GPU Nuclear

Oyster Creek Nuclear Generating Station

PLANT REFERENCED SIMULATOR CERTIFICATION

Volume 1

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NRC FORM 474 (8-95) U.S. NUCLEAR REGULATORY COMMISSION

SIMULATION FACILITY CERTIFICATION

APPROVED BY OMB: NO. 3150-0138 EXPIRES: 08/31/98

Estimated burden per response to comply with this mandatory information collection request: 120 hours. This information is used to certify a simulation facility. Forward comments regarding burden estimate to the Information and Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0138), Office of Management and Budget, Washington, DC 20503. NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

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	DOCKET NUMBER
Oyster Creek Nuclear Generating Station	50-- 219
LICENSEE	**DATE**
GPU Nuclear, Inc.	12.20-96

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 or ANSI/ANS 3.5-1993, as endorsed by NRC Regulatory Guide 1.149.

If there are any **EXCEPTIONS** to the certification of this item, **CHECK HERE [ ]** and describe fully on additional pages as necessary.

NAME *(or other identification)* **AND LOCATION OF SIMULATION FACILITY**

Oyster Creek Plant Referenced Simulator, Forked River, NJ

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 pages as necessary and identify the item description being continued.)*

See Attachment D - Testing Program

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 pages as necessary and identify the item description being continued.)*

See Attachment D - Testing Program

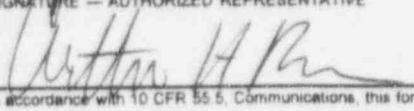
X	PERFORMANCE TESTING PLAN CHANGE. *(For any modification to a performance testing plan submitted on a previous certification.)*

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

See Attachment D - Testing Program

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

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	DATE
	Vice President Nuclear Safety & Technical Services	12/20/96

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 20555-0001

BY DELIVERY IN PERSON TO THE NRC OFFICE AT: ONE WHITE FLINT NORTH
11555 ROCKVILLE PIKE
ROCKVILLE, MD

II. EXECUTIVE SUMMARY

In the four years since the Oyster Creek Simulator was certified (December, 1992), significant progress has been made in improving the performance, reliability and capability of the simulator. **Major improvements include:**

- Simulator availability and reliability have been improved. A new I/O System design (Scan vs. Interrupt) eliminated the nagging I/O failures. The Instructor Station is more robust. Spontaneous computer aborts have been reduced significantly. New hardware such as a sealed SCSI disc drive system have reduced drive problems and maintenance costs.

- 994 plant modifications were reviewed for simulator applicability. Of these, 277 have been installed to bring the simulator up-to-date with the plant design changes. Major mods include a Digital Feedwater and Recirculation Flow Control System (DFRCS), a Temperature Monitoring Panel upgrade, Core Spray and Containment Spray design changes and many others.

- 1,557 Trouble Reports (TRs) have been cleared or voided, reducing the active TR level from 390 on December 28, 1992, to 86 currently open. (Note that 1,253 new TRs were written in the interim period).

- Over 700 Physical Fidelity items have been corrected.

- The Reactor Core Design was upgraded from a cycle 11R core to a cycle 15R core.

- The Radiation Transport model was extensively enhanced, improving the simulator capability to conduct realistic training and to support the E-plan drills.

- The Feedwater Heater model was enhanced to better replicate plant response to a variety of startup, normal operations, and abnormal conditions.

- The simulator response has been extensively tested and evaluated using over 120 Certification Test procedures. These procedures typically utilize a Computer Assisted Exercise Drill file which standardizes testing and minimizes differences in the conduct of the tests. The simulator response is compared to actual plant data when available or to analyzed data where plant data is not available. The simulator response may also be compared to previous test results (where appropriate) to determine if any observable differences have occurred. Many of the tests use the current plant procedures.

- The simulator response was compared to a Generator Runback and scram which occurred in late 1995. Since the plant data was relatively "pure" (i.e.- very little operator intervention occurred), the comparison was especially valid. The simulator matched plant data exceptionally well, with many alarms, control actions and parameters being received within seconds of the plant data.

As a result of the improvements noted above, as well as many others, it is concluded that the Oyster Creek Simulator remains a valid and effective Training and Evaluation tool for use in Operator and STA training programs.

1.0 SIMULATOR INFORMATION

1.1 GENERAL

1.1.1 Owner/Operator/Manufacturer

The Oyster Creek full scope plant referenced simulator, owned by Jersey Central Power & Light Co., is operated by GPU Nuclear Corporation. The simulator was designed and constructed by Westinghouse Electric Corporation, Energy Systems Business Unit, Nuclear Services Division, Pittsburgh, Pa.

The simulator is used primarily for the initial and requalification training and examination of Licensed Operators and Senior Licensed Operators of the Oyster Creek Nuclear Generating Station. Additional training and testing is performed on the simulator for other non-licensed personnel such as Shift Technical Advisors and Emergency Plan Team members.

1.1.2 Reference Plant Type/Rating

Oyster Creek Nuclear Generating Station is a single unit, General Electric BWR 2 with a MARK 1 containment which began commercial operation in December, 1969. The plant is licensed to operate at 1930 MWt under USNRC Operating License DPR-16.

1.1.3 Date Available for Training

The Simulator was first used for training February 22, 1993.

1.1.4 Type of Report

This report is submitted in accordance with 10CFR55.45b(5)(ii) on the anniversary of the first four years since certification of the simulator. The simulator is certified as a plant-referenced simulator per 10CFR55.45b(5)(i) as of December 31, 1992.

1.2 CONTROL ROOM

1.2.1 Control Room Physical Arrangement

The simulator control room is identical in size, shape and layout to the reference plant with the exceptions identified in the initial certification.

1.2.2 Panels/Equipment

The Station Blackout Panel, which is located in the plant 4160V Switchgear Room, was added to the simulator. The panel was installed in the room housing Local Shutdown Panels.

Several physical fidelity inspections of the panels were performed during the last four years. A comparison was made to a full set of control room photographs taken during the fall of 1994 during the 15R plant outage. To date, a total of 1458 discrepancies were identified and dispositioned as follows:

a. 581 were accepted as is, having minimal or no training impact.

b. 706 were corrected .

c. 133 were voided, primarily when equipment was replaced by modifications.

d. 38 will be corrected as scheduled (This count includes physical differences due to planned modifications).

All control room panels and equipment are functionally simulated and are identical in size, shape, color and arrangement, with the exceptions noted in the initial certification. The following differences reported in the initial certification have been corrected :

a. Selected relays and integrating meters are face-front visually simulated. Many electrical system relays, and watt-hour meters which were visually simulated with photographs have been removed from the plant and the simulator. Photographs of actual plant or similar relays are mounted inside a relay case for the remainder of these devices.

b. Substitute recorders of the same type approved for control room replacement were used in many applications in the simulator due to unavailability of the models installed in the control room.

The plant replaced the recorders with the type used in the simulator.

c. One Reactor Vessel Temperature Recorder on panel 8R was moved from the control room to the reactor building. The photo simulation of this recorder was removed and the data was added to the instructor station display screens.

d. Four Traversing Incore Plotters (TIP X-Y Recorders) previously photo face simulated have been removed from the plant and the simulator.

e. Two Local Power Range Monitor (LPRM) Recorders (1 on panel 3R and 1 on panel 5R) which were abandoned in place in the control room and photo simulated have been removed from the plant and the simulator.

f. The Drywell Pressure Recorder on Panel 12XR which was abandoned in place in the control room and photo simulated was removed from the plant and the simulator.

g. The Power Shape Monitoring System (PSMS) computer terminal which previously differed from the plant was replaced with a PC in the plant and the simulator.

h. Modifications to the plant which are not installed in the simulator are listed in Attachment A.5 to this report. Future plant modifications to be installed on the simulator are listed in Attachment A.6.

i. Details of changes to equipment differences since initial certification are listed in Attachment A to this report. This Attachment is presented in three sections, A.1 lists newly identified differences which were accepted and will not be corrected, A.2 contains a schedule for items to be corrected, and A.2.1 contains items which were corrected or voided.

1.2.3 Systems

Since initial certification, significant improvements were made in the Radiation Monitoring System (RMS) model. Radiation transport throughout the plant systems, the reactor building, and the turbine building was improved. Effects of direct radiation shine were added or improved. Fuel failure malfunctions were expanded to allow local as well as gross failures with corresponding appropriate RMS response. As a result of this upgrade, nuisance radiation alarms were virtually eliminated and the RMS

model response more effectively supports operator training. The RMS model improvements have reduced the need for excessive parameter overrides and improved the usefulness of the simulator in conducting emergency drills.

The Feedwater Heater model was also upgraded since certification. Several non-first principle modeling techniques were corrected and as-built heater level control system setpoints were installed. The system response now more closely tracks actual plant data for steady state and transient conditions.

All systems with controls or indications in the control room are simulated with the exceptions noted in the initial certification.

1.2.4 Simulator Control Room Environment

The simulator control room environment is identical to the reference plant control room with the minor exceptions noted in the initial certification. The following differences reported in the initial certification have been corrected as noted:

a. The control room carpeting was replaced and the same carpet was installed in the simulator.

b. The Fire Panel Audible alarms were installed.

1.3 INSTRUCTOR INTERFACE

1.3.1 Initial Conditions

The number of initial conditions on the simulator was increased from 161 to 261, including 60 Backtrack and 5 Snapshot ICs. Password protection for the ICs was reallocated among the users.

The Cycle 11 core loading previously installed in the simulator was replaced with the Cycle 15 core. The plant completed Cycle 15 operation in the fall of 1996.

1.3.2 Malfunctions

Two malfunctions (Master Feedwater Controller Fails and Master Recirculation Flow Controller Fails) are no longer operable since Installation of the Digital Feedwater and Digital Recirculation Flow Control modification. These malfunctions are not credible with the new system and have been deleted from the test schedule.

Several new malfunctions were added:

- Torus Leak
- CRD Hydraulic Lock
- Power Oscillations
- Additional Fuel Failure (Now have local and gross fuel failure malfunctions)

One new malfunction, Loss of DFRCS LIL, cannot be reset without rebooting the simulator computers. A TR is written to correct this problem.

The Instructor Station was upgraded to allow conditional clearing of malfunctions. This feature will automatically clear a malfunction when a condition selected by the instructor occurs.

1.3.3 Local Operator Actions

Local Operator Actions were added for the following:

- Emergency Bearing Oil Pump Breaker
- Steam Packing Exhauster
- Hydrogen Cooler Outlet Isolation Valve
- CRD Over Piston Vent (for EOPs)

1.3.4 Supplemental Features

The following changes to the instructor station were made since initial certification:

a. Backtrack - Installation of the Digital Feedwater and Digital Recirculation Flow Control modification has degraded the

Backtrack function. The Snapshots stored for Backtrack do not contain the settings of the Feedwater and Recirculation Flow Moore Control Stations. Any operator actions on the twelve Moore Control Stations will therefore not be identified in the Switchcheck when initializing to a Backtrack. In addition, the Moore Stations contain software that runs independently of the simulator software. As a result, the feedwater controls and Recirculation flow controls will not exhibit the same response from the backtrack condition as occurred during the initial scenario.

Options to correct these concerns are discussed in section 2.0 below.

b. Switchcheck - See changes to Backtrack above.

c. Time Scales - The Moore Control Stations in the Digital Feedwater and Digital Recirculation Flow Control System contain software that runs at constant speed. When the simulator is operated in slow time, the Moore Stations continue to operate at normal simulator speed. This may have a minor effect on system response, particularly if manual control is initiated.

d. Replay - Installation of the Digital Feedwater and Digital Recirculation Flow Control modification has degraded the Replay function. The operations stored for Replay do not contain the operations of the Feedwater and Recirculation Flow Moore Control Stations. Any operator actions on the twelve Moore Control Stations will therefore not be performed in the Replay mode.

k. Instructor Override - Installation of the Digital Feedwater and Digital Recirculation Flow Control modification as a stimulated, rather than a simulated system, limits the overrides to hardware signals communicated directly to and from the Encore I/O system. I/O overrides are not provided for Moore station controls which communicate with the DCC computer or which only affect the Moore station internal circuits.

l. Plant Performance Parameters (PLPs) were added for the following:

Torus Level

n. Component Level Failures were added for new equipment installed with modifications.

p. In support of emergency drills, a Plant Performance Monitor (PPM) was added to the simulator. This duplicates the plant system which transmits Plant Computer real time data over the Local Area Network (LAN) for use by emergency teams. During emergency drills, stimulated Plant Computer System data is now transmitted over the LAN to all emergency centers. The State of New Jersey also has access to this data.

q. The ability to conditionally clear malfunctions, switch overrides and other instructor directed actions was added to the simulator. This feature will automatically clear these functions when a condition selected by the instructor occurs.

1.5 OTHER SIMULATOR IMPROVEMENTS

1.5.1 I/O System

During early operation of the simulator, frequent I/O Channel failures occurred, including some 'silent I/O failures' which gave no indication that a failure occurred until the operator attempted to operate a switch. After repeated unsuccessful attempts to correct this problem, the interrupt driven I/O system was replaced with a scan I/O system. This fully corrected the I/O failure problem and increased simulator availability.

1.5.2 Simulator Aborts

During early operation, the simulator occasionally aborted during normal use. Improvements to the operating system, system models, and resolution of many individual TRs has reduced the frequency of simulator aborts to a minimum and has increased simulator availability.

1.5.3 Simulator Power Supply

The simulator was built with an Uninterruptable Power Supply (UPS) designed to protect the simulator and allow controlled shutdown of the simulator computers during power supply disturbances such as lightening storms. During the first two years of simulator operation, the UPS was unreliable, failing to transfer back to offsite power during stormy weather. This resulted in some equipment damage and loss of simulator availability. The UPS was repaired, new batteries installed, and a new alarm panel was installed. The system is now functioning as designed. The air conditioning system in the UPS room remains an operating problem and contributed to the premature failure of the UPS batteries.

1.5.4 Disk Storage

The Disk Drives on the A Encore computer were replaced with sealed, removable SCSI disks of higher capacity. This has resulted in improved reliability as well as additional storage space.

2.0 SIMULATOR DESIGN DATA

Status of Modifications:

A continuing review of plant modifications has been performed since the initial certification. Details of the review are shown in Attachment A. A summary of the review is as follows:

994 Modifications reviewed

766 Modifications do not impact the simulator or have negligible effect on training - these will not be installed

277 Modifications were installed since initial certification

36 Modifications are planned for the simulator (including some simulator upgrades which are not plant modifications)

All of the modifications identified in the original simulator certification as required were installed on the simulator. In addition, modifications identified as required since the certification were installed or are scheduled for installation. Eight of the modifications were installed more than 12 months (15 months maximum) after establishing the need for the modification.

As a result of a maintenance activity performed in the plant in November 1994, the valve stroke times for the Backup Scram valves and Scram Discharge Volume valves changed significantly. This changed the plant response to several surveillance tests and the response to certain RPS failures. A decision was made not to update the simulator for these changes since the plant anticipated returning to the original condition in 1996. It was subsequently decided to leave the changes in the plant. Changes to the simulator are now scheduled to be installed by March 30, 1997 to incorporate this plant response.

The Digital Feedwater and Digital Recirculation Flow Control (DFRCS) modification was installed and tested on the simulator prior to installation in the plant. Tuning and logic changes to the DFRCS were developed and tested on the simulator, minimizing the time needed to install the system in the plant. The simulator was also used for the preparation and testing of plant operating

procedure changes associated with the DFRCS. Operator training was conducted on this system prior to plant startup.

The DFRCS is a stimulated system, using virtually the same computer, controllers, and software as installed in the plant. The redundant computer however, was not installed on the simulator. As noted above, this modification has degraded some of the instructor station features for scenarios involving manual operator manipulation of the feedwater and recirculation flow controllers. Several options to recover some of the lost features are under consideration. The most promising option is to replace the stimulated DFRCS with a simulated system. This option, however, would prevent use of the simulator for development and testing of future DFRCS modifications.

3.0 SIMULATOR TESTS

The simulator certification testing was performed per ANS 3.5 - 1985 and USNRC Regulatory Guide 1.149, Revision 1, according to the schedule included with the initial certification, except as noted below. Details of the tests performed and the results are included in Attachment D to this report.

The following Tests were not performed as presented in the test schedule in the initial certification and have been deleted from future schedules:

- TTS59 - Master Feedwater Controller Fails - No longer a credible event due to plant modification
- TTS33 - Recirculation Master Controller Fails- No longer a credible event due to plant modification
- NOT23 - Main Steam line Radiation Monitor Test - This plant surveillance test was deleted by a modification.

The following test was performed as scheduled but is deleted from future test schedules:

- NOT27 - Standby Liquid Control System Functional Test - The plant changed the test procedure to require that a temporary modification be installed to perform the test which is executed once each refueling outage. The Simulator Review Board determined that the training value of this test is minimal and that the simulator should not be modified accommodate the test.

The following Tests were added to the test schedule as substitutions for the above:

- TTS82 - Main Feedwater Regulator Valve Fails
- TTS81 - Recirculation M-G Set Flow Controller Oscillation
- NOT28 - Air Ejector Off Gas Radiation Monitor Test
- NOT29 - Standby Gas Treatment System Test

Several tests were written and scheduled as periodic performance tests prior to completion of the simulator. During simulator construction, the NSSS and Reactor Core models were replaced with proven models supplied by Exitech. Since the replacement model is not capable of performing these evolutions, the following tests are deleted from the test schedule:

- TTS63 - Uncontrolled Rod Withdrawal at Low Power
- NOT10 - Reactivity Coefficient Test
- NOT11 - Reverse Power Effect

To incorporate recent plant operating experience, the following test was performed in 1996 and added to future test schedules:

- OES11 - Generator Runback Scram - December 1995

Core Performance Testing was added to the Steady State Tests performed annually.

Evidence of the significant improvements made in the simulator during the last four years is evident in the overall results of the testing program. The initial certification reported six tests as failed and nine tests as not completed. All six of the failed tests have now passed. Six of the tests which were not completed have now passed and the remaining three were deleted as identified above. Only one test, OES04 which had previously passed, is now reported as failed. The initial certification also reported 39 tests as passed with outstanding Trouble Reports. During the report period, 22 tests passed with outstanding Trouble Reports.

A program for annual testing per ANS 3.5 and Regulatory Guide 1.149 is shown in Attachment D. This program includes testing of approximately 25% of the certified malfunctions per year. To allow for flexibility in the overall simulator training and test schedule, this schedule may be altered, without NRC notification, while maintaining the 25% per year, evenly distributed criteria. Tests required for correction of TRs or testing of modifications may be used to satisfy the required retest and will therefore result in schedule revisions. Each test will be performed at least 1 time in each 4 year period.

4.0 SIMULATOR DISCREPANCY RESOLUTION AND UPGRADING

4.1 Previous plans to start a new TR Database at the end of the simulator warranty period were revised. The TR System started at the beginning of the Factory Acceptance Test (FAT) was converted to a PC based system and remains in use.

Status of TRs is as follows:

Active TRs at Certification	390
New TRs issued since Certification	1253
TRs Closed or Voided since Certification	1557
Current Active TRs (Active + Retest + Hold)	86

Attachment A.3 shows the status of all Trouble Reports written since the start of the Factory Acceptance Test. Also included is a listing of Active and Retest Trs. Retest Trs are in either the Off-Line or On-Line testing phase of the resolution process.

5.0 SUMMARY OF PLANT OPERATING EXPERIENCE REVIEWS

After continuous plant operation since the beginning of Cycle 15 in December 1994, a Generator Run-Back and Reactor Scram occurred on December 18, 1995. Plant and plant PCS data were collected on the transient and used to check simulator performance. Since very little operator intervention occurred, this data provided a great opportunity to verify simulator performance vs. actual plant data. In general, the simulator response was excellent and matched plant data exceedingly well. In many cases, simulator alarms and control actions matched the plant data to within seconds. Some minor differences noted are being evaluated and corrected. A new test procedure was prepared and the event was added to the certification test schedule.

The Cycle 15 Core Reload was tuned to actual plant data from the beginning and middle of the cycle. Criticality conditions, full power rod patterns, and core thermal hydraulic parameters were compared to plant data. Completion of the End of Cycle 15 core conditions is planned for the first quarter of 1997.

Plant data was collected during the plant startup in December 1995 which was used to tune the Cycle 15 Core Reload to actual plant startup conditions.

Data was obtained from the Oyster Creek Plant Computer for several recirculation pump transients that occurred during 1993. One Recirculation Pump trip event was duplicated on the simulator. The Reactor Water Level response was found unsatisfactory and TR 3052 was issued to correct the problem. The difference was later attributed to the DFRCS which was being tested on the simulator prior to installation in the plant. TR 3052 was then closed with no corrective action required. In a related matter, a new Relap5 analysis of a five recirculating pump trip transient was requested for comparison to the simulator five pump trip test results. The simulator level increase for this transient is also lower in magnitude than the previous analysis used for test evaluation. The new Relap5 analysis is scheduled for completion by August 1997.

The program described in the initial certification to review licensing, INPO, and vendor documents specifically for the simulator has been discontinued. The review was found to be redundant and did not result in any improvements to the simulator. Licensing, operations, and training personnel will identify any simulator changes necessary as a result of their review of operating experience documents.

In response to NRC Bulletin 93-02, a task was issued to add a new malfunction for Torus Suction Strainer Plugging. The new malfunction is undergoing testing and is scheduled for installation by March 31, 1997.

ATTACHMENT A

Hardware and Software Known Deficiencies

Note: Items 1, 2, & 3 are generated using the hardware deficiency database created during physical fidelity inspections. Item 4 is generated using the TR database. Items 4 & 5 are generated using the modification database.

A.1 Newly identified hardware deficiencies accepted as is with no plans to modify.

A.2 Hardware deficiencies to be corrected with schedule for completion.

A.2.1 Hardware deficiencies corrected or voided since initial certification.

A.3 Outstanding Trouble Reports (TR) with schedule for correction.

A.5 Modifications to the plant which have not been installed on the simulator, including schedule for installation, if applicable.

A.6 Other modifications planned for the simulator including plant modifications that have not yet been completed in the plant. Also included are simulator upgrades if planned.

A.7 Modifications installed on the simulator since initial certification.

OYSTER CREEK REPLICA SIMULATOR
ADDITIONAL HARDWARE DEFICIENCIES
WHICH WILL NOT BE CORRECTED
ATTACHMENT A.1

BOM ITEM NO.	PLANT PANEL No.	DEVICE DESCRIPTION	TAG	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION
01/17	1F/2F	Annunciator-Panel B	1F/2F-B Ann.	Annunciator Window B-2-d says DEMAND in Plant. Sim says DEMANDS	P01-0063	Accept as is. No impact on training.
02/042	3F	Scale - System Pressure Controller PCV-ND11	PCV-ND11	Simulator Scale has 20 psi major, 2 psi minor divisions Plant has 25 psi major, 2.5 psi minor divisions	P02-0033	On 6/21/94, Human Factors agreed to change plant scale to match simulator which is easier to read.
02/011	3F	Nameplate - 20.70.50.13	TR-IA14	Tag under Recorder TR-IA14 is white on black on the sim should be black on white.	P02-0036	Accept as is - No training impact
02/201	3F	Nameplate - EOP Jumper Box	No Tag	The simulator Nameplate inside the EOP Jumper Box is located on the back panel. The plant nameplate is mounted on the inside of the door.	P02-0039	Accept as is . No training impact
03/197	4F	Recorder - SRM	SRM-RG05	Simulator recorder door does not have silver botton under door handle. Also 03/198,199,202,203	P03-0043	Accept as is
03/197	4F	Recorder - SRM	SRM-RG05	The simulator scale is different: 1)Missing CPS 2) 1 & 10 designation.	P03-0052	Accept as is. No training impact.
03/197	4F	Recorder - SRM	SRM-RG05	The simulator has red and black pens plant has red and blue pens.	P03-0053	Accept as is. No training impact.
03/198	4F	Recorder - IRM-APRM	R105A	The simulator has black scales plant has red scale for IRM 0-40 range. Also 03/199,202,203	P03-0054	Accept as is. No training impact.
03/403	4F	Tape - ARI Demarcation	Alt Rod Injection	The plant has squared corners on demarcation.	P03-0055	Accept as is. No training impact.
04/023	5F/6F	Name Tag - LT-ID13B	LT-ID13B	The LT-ID13B nametag is missing under the plant meter	P04-0156	Plant should reinstall
06/005	9XF	Plaque - EDG Manually Applied Loads	Annunciator 9XF	White Line is missing between Battery Chargers and Fire Pond Pumps	P06-0044	Accept as is. No impact on training
07/013	10F	Scale - Steam Line Rad Monitor Recorder	RN-30	Simulator has an 8 decade scale inside the recorder which is not in the plant	P07-0026	Leave as is. Plant should install the same scale soon.
18/109	7R	ARI Sublogic Panel	PNL-643-8R	The ARI Sublogic Panel is installed behind Panel	P18-0016	Accept as is. Training impact is minimal.

OYSTER CREEK REPLICA SIMULATOR
ADDITIONAL HARDWARE DEFICIENCIES
WHICH WILL NOT BE CORRECTED
ATTACHMENT A.1

BOM ITEM NO.	PLANT PANEL No.	DEVICE DESCRIPTION	TAG	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION
				8R in the plant but behind 7R in the simulator		I/O equipment is in the way in 8R
20/001	9R	Panel DCC X Maintenance Panel	No Tag	The DCC X Maintenance Panel is painted green in the plant. Simulator has a black panel. Also 20/101	P20-0013	Paint Maintenance Panel Green
23/001	16R	Scale - Percent Oxygen Meter Chan A	No Tag	The simulator meter has 5 minor divisions per % The plant has 2 minor divisions per % (Also 23/021)	P23-0041	Accept as is. No training impact.
23/004	16R	Nameplate - Recorder File Identification Number	20.70.52.10.01	The four recorders on 16R have chart identification tags that are black on white. Plant tags are white on black.	P23-0042	No effect on training. Tag has correct information
24/	ER46	Door - ER46	No Tag	The simulator has no door on the front of ER46. The plant has a green door.	P24-0010	Install missing door
	EP	Phone - Operations Line	Emergency Phones	The simulator Operations Line Emergency Phone has a different Head Set connection. Plant has rocker switch assembly mounted to phone.	PEP-0001	Accept as is. Bldg 14 phone system requires difference. Training impact minimal.
	EP	Nameplate	Emergency Phones	Several Nameplates and Operator Aids on the Emergency Phone Panels differ from the plant.	PEP-0002	Accept as is. Emergency Prep Personnel updated nameplates 12/6/94. Differences are acceptable to EP
	ENV	Kickplate - Panels	No Tag	The rubber baseboard is missing on the bottom of the panel bench sections	PEV-0032	Install Missing baseboard
	ENV	Camera - Entrance TV	No Tag	The TV Camera at the control room entrance is missing	PEV-0033	The SRB determined that this is not needed on the simulator
	ENV	Furniture - Water Cooler	No Tag	The Water Cooler near 17R is missing	PEV-0034	The SRB determined that this is not needed on the simulator
	ENV	Phone - Emergency Phone	No Tag	The Emergency Phone near 17R is missing	PEV-0035	The SRB determined that this is not needed on the simulator
	ENV	ARM - Control Room	No Tag	The Control Room Area Radiation Monitor is missing	PEV-0036	The SRB determined that the detector is not needed. The monitor is modeled in RMS.
OC/	OC	Furniture - Tag Box	No Tag	The Tag Box next to the Alarm Display CRT is	POC-0026	Install Missing Tag Box

OYSTER CREEK REPLICA SIMULATOR
ADDITIONAL HARDWARE DEFICIENCIES
WHICH WILL NOT BE CORRECTED
ATTACHMENT A.1

BOM ITEM NO.	PLANT PANEL No.	DEVICE DESCRIPTION	TAG	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION
OC/	OC	Furniture - Calculator	No Tag	missing The calculator on bench above Utility Display CRT is missing	POC-0029	Install missing calculator
OC/	OC	Radio - Motorola	No Tag	The Portable Radio and charger located on the Operator Consol desk top is missing	POC-0030	Install missing radio
SB/012	SBO	Scale - SBO Output XFMR Frequency Meter	No Tag	Simulator scale differs from the plant. Sim has zero mark not on plant meter.	PSB-0001	Accept as is. No training impact.
SB/	SBO	Relay - SBO Relays	No Tag	Six of 12 SBO Panel relays are photo simulations. (3 SBO XFMR Diffs, 1 SBO XFMR GND OC, 1 Synch Check, 1 SBO BKR GND OC)	PSB-0002	Accept as is. Training impact is mimimal.

