP-502, Operating Procedure

6.4 SD-033, System Description

7.0 DATE PERFORMED/TEST RESULTS 12/15/90 **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.21

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.22

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 EH High Pressure Fluid Leak Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(15)

2.0 AVAILABLE OPTIONS

2.1 Leak Size Selection

a. 0 to 100 gpm

2.2 Ramp Time Selection

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

3.1 A 40 gpm leak with a 30 second ramp

3.2 A 50 gpm leak with a 30 second ramp

3.3 A 100 gpm leak with a 30 second ramp

4.0 INITIAL CONDITIONS

4.1 100% Power

4.2 Reactor Critical, Turbine at 1800 RPM, OCB's closed.

4.3 Reactor Critical, Turbine at 1800 RPM, OCB's open.

5.0 TEST DESCRIPTION

This Simulator Performance Test was performed at various leak rates and initial conditions to thoroughly verify the systems integrated response. All associated alarms, interlocks, and indications were verified.

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.26.22

6.0 BASELINE DATA/REFERENCES

6.1 APP-004, Annunciator Procedure

6.2 APP-008, Annunciator Procedure

6.3 APP-009, Annunciator Procedure

6.4 AOP-007, Abnormal Operating Procedure

6.5 Control Wiring Drawings

6.6 Logic Drawings

6.7 MMM-006, Calibration Sheets

6.8 OST-551, Operations Surveillance Test

6.9 Piping and Instrument Drawings

6.9.1 SD-033, System Description

7.0 DATE PERFORMED/TEST RESULTS 11/06/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0607, "Generator Motoring Trip" Alarm not being received	12/31/91
90-0608, Header Pressure not decreasing at proper rate.	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.28.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 High RCS Activity Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(14)

2.0 AVAILABLE OPTIONS

2.1 Activity Selection

a. 1 to 1500 (9.4×10^{-3} μCI/CC)

2.2 Ramp Time

a. 0 to 3600 seconds

3.0 TESTED OPTIONS

1500 with a 90 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This Simulator Performance Test used the external plant parameter for RCS activity to cause the simulator to respond in a realistic manner, consistent with indications, to fuel cladding failure, which results in high activity in the RCS and subsequent radiation alarms. Additionally, the Radiation Monitoring Systems capability of detecting a Steam Generator tube leak is verified.

6.0 BASELINE DATA/REFERENCES

6.1 AOP-005, Abnormal Operating Procedure

6.2 SD-019, System Description

7.0 DATE PERFORMED/TEST RESULTS **10/03/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.29.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Feedwater Flow Transmitter Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9), 3.1.2(19), 3.1.2(22)

2.0 AVAILABLE OPTIONS

The Feedwater Flow Transmitter can be failed high or low to its respective Steam Generator with a 0 to 3600 second ramp.

3.0 TESTED OPTIONS

All three Steam Generator Feedwater Flow Transmitters were failed high and low with a 120 second ramp.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This Simulator Performance Test used the Simulator Transmitter Override capability to cause the individual Steam Generators Feedwater Flow Transmitter to fail. The individual Steam Generator Flow Transmitters were failed high and low. All appropriate system responses including alarms, flows, bistable actuation, indications, and manual control were verified for all three Steam Generators.

6.0 BASELINE DATA/REFERENCES

6.1 APP-006, Annunciator Procedure

6.2 Block Diagrams

6.3 MMM-006, Maintenance Management Manual (calibration sheets)

7.0 DATE PERFORMED/TEST RESULTS **11/09/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.29.3

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 PT-145 Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18)

2.0 AVAILABLE OPTIONS

The Letdown Pressure Transmitter can be failed high or low with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

600 psig with a 2 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the plant at 100% power, PT-145 was failed to 600 psig. The letdown pressure controller output decreased to zero in response to this high pressure signal, fully opening the letdown pressure control valve. The ability to take manual control of the letdown pressure controller was then demonstrated.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 OP-301, Operating Procedure

6.4 Piping and Instrument Drawings

6.5 SD-021, System Description

7.0 DATE PERFORMED/TEST RESULTS **05/19/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.29.4

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 LT:459A Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18), 3.1.2(22)

2.0 AVAILABLE OPTIONS

The Pressurizer Level Transmitter can be failed high or low with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

Failed high and low with a 90 second ramp

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This Simulator Performance Test verified that a failure of the Pressurizer Level Transmitter, produced the integrated system responses indicative of a spurious high and then low failure of the Pressurizer Level Transmitter. All appropriate alarms, interlocks, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 Block Diagrams

6.2 APP-003, Annunciator Procedure

6.3 Logic Diagrams

6.4 SD-059, System Description

7.0 DATE PERFORMED/TEST RESULTS 11/07/90 **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.29.5

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 PT-444 Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(18), 3.1.2(22)

2.0 AVAILABLE OPTIONS

This Pressurizer Pressure Transmitter can be failed high or low with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

Failed high and low with a 90 second ramp.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This Simulator Performance Test verified the simulator's Transmitter Override capability, to cause a failure of the Channel I Pressurizer Pressure Transmitter, to fail high and low. All associated system control/interlock functions including alarm and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-001, Annunciator Procedure