OYSTER CREEK REPLICA SIMULATOR
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ATTACHMENT A.2

BOM ITEM NO.	PLANT PANEL No.	DEVICE DESCRIPTION	TAG	DIFFERENCE/ DEVIATION	DEVIA. No.	DISPOSITION	TARGET DATE
05/035	7F	Scale - Drn TNk Lvls 2nd RHTR 1-5 Left Meter	LT-31	Control rm shows major subdivision have (6) increments, simulator has (12) on each major subdivision.	P05-0023	Replace scale to match control room.	09/15/97
05/079	7F	Indicator Light - Left RHTR Supp. FNS SW & Indicator Light	No Tag	Control rm shows green & red ind. lite for SF 1-10 are on top of green & red ind lite for SF 1-11. This is reversed on simulator.	P05-0031	Old photo shows reverse. Requires investigation.	09/15/97
05/133	7F	Lens - SJAE Drain Pumps Switch & Indicator Light	No Tag	The Right White Lens says 1-1 RUN on the simulator Plant says 1-1 RES	P05-0070	Determine which is correct and issue TA or Oper Concern	09/15/97
07/015	10F	Nameplate - Recorder RN-35 File Tag	RN-35	The File Tag under Recorder RN-35 is black on white in the simulator. Plant tag is White on Black	P07-0032	Replace Nametag	09/15/97
09/022	12F-2	Scale - 0 - 1029 Megawatts And Megavar Meter	No Tag	Scale in simulator is on the range of 500, 300, 100, 0, 100, 300, 500. Cntrl rm. is 500, 250, 0, 250, 500.	P09-0004	Replace meter to match new plant meter.	09/15/97
09/999	12F	Nameplate	12F	All nameplates at the top rear of Panel 11F and 12F are missing from the simulator (12F-1, 12F-2, etc)	P09-0019	Install missing nameplates	09/15/97
11/230	1R	Nameplate - RN12-B Key Tag	RN12-B	The key tag for RN12B says BA501 in the plant. The simulator tag says 7494	P11-0015	Replace key, lock, and tag	09/15/97
19/008	8R	Nameplate - DFCS Power Panel	DFCS Power Panel	The entire panel needs to be relabled. Most of the tags are different from the plant.	P19-0022	Relable Panel.	09/15/97
20/005	9R	Nameplate - DCC X CPU Mode Selector	No Tag	Simulator has Nameplate above keylock switch that says DCC X CPU Mode Selector. Nameplate is not in plant. Also 20/105	P20-0012	Remove Nameplate	09/15/97
20/008	9R	Nameplate - CRT DCC X	CRT DCC X	The CRT DCC X Nameplate size and style is different on the simulator. Also 20/108	P20-0014	Replace Nameplate	09/15/97
20/010	9R	Nameplate - CPU DCC X	CPU DCC X	The CPU DCC X Nameplate size and style is different on the simulator. Also 20/110	P20-0015	Replace Nameplate	09/15/97
20/113	9R	Plate - Moore 320 ICI for	No Tag	The simulator has open slots for additional	P20-0016	Install Cover Plates	09/15/97

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BOM ITEM NO.	PLANT PANEL No.	DEVICE DESCRIPTION	TAG	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	TARGET DATE
		DCC X		modules. The plant has green cover plates over empty slots.			
20/113	9R	Nameplate - Moore 320 ICI for DCC X	320 X	The plant has a nametag under the Moore 320 ICI for DCC X. This is missing on the simulator. Also 20/114.	P20-0017	Install missing nameplate	09/15/97
20/113	9R	Label - Moore 320 ICI for DCC X	320 X	The simulator nametag on the door of the Moore 320 ICI for DCC X is different than the plant. Also 20/114.	P20-0018	Install missing nameplate	09/15/97
20/115	9R	Nameplate - Plant Computer System Communications Link	MICOM	The simulator has a nameplate on the MICOM faceplate. The plant does not have this nameplate	P20-0019	Remove nameplate	09/15/97
21/125	10R	Label - A Emerg Cond Shell HI/LO Alarm	LS IG03A	The LS IG03A module in the plant has a yellow stick-on label with Hi/Lo alarm settings. Simulator is missing label.	P21-0055	Intall missing label on simulator	09/15/97
28/	11XR	Digital Generator Protection Panel	DPRS-RKA	Lights L1/2, L3/4 are labeled 1/2 and 3/4 due to spacing errors	P28-0013	Correct lettering when panel face is replaced	09/15/97
30/007	12XR	Nametag - N2 Purge & Makeup Flow Recorder	12XR-4	The Recorder File Tag is incorrect. Sim: 20.70.52.06, Black on White Plant 20.70.58.06 White on Black	P29-0069	Replace tag to match plant	09/15/97
35/	18R	Photo - 18R Rear, Nest 4	No Tag	The Photo of 18R Rear Nest 4 is incorrect. Sim has RE05B but should have RE02C	P35-0024	Replace Photo	09/15/97
35/001	18R	Photo - 18R Front Nest 3	No Tag	The simulator 18 R Front Nest 3 Photo is missing new alarm module	P35-0025	Update Photo for plant modification	09/15/97
35/	18R	Photo - 18R Rear, Nest 3	No Tag	The Photo of 18R Rear Nest 3 is missing new module installed in the plant	P35-0027	Replace Photo when installing modification	09/15/97
36/	19R	Photo - 19R Front, Nest 3	No Tag	The Photo of 19R Front Nest 3 is missing new module installed in the plant	P36-0020	Replace Photo when installing modification	09/15/97
36/	19R	Photo - 19R Rear, Nest 4	No Tag	The Photo of 19R Rear Nest 4 is missing new module installed in the plant	P36-0021	Replace Photo when installing modification	09/15/97
36/	19R	Photo - 19R Rear, Nest 3	No Tag	The Photo of 18R Rear Nest 4 is incorrect. Sim	P36-0022	Replace Photo.	09/15/97

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BOM ITEM NO.	PLANT PANEL No.	DEVICE DESCRIPTION	TAG	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	TARGET DATE
				has RE02C but should have ~~RE05/19B~~			
	ENV	Switch - Halon Activation and Abort	No Tag	Simulator is missing 3 Halon Activation and Abort switches next to Local Fire Alarm panel.	PEV-0004	Install missing switches.	09/15/97
	ENV	Cover	No Tag	Red electrical box cover under control room halon switches is missing. Simulator has open box.	PEV-0008	Instal. missing box cover.	09/15/97
	ENV	Phone GSS Office	No Tag	All phones are missing in the GSS Office.	PEV-0018	Have SRB evaluate the need for these phones.	09/15/97
	ENV	Sound - Sound Generator	No Tag	The simulator sound generator is inoperable. Background noise (relay hum etc.) is needed.	PEV-0027	Repair sound generator and program applicable sounds.	09/15/97
	ENV	Mimic - Chemistry Status	No Tag	The mimic is missing on the simulator Chemistry Status Board	PEV-0031	Install missing mimic	09/15/97
	ENV	Desk	No Tag	The GOS Desk and Control Room Access routing differs from the plant.	PEV-0038	Modify GOS Desk. Install access control stanchions.	03/15/97
FA/	FP-1	Module	No Tag	There are two blank Modules Missing in the bottom row on the simulator	PFA-0002	Install Missing Blank Fire Panel Modules.	09/15/97
FA/	FP-1	Module	No Tag	Simulator is missing module and red & amber lights for B HVAC for Control Room on the bottom row.	PFA-0003	Install missing modules. (GPUN did not forward info to Westinghouse during simulator design)	09/15/97
FA/	FP-1	Switch - Normal/Alarm Silence	Master Fire Alarm Panel A	The Master Fire Alarm Panel A Normal/Alarm Silence Switch is missing on the simulator	PFB-0005	Install functional Normal/Silence Switch	09/15/97
FA/	FP-3	Switch - Master Fire Alarm Panel B	Master Fire Alarm Panel A	The Normal/Alarm Silence Switch is missing in Master Fire Alarm Panel B	PFM-0008	Install functional Normal/Alarm Silence Switch	09/15/97
OC/	OC	Nameplate	No Tag	Engraved Nameplate above page phone (By the procedure rack) is missing on the simulator.	POC-0016	Install mis: ng tag.	09/15/97
OC/	OC	Nameplate	No Tag	Engraved Nameplate on the end of the console by the Centracom is missing on the simulator.	POC-0017	Install missing tag.	09/15/97
OC/	OC	Phone	No Tag	Phone cord on end of operator consol near procedure rack is too short.	POC-0022	Replace phone cord.	09/15/97
OC/	OC	Phone - All GPU Calls	No Tag	The phone next to the Utility Display CRT is missing (All GPU)	POC-0027	Install missing All GPU phone. Auto ring to Instructor Station.	09/15/97

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
17R	Nameplate - 17R	Control room nameplate is black w/white engraving. Simulator has white w/black engraving.	P00-0003	Replace nameplate to match plant.	04/13/95	Replaced nameplate
1F/2F	Nameplate - Safety Valve Meter	Nameplate located above meter, text differs.	P01-0001	Replace Nameplate to implement plant modificatio	12/01/94	Installed Modification
1F/2F	Nameplate - Safety Valve meters	Nameplate below meters on control rm. is missing on simulator.	P01-0002	Install Nameplate to implement plant modification.	12/01/94	Installed Modification
1F/2F	Annunciator-Cntmt. Spray, Core Spray Ads Sv/EMRV Annun.	On simul. pnl. nameplates on annun. B at positions: 5-a, 5-b, 5-e & 5-f lettering space is short. Cont. rm. is one letter space apart.	P01-0004	Accept as is. No impact on training.	07/14/92	Corrected per photo 7514-11A
1F/2F	Annunciator - Cntmt spray, Core Spray Ads SV/EMRV Ann.	On simul. pnl. nameplates on annun. B at positions: 5a, 5b - the numeral digits 1 & 2 are not located in the lower rt. corner.	P01-0005	Accept as is. No impact on training.	07/14/92	Corrected per photo 7514-11A
1F/2F	Annunciator - Cntmt Spray, Core Spray Ads SV/EMRV Annun.	On simulator pnl. subdivision of window plate in 2 sections w/blue line is missing. Located at 3-d. Exists on control rm. pnl..	P01-0006	Install tape	07/14/92	Accept as is. Window was changed with mod.
1F/2F	Annunciator - Cntmt Spray, Core Spray Ads SV/EMRV Annun.	On simulator pnl. annunciators windows 1e, 2e, 1f, 2f, 5h & 6h text differs.	P01-0008	Implement Plant Modifications (Need to identify source). 5h & 6h to be replaced per task 568.1	10/26/93	Annunciator windows were replaced during mods
1F/2F	Plaque - Isolation condenser/EMRV Discharge Temp Recorder.	Plaque located to the left of recorder #01/025 (3"H x 5"W) black w/white lettering, is on simul., missing on control rm.	P01-0016	Remove Plaque which is no longer in the control room.	12/01/94	Verified Plaque was removed
1F/2F	Nameplate - Auto Depress Valve Switch NR108A	Nameplate above valve switch, is larger on control rm. and text differs. Also for 01/076, 077, 078, 094, 095.	P01-0019	Implement Plant Modification. (Need to determine source of modification)	07/11/96	Replaced nameplates
1F/2F	Annunciator - Containment Spray, Core Spray Ads SV/EMRV Annunciator	Text is missing on simulator window at location 3-d.	P01-0020	Implement Plant Modification (Need to determine source)	10/26/93	Replaced annunciator during mod.
1F/2F	Plaque - Booster Pump	Plaque to the right of 01/130 & 01/132 is red	P01-0033	Install Plaques to match Control Room	12/01/94	Plaque no longer in

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	NZ03B Indicator Light & Switch	w/white engraving. Plaque is on control rm but missing on simulator. Also 01/130 & 01/132.				Control Room
1F/2F	Nameplate - DC Indicator Lights & Switch	Nameplate below the switch on simul. is not on control room pnl.	P01-0034	Remove Nameplate.	12/01/94	Removed Tag
1F/2F	Switch - Static Test Start Switch	On simulator panel the switch is mounted with a ring. Ring is missing on control rm. Also 01/143,146,163,164.	P01-0038	Cosmetic only. Accept as is.	07/14/92	Switches were removed by modificatiion
1F/2F	Mimic - Main Pump NZ01D Indicator Light & Switch	On simulator panel mimic line (black 1/8" wide) is longer between the arrows directed from items 01/150 & 01/151.	P01-0039	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected during modification
1F/2F	Switch - EMRV Disable	On control room panel inside rear panel there are (5) key operated 2 position selector switches w/(2) nameplates for each. There are none on simulator	P01-0042	Determine if Westinghouse is responsible to install.	11/09/93	Installed EMRV Disable Switches
1F/2F	Tape- Demarcation	Plant Annununciator Windows C-3f, C-4f, C-5f, C-6-f, C-5-g, C-6-g, C-5-h, & C-6-h have 1/4" tape around them. Simulator has 1/8" tape.	P01-0044	Accept as is. Cosmetic only. No training impact.	07/14/92	Plant Corrected Tape
1F/2F	Tape- Demarcation	Simulator has 1/8" tape between windows C-5-g & C-6-g. Plant does not.	P01-0045	Accept as is. Control Room requires maintenance.	07/14/92	Plant Corrected Tape
1F/2F	Tape- Demarcation	Plant appears to have a different color tape around windows C-3-f, 4-f, 5-f, 6-f, 5-g, 6-g, 5-h & 6-h. (May be different tape lot number)	P01-0046	Accept as is. Control room used different dye lot or manufacturer. Should all be same shade per H.F.	07/14/92	Plant Corrected Tape
1F/2F	Tape- Demarcation	Simulator has 1/8" tape between Windows C-3-a & C-4-a. Plant has 1/16" tape.	P01-0048	Accept as is. Cosmetic only. No training impact.	07/14/92	Plant corrected Tape
1F/2F	Annunciator	Engraving on plant window is bolder. "And" is a different size between window C-1-a & C-2-a. I & II are in a different location.	P01-0049	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected per photo 7514-34A
1F/2F	Tape - Demarcation	Simulator has 1/4" tape around windows C-7-d & C-8-d. Plant has 1/8" tape.	P01-0050	Accept as is. Cosmetic only. No training impact.	07/14/92	Plant Corrected Tape

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
1F/2F	Tape - Demarcation	Simulator has Demarcation tape around windows B-1-b & B-2-b. Plant does not.	P01-0051	Accept as is. Control Room requires maintenance.	07/14/92	Plant Corrected Tape
1F/2F	Annunciator - Window C-3-a & C-3-b	Engraving on 3rd line is larger in the plant. (Possible Rupture)	P01-0052	Accept as is. Cosmetic only. No training impact.	07/14/92	Plant Corrected per photo 7514-34A
1F/2F	Nameplate	Simulator has metal strip attached to top two metal screws on escutcheon. Plant does not. Also applies to all switches on 1F/2F.	P01-0058	Accept as is. Cosmetic only. No training impact.	07/14/92	Removed from simulator
1F/2F	Escutcheon - V-20-15 Control Switch	"Close" & "Open" are engraved on the escutcheon in the plant. On the sim. they are black tape w/ white (larger) letters. Also applies to 01/115.	P01-0060	Accept as is. Cosmetic only. No training impact.	07/14/92	Switches were changed during mod.
1F/2F	Panel	EMRV Disable Switch Panel behind 1F/2F is not painted green	P01-0061	Paint panel green	12/01/94	Painted Panel Green
1F/2F	Nameplate	EMRV Disable Switch Panel Nameplates (10) are taped on the panel. They should be glued.	P01-0062	Install nameplates properly after painting panel.	12/01/94	Glued Tags
1F/2F	Annunciator-Panel B	Annunciator Windows B-6-e & B-6-f say OVERPRESSURE on simulator. Plant says TEMP HI	P01-0064	Install Modification per B/A 403011, TA 719.1	07/17/95	See REP-0168-950118
1F/2F	Scale	Meter Scales for PIT-RV03A & RV03B are 0 - 300 on sim. Plant has 0 -250 PSIG	P01-0065	Replace Simulator Scales per FCN C1087, B/A 403011	07/17/95	See REP-0168-950118
1F/2F	Nameplate	The tag under Rx Pressure Meter PI-ID76 says PT-ID46A on the simulator. Plant says PI-ID76.	P01-0066	Replace Simulator Nameplate	10/08/96	Replaced Nameplate per REP-244-960709
1F/2F	Key Holder	The Key Holder in the lower right corner has YES Tags in the plant. The sim has keys.	P01-0067	Replace Simulator Keys with YES Tags	10/10/96	Installed YES tags
1F/2F	Switch and Indicator Lights	Core Spray Minimum Flow Switches & Indicator Lights have been removed from the plant. Sim still has these. Also 01/163	P01-0068	Implement Modification on the simulator (B/A 403011)	07/17/95	See REP-0168-950118
1F/2F	Nameplate -	Tags above switches for NR108A,B,C,D say VALVE OPEN on the sim Plant says SOLENOID VALVE OPEN	P01-0069	Replace all 5 nameplates	07/11/96	Replaced Nameplates per REP-244
3F	Annunciator - RX Recirc	On simulator panel annunciator's windows: F-7-b,	P02-0005	Accept as is. Cosmetic only.	07/14/92	Corrected - Do not know

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	Pumps/Drives/Pump C/D/E Annunciator	F-7-d & F-7-f engraving is bolder & darker. Letter size is bigger than on control room panel.				when
3F	Annunciator - Fuelpool Liq. System Reactor Annunciator Frame Name Plate	On simulator panel in the top 2nd window from left the text differs. (LLLIQ POISON SYS vs STDBY LIQ CNTRL)	P02-0006	Implement plant modification. (Need to determine source of modification)	12/02/94	Replaced Nameplate on sim
3F	Annunciator - fuelpool Liq. System Reactor Annunciator	On simulator panel the window division line between window G-7-c & G-8-c is missing.	P02-0007	Replace Window to implement plant mod. See P02-0008	10/08/93	Installed modification REP-0035-930526
3F	Annunciator - Fuel pool Liq. System Reactor Annunciator	On simulator panel in windows: G-7-c & G-8-c engraving of text is missing.	P02-0008	Replace window to implement plant mod.	10/08/93	Installed RPS 1/2 Isolation Alarm Mod. REP-0035
3F	Mimic - Recirc Pump Trip/Reset Panel	On simul. pnl on the mimic are missing 2 arrows located to the left of each black nameplate w/white lettering "Bypasses Trip and Enables Test Lamps"	P02-0011	Install missing arrows.	07/11/96	Reassign to GPU 12/17/92. Installed pieces.
3F	Nameplate - Generator Kilowatts Meter	Nameplate below K-watt meter, size is larger on simulator, 2 dash lines are missing on simul, & engraving has larger letters on simul.	P02-0026	Accept as is. No training impact	07/14/92	Meters were abandoned in modification
3F	Key Holder	Suction Cup Key Holders for Recirc. Pump Trip Switches are missing on the simulator	P02-0034	Install Key Holders	03/23/95	Installed Suction Cups
3F	Recorder - Rx Recirc Pump Temp Recorder	Simulator Recorder TR-IA71 is missing white SPD 4 Tag on the door	P02-0035	Install missing tag	10/08/96	Installed missing tag per REP-244-960709
3F	Plaque	Red caution plaques above all 5 recirc pump start switches have different text.	P02-0037	Replace 5 Caution Plaques	04/18/95	Replaced plaques. See REP-0187-950323
3F	Nameplate	The 5 Gravoply Nameplates are missing from the simulator controllers. The Information is on a paper tag but differs from the plant	P02-0038	Replace 5 Nameplates	07/29/96	Installed Nameplates per REP-244-960709

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
4F	Plaque - Rod Worth Minimizer 13" CRT.	On simulator pnl to the right of CRT there is a plaque w/different text than on cntrl rm.	P03-0003	Install new SRM Count Rate Plaque to match control room plaque.	12/06/94	Installed new plaque
4F	Nameplate - SRM Period GE180 Meter	Nameplate below meter, 1" x 3/4", white w/black engraving is missing on simulator. Also 03/189,190,191,192,193,194,195,196.	P03-0004	Install new tags per plant modification.	07/11/96	Installed nameplates
4F	Escutcheon - SRM Drive Select Switch & Indicator Lights	Simulator has blank black plate screwed on escutcheon (top portion). Also 03/244,271,276,277,286,287,288,289,290,295,300.	P03-0008	Accept as is. Cosmetic only. No training impact.	07/14/92	Removed plate
4F	Nameplate - Liquid Poision Cont. Meters	Nameplate mounted on top of meters have different text.	P03-0015	Replace Name Plate	04/13/95	Replaced nameplate
4F	Nameplate - Range Switch With Reset	Control rm shows red w/white engraving nameplate mounted below range switches 12 & 13, 16 & 17. On simul these are yellow w/black engraving.	P03-0018	Install new Plaque to match Control Room	12/06/94	Installed new nameplate
4F	Nameplate - Range Switch With Reset	Engraving & text differs on the nameplate mounted below range switch 12 & 13 15 & 16.	P03-0019	Install new Plaque to match Control Room.	12/06/94	Installed new plaque
4F	Nameplate - Stabilizer Valve Selector NC19 Switch & Indicator	Engraving is bolder on nameplate mounted on top of the switch as shown on control rm. Also 03/290.	P03-0022	Accept as is. Cosmetic only. No training impact.	07/14/92	Replaced during modification
4F	Tape - Rod cont. Selector Switch and Indicators	Simulator has bigger (wider) space between top demarcation tape & indicating lights & lesser (narrow) space between bottom demarcation tape & sel. sw.	P03-0024	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected during modification
4F	Plate - Level Controller Station	Simulator has bolder engraving on the face plate of the controller for switch position 0-100, Auto, Bal, Man, 0-100.	P03-0025	Accept as is. Cosmetic only. No training impact.	07/14/92	Replaced controller
4F	Nameplate - Transmitter Selector Switch	Simulator has "Pressure PT-1009" third line engraving on the nameplate mounted on top of selector switch. Can't tell on cntrl rm photo.	P03-0026	Correct simulator and Control Room Nameplates.	12/05/94	Void - Switch was removed during modification.

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4F	Nameplate - RX Level Setdown Reset P.B. Switch	Engraving on nameplate mounted at the right side of PB switch differs.	P03-0027	Accept as is. Cosmetic only. No training impact.	07/14/92	Switch was removed
4F	Plaque - GE180 Meter 0-100 Scale Linear	On simulator panel it is missing. On control rm plaque is located to the left of item 03/204.	P03-0040	Post Operator Aid OPS42, Cram Rod Array on panel 4F	04/13/95	Posted Cram Array Plaque
4F	Chart - Paper = IRM R105A Yew 2 Pen Recorder	On simulator pnl the chart paper in the recorders is generic. On control rm is special. Also 03/197,198,199,202,203.	P03-0041	Refer to P03-0035 for recorder replacement. Obtain proper paper with recorders.	10/26/93	Replaced chart paper
4F	Scale - CRD Flow Controller Station	Simulator does not have green transparent tape accross meter scale as shown in control rm. also 03/297.	P03-0042	Install Green banding on CRD Flow & Reactor Level Controllers.	07/30/96	Installed per REP-0244-960709
4F	Plaque - IRM R105C Yew 2 Pen Recorder	On control rm there is a plaque above item 03/202 recorder. Not on simulator.	P03-0044	Install missing CRD Position Units/Tens Plaque.	12/05/94	Installed Plaque
4F	Panel	The IRM Test Panel Behind 4F is not painted green	P03-0045	Paint Panel green	12/05/94	Painted panel green
4F	Nameplate	All Nameplates are missing from the IRM Test Panel Behind 4F.	P03-0046	Install missing nameplates	07/15/96	Installed per REP-0244-960709
4F	Tape SRM Meters	The simulator demarcation tape around the SRM Meters and Recorder differs, apparently due to elevation difference of SRM Meters.	P03-0047	Replace demarcation tape to make panel error less obvious	07/29/96	Replaced part of tape
4F	Recorder - SRM	Simulator recorder scale pointers point up plant's point down. Also 03/198,199,202,203	P03-0049	Replace simulator scale pointers	07/29/96	Replaced Pointers per REP-244-96-709
4F	Recorder - SRM	Simulator recorder has fan-fold paper plant has roll chart. Also 03/198,199,202,203	P03-0050	Replace drive and chart with roll type	04/18/95	Replaced Chart Drives. See REP-187-950323
4F	Nameplate - SRM Recorder	The simulator chart file number tag is black on white plant is white on black. Numbers are wrong on most of them. Also 03/198,199,202,203	P03-0051	Replace 5 nameplates.	09/05/96	Replaced Nametags per REP-0244-960709
4F	Nameplate - Recirc Master Controller	The black information tag is right of controller on simulator	P03-0056	Relocate Nameplate	09/06/96	Relocated Nameplate per REP-0244-960709

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		under controller in plant				
4F	Knob - Setpoint Adjust Knob	The simulator controller has a setpoint adjust knob the knob was removed from the plant controller	P03-0057	Remove setpoint adjust knob from simulator	C7/24/96	Removed Knob
5F/6F	Annunciator - window	Engraving on plant window is bolder.	P04-0004	Replace Window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Annunciator - Window	Plant engraving is bolder & character spacing is different.	P04-0005	Replace Window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Annunciator Window	Engraving is bolder and characters are larger on the simulator	P04-0006	Replace window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape - Demarcation	Plant has 1/4" tape around windows H-1-c & H-2-c, simulator has 1/8" tape.	P04-0007	Replace tape to match control room.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape - Demarcation	Many of the windows on the left 2/3 of the box on the simul. appear to have the wrong color demarcation tape. Need dwg's & tape samples to verify.	P04-0008	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected difference (Not sure how)
5F/6F	Annunciator - Window	Engraving is larger & bolder on the plant window.	P04-0009	Replace Window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Annunciator - Window	Engraving is not centered properly on windows H-1-e & H-2-e on simul. Center line is too high. Top half of window is smaller than bottom half.	P04-0014	Replace Window to match the plant	10/26/93	Replaced window See REP-0067-930916
5F/6F	A[illegible]iator - Window	Oval around CCW on the simulator is a different shape than in the plant . Also H-2-e. Lettering inside oval is larger on the simulator.	P04-0015	Replace Window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape-Demarcation	Plant has 1/32" tape dividing windows H-3-e & H-4-e, simulator has 1/8". Note: Plant line may be engraved into window, can't tell from photo.	P04-0016	Accept as is. No training impact	07/14/92	Corrected difference
5F/6F	Tape - Demarcation	Simulator has 1/4" demarcation tape between windows H-5-e & H-6-e. Plant has 1/8".	P04-0017	Accept as is. No training impact. Replace tile per task 568.1.	12/13/94	Corrected

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
5F/6F	Annunciator - Window	Letter spacing, boldness, arrangement of symbols & size of symbols on the simulator are different. Also H-6-e.	P04-0018	Accept as is. No training impact. Replace tile per task 568.1.	12/02/94	Corrected Annunciator
5F/6F	Annunciator - Window	Letter sizes, boldness, letter spacing, symbol size and symbol arrangement different on the simulator. Also applies to H-4-e.	P04-0019	Accept as is. No training impact	07/14/92	Replaced Window
5F/6F	Annunciator	Spacing between letters, arrangement of symbols & line arrangement different on the simulator. Also H-2-f.	P04-0022	Accept as is. No training impact. Replace tile per TA 568.1.	12/02/94	Corrected Annunciator
5F/6F	Annunciator -	Symbols are in a different location on the simulator.	P04-0023	Accept as is. No training impact	07/14/92	Replaced Window
5F/6F	Nameplate -	Engraved information nameplate below annunciator box H is missing on the simulator.	P04-0026	Fabricate Information Plate with magnetic back.	12/02/94	Installed Nameplate
5F/6F	Tape - Demarcation	Plant has 1/8" tape down left edge of tile and simulator has 1/4". Also J-2-a.	P04-0028	Replace Tape to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Annunciator	Word "AND" between tiles J-1-a & J-2-a is engraved larger on the simulator.	P04-0029	Replace Window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Annunciator -	Word "AND" between J-5-a and J-6-a is engraved larger on the simulator.	P04-0031	Replace Window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape - Demarcation	Plant has 1/4" tape around outside of tile. Simulator has 1/8" tape on top, bottom & right side.	P04-0032	Replace tape.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Annunciator -	Wording on tile J-7-a on the simulator is different.	P04-0033	Replace Window to match plant.	09/16/94	Replaced Alarm Window See REP-0067-930916
5F/6F	Annunciator	Spacing between letters and words is more compressed on the simulator.	P04-0034	Replace Window to match plant.	09/16/94	Replaced Alarm Window See REP-0067-930916
5F/6F	Annunciator -	Symbol (E) is a different size and color on the simulator.	P04-0035	Replace Window to match plant (See P04-0034 for reason)	09/16/94	Replaced Alarm Window See REP-0067-930916
5F/6F	Tape - Demarcation	Plant has 1/4" tape around tiles J-1-b and	P04-0036	Replace tape.	10/26/93	Replaced window See