6.2 APP-003, Annunciator Procedure

6.3 APP-005, Annunciator Procedure

6.4 Block Diagrams

6.5 Logic Diagrams

7.0 DATE PERFORMED/TEST RESULTS 11/06/90 SAT UNSAT

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.29.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Controlling Steam Generator Pressure Transmitter Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(9), 3.1.2(19), 3.1.2(22)

2.0 AVAILABLE OPTIONS

The controlling Steam Generators Pressure Transmitter can be failed high or low with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

The controlling Pressure Transmitter for the A Steam Generator was failed high and then low with a 0 second ramp.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This Simulator Performance Test verified the responses to a failure of the controlling Steam Generator Pressure Transmitter in both a failed high and low output condition. Included in the verification were Steam and Feedwater Flow, Steam Generator level response, and alarms/indications associated with this failure.

6.0 BASELINE DATA/REFERENCES

6.1 APP-006, Annunciator Procedure

6.2 Maintenance Management Manual (calibration sheets)

7.0 DATE PERFORMED/TEST RESULTS **12/09/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.29.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Steam Generator Pressure Transmitter to PORV Failure Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(19), 3.1.2(22)

2.0 AVAILABLE OPTIONS

The individual Steam Generator Pressure Transmitters to their respective PORV can be overridden to cause the transmitter to fail high or low with a 0 to 3600 second ramp time.

3.0 TESTED OPTIONS

The individual Steam Generator Pressure Transmitters were failed high (1400 psig) with a 90 second ramp.

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

The simulators transmitter override capability, was used to override an individual Steam Generators Pressure Transmitter, to its respective PORV to 1400 psig. Integrated plant response to this simulated failure of the Pressure Transmitter was verified.

6.0 BASELINE DATA/REFERENCES

6.1 APP-003, Annunciator Procedure

6.2 APP-005, Annunciator Procedure

6.3 Logic Drawings

7.0 DATE PERFORMED/TEST RESULTS 10/02/90 **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
5.30.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 ESF Passive Failures Test

1.2 ANSI/ANS 3.5, 1985, 3.1.2(23)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

This Simulator Performance Test verified that Local Operator Actions (LOA's) could result in passive failures of the Emergency Safeguards Equipment. The LOA's were entered to prevent automatic actuation of the individual components. In all cases the interlock/control functions of the individual components that should not have occurred, due to the LOA, was verified. Additionally, the components were verified to be operable in manual control, with the LOA entered.

6.0 BASELINE DATA/REFERENCES

6.1 Control Wiring Drawings

6.2 Logic Drawings

6.3 Piping and Instrument Drawings

7.0 DATE PERFORMED/TEST RESULTS **09/21/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.1

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Closure of One MSIV at Full Power Test

1.2 ANSI/ANS 3.5, 1985, 5.4.2

2.0 AVAILABLE OPTIONS

2.1 Valve Selection

a. MSIV for S/G A
b. MSIV for S/G B
c. MSIV for S/G C

2.2 Failure Mode Selection

a. 1 = Inadvertent Closure
b. 2 = Failure of Closure

3.0 TESTED OPTIONS

3.1 MSIV for S/G A, Inadvertent Closure

4.0 INITIAL CONDITIONS

100% Power (BOL)

5.0 TEST DESCRIPTION

With the plant at a stable 100% power condition, the malfunction was entered to inadvertently close the MSIV on the A Steam Generator. All appropriate system responses including alarms, flows, levels, pressures, temperatures, and indications were verified.

6.0 BASELINE DATA/REFERENCES

6.1 Plant Data Package 1, MSIV closure at 100% power

6.2 APP-003, Annunciator Procedure

6.3 APP-004, Annunciator Procedure

6.4 APP-006, Annunciator Procedure

6.5 SD-025, System Description

7.0 DATE PERFORMED/TEST RESULTS **09/28/90** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.1

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

None

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.6

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Valve Stroke Time Test

1.2 ANSI/ANS 3.5, 1985, 3.1.1(10)

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Cold Shutdown

5.0 TEST DESCRIPTION

This Simulator Performance Test verified the ability of the simulator to provide acceptable valve stroke times for control room observable valves. These valves were tested as per their associated Operations Surveillance Tests, and within the guidelines of their individual acceptance criteria.

6.0 BASELINE DATA/REFERENCES

6.1 OST-102

6.2 OST-152

6.3 OST-157

6.4 OST-201

6.5 OST-202

6.6 OST-205

6.7 OST-252

6.8 OST-302

6.9 OST-353

6.9.1 OST-701

6.9.2 OST-702

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.6

6.9.3 OST-703

6.9.4 OST-704

6.9.5 OST-902

6.9.6 OST-908

7.0 DATE PERFORMED/TEST RESULTS **10/12/90** **SAT** **UNSAT**

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
90-0531, Various valves failed their stroke time	12/31/91

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.7

1.0 PROCEDURE TITLE/ANSI 3.5 REFERENCE

1.1 Physical Fidelity Comparison Test

1.2 ANSI/ANS 3.5, 1985, 3.2

2.0 AVAILABLE OPTIONS

Not Applicable

3.0 TESTED OPTIONS

Not Applicable

4.0 INITIAL CONDITIONS

Not Applicable

5.0 TEST DESCRIPTION

This simulator performance test is a item by item comparison of the reference plant's control room to the simulator control room. The follow categories are included in the comparison:

a. Physical Arrangement

b. Panels and Equipment

c. Systems

d. Environment - lighting and sound portions of this category were not performed due to recent plant modifications. This plant modification will be implemented on the simulator in 1992.