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		J-2-b. simulator has 1/8" tape.				REP-0067-930916
5F/6F	Annunciator -	Word "AND" between J-1-b and J-2-b is engraved larger on the simulator. Rest of the letter is more compressed than in the plant.	P04-0037	Replace Window to match plant	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape - Demarcation	Plant has 1/4" tape around tiles J-3-a and J-4-a, simulator has 1/8"	P04-0038	Replace tape.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Annunciator -	Plant has an engraved tile and simulator has a blank tile.	P04-0040	Implement plant modification on simulator.	10/26/93	Replaced window
5F/6F	Annunciator -	Plant has an engraved tile and simulator has a blank tile.	P04-0041	Implement plant modification on the simulator.	10/26/93	Replaced window during modification
5F/6F	Annunciator	Plant has an engraved tile and simulator has a blank tile.	P04-0042	Implement plant modification on the simulator.	10/26/93	Replaced during modification
5F/6F	Annunciator -	Simulator has an engraved tile and plant has a blank tile.	P04-0043	Implement plant modification on the simulator.	09/16/94	Replaced Annunciator Window See REP-0067-930916
5F/6F	Annunciator	Engraving is boider on plant tile. Also applies to K-6-c.	P04-0045	Replace Window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape - Demarcation	Plant has 1/4" tape on all 4 sides of tile. Simulator has 1/8" tape. Includes K-6-c	P04-0046	Replace tape when changing window per P04-0045	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape - Demarcation	Plant has 1/4" tape on all 4 sides of tile. Simulator has 1/8" to-right & bottom, includes K-2-e. Also K-5-e & K-6-c	P04-0049	Replace tape. Replace window per TA 568.1	10/26/93	Replaced window
5F/6F	Annunciator -	Simulator has an engraved tile. Plant tile is blank.	P04-0050	Implement plant modification on the simulator.	03/30/95	Installed Modification per REP-0184-950228
5F/6F	Annunciator -	Engraving is compressed more on the simulator than in the plant. Also K-8-f.	P04-0051	Accept as is. Cosmetic only. No training impact. Replace tile per TA 568.1	12/02/94	Replaced Annunciator
5F/6F	Tape - Demarcation	Plant has 1/4" tape on all 4 sides. Simulator has 1/8" on left-top-bottom, includes K-6-f.	P04-0052	Replace tape.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Annunciator	Engraving on 2nd line on the simulator is	P04-0053	Replace Window to match plant.	10/26/93	Replaced Window See

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		larger. Also L-4-b.				REP-0067-930916
5F/6F	Annunciator	Plant has an engraved tile. Simulator is blank.	P04-0054	Implement plant modification.	10/26/93	Replaced window during modification
5F/6F	Annunciator	Delta p engraving on the simulator is compressed & Delta symbol is larger than in the plant. Also L-7-c,L-8-c,L-1-d,L-2-d,L-3-d,L-4-d,L-5-d,L-6-d, L-1-	P04-0055	Replace Windows to match plant.	10/26/93	Replaced windows See REP-0067-930916
5F/6F	Tape - Demarcation	Simulator has wrong color & size demarcation tape installed. Includes L-4-e	P04-0057	Replace tape to match plant.	10/26/93	Replaced window
5F/6F	Annunciator	Engraving on the simulator is different.	P04-0058	Replace window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape - Demarcation	Simulator has wrong color and size tape installed. Includes L-8-e.	P04-0059	Replace tape to match plant.	10/26/93	Replaced window
5F/6F	Annunciator	Engraving on plant annunciator is bolder. Also applies to L-8-e.	P04-0060	Replace Window to match plant.	10/26/93	Replaced window See REP-0067-930916
5F/6F	Tape - Demarcation	Plant has 1/16" tape between L-5-f and L-6-f. Simulator has 1/8".	P04-0062	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected difference (Not sure How)
5F/6F	Recorder - Total Steam Flow	Simulator recorder is missing dual scale (0-8 E6 1b/hr).	P04-0063	Install missing scale.	10/10/96	Installed scale per REP-244-960709
5F/6F	Scale - RX H20 Level Recorder	Dual scale is missing on simulator recorder. (90 to 186 inch H20) & (-1600 PSIG)	P04-0069	Install missing scale.	10/10/96	Installed scale per REP-244-960709
5F/6F	Tape - Demarcation	Demarc tape above Rx Press. meters & below recorder ID75 needs to be moved up some on the simul. so nameplate for "Reactor Pressure" can be moved.	P04-0071	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected Tape
5F/6F	Nameplate - PT-622-1018	Nameplate is missing below the meter on the simulator. Also 04/017 (PT622-1019)	P04-0072	Install missing nameplate	12/02/94	Installed Nameplate
5F/6F	Nameplate - Channel Indicator	White channel designator nameplates are missing below the meters on the simulator. Also	P04-0073	Install missing nameplates.	12/02/94	Installed nameplate

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		04/016,017,018,019. PT622-1018, PT622-1019.				
5F/6F	Nameplate - Narrow Range	Engraving on plant tag is bolder.	P04-0079	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected
5F/6F	Scale - GF1AC Narrow Range	Numbers are bolder on the plant scale. Also applies to units.	P04-0080	Accept as is. No training impact	07/14/92	Replaced Meters with DFCS mod.
5F/6F	Lens - V-1-107 Red Lens	Plant has different style lens for open (red) position.	P04-0083	Accept as is. No training impact	07/14/92	Replaced lenses
5F/6F	Nameplate - Engraved Information	Engraved information nameplate below meters is missing.	P04-0085	Install missing nameplate.	04/05/95	Installed missing nameplate
5F/6F	Nameplate - Instrument Activated	Nameplate on the simulator is wider.	P04-0086	Accept as is. No training impact	07/14/92	Nameplate was removed by modification
5F/6F	Nameplate - Channel Identifier	Channel identifiers are missing above the fuel zone level meters on the simulator. Also 04/046, 047, 048, 049.	P04-0087	Install missing Nameplates.	12/02/94	Replaced nameplate
5F/6F	Tape - Demarcation	Arrangement of tape between 04/044 & 04/045 on the simul. is different. Simul. has 1/4" gap & there is no gap in the plant.	P04-0090	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected tape
5F/6F	Nameplate - RX FW Inlet Temp Meter	Engraving on plant nameplate is bolder (nameplate above meter).	P04-0092	Replace Nameplate to match plant.	12/02/94	Replaced naame, 'ate
5F/6F	Switch - MFRV A Block Valve	Plant has switch, 2 indicator lights & nameplate mounted below 04/055. Does not exist on simulator.	P04-0096	Implement Plant Modification.	10/26/93	Installed switch during modification
5F/6F	Switch - MFRV C Block Valve	Plant has switch, 2 indicator lights & nameplate mounted below 04/058. Does not exist on simulator.	P04-0097	Implement plant Modification.	10/26/93	Installed swicch during modification
5F/6F	Nameplate - Reactor Pressure	Nameplate on the simulator is longer than the one in the plant. Engraving in the plant is bolder w/more space between the letters.	P04-0101	Replace nameplate to match plant.	12/02/94	Replaced nameplate
5F/6F	Nameplate - Turbine Steam	Nameplate on the simulator is longer. Engraving	P04-0102	Replace Nameplate to match plant.	12/17/94	Replaced Nameplate

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	Flow/1st St. Press	is bolder on the simulator. 1st is engraved different on the simul. (Simul. - 1st) (Plant - 1ST)				
5F/6F	Nameplate - Reactor Water Level	Simulator has 1" x 6" engraved nameplate (Reactor Water Level) above recorders 04/009 & 04/005. Doesn't exist in plant.	P04-0109	Remove tag which was removed from control room.	12/02/94	Removed nameplate
5F/6F	Recorder - RX Level - Fuel Zone	Plant has L & N 2 pen recorder. Simulator has Yokogawa (1) pen recorder installed.	P04-0121	Check if this is an approved hardware substitution.	07/19/95	Replaced recorders in plant and simulator TA 696.1
5F/6F	Lens - 'A' FD PP Flow Limit Indicator Light	Lens engraving on the simulator is different from the plant.	P04-0127	Accept as is. No training impact	07/14/92	Issued new discrepancy 12/3/94
5F/6F	Plaque - Information, Feed Pump Runout Setpoints	The Plaque on the simulator is smaller than the one in the plant. (Matches old photo) Also silkscreen is different.	P04-0132	Replace Plaque to match new plant plaque.	12/03/94	Replaced plaque
5F/6F	Indlite - H2 Injection Solenoid	Simulator is missing pair of indicator lights and Nameplate for the HWC Isolation Valve above FWP A1A control Switch. Also applies to 04/105 & 106.	P04-0136	Install H2 Injection Modification.	12/17/94	Installed modification
5F/6F	Switch - HWC Inlet Isolation Valve	Simulator is missing control switch, pair of indicator lights, Nameplate & demarcation tape for the HWC Inlet Isolation Valve V-567-0005.	P04-0137	Install H2 Injection Modification.	12/17/94	Installed modification
5F/6F	Nameplate - Information	Plant has an information nameplate located between 04/109 & 04/090. Doesn't exist on the simulator.	P04-0144	Install missing information plate.	12/03/94	Installed missing plaque
5F/6F	Nameplate - Information	Plant has an information nameplate located between 04/092 & 04/111 and 04/111 & 04/131. Doesn't exist on the simulator.	P04-0145	Install missing Nameplate.	12/03/94	Installed missing nameplate
5F/6F	Annunciator	Engraving on plant Annunciator window is bolder than that on the simulator.	P04-0150	Replace annunciator window to match plant.	10/26/93	Replaced window See REP-0067-930916

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
5F/6F	Nameplate - DPT-5-IA91A	Text differs on name tag under Fuel Zone A & B Level Meters	P04-0151	Replace simulator Tags (2)	10/10/96	Replaced tags per REP-244-960709
5F/6F	Tape - J-3-c,J-4-c,J-5-c,J-6-c	The sim has blue tape around blank annunciator boxes J-3(4,5,6)-c. Plant has brown	P04-0152	Replace Tape	07/29/96	Corrected tape per REP-244
5F/6F	Nameplate	Nameplates under meters (PT-ID46A & PT-ID46B) on the sim are missing in the plant	P04-0153	Remove 2 nameplates from simulator	09/04/96	Removed Nametags per REP-0244-960709
5F/6F	Annunciator L-8-e	Annunciator L-8-e is blank in the plant. Simulator has CHLR SRG TNK LVL	P04-0154	Install OB HVAC Mod (B/A 409758)	08/01/96	Replaced window during modification
5F/6F	Annunciator L-5-f	Annunciator L-5-f is blank in the plant. Simulator has SF 18 TRIP	P04-0155	Install OB HVAC Mod (B/A 409758)	08/01/96	Replaced alarm window during modification
5F/6F	Plaque	The black FZL/SLC information tag under Fuel Zone Level Meters is missing on the simulator	P04-0157	Install missing plaque	10/08/96	Installed missing Tag per REP-244-960709
5F/6F	Meter - Water Box Pressure	The 6 Waterbox Outlet Pressure Meters are abandoned in place in the plant but active on the sim. Also 04/41,42, 04/72,73,74	P04-0158	Implement modification on the simulator (See FCN C098155)	11/29/95	Installed covers per REP-193-950620
5F/6F	Lens	The text differs on the three MFRV Limit Lights Sim says Initiated. Plant says MFRV A Limit	P04-0159	Replace three lenses	07/17/96	Replaced Lenses per REP-0244-960709
5F/6F	Nameplate	Simulator has MFRV Flow Limit tags above indicator lights. Plant does not have these tags.	P04-0160	Replace three lenses per P04-016C and remove nameplates	07/17/96	Removed nameplates per REP-0244-960709
5F/6F	Controller - Main and Low Flow Feedwater	The 5 Feed Reg Valve controllers in the plant have Gravoply Plaques on the bottom door. Information differs from the sim paper tags.	P04-0161	Install plaques	07/29/96	Installed Nameplates per REP-0244-960709
7F	Annunciator - Turbine and BOP Annunciator	Control room shows engraving on annun windows. Characters are spread further apart. Also 05/001,002,003	P05-0001	Accept as is. Cosmetic only. No training impact.	07/14/92	See detailed discrepancies. Some windows replaced
7F	Annunciator - Turbine & BOP Annunciator	Simulator has demarcation tape between Q-7-b & Q-8-b, none shows on control room. Also 05/002-N-5-e & N-6-e.	P05-0002	Remove dividing tape	10/26/93	Plant corrected tape See REP-0067-930916

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7F	Annunciator - Fire protection & Feedwater Htrs Annunciator	Engraving on simulator annunciator windows are of the same size of letters. Also 05/004, 003, 001.	P05-0005	Accept as is. No training impact	07/14/92	See detailed disccrepancies. Some windows replaced
7F	Indicator Light - Bypass Vlv Pos Indicator Lights	Cntrl rm shows green indlite w/yellow (stick on) dot on upper left corner for BV-2 Closed & BV-8 Closed. Simul has yellow dot mounted on upper right	P05-0008	Accept as is. Control Room requires maintenance.	07/14/92	All dots were removed from plant and simulator
7F	Scale - Steam Seal Reg Unloading Vlv Pos Ind.	Simulator has bigger arrow tip & longer red line indicator on the scale. Also 05/039.	P05-0011	Accept as is. Cosmetic only. No training impact.	07/14/92	Looks OK now 12/3/94
7F	Nameplate -	Control rm shows (4) black plate w/white engraving mounted between/lower portion of item 05/005 & 05/006. These are missing in simulator.	P05-0028	Install 4 new plaques	12/03/94	Installed 4 plaques
7F	Diffuser - Left RHTR 2nd Stage Right PRV 2-R Indicator Light	Diffuser is missing on simulator's red indicating light. Also, 05-099, 109,065,125.	P05-0032	Accept as is. Plant has no diffusers.	07/14/92	Lenses were replaced
7F	Indicator Light - Left RHTR 2nd Stage Right PRV 2-R Indicator Light	Control rm shows red indlite has a yellow (stick on) dot on upper right corner. Simulator has dot at upper left corner. Also 05/099.	P05-0033	Accept as is. Cosmetic only. No training impact.	07/14/92	Lens was replaced in plant and simulator.
7F	Nameplate - Turbine cont. MPR Set PT SW & Indicator light	Nameplate w/% symbol & w/arrow down, & % symbol w/arrow up (mounted on top of control switch) are not on simulator.	P05-0037	Correct or replace nameplate	12/06/94	Installed Nameplate
7F	Lens - SJAE Drain Pumps Switch & Indicator Light	Engraving on simulator indicator light lens are bigger.	P05-0042	Accept as is. No training impact	07/14/92	Replaced lenses. Also see P05-0070
7F	Lens - SJAE Drain Pumps Switch & Indicator Light	Cntrl rm shows engraving for 1-1 Auto/1-2Res & 1-2 Auto/1-1 Res are near center of lens. Simul they are different locations.	P05-0043	Accept as is. No training impact	07/14/92	Replaced lenses. Also see P05-0070
7F	Indicator Light - SJAE Steam Inlet V-1-40 Air Inlets V-7-26 & 28 Sw &	Simulator has ye'low (stick on) dot on red indicating light. Not on control room.	P05-0044	Accept as is. Control Room requires maintenance.	07/14/92	All dots removed. New lenses installed.

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	Ind.					
7F	Tape - Turbine and BOP Annunciator	Control rm shows demarcation tape at the bottom of window Q-2-a, Q-2-c & Q-4-f, missing in simulator.	P05-0049	Install tape	10/26/93	Corrected plant and simulator See REP-0067-930916
7F	Tape - Turbine & BOP Annunciator	Vertical demarcation tape on annunciator windows are of the same uniform sizes (tape width). Also 05/001, 002, 003.	P05-0050	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected to match the plant
7F	Tape - Turbine and BOP Annunciator	Horizontal demarcation tape on annunciator windows are of the same uniform sizes (tape width).	P05-0055	Accept as is. Cosmetic only. No training impact.	07/14/92	Corrected tape
7F	Annunciator - MS-RHTR STM/Drains Annunciator	Simulator has bigger engraving for "(triangle)" on window P-1-a.	P05-0059	Accept as is. No training impact	07/14/92	Looks OK 12/3/94
7F	Meter - MSV #2 Bypass Valve Position	Plant meter scale has additional markings not on simulator meter	P05-0065	Verify source of markings and add to the simulator	10/15/96	Installed markings per REP-0244-960709
7F	Nameplate	The file tags under 1St and 2d Stg Reheat Flow recorders are interchanged - 20.70.53.10 should be under 7F61.	P05-0066	Move 2 tags to proper location	09/05/96	Corrected per REP-0244-960709
7F	Scale - Turb Vibration & Expansion Recorder	The Red Scale markings on Mils Rotor Expansion scale are missing on the simulator	P05-0067	Add red markings to the scale	09/10/96	Installed markings per REP-0244-960709
7F	Scale - Turb Vibration & Expansion Recorder	The Red arrows on the 2 vibration scales are missing on the simulator	P05-0068	Add 2 movable red arrows to the scale	09/10/96	Installed arrows per REP-0244-960709
7F	Lens - Left RHTR 2nd Stage Right PRV -2R Indicator Light	Plant lenses say Open or Closed Simulator lenses are blank	P05-0069	Replace 4 lenses	10/08/96	Replaced Lenses per REP-244-960709
7F	Lens - Turbine Control EPR Setpoint Sw&Ind Lgt	Simulator Lens is blank. Plant lens says ON	P05-0071	Replace Lens	09/04/96	Replaced Lens per REP-0244-960709
5F/6F	Annunciator J-1-a	Annunciator Windows J-1-a & J-2-a have red backlighting in the plant. Simulator is white.	P05-0162	Install red backlighting	02/08/95	Installed Red Backlighting per REP-0167-950105
8F/9F	Nameplate - Elect ANN-9XF	Cntrl. rm. shows black plate w/white engraving	P06-0002	Install 2 missing plaques for DG Loading	12/03/94	Installed 2 Plaques

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	Vital Power	(2 pcs.) mounted below 06/005. These are missing on simulator.		information.		
8F/9F	Scale - Batt C: D-C voltmeter	Control room shows scale w/a range of 0-150 as 0-30-60-90-120-150, simulator is shown as 0-50-100-150.	P06-0010	Replace scale to match control room.	08/19/96	Replaced meter and scale
8F/9F	Pointer - Batt C: D-C Voltmeter	Control room shows black pointer in simulator pointer is red.	P06-0011	Replace Pointer when replacing scale.	08/19/96	Replaced meter and scale
8F/9F	Meter - Vertical Frequency Meter	Simulator has different meter. Frequency/simul=HERTZ, cntrl rm=CYCLES. Pointer/simul=BLACK, cntrl rm=RED. Range/simul=55,60,65, cntrlrm=56,58,60,62,64	P06-0023	Replace meter to match new control room meter.	08/19/96	Changed scalees and pointer
8F/9F	Lens - EDG 1 Breaker Indicator Lamps (G-R)	Control rm shows white outside engraving. Simulator shows black & inside engraving. Also 06/122, 141, 142.	P06-0039	Replace lens.	10/26/93	Assign to GPU 6/26/92. Replaced 10/26/93
9XF	Tape - Annunciator 9XF-5-f, 9XF-6-f	Black tape around annunciators 9XF-5-f and 9XF-6-f is missing on the simulator	P06-0043	Install missing border tape	07/29/96	Installed per REP-244-960709
8F/9F	Meter - Rotor Temp	Simulator Rotor Temp Meter is missing Red Limit Arrow on Plastic Face Cover	P06-0046	Install missing Red Arrow	10/10/96	Installed arrow per REP-244-960709
8F/9F	Meter - Main Generator Kilovolt	Simulator Main Generator Kilovolt Meter is missing 2 Red Limit Arrows on Plastic Face Cover	P06-0047	Install 2 missing Red Arrows	10/10/96	Installed arrows per REP-244-960709
8F/9F	Nametag - Amplidyne Buck - Boost	Simulator Amplidyne Buck - Boost DC Voltmeter nametag is missing the words Buck and Boost	P06-0048	Replace Nametag	10/[illegible]/96	Installed Nametag per REP-244-960709
8F/9F	Meter - Bus 1A AC Volts	Simulator Bus 1A and 1B AC Voltmeters are missing Red Limit Arrows on plastic face cover	P06-0049	Install missing red arrows	10/10/96	Installed arrow per REP-244-960709
8F/9F	Meter - Bank 5 and Bank 6 AC Volts	Simulator is missing Bank 5 and Bank 6 AC Volt Meters	P06-0050	Install modification on the simulator (B/A 402991)	11/30/95	Installed Meters per REP-0208-950928
8F/9F	Switch - DG-1 Voltage/KVAR Control Switch	The simulator has a different style switch, Yellow marking, and different style labels (Also 06/124)	P06-0051	Install DG Modifications	05/09/95	REP-179

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
8F/9F	Switch - DG-1 Governor Control Switch	The simulator has a different style switch, Yellow marking, and different style labels (Also 06/125)	P06-0052	Install DG Modifications	05/09/95	REP-179
8F/9F	Switch - DG-1 Auto Resync Activate Switch	The simulator is missing the Auto Resync Activate Switch for DG-1 and DG-2	P06-0053	Install DG Modifications	05/09/95	REP-179
8F/9F	Lens - DG-1 Unit Start Light	The simulator lens says Unit Available. The plant lens says Unit Start	P06-0054	Install DG Modifications	05/09/95	REP-179
8F/9F	Switch - S1B Synchroscope	The simulator synchroscope switch for S1B is a different model than the plant with different engraving	P06-0055	Replace switch to match the new plant switch (Engr Eval 553-94)	07/24/96	Replaced Switch
8F/9F	Lamp - Gov. Ready	The simulator has a Gov. Ready Indicating Lamp above Governor Control Switch for DG-1 and DG-2. This lamp was removed from the plant. (Also 06/125)	P06-0056	Install Diesel Generator Modifications	05/09/95	REP-179
8F/9F	Annunciator R	Five Annunciator Windows on Panel R differ due to generator Protection Modification not yet installed on the simulator	P06-0057	Install Generator Protection Modification on the simulator	08/19/96	Installed modification
10F	Nameplate - Offgas System, Rad. Mon. Ann.	Nameplate, black w/white engraving below annunciator 10F window 4-d. is on control rm pnl and not on simulator.	P07-0001	Install new Nameplate to match plant.	10/26/93	Nameplate removed from the plant
10F	Nameplate - Radwaste Discharge & Service Water Discharge Rec.	Nameplate on top of recorder on cntrl. rm. is red & black on the left end side & blank grey plate on the right end. Simulator is red & green & none	P07-0003	Accept as is. No training impact	07/14/92	Recorder was removed.
10F	Recorder - Radwaste Discharge & Service Water Discharge Rec.	Cntrl rm shows spare RN31A GE model has green blank paper. Simulator has Yokogawa model w/black blank paper.	P07-0005	Accept as is. This is an approved hardware substitution. No impact on training.	07/14/92	Recorder was removed
10F	Nameplate - Channels A, B, C & D Steam Line Rad.	Nameplate shows red on A or B & black on C or D. Simulator is red on A or B & green on C or D.	P07-0007	Accept as is. This is an approved hardware substitution. No impact on training.	07/14/92	Plant replaced recorder to match simulaator

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	Mon. Rec.	Also 07/015.				
10F	Lens - Condenser A V-7-1 Indicator Lights	Cntrl rm shows outside white engraving on the lens of red ind. light. Simul. is engraved inside w/black engraving. Also 07/026, 027, 029, 038, 040	P07-0010	Replace lens to match plant.	10/26/93	Replaced lens
10F	Indicator light - condenser A V-7-1 Indicator Lights	Simulator shows yellow (stick on) dot on upper right hand corner of red ind. lite. Control rm. does not show dot. Also 07/027, 029, 038, 040.	P07-0011	Remove dots which have been removed from control room.	10/26/93	Removed dot
10F	Indicator light - Stack Air Purge Off/On Sw. & Indicator Light	Control rm shows red indicating light w/AIR PURGE engraved in black, inside. Simul. lite has no engraving.	P07-0012	Install diffuser with correct wording to match control room.	10/26/93	Assign to GPU 6/26/92 Replaced lens 10/26/93
10XF	Annunciator - New/Old Radwaste, Offgas Building, Augmented Offgas Annunciator	Engraving in simulator is smaller on annunciator window 1-a, 2-a & 5-a	P07-0015	Replace Annunciator window to match plant.	09/16/94	Replaced Annunciator See REP-0067-930916
10XF	Nameplate - AOG System Outlet Flow Meter	Control rm nameplate is black w/white engraving, mounted below plate FT-077. Plate missing on simulator.	P07-0017	Install missing nameplate.	12/03/94	Installed missing nameplate
10XF	Lens - AOG System V-7-31 Indicator Lights	Cntrl rm shows outside white engraving on the lens of red ind. light. Simul. it is inside w/black engraving. Also 07/007, 008, 009, 010, 020, 021, 023	P07-0018	Replace lenses to match plant.	10/26/93	Replaced lens
10F	Scale - Off Gas Sample and Line Flow Recorder	Simulator has a 0 - 100 (100 = 2.37 SCFM) scale inside the recorder which is not in the plant	P07-0027	Remove scale from simulator recorder	09/04/96	Removed Scale per REP-0244-960709
10F	Nameplate - Area & Process Rad Monitor Recorder	The Area and Process Radiation Monitors tag is missing from the door of simulator Recorder R006B	P07-0028	Install missing nameplate	10/08/96	Installed Nameplate per REP-244-960709
10F	Nameplate - Off Gas Air Eject A/ Stack Effluent	Recorder Number tag on left under recorder is missing on the simulator	P07-0029	Install missing nameplate	10/08/96	Installed missing Tag per REP-244-960709

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
10F	LRM Ch #1 Nameplate - Off Gas Air Eject A/ Stack Effluent	Simulator reccorder has 2 extra nameplates on door	P07-0030	Remove extra nameplates	09/05/96	Removed Nameplates per REP-0244-960709
10F	LRM Ch #1 Nameplate - Off Gas Air Eject B/ Stack Effluent	Simulator reccorder has 2 extra nameplates on door	P07-0031	Remove extra nameplates	09/05/96	Removed Nameplates per REP-0244-960709
11F	LRM Ch #2 Nameplate - Liquid Poison system Sample Switch	Nameplate above indicator lites on simulator the text differs.	P08-0003	Install new Nameplate to match plant replacement.	12/03/94	Replaced Nameplate
11F	Nameplate - Torus 02 Annal. Isolation Valve Bypass Switch	Nameplate above switch on simulator the text differs. Also for 08/008, 08/010.	P08-0004	Replace 1 Nametag and relocate others to match the plant.	10/26/93	Replaced nameplate during modification
11F	Mimic - Core Spray V-20-40 Indicator Lights	On simulator Mimic lines are missing from 08/042 & 08/046. Exists on control rm pnl.. Also 08/042, 046, 047, 058	P08-0006	Add additional mimic lines that were added to the plant after original plant photos.	07/30/96	Installed per REP-244-960709
11F	Keyholder - Suction Cup	Eleven Suction Cup Keyholders are missing for top row of valves	P08-0019	Install missing keyholders	03/23/95	Installed Suction Cups
11F	Nameplate	The red dymo tape label for 6F10=DPS66 is missing behind Panel 11F	P08-0020	Install missing Dymo Tape label	07/30/96	Installed per REP-244-960709
12F	Kickplate - Stainless Plate	Control rm shows stainless kick plate mounted at the bottom (front & rear) of panel. This is not present on simulator.	P10-0019	Install missing Kickplate after simulator is installed at O.C. Asssigned to GPUN 2/26/93	12/05/94	Installed kickplate on front. Rear missing.
12F-5	Plaque	Operator Aid Number OPS28 is outdated	P10-0021	Replace 4 sheets with current revision.	07/30/96	Replaced 4 sheets per REP-244
1R	Plaque - Stack Gas Switch	Cntrl. rm. has 2 black plaques w/white letters 1 to the right of sw. 11/112 & 1 on chnl. bar btwn. 2 sect. of pnl. 1R. Simul. has none. Also 11/112,	P11-0001	Install missing Plaques.	12/08/94	Installed Plaque
1R	Nameplate - Radwaste	Nameplate (below ind. lights) on simulator	P11-0006	Accept as is. New nameplate label spec. was	07/14/92	Plant Removed monitor.

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	Discharge Log count Rate Monitor 1	engraving is black on white, on control room engraving is white on black. Also 11/140, 150, 270.		used to build simulator. No training impact.		
1R	Nameplate - Radwaste Discharge Log count Rate Monitor 1	Nameplate on simulator engraving is black on white, on control room engraving is white on black. Also 11/140 & 11/150.	P11-0007	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed monitor
1R	Monitor - Service Water Discharge Monitor Power Supply	Monitor is on simulator, is not on control room pnl.	P11-0009	Remove Service water Rad monitor per plant modification.	05/24/94	Removed Rad Monitor
1R	Meter - Servicewater Discharge Log count Rate Monitor	Meter is on simulator panel, meter is not on control room panel.	P11-0010	Remove Service Water Rad Monitor per plant modification.	05/24/94	Removed Rad Monitor
1R	Plate - Service Water discharge Log count Rate Monitor.	Cover plate in place of items 11/241 & 11/242 on simulator panel is missing. Plate exists on control room panel.	P11-0011	Install Cover plate after removing Service Water Rad Moniter per plant Modification.	05/24/94	Removed Rad Monitor
1R	Nameplate - Radwaste Discharge Mon No. 2	Nameplate below count per second meter is on simulator, is not on control room panel.	P11-0012	Remove Nameplate when removing Service Water Rad Monitor.	07/24/96	Monitor & Nameolate removed
1R	Meter - Radwaste Discharge Monitors	The Radwaste Discharge Monitors have been removed from Control Room Panel 1R. The simulator still has this monitor	P11-0013	Implement modification to remove monitors. Also 11/140	07/24/96	Nameplate & Monitor removed
1R	Scale - Recorder RR-661-1618	The scales are missing from simulator recorders RR-661-1618 and RR-661-1625	P11-0014	Install misssing scales. Also see photo 776484 for 11/211	10/08/96	Installed missing scales per REP-244-960709
2R	Nameplate - Station Rad Indicator & Trip Unit	Sim. has metalic gray w/black engraving nameplate (R010A-1) mounted below the module. Cntrl Rm. does not have this nameplate. Also 12/132-135 + more.	P12-0011	Request Human Factors review to determine status.	10/26/93	Removed nameplate
2R	Nameplate - EOP Jumper Box	The simulator is missing the BP2 tag inside EOP Jumper Box 2R-TBEOPJL-1	P12-0013	Install missing tag	09/05/96	Installed tag per REP-0244-960709
3R	Testpoint - System 1 APRM	Size of test point in simulator is bigger.	P13-0002	Replace with correct test jack so that	07/14/92	Accept as is 6/20/92.

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	flow Converter Module			proper test plug will fit.		Plant Removed Equipment
3R	Meter - channel 2 & 3 APRM Drawer.	Meter for channel 2 is different on Simul. (window is oval) & has dymo sticker on face. Also on face of Ch. 3. Also 13/430.	P13-0006	Remove dymo stickers. Accept meter as is. This is an approved substitute.	12/08/94	Removed Dymo Stickers
3R	Nameplate - channel 1 & 4 APRM Drawer	Cntrl. Rm. shows white name plates w/black engraving mounted one on left side & one on right side of drawer missing in simulator. Also 13/230.	P13-0015	Install new information plates.	12/08/94	Installed New Nameplates
3R	Module - System I Flow Converter	The Flow Converter Electronics Modules in the plant were replaced. Simulator has original modules	P13-0019	Install Modification to replace Flow Control Electronics (B/A 402966)	07/24/96	Installed modification
5R	Name Tag	System 1 Nametag above Panel is Missing. (Also System 2 on 5R)	P13-0020	Install Missing Nametags	07/15/96	Installed Nametags per REP-0244-960709
3R	Tag	Tags on FY-622-36A & 36B say Bias & Gain. Should say Zero & Span. (Also FY-622-4B on 5R)	P13-0021	Replace tags	07/15/96	Replaced Tags
3R	Tag	Tags on FY-622-4A are White on Black. Should be Black on White (Also FY-622-4B on 5R)	P13-0022	Replace Tags	07/15/96	Replaced Tags
5R	Nameplate - System II Total Recirc Flow Loops ISO Pwr. Suply.	Nameplate below Isol. Pwer Suply. Module is larger on simulator.	P15-0001	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed this equipment
5R	Nameplate - System II APRM Flow Conv. Module	Nameplate is larger on simulator.	P15-0002	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed this equipment
5R	Nameplate - System II APRM Flow conv. Pwr Supl. Mod.	Nameplate below Flow conv. Pwr Supl. unit, engraving is black w/white on simul. & white w/black on Control Rm., mounted w/screws.	P15-0003	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed this equipment
5R	Nameplate - Sys. II Recirc Flow Loop A Square Root Convert.	Nameplate below module is larger on simulator. Also 15/131, 132, 133, 134, 135, 136	P15-0004	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed this equipment
5R	Label - System II Recirc	Panel Sq. Root Convertr has green label, none on	P15-0005	Install new Sq. Root Converter to match	12/08/94	Plant removed equipment.

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	Flow Loop B	Control Room. Cntrl. Rm. has Input & Output + & - receptacles, Dial Knob, lock screw - not on simul.		plant Modification.		See TA 641.1
5R	Label - System total Recirc Flow converter.	Simulator Pnl. on module 15/136 there is a green tape label, none on Control Room panel.	P15-0006	Remove label which no longer exists in the plant.	04/18/95	Plant removed equipment
5R	Label - LPRM flux Ampl. Pwr. Supl. & Monitor Module	Simulator pnl. has tape label - black w/white lettering. None on Control Rm. panel.	P15-0014	Remove label which no longer exists in the plant.	12/08/94	Removed label
5R	Module - LPRM Flux Amplifier Module	On simulator panel the module has a screw cap w/chain for the receptacle of fluxamplifier. There is none on Control Rm. Panel.	P15-0015	Accept as is. Control Room requires maintenance.	07/14/92	Plant corrected.
5R	Label - Channel 6 & 7 APRM Drawer	Simulator percent power meters have labels, red w/white lettering. There are none on Control Room.	P15-0016	Remove labels that no longer exist in the plant.	12/08/94	Removed labels
5R	Label - Channel 5 & 8 APRM Drawer	Simulator Panel Percent Power Meters have tape label, black w/white lettering. There are none on control Room panel.	P15-0017	Remove labels that no longer exist in the plant.	12/08/94	Removed labels
5R	Plaque - channel 6 & 7 APRM Drawer	4 plaques are missing on simulator panel. Cont. Rm pnl. shows plaques on ea. side of B/M 15/230, 340, & 430.	P15-0027	Install new plaques which were added in control room.	12/08/94	Installed new plaques
5R	Module - System II Flow Converter	The Flow Converter Electronics Modules in the plant were replaced. Simulator has original modules	P15-0032	Install Modification to replace Flow Control Electronics (B/A 402966)	07/24/96	Installed modification
6XR	Test Plug - Rod Scram Test Panel	Control Room has Control Rod Scram Insertion Test Plugs which replace Item 17/102 (Rod Scram Bus 1&2 Event Recorder)	P17-0004	Install modification in the simulator.	12/17/94	Installed Non-Functional Scram Test Panel
6XR	Nameplate - Rod scram test panel	The simulator is missing the SPARE tag under tag for 02-35	P17-0008	Install missing SPARE Tag	10/08/96	Installed missing tag per REP-244-960709
7R	ARI Sublogic Panel	The ARI Sublogic Panel should be painted green	P18-0017	Paint Panel green	12/17/94	Painted Panel

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7R	Nameplate	The ARI Sublogic Panel is missing the 'RV-LO-LO Water Level PNL-643-8RCS1' Nameplate	P18-0018	Install missing Nameplate	12/17/94	Installed Nameplate
7R	Nameplate	The ARI Sublogic Panel Nameplates are fastened with tape. They should be glued.	P18-0019	Install Nameplates properly after painting	12/17/94	Installed Nameplates properly
7R	Alarm Unit	Non Functional Alarm Units PAH-643-001 & PAH-643-002 are missing from the ARI Sublogic Panel	P18-0020	Install missing Alarm Units	12/17/94	Installed missing equipment
6R	Nameplate - EOP Jumper Box	The simulator is missing the BP1 Nameplate inside the EOP Jumper Box on Panel 7R.	P18-0021	Install missing BP16 nametag 8/28/96: Changed from BP6 to BP1 & 7R to 6R	09/05/96	Installed Missing Tag per REP-0244-960709
8R	Name Plate - Reactor Vessel Temperature Recorder	The Name Plate mounted beside item 19/001 in the Control Room is missing on the simulator.	P19-0002	Install name plate when installing photo of recorder.	02/26/93	Cancel 2/26/93 Recorder is removed from plant
8R	Name Plate - Reactor Vessel Temperature Recorder	The Name Plate with "Reactor Vessel Temperatures" mounted below item 19/001 in the Control Room is missing on the simulator.	P19-0003	Install name plate when installing photo of recorder.	02/26/93	Cancel 2/26/93 Recorder is removed from plant
8R	Chart - MG Set Fluid Coupler Bearing Temperature Recorder	Simulator Chart Paper has Range of 0-300 w/ 0, 50, 100, 150, 200, 250, 300 subdivisions. Plant has 0, 25, 50, ... 300 subdivisions. (Chart # 11-2254)	P19-0004	Install correct chart paper. Assign to GPUN 2/26/93	02/26/93	Ordered correct chart 2/25/93
8R	Name Plate - Reactor Recirc Pmp Motor & MG Set Winding Temperature Recorder	Two Name Plates (black with white engraving) mounted below IA-70 are missing on the simulator.	P19-0010	Install missing name plates. Also correct software or recorder for bypassed points.	10/08/96	Installed nameplates and bypassed points 7 & 8
8R	Recorder - Control Rod Drive Temperature Recorder	Recorder RD-468 mounted beside item 19/005 is mising on the simulator.	P19-0014	Install operable recorder. Moderate training impact. Plant recorder removal cancelled.	12/09/94	Installed Photo in frame
8R	Name Plate - Set Point Station	Simulator Name Plate engraving is larger and without spacing as shown in plant photo. Also applies to	P19-0015	Accept as is. Cosmetic only. No training impact.	07/14/92	Equipment is removed

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8R	Screws -	19/010,011,014,016,017,020,022,023,024 & 19/025 Simulator has plated mounting screws. Control Room has painted screws.	P19-0017	Accept as is. Cosmetic only. No training impact. Plant painted screws after original photos.	07/14/92	Panel was changed extensivly
8R	Recorder - Control Rod Drive Temperature Recorder	Recorder RD-46A is missing on the simulator. (Located below item 19/002)	P19-0018	Install operable recorder. Training impact moderate. Plant recorder removal cancelled.	12/09/94	Installed new photo in frame.
8R	Nameplate - Recorder IA55	Nameplate above Reactor Plant Temperatures Recorder IA55 does not exist in the plant	P19-0019	Remove Nameplate above recorder IA55	09/04/96	Removed Nameplate per REP-0244-960709
8R	Door - DFCS Power Panel	The Plexiglass Cover is hinged right on the simulator but left in the plant	P19-0020	Reverse Door Hinge	07/30/96	Corrected hinge to match plant photo per REP-0244
8R	Module - DFCS Power Panel	The 24V and 48V modules are interchanged on both rows	P19-0021	Relocate modules or labels	07/30/96	Corrected per REP-0244-960709
9R	Screw - Mounting plate screw	The simulator Mounting Plate screws are silver. The Control Room Screws are painted with the panel color.	P20-0002	Accept as is. Cosmetic only. No training impact. (Plant painted screws after original photos.)	07/14/92	Equipment was rremoved
9R	Module - Reactor Level Proportional Amplifier	The Control Room Prop. Amp. engraving is lighter than the simulator and uses a different print style (script). Also applies to 20/124	P20-0003	Accept as is. Cosmetic only. No training impact. (Plant replaced module since original photos)	07/14/92	Equipment was removed
9R	Module - Reactor Level Multiplier Divider	The Control Room Mult. Div. engraving is lighter than the simulator and uses a different print style (script). Also applies to 20/16, 20/133, & 20/142	P20-0004	Accept as is. Cosmetic only. No traini ng impact. (Plant replaced module after original photos)	07/14/92	Equipment was removed
9R	Name Plate - Feed water Flow Milivolt Transmitter	The simulator Name Plate says ID19C. The Control Room Name Plate says ID-19C. (Missing dash)	P20-0006	Accept as is. Cosmetic only. No training impact. (Plant replaced name plate after original photos)	07/14/92	Equipment was removed
9R	Name Plate - Recirc. PP Cont Rack MTD Controller	The simulator has a Name Plat hat says RY06A below the module. The Control Room does not have this Name Plate.	P20-0007	Accept as is. Control Room requires maintenance.	07/14/92	Equipment was removed

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9R	Module - Recirc. PP Cont Rack MTD Controller	The engraving on the Control Room Module is lighter and of a different style (script) than the simulator.	P20-0008	Accept as is. Cosmetic only. No traini ng impact. (Plant replaced module after original photos)	07/14/92	Equipment was removed
9R	Name Plate - Recirc PP Dual Hi/Lo Limit Station	The simulator Name Plate for RY23A has the letter A engraved. The Control Room has a hand written A.	P20-0009	Accept as is. Control Room requires maintenance.	07/14/92	Equipment was removed
9R	Name Plate - Condensate Storage Tank Level	The simulator Name Plate (mounted below item 20/266) is white with black engraving. The Control Room has a black Name Plate with white engraving.	P20-0010	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Equipment was removed
9R	Switch - ARI Logic Surveillance Test Switch Panel	The ARI Logic Surveillance Test Panel at the back of Panel 9R is not present on the simulator.	P20-0011	Determine whether this test panel should be installed on the simulator.	11/09/93	Installed ARI Logic Test Panel
10R	Name Plate - Clean up System Room Temperatures	Simulator Name Plate is longer,engraving is smaller, and is mounted below Modules. Control Room Name Plate is above modules. Text differs.	P21-0002	Replace nameplate when installing new modules.	01/13/95	Installed Temperature Monitoring System Mod.
10R	Module - Clean up System Room Temperatures	Simulator has TM-400 Monitor Model. Control Room has TM-2485 Model (13R outage Modification) Affects BOM Item No. 21/111 thru 21/116	P21-0003	Implement plant modification.	12/09/94	Installed Temperature Monitoring System Mod.
10R	Name Plate	TI-611-1 Name Plate below Clean up System Temp/Process Monitor is missing	P21-0004	Install nameplate when replacing monitoring system.	12/09/94	Installed Temperature Monitoring System Mod.
10R	Name Plate - Shutdown Cooling Room Temperatures	Text differs. Name Plate is mounted below the modules. Control Room Name plate is mounted above the modules.	P21-0005	Replace nameplate when installing new monitoring system.	12/09/94	Installed Temperature Monitoring System Mod.
10R	Modules - Shutdown Cooling Room Temperatures	Simulator has TM-400 Monitor. Control Room has TM-2485 Model (13R outage modification). Affects BOM Item No. 21/211 thru 21/213	P21-0006	Implement plant modification.	12/09/94	Installed Temperature Monitoring System Mod.
10R	Name Plate - Isolation Condenser Room	Control Room photo shows Name Plate above module w/ ISO COND RM TEMPS engraved on it. This is	P21-0007	Install nameplate when replacing monitoring system.	12/09/94	Installed Temperature Monitoring System Mod.

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	Temperatures	missing on the simulator				
10R	Module - Isolation Condenser Room Temperatures	Simulator has model TM-400 monitor. Control Room has TM-2485 model	P21-0008	Implement plant modification.	12/09/94	Installed Temperature Monitoring System Mod.
10R	Name Plate - Main Steam Tunnel Temperatures	Control Room photo shows Name Plate with "MN STM TUNNEL TEMPS" engraving located on top of modules. This is missing on the simulator	P21-0009	Install nameplate when installing new monitoring system.	12/09/94	Installed Temperature Monitoring System Mod.
10R	Module - Main Steam Tunnel Temperatures	Simulator has model TM-400 Monitor. Control Room has Model TM-2485 (13R outage modification)	P21-0010	Implement plant modification.	12/09/94	Installed Temperature Monitoring System Mod.
10R	Name Plate -	Name Plate with "TI_611-2" engraving for SDC/IC/MN STM Temps is missing on the simulator. (Located below Temp Process Monitor 21/211)	P21-0011	Install name plate when installing new monitoring system.	12/09/94	Installed Temperature Monitoring System Mod.
10R	Name Plate - Blank Cover	Simulator has a white name plate. Control Room has black Name Plate.	P21-0020	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed. See P21-0053
10R	Name Plate - Blank Cover	Simulator has a white name plate. Control Room has black Name Plate.	P21-0024	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed. See P21-0053
10R	Name Plate - Blank Cover	Simulator has a white name plate. Control Room has black Name Plate.	P21-0025	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed. See P21-0053
10R	Name Plate - Blank Cover	Simulator has a white name plate. Control Room has black Name Plate.	P21-0029	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed. See P21-0053
10R	Name Plate - Blank Cover	Simulator has a white name plate. Control Room has black Name Plate. Control Room has no Cover Plate on Module.	P21-0030	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed. See P21-0053
10R	Name Plate - Blank Cover Plate	Simulator has a white name plate. Control Room has black Name Plate.	P21-0032	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed. See P21-0053
10R	Name Plate - Blank Cover Plate	Simulator has a white name plate with black engraving. Control Room has black Name Plate with white engraving.	P21-0034	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed. See P21-0053
10R	Module - Rx Recirc pump	Simulator has a different arrangement. See	P21-0036	Implement modification to Recirc/FW	12/08/95	See REP-0210-951025

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	Suction Temperatures	sketch.		temperature modules.		
10R	Name Plate - Rack Power Supply	Text differs. Simulator has 115 VAC Name Plate. Control Room has IPS-733-010 Name Plate.	P21-0037	Correct when modifying Temperature Modules.	10/08/96	Replaced Tags per REP-244-960709
10R	Name Plate - Blank Cover Plate	Simulator has a white Name Plate. Control Room has a black Name Plate.	P21-0047	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed. See P21-0053
10R	Nameplate - Blank Cover	The simulator has blank nameplates under all blanked off modules. The plant does not have these nameplates.	P21-0053	Remove nameplates	09/04/96	Removed nameplates per REP-0244-960709
10R	Nameplate - Cleanup System Room Temperatures	The individual detector nametags (18 tags) on the RIS Cleanup System Room Temperature Monitor differ in wording from the plant	P21-0054	Replace 16 nametags	04/04/96	See REP-0231-960403 and TA 1087.1
10R	Module Ronan Temperature Monitors	The Ronan temperature rack in the plant has three additional units (11 vs. 8) and all cards have been relocated.	P21-0056	Install modification to update units. Include new nameplates.	12/08/95	Installed per REP-216
10R	Nameplate - CST Level	The Nameplate under the ID28C tag in the plant is blank. Simulator has CST Level.	P21-0057	Replace nameplate with blank. Should have changed under TA 396.2	09/04/96	Replaced with a blank nametag per REP-0244-960709
11R	Name Plate - TB Exhaust Diff Pressure Indicator	Text differs. Name Plate is larger, has 4 lines, and is located below meter on the simulator. Located above meter in Control Room with 3 lines.	P22-0013	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	11/26/93	Removed during modification
11R	Name Plate - Emerg. Exhaust Diff Pressure Indicator	Simulator has larger white Name Plate with black engraving. Control Room has black Name Plate with white engraving.	P22-0015	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	11/26/93	Removed during modification
11R	Name Plate - RB Exhaust Diff Pressure Indicator	Text differs. Simulator has a larger Name Plate mounted above the meter with 4 lines. Control Room has 3 lines located below the meter.	P22-0018	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	10/26/93	Corrected with modification
11R	Meter - Not Used	On the simulator panel there is a dummy meter w/ indicating dial with no increments. On Control	P22-0025	Accept as is. No training impact	07/14/92	Meter was used in modification

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		Room Panel, there is just a blank meter plastic cover.				
11R	Meter - Not Used	On the simulator panel there is a Dummy Meter with indicating dial with no increments. On Control Room panel there is a blank meter plastic cover.	P22-0027	Accept as is. No training impact	07/14/92	Meter was used in modification
11R	Name Plate - Emergency Exhaust Switch	The simulator Name Plate Text, and letter size differs from the Control room.	P22-0063	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	10/26/93	Replaced. Noted spacing problem. Accepted 10/26/93
11R	Name Plate - M-G & Bat Room Exhaust Fan EF-1-20 Switch	The simulator Name Plate text, size, and letter size differs from the Control Room.	P22-0066	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	10/26/93	Replaced. Noted Spacing Problem. Accepted 10/26/93
11R	Demarcation - Reactor Bldg. Exhaust Fan EF-1-5 con. Sw. w/Lamp	Demarcation for switches 22/044, 045, 046 is missing from simulator pnl. In Control rm. pnl. is below switches 22/044, 045,046.	P22-0097	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	07/11/96	Installed
11R	Nameplate - Reactor Bldg. Exhaust EF-1-5 Ctr. Sw. w/lamps	Nameplate above switch, simulator size is larger, text differs, also applies to 22/044, 045, 046.	P22-0098	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	12/11/94	Replaced. 22/046 still incorrect. OK 12/11/94
11R	Nameplate - SGTS Crosstie Cntl. Sw. W/Ind. Lamps	Nameplate to the right of sel. sw. is missing on simulator. (Nameplate is screw mounted.)	P22-0119	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	10/26/93	Accept as is 10/26/93
11R	Nameplate - Vlvs Reactor Bldg. to Main Exh. cont. Sw. W/Lamp	Nameplate to the right of ind. lamps on simul. size is larger, text differs, engraving is black w/white white. On Control rm. engrav. is white, color	P22-0122	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	10/26/93	Accept as is 10/26/93
11R	Nameplate - Valve V28-19 main Exh sys cont. sw. W/Lamp	Nameplate above indicator lamps on simulator has black engraving color white. On control rm. white engraving , color black.	P22-0125	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	10/26/93	Accept as is 10/26/93
11R	Nameplate - Spare	Nameplate above sel. sw. on simul. has black engraving, color white. On cont. rm. engraving is white, color is black, & is mounted by	P22-0126	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	10/26/93	Accept as is 10/26/93

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		screws.				
9XR	Label - Intake, Discharge & Bridge Temperature Recorder	Simulator has a label engraved on a plate mounted on top of recorder. Control Room has Dymo Tape on top of recorder	P22-0159	Update Panels 11R & 9XR for Human F actors Modification B/A 328030.	10/26/93	Accept as is 10/26/93
9XR	Computer - Hewlett Packard Environs System	The Hewlett Packard computer that is used to monitor Circ H20 Temps, Dilution flows etc is not installed on the simulator.	P22-0167	Computer is behind the panel and is not simulated. Training impact moderate.	12/11/94	Plant removed HP. Sim installing Env Mon on PCS
11R	Nameplate - Lowest Indicated	The reactor Building Differential Pressure Indication has been modified in the plant but not on the simulator. Five Nameplates must be installed	P22-0169	Install modification (B/A 403005)	07/17/95	See REP-0181-950214
11R	Meter - West Wall	The simulator has Abandoned in Place on the face of meter 22/008. The plant has a meter for DPT-822-13	P22-0170	Install Modification (B/A 403005)	07/17/95	See REP-0181-950214
16R	Name Plate - Panel Identifier	Simulator Name Plate is white with black engraving. Control Room is black with white engraving.	P23-0001	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Replaced Nameplate
16R	Scale - Percent Oxygen Meter Chan A	Simulator has the wrong scale installed (Single Scale 0-10). Should have Dual Scale (0-10 and 0-25).	P23-0004	Correct 16R for modifications made to simulator but not the plant.	12/12/94	Plant changed meter
16R	Scale - Percent Hydrogen Meter	Simulator has the wrong scale installed (Single Scale 0-30). Should have Dual Scale (0-10 and 0-30).	P23-0005	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant cchanged meter
16R	Switch - 02 Dual Range Switch Chan A	Switch, 2 indicating lights and 3 Name Plates are missing on the simulator. Should be located below % Oxygen Meter.	P23-0006	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant Removed switch
16R	Scale - Chan A H2/02 Recorder	Sim. has 2 wrong scales (single range 0-10 & 0-30). Should have 2 Dual Range (0-10 & 0-100 and 0-30 & 0-100). CR scale says linear but 0-30	P23-0007	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant changed scale

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		is not.				
16R	Switch - H2 Dual Range Switch Chan A	Switch, 2 indicator lights and 3 Name Plates are missing on the simulator. Should be located below % H2 Meter.	P23-0010	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant Removed Switch
16R	Scale - Chan A Torus Pressure/Level Recorder	Sim. Top Scale Major/Minor divisions, Position on Scale, Units, & Orientation on scale are different. Sim. has scale No. SCH61432, plant H62913	P23-0015	Correct recorder scales and range.	12/02/96	Installed new scale
16R	Scale - Chan A Torus Pressure/Level Recorder	Bottom Scale on the Sim. is Dual Range (0-260 & 0-100 PSIA Linear), Plant has (-15 to 245 PSIG Linear). Plant has scale H62914, Sim. No Number.	P23-0016	Correct Recorder scales and range.	12/02/96	Replaced scale
16R	Chart - Chan A Torus Pressure/Level Recorder	Simulator has 0-100 Linear chart. Plant has Dual Range chart (-15 to 245 PSIG Linear & 10 to 360 inches Linear)	P23-0017	Install correct chart.	12/12/94	Replaced Chart
16R	Scale - Percent Oxygen Meter Chan B	Simulator has single Scale 0-10. Plant has Dual Scale (0-10 & 0-25)	P23-0018	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant changed scale
16R	Scale - Percent Hydrogen Meter Chan B	Simulator has single Scale 0-30. Plant has Dual Scale (0-10 & 0-30)	P23-0019	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant changed scale
16R	Switch - O2 Dual Range Switch Chan B	Switch, 2 indicating lights and 3 Name Plates are missing on the simulator. Should be below % Oxygen Meter.	P23-0020	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant removed switch
16R	Switch - H2 Dual Range Switch Chan B	Switch, 2 indicating lights and 3 Name Plates are missing on the simulator. Should be below % Hydrogen Meter.	P23-0021	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant removed switch
16R	Scale - Chan B H2/O2 Recorder	Sim. has 2 Single Range Scales (0-10 & 0-30). Plant has Temporary Dual Range Scales (0-25 & 0-10 and 0-30 & 0-12.5). Also see P23-0007 for Chan A	P23-0022	Correct 16R for modifications made to simulator but not the plant. (DRF 067670)	12/12/94	Plant changed scale
16R	Name Plate - Valve	Simulator has white engraving on green tag.	P23-0024	Implement H2-O2 isolation valve modification	12/12/94	Installed modification