6.0 BASELINE DATA/REFERENCES

6.1 Simulator Support Procedure, 216.2

6.2 ANSI/ANS 3.5 - 1985, Section 3.2

7.0 DATE PERFORMED/TEST RESULTS **1/14/91** **SAT** **UNSAT**

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.7

8.0 DEFICIENCIES FOUND DURING TESTING AND ASSOCIATED DATES

SSR # DESCRIPTION	TO BE CLEARED BY
91-0011 The wall between the entrance area and control board area is not installed in the simulator.	12/31/91
91-0012 Shift Foreman's area is not located in the same physical location nor is it the same size.	12/31/91
91-0013 Distance between the II (Incore) Panel and the LP (Line) Panel is approximately 13 inches larger in the simulator.	12/31/91
91-0014 The RVLIS/CM Panel is approximately 9 inches shorter in width on the simulator.	12/31/91
91-0015 The Fire Protection Panel is not located in the same physical position as the reference plant.	12/31/91
90-0656 The AO control board panel has the following differences: 1. Five annunciator windows are labeled incorrectly. 2. One meter labeled incorrectly. 3. One recorder scale different. 4. Containment Spray & Isolation, Feedwater Isolation buttons are different color. 5. One controller is missing a label. 6. One controller has label in wrong position. 7. Boric acid pump A&B label missing velcro. 8. Cover plates different.	12/31/91

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.7

9. Two status lights different.

12/31/91

89-0282
Protection Tavg and delta T meters have wrong scale.

12/31/91

90-0658
The BO control board panel has the following differences:
1. Three bistable status lights are incorrectly labeled.
2. Two annunciator windows are labeled incorrectly.
3. One breaker status light engraving is different.
4. One recorder label is not legible on the simulator.
5. Two labels are missing from boric acid and primary water totalizers.
6. First Out Reset is the wrong color.
7. One caution tag label is not installed on the simulator.

12/31/91

90-0659
The CO control board panel has one meter label that is handwritten on the simulator and is printed in the reference plant.

12/31/91

90-0660
The DO control board panel has the following differences:
1. AFW labels read different and lens need engraving.
2. One annunciator window is label incorrectly.
3. Four meter scales are different.
4. One meter label is different.
5. Auxiliary building Supply and Exhaust Fans lens are different.
6. Steam driven auxiliary feedwater pump lens labels are different.
7. Moisture Separator Load < 10% status light reads different.

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.7

12/31/91

90-0657
The ST control room panel has the following differences:
1. Various label plates missing.
2. One orange caution tag is missing.
3. One recorder has wrong scale.
4. Recorders are different model number.
5. Plate mounting screws are different.

12/31/91

90-0662
The nuclear instrumentation panels have the following differences:
1. Fuses are different in shape
2. Ground plug is different in color on audio count rate drawer.
3. Scaler/Timer is a different model than plant.

12/31/91

90-0661
The radiation monitoring system panels have the following differences:
1. Various labels are in the wrong position.
2. Annunciators are different from reference plant.
3. Various radiation monitor drawers are labeled incorrectly.
4. Plastic cover different on Tigraph recorders.
5. One recorder has different color door.
6. Modules are arrange different.

12/31/91

90-0664
The APDMS panel has one label with incorrect wording.

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.7

12/31/91

90-0665
The LD panel has the following differences:
1. Status board not spaced the same and pens missing.
2. Two annunciator windows are different.
3. One recorder has door with different color.

12/31/91

88-0070-1 (SMR)
The LD panel is different due to modification in plant which removed control and protection of 230KV switchyard from panel.

12/31/91

90-0667
The RV/CM panels have the following differences:
1. Two tags are in the wrong location.
2. Four meter scales are incorrect.
3. Two CV water level panels are the wrong color.
4. Three labels are incorrect.
5. Two blank labels are missing.

12/31/91

90-0666
The incore instrumentation panels have various tags missing and some incorrectly worded.

12/31/91

91-0016
Control switches are different on simulator.

12/31/91

91-0017
PA handsets are missing labels.

12/31/91

90-0045 (MOD 1010)
Environment (lighting and acoustic) has changed in the reference plant.

12/31/91

91-0026
Phones on desks have different numbers than reference plant.

SIMULATOR PERFORMANCE TEST
ABSTRACT
6.7

12/31/91

90-0663
The GP panel has the following differences:

1. Extra labeling at bottom of instrument panel.
2. Relay boxes reset switches are different color.
3. One label is a different color.
4. Serial numbers on relay boxes are different.

9.0 EXCEPTIONS TAKEN AS A RESULT OF TEST PERFORMANCE, INCLUDING JUSTIFICATION

None