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	V-38-41	Plant has black engraving on white tag. This also applies to 23/038, 23/039 & 23/040.		on the simulator.		
16R	Name Plate - Valve V-38-41	Text differs. Simulator has "H2 Sample Supply Line VLV V-38-41". Plant has "H2 Sample Return Line VLV V-38-93".	P23-0025	Implement H2-02 isolation valve modification on the simulator.	12/12/94	Installed modification
16R	Name Plate - Valve V-38-43	Text differs. Simulator has "H2 Sample Supply Line VLV V-38-43". Plant has "H2 Sample Return Line VLV V-38-94".	P23-0026	Implement H2-02 isolation valve modification on the simulator.	12/12/94	Installed modification
16R	Name Plate - Valve V-38-44	Text differs. Simulator has "H2 Sample Return Line VLV V-38-44". Plant has "H2 Sample Supply Line VLV V-38-44".	P23-0027	Implement H2-02 isolation valve modification on the simulator.	12/12/94	Installed modification
16R	Name Plate - Valve V-38-46	Text differs. Simulator has "H2 Sample Return Line VLV V-38-46". Plant has "H2 Sample Supply Line VLV V-38-46".	P23-0028	Implement H2-02 isolation valve modification on the simulator.	12/12/94	Installed moodification
16R	Name Plate - B H2/02 Analyzer	Information Name Plate above B H2/02 Recorder is missing on the simulator. Plate says: B H2/02 Analyzer Scale on Recorder..... for H2 Value.	P23-0029	Install nameplate with magnetic backing to match the plant.	12/12/94	Plant removed nameplate
16R	Scale - Chan B Torus Pressure/Level Recorder	Sim. Top Scale Major/Minor divisions, Position on Scale, Units, & Orientation on scale are different. Sim. has scale No. SCH61432, Plant H62913	P23-0030	Correct 16R Torus Pressure/Level Recorder.	12/02/96	Replaced Scale
16R	Scale - Chan B Torus Pressure/Level Recorder	Bottom Scale on the Sim. is Dual Range (0-260 & 0-100 PSIA Linear), Plant has (-15 to 245 PSIG Linear). Plant has scale H62914, Sim. No Number.	P23-0031	Correct 16R Torus Pressure/Level Recorder.	12/02/96	Replaced Scale
16R	Name Plate - Chan A Torus Pressure/level Recorder	Text differs. Name Plate below Recorder for red pen. Sim. says: PSIA, Plant says: PSIG	P23-0032	Correct Torus Pressure/Level Recorder.	12/12/94	Plant removed nameplate
16R	Name Plate - Chan B Torus Pressure/level Recorder	Text differs. Name Plate below Recorder for red pen. Sim. says: PSIA, Plant says: PSIG	P23-0033	Correct Torus Pressure/Level Recorder.	12/12/94	Plant removed nameplate
16R	Name Plate - Chan B Torus	Simulator has 0 to 100 Linear Chart. Plant has	P23-0034	Correct Torus Pressure/Level Recorder.	12/12/94	Replaced chart

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	Pressure/level Recorder	Dual Range Chart (-15 to 245 PSIG Linear and 10 to 360 inches Linear)				
16R	Nameplate - Recorder File Identification Number	The four recorders on 16R have incorrect chart file identification numbers on the door tags. (also 23/016,024, & 036)	P23-0039	Replace four nameplates.	10/08/96	Replaced Tags per REP-244-960709
16R	Nameplate - Recorder Panel No. 16R	The simulator has an information plaque at the top of the panel which is not on the plant panel	P23-0040	Remove Plaque	09/04/96	Removed Plaque per REP 0244-960709
ER46	Cabinets - SAR	Simulator cabinets are a different color. Plant cabinets are green & simul. are blue.	P24-0001	Paint cabinets green.	10/26/93	Accept as is 10/26/93
11XR	Kickplate - Stainless Steel	Stainless Steel Kickplate is missing on simulator panel.	P28-0006	Install missing Kickplate after simulator is installed at O.C. Assigned to GPUN 2/26/93	/09/93	Installed missing kickplate
11XR	Relay - Over Excitation Auxiliary	Simulator has a photo installed behind cover instead of actual relay. Also applies to 28/002,004,006,007,008,009,& 010.	P28-0007	Simulator specification allows photo simulation of relays. Training impact is minimal.	07/14/92	Relay was removed from the plant
11XR	Nameplate - Over Excitation Backup	Nameplate on the simulator is smaller. Sim has 3/4" X 2". Plant has 3/4" X 3".Also applies to 28/006,007,008,009,& 010.	P28-0008	Accept as is. Cosmetic only. No training impact.	07/14/92	Relay was removed from the plant
11XR	Relay - Generator Protection	Simulator haas 8 Generator Protection Relays on 11XR. Plant has 1 unlabeled relay	P28-0010	Install Generator Protection Modification (B/A 402925)	07/24/96	Installed modification
11XR	Panel - Digital Telemetering	Simulator has L&N Digital Telemetering Panel on 11XR. This unit was removed from the plant	P28-0011	Remove when installing Generator Protection Modification (B/A 402925)	07/24/96	Installed modification and removed L&N
11XR	Panel - Generator Protection	Plant has a Digital Generator Protection System which is not on the simulator	P28-0012	Install Generator Protection Modification (B/A 402925)	07/24/96	Installed modification
12R	Recorder - Generator Volts	Plant has GE 1 pen recorder. Simulator has Yokogawa 1 pen recorder.	P29-0010	Accept as is. This is an approved hardware substitution. No impact on training.	07/14/92	Plant removed recorder
12R	Scale - Generator Volts Recorder	Plant has 0 - 30 Kilovolt scale installed. Simulator has no scale.	P29-0012	Install scale similar to plant and correct chart paper on approved substitute recorder.	06/21/93	Westinghouse installed scale.
12R	Nameplate - Generator Volts Recorder	Plant has black nameplate w/ white engraving below recorder. Simulator has white w/ black	P29-0013	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant removed recorder

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		engraving.				
12R	Nameplate - Aux. XFMR Watthour Meter	Plant Nameplate has space between Watt & Hour. Simulator doesn't. Also applies to 29/037.	P29-0017	Accept as is. Cosmetic only. No training impact.	07/14/92	Plant replaced meeter
12R	Nameplate - Generator Watthour Meter	Plant has black tag w/ white Lettering. Simulator has white w/ black Lettering.	P29-0020	Accept as is. New Nameplate Label Spec. was used to build simulator. No training impact.	07/14/92	Plant replaced meter
12R	Kickplate - Stainless Steel	Simulator Panel is missing Kickplate on front of panel.	P29-0022	Install missing Kickplate after simulator is installed at O.C. Assigned to GPUN 2/26/93	11/09/93	Installed missing kickplate
12R	Cover - Contact Block	Simulator has a different style cover installed on lower left corner of the panel.	P29-0023	Accept as is. Cosmetic only. No training impact.	07/14/92	Plant removed equipment
12R	Recorder - Generator MW MVAR	Simulator has Generator MW & MVAR Recorder. This recorder was removed from the plant.	P29-0026	Install Generator Protection Modification (B/A 402925)	07/24/96	Installed modification and removed recorder
12R	Recorder - Generator Volts	Simulator has Generator Volts Recorder. This recorder was removed from the plant.	P29-0027	Install Generator Protection Modification (B/A 402925)	07/24/96	Installed modification and removed recorder
12R	Relays - Generator Protection	Simulator has 21 Generator Protection Relays which were removed from the plant.	P29-0028	Install Generator Protection Modification (B/A 402925)	07/24/96	Installed modification
12R	Meter - Generator MW	Simulator has a photo of a GE MW Meter. Plant has Schlumberger Meter	P29-0029	Install Generator MW & TLC Meter Modification	12/19/94	Installed new photo
12R	Meter - Generator TLC	Simulator has a photo of a GE MW Meter. Plant has Schlumberger Meter	P29-0030	Install Generator MW & TLC Meter Modification	12/19/94	Installed new photo
12R	Cover - Contact Block	Simulator has a Contact Block under MW Meter. This was removed from the plant.	P29-0031	Remove when installing Generator MW & TLC Meter Modification	12/19/94	Removed Contact Block
12XR	Nameplate - N2 Purge & Makeup Flow Recorder	White on Black Nametag under recorder is missing on the simulator.	P29-0060	Install missing nametag	10/08/96	Installed missing tag per REP-244-960709
12XR	Nameplate - Drywell & Torus Pressure	White on Black Nametag under recorder is missing on the simulator.	P29-0061	Install missing nametag	08/15/96	Recorder was replaced with 3 pen in REP-222-960425
12XR	Annunciator - Window 2-9	Annunciator Window 2-9 is engraved (Seal & Lube Oil Pumps Both Running) on the simulator. Plant window is blank.	P29-0062	Install Modification	11/14/96	Replaced Window per REP-251-961004
12XR	Annunciator - Window 4-23	Annunciator Window 4-23 is engraved on the	P29-0063	Install Modification	11/19/96	Replaced Window per

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		simulator. Plant window is blank.				REP-251-961004
12XR	Nameplate - Generator Temperature Recorder	The Nameplate on the door of Recorder TR-664-0064 text differs from the plant	P29-0064	Install Modification (Add Generator Output) (B/A 402925)	08/27/96	Installed new nameplate per REP-0244-960709
12XR	Plaque - Generator Temperature Recorder	The Plaque under Recorder TR-664-0064 text differs from the plant	P29-0065	Install Modification (Add Generator Output) (B/A 402925)	08/27/96	Replaced Plaque per REP-244-960709
12XR	Module - Makeup Line Flow	The Makeup Line Flow Square Root Module in the plant has an adjustment knob. Knob is missing from simulator.	P29-0066	Replace module to match the plant	09/04/96	Replaced Module per REP-0244-960709
12XR	Module - Nitrogen Makeup Flow Integrator	The Makeup Flow Integrator Module in the plant says X 25. Simulator says X100	P29-0067	Replace tag	09/04/96	Replaced Tag per REP-0244-960709
12R	ABB Relay Cases	Ten ABB Relay Cases are missing Identification Tags	P29-0068	Install missing tags	07/15/96	Installed Tags per REP-0244-960709
12XR	Name Plate - Generator Temperature Recorder	Plate for pt. IDs below rec.: different color, right justified vs. left, missing ID at top, missing pts. 18 & 19, and mounted high. Text differs.	P30-0005	Replace name plate to match plant.	12/11/94	Plant replaced recorder. Sim will install mod
12XR	Name Plate - Transformer Temperature Recorder	Text differs. Simulator says: Recorder No. TR-624-1042. Plant says: TR-723-1042	P30-0007	Replace nameplate to match plant.	04/13/95	Replaced nameplate
12XR	Name Plate - Transformer Temperature Recorder	Name Plate on simulator for point IDs is engraved different and arrangement on the Name Plate is different. Text differs.	P30-0008	Replace nameplate to match plant.	04/13/95	Replaced nameplate
12XR	Recorder - N2 Flow Purge & Make up	Simulator has Yokagawa 2 pen recorder. Plant has 2 pen G.E. recorder.	P30-0009	Accept as is. This is an approved hardware substitution. No impact on training.	07/14/92	Plant replaced recorder
12XR	Recorder - Drywell & Torus Pressure Recorder	Simulator has a 2 pen Yokogawa recorder installed. Plant has a 2 pen G.E. recorder.	P30-0016	Accept as is. This is an approved hardware substitution. No impact on training.	07/14/92	Plant replaced recorder
12XR	Scale - Purge N2 Temperature Meter	Numbers, Major-Minor Subdivisions on the simulator meter are bolder than the plant. Also applies to 30/011.	P30-0020	Accept as is. Cosmetic only. No training impact.	07/14/92	Looks OK 12/11/94
12XR	Meter - Pump & Motor	Meter & Name Plate have been removed in the	P30-0025	Replace temperature monitoring system to	12/11/94	Installed modification

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	Bearing Temperature	plant. They exist on the simulator.		implement plant modification.		
12XR	Meter - Motor Stator Temperature	Meter & Name Plate have been removed from the plant. They exist on the simulator.	P30-0026	Replace temperature monitoring system to implement plant modification.	12/11/94	Installed Modification
12XR	Ring - Seal H20 Pump No. 1 Lockout P/Button	Simulator has silver backing ring on Push Button does not exist in the plant. Also applies to 30/023.	P30-0028	Accept as is. Cosmetic only. No training impact.	07/14/92	Visible on plant photo 7792-13A
12XR	Lens - Torus Sample Valve & Pump	Simulator has OPEN on lens. Plant has ON engraved on lens.	P30-0032	Implement plant modification on the simulator.	10/26/93	Replaced lens during modification
12XR	Switch- Torus Sample Valve & Pump	Simulator has wrong Manufacturer & Type of switch installed. Simulator has 2 position maintained. Plant has 3 position maintained.	P30-0033	Implement plant modification on the simulator.	10/26/93	Installed modification
12XR	Name Plate- Torus Sample Valve & Pump	Simulator Name Plate is engraved different. Text differs. Plant Name plate says OFF AUTO ON.	P30-0034	Implement plant modification on the simulator.	10/26/93	Installed modification
12XR	Name Plate- Torus Sample Valve & Pump	Engraved information Name Plate below the control switch is missing on the simulator.	P30-0035	Install name plate when implementing plant modification on the simulator.	10/26/93	Installed modification
12XR	Name Plate - Dilution Pump No. 2	Engraved information Plate located below Dilution pump No. 2 is missing on the simulator.	P30-0038	Install missing nameplate on simulator.	12/11/94	Installed Nameplate
12XR	Annunciator - Feed and Condensate Pump Temperatures	Simulator has RIS TM-400 Monitors. Plant has new TM-2485 Monitors. Also applies to 30/027, 30/028, 30/029, 30/047, 30/048, 30/049, & 30/050.	P30-0040	Implement plant modification.	12/11/94	Installed Modification
12XR	Plate - Stainless Steel Kick Plate	Stainless Steel Kick Plate is missing on the simulator.	P30-0043	Install missing Kickplate after simulator is installed at O.C. Assigned to GPUN 2/26/93	12/11/94	Installed Kickplate
12XR	Diffuser - Vacuum Pump Lights	Green and red diffusers are missing from the indicator lights on the simulator.	P30-0045	Accept as is. Cosmetic only. No training impact.	07/14/92	12//11/94: Looks same as plant (Red missing)
12XR	Annunciator - Window 5-23	Plant has blank window. Simulator has an engraved window.	P30-0046	Implement plant modification on the simulator.	11/19/96	Replaced window per REP-251-961004
12XR	Annunciator - Window 5-17	Engraving on plant window is bolder than that on the simulator.	P30-0047	Correct engraving when making new window for modification. (See P30-0046)	11/19/96	Replaced Window per REP-251-961004

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
12XR	Annunciator - Window 2-9	Line spacing is wider & engraving is bolder on the simulator window.	P30-0048	Accept as is. Cosmetic only. No training impact.	07/14/92	Plant replaced window
12XR	Nameplate - Generator Outputs and Temperatures Recorder	The Generator Outputs and Temperature Recorder is labeled Generator Temperatures on the simulator	P30-0059	Install modification (6/A 402925)	08/27/96	Installed new nameplate per REP-0244-960709
13R/14R	Plate - Stainless Steel Kickplate	Stainless Steel Kickplate is missing on the Simulator.	P31-0002	Install missing Kickplate after simulator is installed at O.C. Assigned to GPUN 2/26/93	11/09/93	Installed missing kickplate
13R	Diffuser - B/U Over speed Lites	Green & red diffusers are missing from the lens caps on the simulator. Lites are too bright w/o them.	P31-0021	Install correct lens.	10/26/93	Replaced lens
13R	Lens - Indicator Lites V-1-65	Plant has "CLOSED" "OPEN" engraved on front of lens. On the simulator it's inside on the Diffuser.	P31-0026	Replace lenses to match plant.	10/26/93	Replaced lenses
13R	Lens - V-1-66 Indicator Lite	On the simulator "Closed" is engraved on outside of lens cap. In the plant it"s inside on diffuser.	P31-0030	Replace lens to match plant.	10/26/93	Replaced lens
13R	Lens - V-1-68 Indicator Lite	On the simulator "Closed" is engraved on the front of the lens. In the plant it's inside on the diffuser.	P31-0035	Replace lens to match plant.	10/26/93	Replaced lens
13R	Lens - V-1-73 Indicator Lite	Closed is engraved in white letters on the front of the lens cap in the plant. Simul. black letters inside cap on diffuser.	P31-0041	Install correct lens.	10/26/93	Replaced lens
13R	Lens - V-1-67 Indicator Lite	Plant has "Closed" engraved on outside of lens cap in white letter. simul. has black letter inside on diffuser.	P31-0049	Install correct lens.	10/26/93	Replaced lens
13R	Nameplate - RBCCW Pump 1-2	Engraved information tag next to pump 1-2 control Switch is missing on simulator.	P31-0061	Install missing nameplate.	12/11/94	Installed Nameplate
14R	Recorder - Control & Bypass Valve Position	Plant has 2 pen GE recorder. Simulator has 2 pen Yokogawa. Also applies to 31/008 except 31/008	P31-0073	Accept as is. This is an approved hardware substitution. No impact on training.	07/14/92	Plant replaced recorder

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		is a 1 pen recorder.				
14R	Chart - Control & Bypass Valve Position Recorder	Simulator has a generic 0-100 Chart installed. Plant has special chart.	P31-0074	Install correct chart paper.	07/14/92	Accept as is 12/17/92. 12/11/94:plant replaced
14R	Scale - Control & Bypass Valve Position Recorder	Plant has (2) 0-100 scales for "Control Valve Percent Open" & "Bypass Valve Position". Simulator has no scales.	P31-0075	Install scale similar to plant and correct chart paper on approved substitute recorder.	02/26/93	Installed Scale. Generic chart acceptable.
13R	Plaque - Recorder 13R-4 "204"	The simulator has 2 plaques under Recoorder 13R-4. The plant only has one plaque.	P31-0104	Remove plaque which was removed from the plant	10/08/96	Removed Plaque per REP-244-960709
14R	Plaque - Recorder 13R-3 (203)	The Plaque below Recorder 13R-3 points 17 & 18 wording differs 17 Plant: Gear Drain, Sim:Gear Box Metal 18) Plant: Bearing Drain, Sim:Bearing Metal	P31-0105	Check reason for difference and replace plaque	09/10/96	Replaced Plaque per REP-0244-960709
15R	Meter - Temperature Indicating	Temperature indicating meter on right side of the panel is missing on the simulator.	P33-0002	Install missing temperature indicating meter.	10/01/96	Reassigned to GPU 6/26/92 Letter 6223-92-0141
15R	Nameplate - Master Alarm #2	Engraved Nameplate below module is missing on the simulator.	P33-0010	Install missing nameplate.	12/11/94	Installed nameplates during modification
15R	Nameplate - Monitor I.D.	All of the Monitor I.D. Nameplates on the simulator modules are mounted above the module. In the plant they are mounted below the module.	P33-0015	Relocate nameplates to match plant.	12/11/94	Installed new nameplates in correct location
15R	Nameplate - VMS-1	Nameplate on the simulator is engraved different (see pages 2 thru 8). Also applies to 33/112,113,114,115,116,121,122,123,124,125,126,131,132,133,&134	P33-0016	Implement acoustic monitor modification on the simulator.	12/11/94	Installed new nameplates during modification
15R	Plaque - Operator Aid	The plant has an Operator Aid posted inside the front panel door showing detector locations. This is missing on simulator	P33-0019	Install missing Operator Aid	08/21/96	Installed per REP-0244-960709
18R	Nameplate - Front/Panel 18R	Control rm shows black w/white engraving nameplate. Simulator has white w/black engraving nameplate.	P35-0001	Replace nameplate to match plant.	04/13/95	Replaced nameplate

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
18R	Nameplate - TI-664-42A	The simulator Nametag for TI-664-42A is located above the meter. The plant tag is below.	P35-0026	Relocate nametags to match plant photo	09/04/96	Relocated Scale per REP-0244-960709
ENV	Plaque - Master Fire Alarm Panel	Simulator is missing 3 Master Fire Panel Operator Aids.	PEV-0001	Install missing Operator Aids.	08/21/96	Installed per REP-0244-960709
ENV	Plaque - Master Fire Alarm Panel	Simulator is missing Site Plan (Color coded) next to Master Fire Alarm panel.	PEV-0002	Install missing Site Plan.	10/08/96	On 8/20/96, verified Site plan was removed from CR
ENV	Book - Control room access list.	Simulator is missing control room access list next to Master Fire Alarm panel.	PEV-0003	Install missing control room access list.	08/21/96	Installed per REP-0244-960709
ENV	Furniture - Photo Copy Machine	Photo Copy machine is missing.	PEV-0005	Install missing copy machine.	12/17/94	Installed Photo Copy machine
ENV	Horn - Fire Alarm Bells	Fire Alarm Bells (3) are missing above control room Halon activation and abort switches.	PEV-0007	Install missing Fire Alarm Bells.	06/09/93	Westinghouse installed missing Alarm Bells.
ENV	Module - Air Sampler	Air sampler (CAM) on East wall of control room is missing.	PEV-0015	Install missing air sampler.	06/09/93	Installed air sampler on shelf. Not connected..
ENV	Furniture - Carpet	Floor carpeting is missing from the simulator. Tile differs from the control room.	PEV-0017	Install missing carpet. Accept tile as is.	10/25/93	Installed Carpet per future control room plans
ENV	Plaque - Exclusion Area.	Exclusion Area signs hanging from the ceiling arw missing.	PEV-0024	Install missing signs.	12/15/95	Installed signs
ENV	Sound - Evacuation Alarm	The Station Evacuation, Station Fire, and Reactor Building Evacuation alarms are inoperable	PEV-0026	Repair alarms and take sound measurements.	12/14/93	Tested alarms after they were made operable.
ENV	Sound - Alarm Audio	The simulator alarm volume is too high. The Chime frequency does not agree with the plant.	PEV-0028	Adjust alarm volume after background sounds are added with the sound generator. Correct the chime	12/14/93	Accept chime as is. Adjusted alarm volume.
ENV	Furniture - Carpet	The Simulator Carpet does not match the control room and the tile area is carpeted.	PEV-0030	Accept as is. The simulator carpet is installed using plans for future control room carpet change	12/17/94	Control room installed same carpet as simulator
ENV	Sign - Panel Doors	The NO ENTRY/NO RADIO signs on panel doors are missing	PEV-0037	Install Missing signs	08/21/96	Installed signs

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
FP-1	Nameplates	Two (2) Engraved Nameplates at top of Local Fire Alarm Panel 6 are missing on the simulator. Revised 12/13/94	PFA-0001	Install Missing Nameplates	07/30/96	Completed under TA 828.1, REP-244-960709
FP-1	Nameplate - Local Fire Alarm Panel 6	All module Nametags on Local Fire Alarm Panel 6 have text and color differences	PFA-0004	Replace all module Nameplates	07/30/96	Installed new tags per REP-244. Also see TA 828.2
FP-1	Nameplate - Local Fire Alarm Panel 6	The Module Coordinate Nametags on the cover of Local Fire Alarm Panel are missing	PFA-0005	Install missing Nameplates	07/30/96	Installed missing Coordinates per REP-244-960709
FP-2	Nameplate - Trouble	Simulator has black tag with white engraving. Plant has white tag with black handwriting. Also applies to FB/023,024,& 025 (2 tags total)	PFB-0001	Accept as is. No impact on training.	12/13/94	See PFB-0007
FP-2	Nameplate - Fire & Flow	Engraving on plant tag is larger & bolder but contains same information.	PFB-0002	Accept as is. Cosmetic only - No impact on training.	12/13/94	See PFB-0007
FP-2	Nameplate - Master Fire Alarm Panel A	White Nameplate with black engraving is missing at top of panel.	PFB-0003	Install missing Nameplate	07/30/96	Completed under TA 828.1, REP-244-960709
FP-2	Chain	Chain is missing for door key	PFB-0004	Install missing chain	06/21/93	Installed missing chain.
FP-1	Nameplate - Master Fire Alarm Panel A	The Module Coordinates nameplates are missing from the panel cover on the simulator	PFB-0006	Install Missing Nameplates	07/30/96	Installed missing coordinates per REP-244-960709
FP-1	Nameplate - Master Fire Alarm Panel A	All Nameplates on modules have text and color differences from the plant	PFB-0007	Replace all Module Nameplates	07/30/96	Replaced nameplates per REP-244. Also see TA 828.2
FP-1	Nameplate - Master Fire Alarm Panel A	All Existing Black and White Nameplates on the cover are improperly located.	PFB-0008	Relocate Nameplates	07/30/96	Replaced nameplates per REP-244. Issued TA 828.2
FP-1	Nameplate - Master Fire Alarm Panel A	Master Fire Alarm Panel A is missing 9 White on Black Module Description Nameplates mounted on door.	PFB-0009	Install Missing Nameplates	10/08/96	Installed Missing Tags per REP-244-960709
FP-4	Nameplate - Fire Panel	The plant has a ER-811-187 Nameplate mounted at top of panel. This is missing on the simulator	PFC-0012	Install Missing Nameplate	10/08/96	Installed missing tag per REP-244-960709
FP-4	Nameplate - Fire Panel	Two Retired In Place nameplates are missing from	PFC-0013	Install Missing Nameplates	10/08/96	Installed missing tags per

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		the simulator panel				REP-244-960709
FP-3	Nameplate - On Battery	Simulator has white engraving on black tag Plant has black on white.	PFM-0001	Accept as is. Cosmetic only - No training impact.	12/13/94	See PFM-0006
FP-3	Nameplate - Alarm Silence	Simulator has black tag with white engraving. Plant has black on white.	PFM-0002	Accept as is. Cosmetic only - No training impact.	12/13/94	See PFM-0006
FP-3	Nameplate - Audible Circuit Trouble	Simulator has black tag with white engraving. Plant has white on balck.	PFM-0003	Accept as is. Cosmetic only - No training impact.	12/13/94	See PFM-0006
FP-3	Nameplate - Alarm	Simulator has black tag with white engraving. Plant has white with black handwriting. Also FM/011,012,013,014,015,016,& 017	PFM-0004	Accept as is. Cosmetic only - No training impact.	12/13/94	See PFM-0006
FP-3	Nameplate - Master Fire Alarm Panel B	Nameplate is missing on the simulator.	PFM-0005	Install Missing Nameplate	07/30/96	Completed under TA 828.1, REP-244-960709
FP-3	Nameplate - Master Fire Alarm Panel B	All Existing Nameplates on modules have text and color differences	PFM-0006	Replace all Module Nameplates	07/30/96	Replaced Nameplates per REP-244-960709
FP-3	Nameplate - Master Fire Alarm Panel B	All Module Coordinates Nametags are missing from the cover of Master Fire Alarm Panel B	PFM-0007	Install Missing Module Coordinate Nameplates	07/30/96	Installed Coordinates per REP-0244-960709
1A2	Lens - USS 1A2 Indicating Lights	"TRIPPED" & "CLOSED" are engraved on the lens in the plant. Simulator has insert inside lens on the diffuser.	PLC-0004	Replace lenses to match plant. Change on 7/29/92 to GPUN correct per RDD letter 6223-92-0141.	07/30/96	Replaced Lens per REP-244-960709
1A2	Lens - Pump NC08-A Indicator Lights	"OFF" & "ON" are engraved on the lens in the plant. Simulator has insert inside lens on the diffuser.	PLC-0005	Replace lenses to match plant. Change on 7/29/92 to GPUN correct per RDD letter 6223-92-0141	07/29/96	Replaced Lens per REP-244-960709
1A2	Lens - FN-56-007 Trouble Indicator Light	"TROUBLE" engraving is missing on the lens on the simulator.	PLC-0007	Replace lens to match plant. Change on 7/29/92 to GPUN correct per RDD letter 6223-92-0141	10/26/93	Replaced lens
1A2	Lens - Pump NU02-A Indicator Lights	Simulator has a different style of lens. Also applies to LC/008.	PLC-0008	Replace lenses to match plant. Change on 7/29/92 to GPUN correct per RDD letter 6223-92-0141	07/30/96	Replaced Lens per REP-0244-960709
1A2	Lens - Pump NU02-A	Plant has "OFF" & "ON" engraved on the lens	PLC-0009	Replace lens to match plant. Change on	07/29/96	Replaced Lens per

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
	Indicator Lights	caps. Simulator has insert on the diffuser. Also applies to LC/008.		7/29/92 to GPUN correct per RDD letter 6223-92-0141		REP-244-960709
1B3	Lens - Service H20 pump 1-2 Indicator Lights	"OFF" & "ON" are engraved on the indicating lights in the plant. Simulator has insert on the diffuser.	PLD-0009	Replace lenses to match plant. Change on 7/29/92 to GPUN correct per RDD letter 6223-92-0141	07/30/96	Replaced Lens per REP-244-960709
1D	Lens - Breaker 1B2P Indicator Lights	Simulator has a different style lens on the indicating lights. Also applies to LE/003	PLE-0004	Replace lenses to match plant. Change on 7/29/92 to GPUN correct per RDD letter 6223-92-0141	07/30/96	Replaced Lens per REP-244-960709
1D	Lens - Breaker 1B2P Indicator Lights	"TRIPPED" & "CLOSED" are engraved on the lens in the plant. Simulator has insert inside lens on the diffuser. Also to LE/003.	PLE-0005	Replace lenses to match plant. Change on 7/29/92 to GPUN correct per RDD letter 6223-92-0141	07/30/96	Replaced Lens per REP-244-960709
OC	Radio	Digital Display & Call/Talk Lights missing on the simulator. Next to M.C.M. Module	POC-0003	Accept as is. Unit functions without these items.	12/18/92	Accept as is.
OC	Radio	Keypad missing on simulator unit	POC-0004	Accept as is. Keypad is no longer in the control room.	12/18/92	Accept as is. 12/17//94: Removed from plant
OC	Radio	Phone patch modules are missing on the simulator unit.	POC-0005	Accept as is. Not needed on the simulator	12/18/92	Accept as is. 12/17/94: Removed from plant
OC	Radio	Engraved tag is missing on simulator desk unit	POC-0006	Install missing tag.	10/26/93	Installed missing tag
OC	CRT	Engraved nameplate with instructions for initializing CRT is missing on the simulator	POC-0008	Install missing tag.	10/26/93	Installed missing tag
OC	Switch	Engraved tag to the left of switch is missing on the simulator	POC-0009	Install missing tag.	07/24/96	Installed tag
OC	Operator Aid	Operator Aid between Alarm & Utility CRTs is missing on the simulator	POC-0011	Install Missing Operator Aid	08/21/96	Installed per REP-0244-960709
OC	Nameplate	Engraved nameplates above "Plant" & "Outside" phones are missing on the simulator.	POC-0012	Install missing tag.	07/24/96	Installed Nameplates
OC	Operator Aid	Rumor Control sign is missing on simulator	POC-0014	Install missing Operatoor Aid	08/21/96	Installed per REP-0244-960709
OC	Nameplate	Nameplate above page phone 13FPH-6 is missing on	POC-0015	Install missing tag.	07/24/96	Installed Nameplate

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		the simulator.				
OC	Phone Jack	Phone Jacks are missing on Centracom end & Procedures end of Opcon on simulator	POC-0018	Phone jacks are no longer used in the control room	12/17/94	Removed from plant
OC	Phone Jack	Phone Jack left of Paging System General/Restricted switch is missing	POC-0019	Install missing phone jack	10/26/93	Phone jack was removed from the control room
OC	Plaque	Information plaque left of paging system General/Restricted switch is missing	POC-0020	Install missing information plaque	07/24/96	Installed missing Plaque
OC	Phone - Security	The Security phone and plaque are missing from the simulator	POC-0023	Install Missing phone. Assigned by Emerg. Prep to W. Sonday. No SM Task is assigned.	07/24/96	Installed phone
OC	CRT - SPDS and Utility	Information Plaque is missing on 2 CRTs	POC-0024	Install Missing plaque	08/21/96	Installed per REP-0244-960709
OC	Radio - Operator Aid	The Operator Aid right of the Centracom is missing	POC-0025	Install Missing Operator Aid	08/21/96	Installed per REP-0244-960709
OC	Plaque - Operator Aid	The Power Supply Locations Operator Aid (Next to EO on Duty Board) is missing	POC-0028	Install missing sheet	08/21/96	Installed per REP-0244-960709
RSP	Lens - V-11-34 Indicator Lites	"CLOSED" & "OPEN" are engraved on the outside of the lens in the plant. Simulator has them on the inside. Also RP/027.	PRP-0021	Replace lens to match plant. Revised to: Accept as is.	07/14/92	Replaced simulator lenses.
RSP	Lens - V-11-34 Indicator Lites	Simulator has a different style of lens installed. Also RP/027.	PRP-0022	Replace lens to match plant. Revised to: Accept as is.	07/14/92	Replaced simulator lenses
RSP	Lens - RBCCW PP 1-2 Indicator Lites	Simulator has a different style of lens installed. Also RP/032.	PRP-0026	Replace lens to match plant. Change on 7/29/92 to GPUN correct per RDD letter 6223-92-0141	07/30/96	Replace Lens per REP-244-960709
14XR	Panel 14XR	Simulator panel is designed for storage. Contains no instrumentation or electronics.	PXX-0001	The equipment in panel 14XR is not functional in the plant and is not simulated. No trianing impact.	07/14/92	Plant removed instruments from 14XR
14XR	Recorder - Met Tower Air Temp	Plant has Tracor Westronics Recorder installed & Tagged that it is permanently out of service. Simulator doesn't have recorder.	PXX-0002	The equipment in panel 14XR is not functional in the plant and is not simulated. No training impact.	07/14/92	Plant removed instruments

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PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
14XR	Recorder - Wind Direction & Speed	Plant has Science Assoc. Inc. Recorder installed & Tagged that it is permanently out of service. Simulator doesn't have recorder.	PXX-0003	The equipment in panel 14XR is not functional in the plant and is not simulated. No training impact.	07/14/92	Plant removed recorder.

ATTACHMENT A.3

Outstanding Trouble Reports (TR)

Attached is a summary of the status of all TRs written since the start of the Factory Acceptance Test.

Also attached is a listing of all outstanding TRs indicating priority and scheduled completion date.

DATE: 12/11/96 OYSTER CREEK TR STATUS SUMMARY

PRIORITY	1	2	3	4	5	TOTAL
ACTIVE	0	11	47	6	1	65
FAILED	0	0	0	0	0	0
RETEST	0	5	12	3	0	20
HOLD	0	1	0	0	0	1
CLEARED	121	527	2346	278	14	3286
VOID	12	61	231	24	5	333
TOTAL	133	605	2636	311	20	3705

OYSTER CREEK REPLICA SIMULATOR
OPEN TROUBLE REPORTS
BY PRIORITY

TR	PRIORITY	STATUS	SYSTEM		TITLE	TARGET DATE
3514	2	A	EDS	INPLANT ELECTRICAL	TUNING OF LARGE LOADS	04/30/97
3470	2	A	ISS	INSTRUCTOR SYSTEM	C-NODE LOGOUT PROBLEMS	02/15/97
3598	2	A	CFW	CONDENSATE AND FEEDWATER	CFW MODEL INSTABILITY DURING LOCA	03/30/97
3358	2	A	FWC	FEEDWATER CONTROL	DFCS LINK STARTUP PROBLEM	02/15/97
3466	2	A	FWC	FEEDWATER CONTROL	DFC DRV INACTIVE	01/15/97
3360	2	R	ISS	INSTRUCTOR SYSTEM	NEW EXACT DEVELOP TOOLS	12/31/96
3585	2	H	PCN	PRIMARY CONTAINMENT	TORUS SUCTION STRAINER PLUGGING MOD - NR TORUS LEVEL	/ /
3617	2	A	PCN	PRIMARY CONTAINMENT	C-NODE BLOWS UP DURING E-PLAN DRILL PREP	03/30/97
3668	2	A	ISS	INSTRUCTOR SYSTEM	IC Files Get Corrupted	03/30/97
3672	2	A	GEN	GENERATOR AND EXCITOR	GENERATOR FREQ METER READS 60 HZ W/ GEN OFF-LINE	03/30/97
3674	2	R	FPS	FIRE PROTECTION SYSTEM	FIRE PROTECTION HORNS DON'T WORK	03/30/97
3684	2	R	ICS	ISOLATION CONDENSER	ISOL COND FLOWS APPEAR TO BE TOO LOW	12/30/96
3687	2	R	CSS	CORE SPRAY SYSTEM	CS DEMAND FOR PUMPS ALARM	12/31/96
3690	2	R	MSS	MAIN STEAM SYSTEM	MSL Drain Flow excessive	12/30/96
3694	2	A	FWC	FEEDWATER CONTROL	ADJUST MFRV CHARACTERISTICS AT LOW FLOW COND. TO MATCH PLANT	12/30/96
3697	2	A	ICS	ISOLATION CONDENSER	ISOLATION CONDENSERS ISOLATE WHEN THEY SHOULDN'T	12/30/96
3703	2	A	NSS	VESSEL AND RECIRCULATION	ATWS RESPONSE INCONSISTENT	01/20/97
3254	3	A	PCS	PCS/SPDS	CORRECT DCC MALF'S RESPONSE ON PCS	06/01/97
3553	3	A	ICH	INSTRUMENTATION CHANNEL	MVAR METER ON PANEL 8F/9F (-200 TO 600) READING INCORRECTLY	03/01/97
3359	3	A	FWC	FEEDWATER CONTROL	DCC INIT FAILURE MESSAGES	03/15/97
2887	3	R	PSM	PSMS/TIP	NODAL XENON RATE OF CHANGE TOO HIGH	03/30/97
3596	3	A	ISS	INSTRUCTOR SYSTEM	ISS WAIT COMMAND DOESN'T WORK IN A "DO" LOOP	03/30/97
3633	3	A	GEN	GENERATOR AND EXCITOR	IF T/G ON GEAR AND GC1/GD1 CLOSED, NO AMPS	03/30/97
3279	3	R	IOS	I/O SYSTEM	DFRCS DIAG TESTS	01/31/97
3628	3	A	PCS	PCS/SPDS	PCS NOT READY MESSAGE	03/30/97
3586	3	A	EDS	INPLANT ELECTRICAL	DC-A/C-B PANELS SLOW TO DE-ENERGIZE	03/30/97
3530	3	A	PCS	PCS/SPDS	COLOR COPY CAPABILITY FOR IDT EMUL	03/01/97
3503	3	A	ISS	INSTRUCTOR SYSTEM	ISS HANGS ON SET NMPTS (DATAPOOL MONITORING)	03/17/97
3546	3	R	NSS	VESSEL AND RECIRCULATION	ISO COND STM LINES DON'T HEATUP DURING FAST TIME	03/30/97
3643	3	A	GEN	GENERATOR AND EXCITOR	PT FUSE RESETS DON'T WORK	03/30/97
3569	3	A	MIS	MISCELLANEOUS	NUMAC BACKTRACK AND REPLAY	02/15/97
3533	3	R	PCN	PRIMARY CONTAINMENT	TOR TO DW VAC BKR DP TOO HIGH	01/15/97
3505	3	A	ISS	INSTRUCTOR SYSTEM	DEFUNCT PROCESSES	03/15/97
3281	3	R	SWC	SWITCH CHECK	SQUIB METER BACKTRACK RESPONSE	01/30/97
3642	3	A	GEN	GENERATOR AND EXCITOR	INSTRUMENTATION NOT RESPONDING TO BLOWN 24 KV PT FUSE	03/30/97

OYSTER CREEK REPLICA SIMULATOR
OPEN TROUBLE REPORTS
BY PRIORITY

TR	PRIORITY	STATUS	SYSTEM		TITLE	TARGET DATE
3579	3	A	ISS	INSTRUCTOR SYSTEM	PASSWORD PROTECT FEATURE	03/30/97
3422	3	R	HWC	HYDROGEN WATER CHEMISTRY	HWC CONTROLLERS FOR V-567-71 AND V-567-73 SPAN/SETPT	02/25/97
3576	3	A	PCN	PRIMARY CONTAINMENT	PCN/ATHENA - DW TEMPS DON'T MATCH PLANT DATA	03/30/97
3589	3	A	ISS	INSTRUCTOR SYSTEM	REMOTE CONTROL DOESN'T WORK RIGHT	03/30/97
3330	3	R	IOS	I/O SYSTEM	SW CHK PROBLEMS	01/30/97
3620	3	A	PCS	PCS/SPDS	PCS-SIM DRIVEN ALARMS DO NOT INITIALIZE CORRECTLY	03/30/97
3515	3	A	PCS	PCS/SPDS	LNKPNT DIGITAL INPUTS SENT TO PCS VIA LNKPT ARE WRONG	02/15/97
3504	3	A	IOS	I/O SYSTEM	GENERATOR PHASE A, B, AND C AMMETER RESPONSE	04/15/97
3556	3	R	MSS	MAIN STEAM SYSTEM	REHEAT TEMPS WILL NOT INCREASE W/ LO FLOW	12/30/96
3640	3	A	EDS	INPLANT ELECTRICAL	MOMENTARY LOSS OF CIP-3 ON BUS B/BUD FAULT	03/30/97
3610	3	A	NSS	VESSEL AND RECIRCULATION	LIQ POISON FLOWPATH ONCE INJECTED INTO VESSEL	03/30/97
3646	3	A	PCS	PCS/SPDS	INDICATION ON V-14-36 AND 37	03/30/97
3647	3	A	GEN	GENERATOR AND EXCITOR	GENERATOR FIELD RHEOSTAT WON'T BUCK	03/30/97
3649	3	A	GEN	GENERATOR AND EXCITOR	GENERATOR PROTECTION RELAYING LOGIC/SETPOINT CHANGES	03/30/97
3653	3	A	RMS	RADIATION MONITORING	RAGEMS HI RANGE/LO RANGE CALIBRATION DISCREPANCY	03/30/97
3656	3	A		UNASSIGNED	TIPDRV ABORT	03/30/97
3659	3	A	PCS	PCS/SPDS	RWMDRV ERROR MESSAGES	03/30/97
3665	3	A	ISS	INSTRUCTOR SYSTEM	GPU1 REFRESHES ITSELF AFTER A REBOOT WHEN INITING TO IC-101	03/30/97
3667	3	A	NSS	VESSEL AND RECIRCULATION	NSS PLPs	03/30/97
3671	3	R	MSS	MAIN STEAM SYSTEM	MSS - SECOND STAGE REHEAT EXIT TEMP PROBLEMS	03/30/97
3673	3	R	MSS	MAIN STEAM SYSTEM	STEAM SEAL REGULATOR "BURPING" PHENOMENON	03/30/97
3675	3	A	FWH	FEEDWATER HEATERS AND DRAINS	Aux Flash Tank is 100' high instead of 10'	03/30/97
3676	3	A	FWH	FEEDWATER HEATERS AND DRAINS	FLOW FROM MFT'S TO RDT'S/MDT'S VIA NORMAL DRAINS NOT WORKING	03/30/97
3678	3	A	PCS	PCS/SPDS	ERDS LINE - PRIMARY/BACKUP SWITCHING	03/30/97
3682	3	A	MSS	MAIN STEAM SYSTEM	2ND STG REHEATERS DO NOT WARM UP DURING TURB WARMING	02/15/97
3683	3	A	MSS	MAIN STEAM SYSTEM	2ND STG R/H DRAIN TANKS/R/H/EXIT TEMP COOLS TOO SLOW	02/15/97
3685	3	A	ICS	ISOLATION CONDENSER	ISOL COND SHELL TEMPS INCORRECTLY CALCULATED	12/30/96
3686	3	A	CNS	CONTAINMENT SPRAY SYSTEM	FUEL ZONE STATUS	02/25/97
3688	3	A	ICS	ISOLATION CONDENSER	ICS VALVE STROKE TIMES	12/31/96
3689	3	R	RFC	RECIRCULATION FLOW CONTROL	Adjust Individual Recirc Pump Scoop Tube Characteristics	02/01/97
3691	3	A	CWS	CIRCULATING WATER SYSTEM	Circ Water Discharge Valvs close on LOOP	01/01/97
3692	3	A	MOT	MOTOR/PUMP COMPONENT LOGIC	ISO COND/EMRV TEMP RECORDER READINGS	03/01/97
3693	3	R	MSS	MAIN STEAM SYSTEM	Steam Seal Header Warming	01/02/97
3695	3	A	OED	OFFSITE ELECTRICAL DISTRIBUTION	GENERATOR VOLTAGE TOO LOW WHEN RHEOSTAT ON LOW STOP	02/20/97
3696	3	A	OED	OFFSITE ELECTRICAL DISTRIBUTION	GC1/GD1 DISAGREEMENT ALARMS	01/20/97

OYSTER CREEK REPLICA SIMULATOR
OPEN TROUBLE REPORTS
BY PRIORITY

TR	PRIORITY	STATUS	SYSTEM		TITLE	TARGET DATE
3699	3	A	PCS	PCS/SPDS	MISSED SAR ALARMS	02/19/97
3700	3	A	SCN	SECONDARY CONTAINMENT AND STANDBY GAS	TEMP MONITOR RESPONSE TO STEAMLINE BREAK	02/19/97
3701	3	A	SLC	STANDBY LIQUID CONTROL	STANDBY LIQUID FLOW PROBLEMS	02/19/97
3702	3	A	DGN	DIESEL GENERATOR	DIESEL GENERATOR LOA NOT FUNCTIONING	02/19/97
3704	3	A	FWH	FEEDWATER HEATERS AND DRAINS	AUX FLASH TANK BIG PUMP RUNS CONTINUOUSLY	02/19/97
3705	3	A	DGN	DIESEL GENERATOR	DIESEL GENERATOR LOADING	02/20/97
3563	4	A	PCS	PCS/SPDS	CORE LIMITS COORDINATES	02/15/97
3506	4	A	PCS	PCS/SPDS	SAVE/RESTORE DCC MESSAGE	04/30/97
3639	4	A	EDS	INPLANT ELECTRICAL	UV RELAYS PICK UP W/O DC POWER AVAILABLE	03/30/97
3532	4	R	RCU	REACTOR WATER CLEANUP	RCU PRESSURE LESS THAN ABSOLUTE WHEN ISOLATED	02/25/97
3573	4	R	EDS	INPLANT ELECTRICAL	EDS77 LOA DESCRIPTION ERROR	03/30/97
3651	4	A	IOS	I/O SYSTEM	CLEANU[illegible](ALLBOMS) OCDEVDAT FILE	03/30/97
3677	4	A	FWH	FEEDWATER HEATERS AND DRAINS	CLF FWH-40 THROUGH FWH-51 TITLES ARE INCORRECT	02/11/97
3679	4	R	GEN	GENERATOR AND EXCITOR	PROGRAM GEN MESSAGE	03/11/97
3681	4	A	FWH	FEEDWATER HEATERS AND DRAINS	TANK/TANK2 ROUTINES STILL USING INCORRECT HEAT SINK	03/11/97
3652	5	A	IOS	I/O SYSTEM	DI SCANFLAG MISLEADING	04/12/97

INSTALLED PLANT MODIFICATIONS
SCHEDULED FOR INSTALLATION ON THE
OYSTER CREEK SIMULATOR
ATTACHMENT A.5

B/A No.	Title	PROPOSED SIMULATOR HARDWARE CHANGES	PROPOSED SIMULATOR SOFTWARE CHANGES	PROPOSED INSTRUCTOR STATION CHANGES	P R I	SCHEDULE FOR SIM. CHANGE	Plant Install Date
125-1	Scram, BU & SDIV Sol Pilot Material Replacement	None	Increase ARI Control Rod Insertion Time to 37.3 sec. (double)	None	2	03/30/97	11/30/94
244-96	RWCU Filter Inlet Valves Control Logic Mod	None	Revise RCU Filter Valve Logic	None	3	06/01/97	08/28/96
275-95	SDC Minimum Flow Valve Control	Add Switches behind 1F/2F	Revise valve controls	Add Switch Overrides Delete defeated Flow Switches	3	12/15/97	08/20/96
285	Correct Archive Utility	None	Correct RWM Archive Utility	None	2	12/30/96	02/20/96
311	Add Total Feedwater Flow on Cond System Display	None	Add FW Flow to PCS display	None	2	02/28/97	05/16/96
312	SAR Alarm Change Capability	None	Add Ability to add/delete Alarms & Checkpoint Alarms	None	2	02/01/97	06/03/96
312400	SBO CONTROL PANEL MOD	None	Change Power Supplies to SBO Meters from DPA1 to the SBO	None	2	03/01/97	01/30/96
315	Initialize SAR Common Global	None	Revise SAR	None	2	02/01/97	06/20/96

INSTALLED PLANT MODIFICATIONS
SCHEDULED FOR INSTALLATION ON THE
OYSTER CREEK SIMULATOR
ATTACHMENT A.5

B/A No.	Title	PROPOSED SIMULATOR HARDWARE CHANGES	PROPOSED SIMULATOR SOFTWARE CHANGES	PROPOSED INSTRUCTOR STATION CHANGES	P R I	SCHEDULE FOR SIM. CHANGE	Plant Install Date
316	Expand PCS Dispatch Queue	None	Change PCS Dispatch Queue	None	3	03/28/97	07/15/96
319	RAGEMS Display Task Changes	None	Change RAGEMS Display on PCS	None	3	03/30/97	08/16/96
328333	ESW ORIFICE RELOCATION	None	Revise Sim. Diagrams Retune ESW flows	None	4	11/30/96	11/23/94
328383	EDG RELAY PANEL MOD		Revise Function of relays, revise logic	Revise CLFs	3	/ /	10/11/96
328395	N2 Makeup Flow Meter Relocation	Mark Integrator with 30	Relocate flow transmitter to include N2 Compressors. Change range of Makeup Flow & Recorder	None	3	06/15/97	10/07/96
328401	Circulating Water System Starting Logic	None	Add Interlock Relay to Pump Start Circuits	None	3	06/15/97	10/08/96
329-95	NRW Spare Annunciators	New Annunciator Window for 10XF-2-a	Spare Annunciator 10XF-2a	Correct override for 10XF-	3	12/31/96	05/13/96
403014	ABANDON LPRMs	Cover LPRM or 4F. Rearrange APRM Inputs. Blank TIPs	Revise NIS model	Delete Malfs & CLFs for inactive LPRMs	2	02/01/97	11/27/94

INSTALLED PLANT MODIFICATIONS
SCHEDULED FOR INSTALLATION ON THE
OYSTER CREEK SIMULATOR
ATTACHMENT A.5

B/A No.	Title	PROPOSED SIMULATOR HARDWARE CHANGES	PROPOSED SIMULATOR SOFTWARE CHANGES	PROPOSED INSTRUCTOR STATION CHANGES	P R I	SCHEDULE FOR SIM. CHANGE	Plant Install Date
403063	HIGH RX RECIRC FLOW SCRAM LOGIC DELETION	Replace Trip Status and Reset Modules	Delete High Recirc Flow Scram	Add & Revise I/O Overrides Revise Malfunctions.	1	02/01/97	10/14/96
403079	MG-Set Charger B Auto Start Modification	Replace 3 Position Control Switch with 2 Position Switch	Add auto restart of B Battery Charger	Revise CLFs & Overrides	2	12/31/96	10/19/96
408847	EDG-2 DATA AQUISITION MOD	None	Revise for PCS connection to new monitor	None	4	06/30/97	11/02/95
408943	Replacement of OG Flow Transmitters FT-2,3,4	None	Add Total Air Ejector Flow	Add Individual & Total Off Gas Flow to Plant Status Display	3	09/30/97	10/02/96
484-94	Reactor Vessel Thermocouples Abandonment	None	None	Revise Rx Vessel Temp Status Display	4	09/30/97	06/10/96
ASFOUND	TLO Lift Pump/Drive Motor Arrangement	None	Correct Motor/Pump correlation	None	4	07/01/97	02/23/96
C200125	Intake/Discharge RTD Power Supply	None	Change Power Supply From CIP3 to LP-1A31	None	4	06/30/97	05/02/95

INSTALLED PLANT MODIFICATIONS
SCHEDULED FOR INSTALLATION ON THE
OYSTER CREEK SIMULATOR
ATTACHMENT A.5

B/A No.	Title	PROPOSED SIMULATOR HARDWARE CHANGES	PROPOSED SIMULATOR SOFTWARE CHANGES	PROPOSED INSTRUCTOR STATION CHANGES	P R I	SCHEDULE FOR SIM. CHANGE	Plant Install Date
SETPOINT	Generator Output & Temperature Recorder	Reprogram Recorder	Change Gen Temps from F to Celsius scale	Revise CLFs and Overrides	3	06/30/97	09/13/96

OTHER MODIFICATIONS
SCHEDULED FOR INSTALLATION
(INCLUDES PLANT MODS NOT COMPLETE AND SIMULATOR UPGRADES)
ATTACHMENT A.6

B/A No.	Title	PROPOSED SIMULATOR HARDWARE CHANGES	PROPOSED SIMULATOR SOFTWARE CHANGES	PROPOSED INSTRUCTOR STATION CHANGES	P R I	SCHEDULE FOR SIM. CHANGE	Plant Install Date
012-96	Cycle 15 Recorder Replacements	7 Recorders:TR-IG02, TR-IA70, TR-IA0071, TR-RV0008, 13R-003, 7F-0014, 7F-0015	Revise to linear output Change ranges	Change as required for new ranges and recorder.	3	/ /	/ /
211-96	DG APTL Replacement and Adjustment	None	Adjust DG tuning	None	3	11/05/97	/ /
288	RWM Power Operations Mode Enhancement	None	Add additional RWM sequence	None	2	12/30/96	/ /
316400	RAC Workstation in Control Room	Add RAC Workstation	Duplicate software used in plant installation	None	3	/ /	/ /
349-95	Replace TIP Drawer Lamps with Sockets	Replace TIP,SRM,& IRM Drawer Lamps to match the plant.	None	None	4	12/30/97	/ /
403060	Deaerating Steam System Retirement	Install New Labels	Defeat valve operation	Remove CLFs	5	12/30/97	/ /
403061	Retire Reheat Protection System Supply Side	None	Disable Fans and Valves	Remove overrides and CLFs	5	12/30/97	/ /
408847	EDG-1 DATA AQUISITION MODIFICATION	None	Revise for PCS connection to new monitor	None	4	06/30/97	/ /

OTHER MODIFICATIONS
SCHEDULED FOR INSTALLATION
(INCLUDES PLANT MODS NOT COMPLETE AND SIMULATOR UPGRADES)
ATTACHMENT A.6

B/A No.	Title	PROPOSED SIMULATOR HARDWARE CHANGES	PROPOSED SIMULATOR SOFTWARE CHANGES	PROPOSED INSTRUCTOR STATION CHANGES	P R I	SCHEDULE FOR SIM. CHANGE	Plant Install Date
47-96	RAGEMS I Linear Low Range Link to Plant Computer		Add Points to PCS		0	/ /	/ /
N/A	Add LOAs for Lo-Med-Hi Switch on the Cond. Meters	None	Add Condensate Conductivity Meter LOAs	Add new LOAs	3	06/01/97	/ /
N/A	LOAs for 4160V & 480V breaker Manual Local Ops.	None	Add Local Manual Control	Add LOAs	3	04/30/97	/ /
N/A	Torus Suction Strainer Malfunction	None	Add new Malfunction	Add Malfunction to IS	2	03/31/97	/ /

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
SINCE INITIAL CERTIFICATION
ATTACHMENT A.7

B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
003	Enhanced TIP Functions	Modify TIP Functions	None	11/08/90	03/21/94	2
005	SIMDATA	Generate SIMDATA for each Reboot catagory	None	/ /	03/19/93	2
007	Plant Performance Monitoring	Remove code to write to backup discs for p14-p16 in periodic processor & PERFCA Program	None	09/28/90	11/30/93	3
021	Rx State and PCS Heat Balance Mods	Revise Heat Balance for Reactor State and PCS	None	02/04/91	03/21/94	1
022	LPRM Feedback in Pred. Analysis & remove TR opt.	Revise LPRM Feedback in Predictive Analysis and remove TR option.	None	10/10/90	03/21/94	3
023	Weather Program Changes	Revise weather program	None	04/27/90	03/21/94	4
029	ERDS Phone Number	Change ERDS Phone Number	None	10/25/91	03/19/93	3
034	OCTD/HISTCHECK/OP.TRIG mods	Revise PSMS for OCTD/HISTCHECK/OP.TRIG mods and setpoint changes	None	01/14/92	03/21/94	4
037	TIP Functions Changes	Install TIP Functions modification	None	01/28/92	03/21/94	3
039	Replica Tie in linkage hardware	Install Replica Tie-in software	Install Replica Tie-in Hardware	04/03/91	03/19/93	2
060	Install Digital Output Capability on PCS	Install Digital Output Capability	None	/ /	06/01/93	2
064	Remove RW02B Hi 1 Alarm	Remove PCS Alarm	None	06/22/92	10/22/93	4
065	ERDS Link indicates status with database point	ERDS Link Status	None	07/07/92	05/12/94	3
067	Restore Dynamic Function Key Assignments on Boot	Correct Software	None	06/22/92	02/10/93	2
070	Display/Print Modifications	Revise Displays and printouts per Plant EP-034 (PSMS-0106-920218)	None	08/03/92	03/21/94	3
071	Rebuild ACE Software	Rebuild ACE Software (ACEGEN)	None	08/24/92	10/22/93	2
073	Weather Program Modifications	Revise Weather Program in simulator PSMS	None	09/10/92	03/21/94	3
074	Add ERDS backup phone line	Revise software for new phone line	Add new phone line	09/22/92	05/12/94	3
075	Replace Tape Drives on the System	None	Replace Tape Drives	06/30/92	06/14/94	2

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
SINCE INITIAL CERTIFICATION
ATTACHMENT A.7

B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
077	Check SAR alarm initialization file	Revise Software as required for accuracy	None	/ /	01/15/93	1
080	Add Calculation for Total FW Flow from new venturi	Add new total FW Flow	None	11/10/92	09/10/93	3
081	Remove CYCLE VALVES message from Heat Balance	Remove CYCLE VALVES message from heat balance	None	11/10/92	03/21/94	2
082	Modify RPTSUM display to activate BRUX00	Modify RPTSUM Display to activate BRUX00 rather than JAQY00	None	/ /	10/22/93	3
084	Error on write to AI Chan causes MGIL00 to Exit	Correct error on write to AI Channel which causes MGIL00 to exit	None	/ /	10/22/93	3
086	Programs with task ID > 128 cannot read mail	Correct PCS to allow programs with Task ID > 128 to read mail	None	/ /	10/22/93	3
087	Resolve missing SAR Alarms data gap	Resolve Missing SAR Alarms Data Gap	None	/ /	01/25/93	1
089	Transmit Modeled RAGEMS Points to PCS Data Base	Modify software to transmit RAGEMS Points to PCS Data	None	/ /	04/23/93	3
090	PCS Data Base Corrections	Correct PCS Database	None	01/11/93	09/29/94	3
104	Change Default Rod Group to Sequence #12-001	Revise RWM Sequence per RWM-0019-9881207	None	/ /	11/08/93	3
110	14 R SAR Alarm Changes	Change SAR Alarms when Cycle 14 mods are installed on the simulator	None	02/05/93	09/29/94	2
113	DAS Trigger and Auto Modification	Modify DAS Trigger and Auto per EP-034 (PSMS-105-920213)	None	01/24/93	01/07/95	3
116	Dedicate PSMS02 as the Default Display for CRT#2	PSMS Display	None	/ /	10/22/93	2
120	Re-Install Modified AI Handler with FCB PURGE Bit	AI Handler	None	02/23/92	10/26/93	2
121	CNTRLVLV Range Change	PCS Variable Range Change	None	04/15/93	09/29/94	3
123	Canal Monitoring with PCS	Add Environmental Monitoring to PCS	None	05/17/93	01/06/95	3
125	Integrate an O.S. Program to Save CPU Scratchpad	Add PCS program for CPU Scratchpad	None	04/23/93	09/29/94	3
126	Upgrade PCS Rev. F AI Boards to Rev.	None	Install updated boards in PCS	03/26/93	08/19/94	1

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
SINCE INITIAL CERTIFICATION
ATTACHMENT A.7

B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
	G		computer			
127	Add Calc for CTP Moving Average and Display Same	Add Core Thermal Power Moving Average	None	/ /	09/29/94	2
128	Add Single Element FW Flow to PCS	Add Common FW Flow to PCS Displays	None	/ /	09/10/93	2
129	Drywell Pressure Points and SAR Changes for 14R	Add PCS Changes	None	/ /	05/12/93	2
131	Suspend RWM Message Transmission to PCS	Suspend RWM Messages	None	03/31/93	12/29/94	3
134	Drywell H2 Monitor Range Change	PCS H202 Software	None	04/23/93	09/29/94	3
140	ICS Alarm Data	Revise PCS	None	/ /	10/07/93	1
141	Correct HU/CD Rates on PCS	Correct PCS Software	None	/ /	08/12/93	2
146	PCS Init Delay	Prevent PCS from re-initing until previous Init is complete	None	/ /	08/02/93	2
147	Add 4 mb memory to Simulator PCS	Revise to accept memory	Add 4 mb memory to PCS	/ /	01/21/94	2
148	Heat Balance Program Mods.	Revise Quality to Questionable if Wide Range Pressure is used	None	06/30/93	09/29/94	2
157	Add Files (DFTDIR) DOAD, DOPT to ACEGEN List	Add Files	None	/ /	10/22/93	2
160	Deletion of 2 SOE Points from the PCS Database	Remove Points	None	/ /	05/12/93	3
161	Update Point Editor	Revise Point Editor on PCS	None	/ /	09/29/94	3
162	PSMS Xenon Calculation and Display Mods	Revise Xenon Calculation and Display	None	08/05/93	01/07/95	2
164	PSMS Passwords	Revise PSMS Passwords	None	/ /	10/28/93	2
166593	1K123 Setpoint Change	Change 1K123, 1K124, 2K123, 2K124 Time Delay from 2 to 4 seconds	None	11/30/95	04/29/96	3
168	Fix ERDS Link	Repair ERDS Link	Repair ERDS Link	/ /	10/18/93	1
171	Remove IFLLPR File from PSMS	Remove IFLLPR File	None	/ /	03/21/94	3
172	Remove CRT #2 From CRT #1 Failover Chain	Revise CRT Failover	None	/ /	10/22/93	2
173	Replace PSMS RAMTEK Graphic CRT with	Supporting Software	Replace Simulator IDT with PC	10/01/93	02/07/95	2

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	IBM-PC					
178	Fix ERDS Link	Fix ERDS Link	Fix ERDS Link	/ /	10/18/93	1
179	Install 3 1.2 GB SCSI Drives for PCS	Supporting Software	Replace four 300 MB Drives with three 1.2 GB SCSI Drives	/ /	05/03/94	2
180	RWM Error Message File	Correct RWM Error Message File	None	11/24/93	12/29/94	3
181	Add ESW Flow Calculation to Heat Balance Task	Revise Heat Balance Task	None	05/13/94	04/12/95	3
182	RWM Backup Macro System Disk Restore	Add Restore Option to Menu	None	12/29/93	12/29/94	3
182282	Core Spray Setpoint Change DPS-RV40	Change Trip & Reset setpoints for RV-40A,B,C,D	None	06/29/95	04/29/96	3
183	Design/Install Digital Recirc/Feedwater System	Add New System	Add new System	/ /	05/03/94	1
185	Delete PCS Database Points HB-100DF and HB-RXTMP	Delete Heat Balance Database Points	None	/ /	10/05/94	2
187	Add RWM/PCS Link Point Alarm to PCS	Add PCS Alarm	None	01/27/94	04/12/95	3
188	Add 5 New Group Points to PCS Database for PTSC	Add PCS Displays	None	/ /	03/01/94	2
189	Install PCS Link to DCC Computer	Add supporting software	Add Link	09/09/94	10/05/94	1
190	Install PCS Displays and Mimics for DCC	Add Displays and Mimics	None	09/09/94	10/05/94	1
190-92	SRM, IRM, APRM Bypass Switch Replacement	None	Replace SRM, IRM, APRM Bypass Switches with new model	/ /	11/19/94	3
191	Speed up Symbol Processing	PCS changes	None	/ /	03/04/94	1
192	Misc. SPDS DRs & DW Bulk Temperature Calculation	Revise HCTL Calculation	Nine	04/09/94	04/12/95	2
193	Change Alarm Actuation States	Change Alarms	None	09/01/94	04/12/95	3
194	Add Fuel Zone Level A & B Calculations	Add calculations to indicate whether FZ A & B are active	None	07/07/94	04/12/95	2
195	Heat Balance Abort	Prevent Heat Balance Abort on bad status from M:SSPND Call	None	05/04/94	04/12/95	2
200	Change Modem Access Number for ERDS	Change Modem Access Number	None	/ /	11/04/94	2

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205	Change Equation for Heat Discharge in Env. Monitor	Revise Calculation for Heat Discharge in Env. Monitor	None	[illegible]4/94	01/06/95	3
208	Historical Exception Deltas	Revise PCS Code	None	08/06/94	04/12/95	2
211	Add RGILOO (Plant Performance Monitor) to Startup	Drive PPM	None	/ /	12/15/95	2
212	Calc for 15 Minute Average MW (Main Gen)	Add PCS Calculation	None	08/01/94	09/07/95	2
213	Containment Spray Alarm Suppression	PCS Alarms	None	08/15/94	09/07/95	2
215	Wide Range Level PCS Changes	New Range	New Meter Scale	09/12/94	11/10/95	2
216	Add File TTME to Config File List. Add RGILOO	Revise PCS Software	None	/ /	12/15/95	3
218	RWM Lost Insert Errors	Correct RWM Lost Insert Errors	None	11/23/94	11/18/94	2
221	Add High Range SGM to ERDS	Add PCS Software	None	11/02/94	02/28/95	1
224	Cycle 15 Initialization	PSMS Software	None	11/23/94	11/22/95	1
225	Cycle 15 Shutdown Margin Installation	RWM Sequence Revision	None	11/23/94	03/30/95	3
226	15R Database and SAR Changes	Update PCS for Plant Modifications as installed	None	11/18/94	12/15/95	2
227	RAGEMS Computer Alarm	Add PCS Displays. Alarm from PCS.	None	09/06/94	12/18/95	2
228	Swap High Range Monitor at 990 mr/hr	Change calculation for SPDS-116	None	11/04/94	09/07/95	3
233-95	Jumper Out HWC Low Power Trip (PS-567-32)	Defeat HWC Low (<40%) Power Trip	None	/ /	02/01/96	2
234	Remove Rx Iso Demand Points from PCS	Remove PCS database points	None	12/16/94	12/18/95	2
235	Add Weather Data to the ERDS Link	Add weather data to ERDS	None	12/22/94	09/07/95	1
236	One Dozen DFCS Computer Link DRs	Correct PCS and DFRCS Link	None	12/09/94	12/13/95	1
237	DFCS FCN C118552	Revise DFCS Software	None	11/15/94	04/18/95	2
238	Install DFRCS Tuning Changes from Cycle 15 Startup	Change DFRCS Constants	None	/ /	04/18/95	2
241	Transmit PCS Year to RWM	Revise date sent to RWM	None	03/02/95	09/07/95	2
245	Install ORBIS Online Package	Install Software	None	02/28/95	12/15/95	3
253	Fix TIP Shifting and Compression Displays	Correct Displays to work on IDT and PC IDT Emulator	None	05/11/95	12/12/95	2

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254	Turbine Control Valve Conversion Change	Revise code for Turbine Control Valve Conversion	None	04/26/95	12/15/95	2
255	PCS to Met Tower Data Link	Transmit met data from simulator to PCS	None	04/17/95	09/07/95	2
256	ERDS Transmission Rate Correction	Correct ERDS Transmission Rate	None	07/05/95	09/07/95	2
261	Exit PLTCOL if Point does not exist	Modify PCS per PCS-0309-950706	None	08/01/95	06/26/96	2
262	Performance Calculation Corrections	PCS changes per PCS-0296-950314	None	08/02/95	06/26/96	2
263	Drywell Pressure Input for Containment Flooding	Modify PCS per PCS-0297-950421	None	07/26/95	07/15/96	2
264	Critical Alarm Displays	Add PCS Alarm Displays per PCS-0264-950524	None	08/18/95	06/26/96	2
266	Corrections to Database and SAR Description File	Modify PCS per PCS-0299-950427	None	08/18/95	06/26/96	2
267	Revise Critical Task List and Change Heat Balance	Revise PCS per PCS-0300-950503	None	09/11/95	06/26/96	2
268	Modify ENVR	Modify PCS per PCS-0311-950817	None	10/04/95	10/01/96	2
270	Correct Error Mask	Modify PCS per PCS-0314-950908	None	09/25/95	06/26/96	2
275	Install Enhanced PPM	Expand PPM to xmit 1250 analog + 1250 digital points	None	/ /	12/01/95	2
277	Suppress Print of DCC Messages to PCS Printer	Suppress Printing	None	/ /	12/12/95	2
278	Prevent Bad Rod Data transfer from RWM to PCS	Revise RWM	None	/ /	02/09/96	2
281	Upgrade Encore PC Boards to Latest Revision	None	None	12/04/95	02/12/96	3
283	PCS Alarm Reduction, Phase #1	Revise PCS Alarms	None	10/31/95	06/26/96	2
294	Add 60 Sec Moving Average Calc for Point APRMPWR	Add average Calculation	None	01/25/96	10/17/96	2
295	Define Regions on Power/Flow Diag on CSF #1 Displ.	Modify Power/Flow Display	None	12/27/95	08/20/96	1
305	Improve Operator Interface for the	Revise PCS ERDS Software	None	04/11/96	07/29/96	2

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	ERDS Link					
308	Correct SPDS Power/Flow Plot Errors	Correct PCS Software	None	05/08/96	08/20/96	2
310	DFRCS Tuning Changes	DCC Software changes	None	05/20/96	10/01/96	2
312400	FUEL ZONE LEVEL INDICATION SYSTEM MOD	Delete High Precision Fuel Zone Level	None	02/10/93	02/20/93	1
312400	IRM METER FACE CHANGE (127%)	Revise range to 127% max.	Mark Meter Faces for 127%	02/04/93	12/28/95	4
312400	RAGEMS TROUBLE ALARM	Revise software for Alarm 10F-3-d	None	11/21/94	12/18/95	2
312400	RAGEMS TROUBLE ALARM TO PLANT COMPUTER SYSTEM	Add Trouble Alarm to PCS	None	03/30/95	12/18/95	2
312400	RELOCATE RAGEMS COMPUTER	Change RAGEMS Power Supply	None	11/26/94	12/18/95	3
312400	REMOVAL OF ESW AND ISO CONDENSEP VENT RAD MONITORS	Disable monitors; Revise alarms	Remove monitors and annunciators when removed from plant	12/06/95	07/12/96	2
312400	TBCCW HX SHELL SIDE DP GAUGES (MV91-124 & 129)	Calculate DP variables	None	08/13/92	10/19/94	4
312400	TBCCW HX TUBE SIDE DP GAUGES	Calculate DP variables	None	08/13/92	10/19/94	4
312400	RELOCATE ISO COND TEMP ELEMENTS TE-0101D\E TO DW	Verify that these signals are included in CNA model, not ICS	Change Label Plate at Recorder TR-IA-55	09/23/92	10/31/94	4
315101	V-11-34 & V-11-36 Portable Air Tank	Add LOA for Air Cylinder	None	03/30/94	10/31/94	2
315302	UV Relay Setpoint Changes	Revise Setpoints for selected trips	None	/ /	02/16/95	1
317	Modify PCS Point List for 16R DCC Logic Changes	PCS Software	None	10/18/96	09/20/96	2
323476	EMERGENCY DIESEL GENERATOR CABINET UPGRADES-EDG #1	Add new LOAs. Modify control circuit.	None	04/01/91	03/30/93	3
323476	EMERGENCY DIESEL GENERATOR CABINET UPGRADES #2	Add new LOAs. Modify control circuit.	None	05/01/91	03/30/93	3
323545	REMOVE CWP SEAL WATER STRAINER HIGH DP ALARM	Revise software to delete alarm K-3-f	Remove alarm K-3-f	03/01/89	03/30/95	4
323559	RECIRC PUMP D MOTOR TEMP ALARM BYPASS		Bypass Recorder Points	03/02/90	10/08/96	0
323559	REMOVAL OF CORE SRAY MIN FLOW CHECK VALVE INTERNAL	Removes internals from check valves V-20-10 & 11, & V-20-38&39, update Sim. Dwg. 10.2.7 Sh 1 & 2	None	05/08/91	08/19/93	3
323560	CONTROL ROD SCRAM INSERTION TEST	None	Adds new test plugs, plexiglass	05/08/91	12/01/94	4

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	PLUGS		door & tags on front of panel 6XR			
323560	INSTALLATION OF TEST PLUGS FOR IRMS	Need to evaluate - depends on the use of the test plugs.	Install IRM Test Plug Modules	05/08/91	11/03/93	2
323560	ELIMINATION OF JUMPER INSTALLATION IN EF-1-5	Change Logic for EF-1-6 when EF-1-5 Breaker is racked out	None	10/30/90	08/17/93	4
323560	125V DC SYSTEM KNIFE SWITCH MODIFICATION	Changes the LOA's for the 125VDC manual throwover switches. (May just require a description change)	None	04/19/91	08/06/94	4
323560	USS 1E1 TRANSFER SWITCH MODIFICATION	Changes Control Power for Breaker Transfer	None	10/10/90	10/12/93	4
323624	GEAR SET CHANGE FOR RWCU VALVE V-16-1,-14,-61	Change stroke time of V-16-1 from 12 seconds to 17 seconds	None	02/19/93	09/15/94	3
323635	REACTOR BUILDING DP INDICATING SYSTEM	Change Range of DPT-822-1102, 1103, 1104, 1105. New Annunciator	New Annunciator Window L-6-c; Change scale on 11R10	05/24/91	10/06/93	2
323653	EOP JUMPERS AND LIFTED LEADS MODIFICATION - PHASE2	Revise models for jumpers	Add new terminal boxes and jumper plugs	02/09/93	05/14/93	1
323653	RWCU INLET PRESSURE CONTROLLER PIC-1JC 37 (ND11)	Revise controller handler for new type of controller.	Replace existing GEMAC controller on panel 3F.	01/14/93	06/21/94	2
323692	LIMITORQUE OVERHAUL - GL 89-10	To Be Determined		11/22/94	04/18/95	2
323704	VALVE RELIABILITY MAINTENANCE - GL 89-10 MODS	Change Stroke time. Limit V-14-36,37 to 70% Open	None	11/22/94	04/18/95	2
323713	EDG CONTROL UPGRADES	Numerous logic changes	Change indicating lights	11/21/94	05/09/95	1
328030	CONTROL ROOM FACTORS PHASE 2 REDESIGN	None	Install New Mimic, Lights, and Labels.	/ /	12/16/94	2
328030	CONTROL ROOM HUMAN FACTORS REDESIGN 9XR & 11R	None	Adds new name tags & demarcation tape to pnls 9xR & 11R	02/22/91	11/01/93	2
328100	TEMPERATURE RECORDER IA-02 T/C REMOVAL	Remove Points from Recorder IA-02, Vessel Temperatures. (Note: This recorder is not installed on the	Coordinate with B/A 02910. Removes points from recorder IA-02	02/10/89	11/28/94	4
328184	DRYWELL PRESSURE RECORDER ABANDONMENT	Deletes alarm inputs to C-3-F from Drywell Press & Torus pressure.	Deletes & abandons in place recorder	03/30/89	11/28/94	5

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328184	DISABLE LPRM RECORDERS RJ-13A&B	Deletes inputs to the Recorders.	Recorders are Abandoned in place - Need photos on the simulator.	/ /	02/19/93	5
328184	RECIRC MG SET WATT TRANSDUCER REMOVAL	Eliminate 5 Recirc. KW meter calculations	Cover Scale with ABANDONED IN PLACE cover	/ /	09/15/94	3
328279	CORE SPRAY\ADS LOGIC MODIFICATION	Changes the control logic for core spray and ADS	None	04/26/91	05/12/93	2
328279	CORE SPRAY\ADS LOGIC MODIFICATION	Changes Control Logic for Core Spray and ADS	None	06/07/91	05/12/93	2
328293	RESTORATION OF IC STEAM INLET TEMPERATURE POINTS	Defeats alarms for points 1,2,4 & 5 on recorder TR-IG02 (1F/2F). Cont'd.	New Annun Window installed for C-7-b	05/13/91	10/08/93	2
328312	GL 89-10 MOTOR OPERATOR WIRE MOD	New RCU Valve Stroke Time, Change IC Isol Time Delay	None	11/23/94	04/18/95	2
328331	RAGEMS PURGE SOLENOID VALVE OPERATOR REPLACEMENT	Changes logic for purge valves.	Replace Alarm Window 10F-4-d	10/23/92	12/05/94	3
335400	Cycle 15 Rel [illegible]	Update Core Model	None	11/30/94	11/15/95	2
340-93	Change Recor[illegible] TR-624-1040 Scale from 400 to [illegible]	Revise software for new range on recorder	Change Scale and chart paper	05/27/93	10/31/94	3
402011	REPLICA SIMULATOR [illegible]MUNICATIONS LINK	None	Install New Switch and nameplate on Operator Consol	04/21/93	02/22/94	0
402631	ALTERNATE ROD INJECTION SYSTEM ADD ADS SWITCH	Changes Logic & allows existing ADS timer reset switches to be used for continuous inhibition of ads	Replaces an existing Nametag. Adds (2) new Annun Windows (B-5-h & B-6-h	03/08/89	11/03/93	2
402728	APPENDIX R DEVIATION EMRV LOGIC KEYLOCK SWITCHES	Changes EMRV Logic & adds new alarm for EMRV disabled. Adds new fuses in control circuits for V-16-2	Adds (5) new 2 pos switches & name tags in rear of PNL 1F/2F. Adds new annun window.	08/05/88	11/03/93	2
402728	EMRV DISABLE SWITCH ALARM	EMRV Logic, Alarm, New Fuses	New Alarm; New Disable Switches; Name tags	01/19/89	11/03/93	2
402815	CONTAINMENT AIRBORNE PARTICULATE MONITOR (PHASE 2)	Changes out old, nonfunctioning contain part monit. sys & adds new Capgrms System	Adds 2 new annun windows on pnl 1F/2F (C-1-g & C-2-g)	06/07/91	11/03/93	2
402840	H2 CHEMISTRY FLOW ELEMENT FE-567-18	Change flow range from 0-20 to 0-15	None	05/05/95	11/04/94	3

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	REPLACEMENT	SCFM				
402840	HYDROGEN WATER CHEMISTRY FLOW ELEMENT REPLACEMENT	None	None	05/15/92	11/04/94	0
402840	HYDROGEN WATER CHEMISTRY	Add Hydrogen Water Chemistry model	Add new switch, 4 lights, and a new annunciator on 5F/6F	03/13/89	11/04/94	2
402840	HYDROGEN WATER CHEMISTRY	Add Air Injection into AOG system and logic for air compressor	None	03/15/90	11/04/94	2
402857	SWRM SUPPLY AND RETURN LINE UPGRADE	Delete I/O for Panel 1R Service Water Rad Monitor	Remove Instrumentation from Panel 1R and Install Blank Plate	04/14/93	03/21/94	3
402859	EMERGENCY SERVICE WATER FLOW INDICATION	Adds two new points to PCS for ESW Flow	None	06/17/91	09/06/93	2
402870	Unidentified Leak Rate Digital Display	Drive Display	Add Digital Display behind 3F	03/08/89	07/12/96	2
402872	TORUS O2 SAMPLE LINE ISOLATION MODIFICATION	Changes Logic for aV-38-22 & V-38-23	Replace existing SW 12XR-18 with new 3 posit spring to auto from on new labels on 11F & 12XR.	04/22/91	11/03/93	2
402879	RPS/ESG INSTRUMENT UPGRADE	Decreased range of RE-22, IP-15, & RV-46. May affect some handlers	None	06/10/91	08/04/93	2
402879	RPS/ESF INSTRUMENT UPGRADE 3 PRESSURE SWITCHES	Revise Software	None	01/12/89	08/04/93	2
402894	DELETION OF CONTAINMENT SPRAY AUTO START LOGIC	Revise Containment Spray logic.	Panel 1F/2F lights, switches, alarms.	02/09/93	05/12/93	1
402901	DFRCS 16R Logic Changes	Revise DFRCS Computer Software	None	10/18/96	10/01/96	2
402901	FEEDWATER IMPROVEMENTS - WIDE RANGE LEVEL IA12	Revise code for new Level Range	Replace LI-IA13 with 100-700" Range	09/12/94	11/10/95	3
402901	FEEDWATER/RECIRC DIGITAL CONTROL SYSTEM	Replaces existing FW & RFC systems with digital controls.	Replaces all existing RFC Hardware	11/18/94	05/03/94	2
402901	MAIN FEEDWATER SYSTEM BLOCK VALVE MODIFICATION	Adds FW Block Valves V-2-740 & V-2-741 changes logic for MFRV Lock Up Signals. Adds 3 new annun. & S	Adds new control SW's & indicating lites on 5F/6F. Adds 3 new annun windows. Relocated existing Hyd/	05/24/91	08/30/93	2
402903	CORE SPRAY TEST VALVE MODIFICATION	Add variable speed controller to	None	03/03/89	08/20/93	3

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		V-20-26 & V-20-27 for Surveillance Testing				
402910	CONTR RM REC - RW OVERBOARD/RBCCW REMOVAL - PART 1	Remove Recorder Points	Remove Recorder RN31A and install blank	11/10/93	11/28/94	3
402910	CONTR RM REC - RW OVERBOARD/RBCCW REMOVAL - PART 2	Remove associated software	Remove Monitor from Panel 1R	10/26/94	05/09/95	3
402910	CONTROL RM RECORDER LPRM REC. RJ13A,B REMOVAL	None	Remove Photos of recorders	09/23/94	11/28/94	3
402910	CONTROL RM RECORDER MOD -N2 PURGE/MAKEUP FLOW 12XR	Change Recorder Range	Replace Labels to Match the Plant	01/13/94	11/28/94	3
402910	CONTROL RM RECORDER X-Y PLOTTER RJ37A-D REMOVAL	None	Remove Photos of Plotters.	11/10/93	11/28/94	4
402910	CONTROL ROOM REC MOD- TURBINE SPEED/ECCENTR 13R-1	Revise for dual pen recorder.	Replace Recorder with dual pen recorder. Replace Labels to match plant	11/12/93	11/28/94	3
402910	CONTROL ROOM RECORDER MOD - CONTROL/BYPASS VLV POS	None	Replace labels to match the plant	10/25/93	11/28/94	3
402910	CONTROL ROOM RECORDER MOD - IRM RG105A-D (WESTRON)	None	Change Chart from Z Fold to Roll. Add internal Illumination. Replace Selector Switches. Verify Tags.	10/01/94	03/23/95	3
402910	CONTROL ROOM RECORDER MOD - LPRM REC. RJ13A,B	None	Remove Existing Photos of Recorders RJ13A and RJ13B	/ /	11/11/94	3
402910	CONTROL ROOM RECORDER MOD - SRM RG05 (WESTRONICS)	None	Change Chart from Z Fold to Roll. Add Internal Illumination. Replace Selector Switches. Verify Tags.	10/01/94	03/23/95	3
402910	CONTROL ROOM RECORDER MOD- OFFGAS SAMPLE FLOW RN35	Respan Flow Transmitters and Recorder.	Install New Paper and Scales. Respan Recorder. Verify Correct Tags.	11/21/94	06/14/95	3
402910	CONTROL ROOM RECORDER REPLACE - DW PRES/TORUS PRES	None	Verify recorder, scales, and nameplates match new plant equipment; Remove photo of 12XR-6X	09/28/92	11/28/94	3

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402910	CONTROL ROOM RECORDER REPLACEM'T - MSL RAD MONITOR	None	Verify simulator recorder, scales, and nameplates match the new plant equipment	02/10/93	11/28/94	3
402910	CRD TEMP RECORDER REPLACE. - TR RD46ABC	None	Replace photos	01/04/93	11/28/94	4
402910	RX VESSEL TEMP/VESSEL-VESSEL & RCP BRG TEMP.	Add Vessel Temperature Variables if missing	Revise Tags	02/11/93	11/28/94	2
402915	REDUCE NUMBER OF REACTOR SAFETY VALVES	Remove 7 Safety Valves. Change Setpoints. Reassign Acoustic Monitors. Update PCS Displays.	New Name tags on 1F/2F and 15R	05/31/91	06/20/94	3
402916	CORE SPRAY ALARM MODIFICATIONS	Adds alarm units into Core Spray disch. press. transmitter loops. Cont'd.	Adds New Window B-3-d & Changes Engraving for B-2-e & B-2-f	04/26/91	05/12/93	2
402918	RAGEMS INTERFACE TO PLANT COMPUTER	Calculations for Turbine RAGEMS High and Low Range Monitors. Add interface software PCS/RAGEMS.	Add Data Link between RAGEMS and PCS	11/15/90	04/23/93	3
402918	STACK EFFLUENT MONITOR ALARM CHANGE	Remove Alert Feature as an input to Annunciator Window 10F-2-d. Remove Reflash Capability.	None	02/12/90	09/10/93	2
402918	RPS HALF SCRAM ISOLATION MONITORING	Adds annun inputs from RPS ISOL Relays 1K71, 1K72, 1K73, 1K74, 1K75 & 1K76, 2K71, 2K,73, 2K74, 2K75	Adds 2 new annun windows G-7-c & G-8-c.	05/07/91	10/08/93	2
402918	TURBINE TURNING GEAR POSITION INDICATION	Minor change in logic for Turning Gear Engage, Disengage position indication. Cont'd.	None	05/16/91	08/15/94	4
402925	MAIN GENERATOR PROTECTION UPGRADE	Adds numerous changes to Turbine Generator Tripping/Protection Logic.	New Relays being added to 12F & 12R recorder relocated & new recorder installed on 12R. (new tags)	04/25/91	09/24/93	2
402925	MAIN TURBINE GENERATOR PROTECTION UPGRADE	Replace Generator Protection Relays with redundant Digital system; Modify power supplies	Remove and Replace Equipment on 11XR, 12R, 12XR. Add and change Annunciators	10/28/94	03/20/96	2

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B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
402927	ISOL CONDENSERS A & B HIGH FLOW PROTECTION LOGIC	Changes power for IC-B High Flow Protection circuit from 125V DC Panel F to Dist. Center C.	None	04/21/91	04/07/94	2
402933	CRD HYDRAULIC SYSTEM FLOW ELEMENT	Add Flow Variable	None	04/26/91	08/19/93	2
402936	CONT PART MON DW ISOLATION VALVE RESET LOGIC MOD	Changes logic for containment isolation signal and changes valve control on 11F.	Rewire 2 switches and add 4 new switches on 11F	01/21/93	11/03/93	2
402945	TOTAL FEEDWATER FLOW ELEMENT	Add New Flow Element and Modify PCS software	None	05/24/91	09/10/93	2
402951	DRYWELL H2O2 ANALYZER MODIFICATION - VALVES	Retire old valves. Add new valves.	Modify Panel 16R (New Labels)	02/06/93	08/25/94	4
402953	DILUTION PUMP AUX OIL PUMP TIME DELAY	Adds time delay relays in aux oil pump start circuit.	None	11/24/92	10/28/94	4
402953	MAIN GENERATOR MW METER & TLC METER REPLACEMENT	Drive new meters	Install new meters	11/04/91	12/19/94	3
402953	INSTALLATION OF ECEP TEST MODULES (SDIV)	This Modification may reconfigure the level instruments.	None	05/08/91	10/20/94	3
402961	EDG Governor Upgrade	Add Sync Circuit. Tune for new Governor. May need code changes for Governor.	Add Auto Resync Switch to 8F/9F	11/21/94	05/09/95	1
402965	STATION BLACKOUT - FIRE SYS, CONTRLS, ELECT TIE-IN	Add tie-in to bus 1B	Need to determine	02/01/93	03/18/94	1
402965	STATION BLACKOUT MOD - ELECTRICAL TIE-IN	Add tie-in to bus 1B.	Need to determine.	02/03/93	03/18/94	1
402965	STATION BLACKOUT MOD - PLANT TIE-IN	Add tie-in to bus 1B	Need to determine	/ /	03/18/94	1
402966	RECIRC FLOW SCRAM ELECTRONICS	Revise for new modules and logic	Replace Recirc Flow modules on 3R and 5R; Modify I/O as required	10/11/94	02/02/96	2
402968	DRYWELL HARDENED VENT - AIR/STACK TIE-IN	Add and modify valves and piping; revise isolation logic; add valve accumulators.	New switches and alarms	02/01/93	05/15/93	*
402968	DRYWELL HARDENED VENT PIPING	Add and modify valves and piping;	New switches and alarms.	02/01/93	05/15/93	1

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
SINCE INITIAL CERTIFICATION
ATTACHMENT A.7

B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
		revise isolation logic; add valve accumulators.				
402968	HARDENED VENT MOD - NITROGEN SYSTEM TIE-IN	Add and modify valves and piping; revise isolation logic; add valve accumulators	New Switches and alarms	/93	05/15/93	1
402974	REACTOR OVERFILL PROTECTION SYSTEM	Modify to trip Feedpumps as required	New Switch, New Alarms, New Bistables	11/08/94	10/28/94	1
402986	ENVIRONMENTAL MONITOR CONNECTIONS TO PLANT COMP	Add new software to the PCS.	Eliminates the HP computer which was never installed in the simulator.	02/10/93	01/06/95	3
402986	REMOVAL OF CONDENSATE STORAGE TANK LEVEL SWITCHES	Remove LS-0022 and LS-0023. Verify level transmitter is modeled. Verify power supply to LS-424-100	None	01/14/93	06/17/94	4
402986	CONTROL ROOM 3F TERMINAL BLOCK SUPPORT & COVER	Revise to include operable jumpers	Add new Terminal Boxes	12/31/92	05/14/93	1
402986	EOP JUMPER/LIFTED LEADS MOD (3F)	Revise software to include the jumpers.	Add new panel in 3F rear.	12/31/92	05/14/93	1
402990	RECIRC SUCTION TEMP UPGRADE	Disable Alarm Units IA86A,B,C	Replace Ronan Units ;Remove IA86A,B,C ;Relabel affected components	10/26/94	12/08/95	4
402990	RETIRE MAIN STEAM LINE RADIATION MONITOR	Remove MSL Hi Rad Trips	Change Alarms	08/26/94	10/28/94	1
402991	SAFETY SYSTEM DP SWITCH REPLACEMENT - CORE SPRAY	Change setpoint of RV-40 switches from 50 to 47.5 psi	None	06/29/95	04/29/96	3
402991	STARTUP TRANSFORMER CONTROL ROOM METERS - TM 94-42	Drive Meters	Add 2 Meters to 8F/9F	06/08/95	11/30/95	3
402996	CORE SPRAY PUMPS PULL-TO-LOCK ADDITION	Revise logic	New switches, alarms	01/25/93	05/12/93	1
402996	CORE SPRAY UPGRADES	Individual switches for V-20-15,21,40,& 41. PTL for Pumps. Logic changes.	New Switches and Indicating lights. New annunciator.	01/25/93	05/12/93	1

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
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ATTACHMENT A.7

B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
402996	CORE SPRAY RELIEF VALVE REPLACEMENT	Replacement relief valves have 50 GPM capacity vs. 400 GPM for old valves.	None	01/25/93	08/19/94	4
403005	REG GUIDE 1.97 MODS - PHASE 1 (NEW POWER PANEL)	Add 2 new 125VAC Power Supplies; Revise instrument Power Supplies; Revise Instruments; Replace PS1	Replace FZ Recorder on 5F/6F with 2 new recorders	11/15/94	03/14/95	2
403005	REG GUIDE 1.97 PHASE 1 - RB DP INDICATOR	Drive Meters	New Meters	11/15/94	03/14/95	2
403005	REG GUIDE 1.97 PHASE 2	See Phase 1	See Phase 1	11/26/94	03/14/95	2
403009	A/B BATTERY REPLACEMENT	Battery size changes from 1200 to 1600 Amp Hours	None	02/01/93	10/31/94	4
403011	REPLACE CORE SPRAY MIN FLOW LINE - SYSTEM 1	Delete min flow valves, PS-27; add new vent, temp monitors, flow element, valves; Change RV03 setpoi	Remove switches for min flow valves; Revise alarms	11/01/94	03/10/95	2
403011	REPLACE CORE SPRAY MIN FLOW LINE - SYSTEM 2	Delete min flow valves, PS-27; add new vent, temp monitors, flow element, valves; Change RV03 setpoi	remove switches for min flow valves; Revise alarms B-6-e&f	11/23/94	03/10/95	2
403022	CONTAINMENT SPRAY LOW FLOW ALARM	Modify alarm reset logic	Add 2 New Pushbutton Switches on Panel 1F/2F	11/15/94	10/20/94	2
403040	REACTOR RECIRC PUMP HIGH PRES TRIP TIME DELAY	Add 10.5 second delay to High Pressure Trip of C & D Recirc Pumps	None	/ /	09/27/96	2
408773	1-2 SUMP UPGRADE MODIFICATION	Change pump type, restore Auto logic for pump start-stop, Add new input to Alarm P-2-f, New setpoint	None	05/23/91	10/20/94	5
408773	TEMPERATURE MONITORING SYSTEMS REPLACEMENT	Software to support new hardware	Replace RIS-TM-400 Monitors with RIS-TM-2480 Multi Point Mon. on 10R & 12XR	06/20/91	03/11/94	2
408847	DEISEL GENERATOR PINION ENGAGEMENT MOD	Add several LOAs	None	01/15/93	05/26/94	4
408847	Diesel Generator No 2 Electrical & Mech. Upgrades	Add several LOAs	None	/ /	05/26/94	4
408847	EDG1/EDG2 CABINET UPGRADES	Revise DG Control System software to	None	12/22/92	05/26/94	3

MODIFICATIONS INSTALLED ON
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B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
		prevent lockout when securing from Fast Start				
408853	CRD BYPASS GATE VALVE INSTALLATION V-15-237	Add new gate valve to CRD	None	01/01/93	08/16/94	5
408853	GENERATOR TEMPERATURE MONITORING SYSTEM	Delete 12 points on TR-624-1038 and change 2 annunciators	New Nameplates and Annunciator Windows	05/03/93	10/31/94	3
408887	Feed Water Block Valve Operator Replacement	Change Valve Stroke Time. Change DCC program for new time	None	11/22/94	11/04/94	2
408887	LIMITORQUE OPERATOR REPLACEMENT-GEAR RATIO CHANGE	Change Valve Stroke time.	None	11/22/94	11/04/94	0
408925	DRYWELL HIGH LEVEL PRESSURE INDICATOR (EOPS)	Add new Pressure Transmitter; Add Recorder Point	Replace Recorder 12XR-006 with 3 Pen	08/02/95	07/15/96	2
409758	MOB HVAC REPLACEMENT	Revise Elect Loads; Delete SF-1-18 & Chilled Water System	Delete Alarm L-5-f; Modify Panel 11R	09/26/94	09/29/95	3
542-94	Replacement for PIS-31D	Eliminate alarm on loss of VACP1	None	09/15/94	08/29/96	3
553-94	S1B Synchronizing Switch Replacement	None	Replace Switch to match new plant switch	11/30/94	12/28/95	3
ASFOUND	Heater Vent Valve Control Room Tagging	Revise I/O to match valves with new tags	New Tags for 1A1, 1B1, 1C1 Heater Vents	/ /	08/13/96	0
C101115	EOP Blue Alarm Backlight	None	Install Blue Alarm Backlighting	/ /	12/01/94	2
C101163	Tape - RPS Test Switches	None	Add Demarcation Tape to Panels 6R and 7R	07/11/95	07/29/96	3
C101193	Recorder Label Changes per FCN C101193	None	Install 4 new labels for Recorders 12XR-4 and TR-656-001	06/05/96	09/05/96	3
LL85291	RB & TB HVAC - MAKE LL 85-291,-292 PERMANENT	See REP-49	See REP-49	07/26/93	10/06/93	2
Label	Label Control Room Panels with Power Supplies	None	Install approximately 264 labels on control panels	03/01/96	04/04/96	2
N/A	Add 100 Additional ICs	Add Additional ICs	None	/ /	04/12/95	3
N/A	Add Turn Printer Off Option to the Simulator	Add option to turn printers off	None	/ /	07/24/96	3

MODIFICATIONS INSTALLED ON
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B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	PR I
N/A	CRD Hydraulic Lock Malfunction	Add new Malfunction	None	/ /	11/04/94	3
N/A	CRD Over Piston Vent	Add 2 manual CRD valves	None	/ /	09/22/93	1
N/A	Emerg. Brg. Oil Pump Breaker LOA	Add LOA for EBOP DC Breaker	None	/ /	04/18/95	3
N/A	H2 Cooler Outlet Isolation Valve	Add new CLF for H2 Cooler Outlet Valves	None	/ /	10/25/95	3
N/A	INSTALL GAGS ON VALVES V-1-47,51&55	Add LOAs to simulate gagging shut Valves V-1-47, 51, & 55	None	03/02/90	08/17/94	4
N/A	Relocate PLP FWH-1	Move the Feedwater System Leak to different point in system	None	/ /	08/05/96	3
N/A	Replace DCC X CPU Card with 486DX-33	None	Replace DCC CPU	02/06/95	02/06/95	2
N/A	Simulator Setpoint Changes	Revise Card Deck for new setpoints	None	/ /	01/30/93	1
N/A	Simulator Setpoint Changes Year 1995	Revise Card Decks, Modify V-2-17	None	/ /	03/30/95	2
N/A	Steam Packing Exhauster LOAs	Add LOA for Valve handwheel	None	/ /	04/07/94	3
N/A	Torus Water Leak Malfunction	Add New Torus Water Leak Malfunction	None	/ /	06/21/96	2
N/A	Use Rx Inlet Total Flow for PCS Core Thermal Power	Change PCS	None	/ /	09/10/93	2
SETPOINT	4160 V Bus Overvoltage Alarm Relay	Change OV Relay 59-1-A and 59-1-B to 4340 Volts	Nor	09/30/95	04/29/96	3
SETPOINT	Setpoint Change SCR-PSH-A,B,C,D	Revise PSH TCS setpoint to match new plant value of trip and reset	None	11/01/95	04/29/96	2

GPU Nuclear

Oyster Creek Nuclear Generating Station

PLANT REFERENCED SIMULATOR CERTIFICATION

Volume 2

ATTACHMENT D

Testing Program

D.2 Test Index, with date performed and scheduled future test dates.

D.3 Test Abstracts

ATTACHMENT D.2

TEST INDEX AND SCHEDULE

The first part of this attachment is a listing of certification tests performed during the four year report period. For those tests performed more than once, only the last date performed is indicated. The TR column shows .T. for procedures which passed with outstanding Trs and .F. for those with no Trs. The single test failure is listed separately.

The last part of this section is the test schedule showing the last date the test was performed and the future schedule dates for each procedure.

OYSTER CREEEK SIMULATOR
CERTIFICATION TEST PROCEDURES
PASSED ONLY

GPU PROC NUM.	TITLE	LAST TEST DATE	TR
NOT01	Approach to Critical	12/03/93	.F.
NOT02	Heatup to Hot Standby	12/22/94	.T.
NOT03	Plant Startup from Hot Standby to Rated Power	10/26/95	.T.
NOT04	Reactor Trip and Recovery	11/09/94	.F.
NOT06	Power Operation With Less Than 5 Recirculation Pumps	11/05/93	.T.
NOT07	Plant Shutdown to Hot Standby	10/23/96	.F.
NOT08	Plant Cooldown from Hot Standby to Cold Shutdown	12/13/9?	.F.
NOT09	Shutdown Margin Test	11/21/95	.F.
NOT12	SRM/IRM Response to Control Rod Motion	12/03/93	.F.
NOT14	Recirc Pump Trip Circuit Test	10/12/94	.F.
NOT15	EMRV Operability Test	09/25/95	.F.
NOT16	Isolation Condenser Valve Operability Test	09/09/96	.T.
NOT17	Core Spray Pump Operability Test	11/09/93	.F.
NOT18	CRD Pump Operability Test	10/13/94	.F.
NOT19	Anticipatory SCRAM Turbine Stop Valve Closure Test	09/25/95	.F.
NOT20	APRM Front Panel Check	09/10/96	.F.
NOT21	SRM Front Panel Test	11/09/93	.T.
NOT22	IRM Front Panel Check	09/28/95	.F.
NOT24	Diesel Generator Load Test	09/10/96	.T.
NOT25	Primary Containment Isolation Valve Operability Test	11/09/93	.F.
NOT26	Alternate Shutdown Monitoring Instrument Chanel Check	10/12/94	.F.
NOT27	Standby Liquid Control System Functional Test	09/11/96	.F.
NOT28	Air Ejector Off Gas Radiation Monitor Test	11/21/95	.F.
OES01	Inadvertant Scram on High Pressure (May 2, 1979 Lo-Lo-Lo Level Event)	02/23/93	.T.
OES02	Reactor Isolation Scram (TAR-008)	02/16/93	.T.
OES03	Rx Scram on M1A Main Transformer Failure (TAR 23)	10/01/96	.F.
OES05	Reactor Scram on Neutron Monitoring Sys (TAR-012)	11/02/94	.F.
OES06	Reactor Scram on Anticipatory Turb Trip Sig. (TAR-013)	12/06/94	.F.
OES07	Reactor Scram on Excessive Feedwater Injection (TAR-015)	10/09/96	.F.
OES08	Reactor Scram on Neutron Monitoring System (TAR-017)	10/07/96	.F.

OYSTER CREEEK SIMULATOR
CERTIFICATION TEST PROCEDURES
PASSED ONLY

GPU PROC NUM.	TITLE	LAST TEST DATE	TR
OES09	Reactor Scram on High Water Level (TAR-018)	12/16/93	.F.
OES10	July 17, 1980 Blowdown Transient	02/06/93	.F.
OES11	Generator Runback Scram - December 1995	11/27/96	.F.
RTT01	Gould Computer Spare Time Test	11/27/96	.F.
RTT02	Simulator Real Time Test	09/06/96	.F.
SSP01	100% Steady-State Accuracy Test	10/21/96	.F.
SSP02	75% Steady-State Accuracy Test	10/21/96	.F.
SSP03	39% Steady-State Accuracy Test	10/22/96	.F.
TTS01	Recirc Loop Rupture (Unisolable)	10/10/96	.F.
TTS02	Reactor Vessel Instrument Reference Leg Rupture	06/15/95	.F.
TTS03	Reactor Safety Valve Fails open	09/22/95	.T.
TTS04	Loss of Instrument Air	12/21/93	.F.
TTS05	Loss of Offsite Power Sources	11/10/93	.T.
TTS06	4.16 KV Emergency Switchgear 1C and/or 1D Fault	09/05/96	.F.
TTS07	Emergency Diesel Generator Trip	12/10/93	.F.
TTS08	4.16 KV Bus 1A and/or 1B Fault	11/14/95	.T.
TTS09	Loss of 460 V Unit Substation	11/04/93	.F.
TTS10	Loss of 460 V MCC Train A	11/17/93	.F.
TTS11	Loss of Vital Panel Bus	06/15/95	.F.
TTS12	Loss of 120 V Continuous Instrumentation Panel CIP-3	10/23/96	.F.
TTS13	Loss of 125 V DC Panel	10/13/94	.F.
TTS14	Loss of 24 V DC Panel	06/15/95	.T.
TTS15	Loss of 460 V USS 1E1	09/04/96	.F.
TTS16	Loss of 120 V Protection System Panel	11/04/93	.F.
TTS17	Loss of Vital 460 V MCC	10/13/94	.F.
TTS18	Main Condenser Air Inleakage	11/17/93	.F.
TTS19	Hotwell Reject Level Controller Fails	10/13/94	.F.
TTS20	Service Water Pump Trip	09/06/96	.F.
TTS21	Shutdown Cooling Inadvertant Isolation	11/28/95	.F.
TTS22	RBCCW Pump Trip	09/21/95	.F.
TTS23	Loss of All Feedwater	09/13/96	.F.
TTS24	Control Rod Blade Stuck	11/15/94	.T.
TTS25	Control Rod Blade Uncoupled	09/21/95	.F.
TTS26	Control Rod Drifts Out	10/12/94	.F.
TTS27	Stuck and Uncoupled Control Rod	02/19/93	.T.
TTS28	Control Rod Maloperation @75% Power & at 100% FSAR Conditions	09/12/96	.F.
TTS29	CRD Flow Control Valve Fails	09/04/96	.F.

OYSTER CREEEK SIMULATOR
CERTIFICATION TEST PROCEDURES
PASSED ONLY

GPU PROC NUM.	TITLE	LAST TEST DATE	TR
TTS30	Fuel Cladding Failure	10/18/94	.F.
TTS31	Main Turbine Trip	11/10/94	.T.
TTS32	Main Generator Trip	11/10/93	.T.
TTS34	Loss of Power to DCCS (Not Implemented)	09/21/95	.F.
TTS35	Isolation Condenser Return Valve Fails Open	10/19/94	.F.
TTS36	Steam Leakage Outside Containment on 30" Header	09/05/96	.F.
TTS37	Feedwater Line Rupture Outside Primary Containment	09/20/95	.F.
TTS38	Feedwater Line Rupture Inside Primary Containment	12/15/93	.T.
TTS39	SRM Fails	06/15/95	.F.
TTS40	IRM Fails	09/05/96	.F.
TTS41	LPRM Fails	11/03/93	.F.
TTS42	APRM Fails	10/12/94	.F.
TTS43	Reactor Vessel Level Transmitter Fails	09/05/96	.T.
TTS44	Reactor Vessel Pressure Transmitter Fails	11/03/93	.F.
TTS45	Feedwater Flow Transmitter Fails	09/04/96	.F.
TTS46	Drywell Pressure Transmitter Fails	10/12/94	.F.
TTS47	RMCS Timer Malfunction	09/06/96	.F.
TTS48	RCU Flow Control Valve Failure	10/12/94	.F.
TTS49	Partial/Total Failure of Control Room Annunciators	11/15/93	.F.
TTS50	Core Spray System Failure to Autostart	09/04/96	.F.
TTS51	ESW Pump Trip	10/12/94	.F.
TTS52	Containment Spray Pump Trip	09/20/95	.F.
TTS53	Emergency Diesel Generator Fails to Start	09/21/95	.F.
TTS54	Auto Scram Fails	11/17/93	.F.
TTS55	MPR Fails High/Low	10/28/96	.F.
TTS56	EPR Fails High/Low	02/17/93	.T.
TTS57	Any Turbine Bypass Valve Fails	10/12/94	.F.
TTS58	Loss of Extraction Steam to Feedwater Heaters	09/05/96	.F.
TTS60	Turbine Trip Without Bypass	11/02/95	.F.
TTS61	Reactor Recirculation Pump Seizure	09/06/96	.F.
TTS62	Recirc Pump Shaft Shear	11/17/93	.F.
TTS64	Uncontrolled Rod Withdrawl at Power	09/12/96	.F.
TTS65	Improper Startup of an Inactive Recirc Loop at 100 degrees F	10/28/96	.F.
TTS66	Recirc Flow Controller Malfunction	11/05/93	.F.

OYSTER CREEEK SIMULATOR
CERTIFICATION TEST PROCEDURES
PASSED ONLY

GPU PROC NUM.	TITLE	LAST TEST DATE	TR
TTS67	ATWS (Failure to Scram, Turbine Trip w/o Bypass)	11/27/96	.T.
TTS68	Loss of All AC Power	10/13/94	.T.
TTS69	Manual Reactor Trip	09/13/96	.F.
TTS70	Simultaneous Trip of All Feedwater Pumps	09/13/96	.F.
TTS71	Simultaneous Closure of All MSIVs	09/13/96	.F.
TTS72	Simultaneous Trip of All Five Recirc Pumps	09/17/96	.F.
TTS73	Single Recirc Pump Trip (LER 50-219 87-09)	09/16/96	.F.
TTS74	Main Turbine Trip from 40% Power	09/16/96	.F.
TTS75	Max Rate Power Ramp from 100% to 75% and Back to 100%	09/16/96	.F.
TTS76	LOCA with Loss of Offsite Power	10/24/96	.F.
TTS77	Max Size Unisolable Main Steam Line Rupture	10/24/96	.F.
TTS78	Sim. Closure of All MSIVs/Stuck Safety, IC Fails, Loss of FW	10/24/96	.F.
TTS79	Loss of All AC Power with EMRV Failure to Close (PRA Scenario 3.2.1)	02/20/93	.T.
TTS80	MOOG Valve Fails	09/06/96	.F.
TTS81	Recirculation M-G Set Flow Controller Oscillation	11/21/95	.F.
TTS82	Main Feed Regulator Valve Fails	11/21/95	.F.

EXCEPTIONS TO ANS 3.5
OYSTER CREEK SIMULATOR
CERTIFICATION TEST PROCEDURES
FAILED ONLY

GPU PROC NUM.	TITLE	LAST TEST DATE
OES04	Reactor Scram on Turbine Generator Trip (TAR-011)	10/07/96

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
NOT01	Approach to Critical	12/03/93	11/08/97	2001	2005	2009	
NOT02	Heatup to Hot Standby	12/22/94	11/09/98	2002	2006	2010	
NOT03	Plant Startup from Hot Standby to Rated Power	10/26/95	11/15/99	2003	2007	2011	
NOT04	Reactor Trip and Recovery	11/09/94	12/22/98	2002	2006	2010	
NOT06	Power Operation With Less Than 5 Recirculation Pumps	11/05/93	10/27/97	2001	2005	2009	
NOT07	Plant Shutdown to Hot Standby	10/23/96	11/06/00	2004	2008	2012	
NOT08	Plant Cooldown from Hot Standby to Cold Shutdown	12/13/93	11/08/97	2001	2005	2009	
NOT09	Shutdown Margin Test	11/21/95	10/19/98	2002	2006	2010	
NOT12	SRM/IRM Response to Control Rod Motion	12/03/93	11/17/97	2001	2005	2009	
NOT14	Recirc Pump Trip Circuit Test	10/12/94	10/08/98	2002	2006	2010	
NOT15	EMRV Operability Test	09/25/95	10/27/99	2003	2007	2011	
NOT16	Isolation Condenser Valve Operability Test	09/09/96	10/24/00	2004	2008	2012	
NOT17	Core Spray Pump Operability Test	11/09/93	10/26/97	2001	2005	2009	
NOT18	CRD Pump Operability Test	10/13/94	10/26/98	2002	2006	2010	
NOT19	Anticipatory SCRAM Turbine Stop Valve Closure Test	09/25/95	10/09/99	2003	2007	2011	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
NOT20	APRM Front Panel Check	09/10/96	10/08/00	2004	2008	2012	
NOT21	SRM Front Panel Test	11/09/93	10/06/97	2001	2005	2009	
NOT22	IRM Front Panel Check	09/28/95	01/07/99	2003	2007	2011	
NOT24	Diesel Generator Load Test	09/10/96	10/26/00	2004	2008	2012	
NOT25	Primary Containment Isolation Valve Operability Test	11/09/93	10/27/97	2001	2005	2009	
NOT26	Alternate Shutdown Monitoring Instrument Chanel Check	10/12/94	10/27/98	2002	2006	2010	
NOT28	Air Ejector Off Gas Radiation Monitor Test	11/21/95	10/08/99	1903	1907	1911	Added in 1995
NOT29	Standby Gas Treatment System Test	/ /	10/28/00	1904	1908	1908	Added in 1996
OES01	Inadvertant Scram on High Pressure (May 2, 1979 Lo-Lo-Lo Level Event)	02/23/93	12/31/97	2001	2005	2009	
OES02	Reactor Isolation Scram (TAR-008)	02/16/93	02/16/96	2000	2004	2008	
OES03	Rx Scram on M1A Main Transformer Failure (TAR 23)	10/01/96	01/12/00	2004	2008	2012	
OES04	Reactor Scram on Turbine Generator Trip (TAR-011)	10/07/96	12/20/00	2004	2008	2012	
OES05	Reactor Scram on Neutron Monitoring Sys (TAR-012)	11/02/94	01/12/98	2002	2006	2010	
OES06	Reactor Scram on Anticipatory Turb Trip Sig. (TAR-013)	12/06/94	12/21/98	2002	2006	2010	
OES07	Reactor Scram on Excessive Feedwater Injection (TAR-015)	10/09/96	02/18/00	2004	2008	2012	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
OES08	Reactor Scram on Neutron Monitoring System (TAR-017)	10/07/96	12/20/00	2004	2008	2012	
OES09	Reactor Scram on High Water Level (TAR-018)	12/16/93	12/21/97	2001	2005	2009	
OES10	July 17, 1980 Blowdown Transient	02/06/93	02/06/96	2000	2004	2008	
OES11	Generator Runback Scram - December 1995	11/27/96	02/18/00	1904	1908	1912	Added in 1996
RTT01	Gould Computer Spare Time Test	11/27/96	12/31/94	1995	1996	1997	
RTT02	Simulator Real Time Test	09/06/96	10/25/97	1998	1999	2000	
SSP01	100% Steady-State Accuracy Test	10/21/96	10/30/97	199_	1999	2000	
SSP02	75% Steady-State Accuracy Test	10/21/96	11/12/97	1998	1999	2000	
SSP03	39% Steady-State Accuracy Test	10/22/96	01/10/97	1998	1999	2000	
TTS01	Recirc Loop Rupture (Unisolable)	10/10/96	01/13/00	2004	2008	2012	
TTS02	Reactor Vessel Instrument Reference Leg Rupture	06/15/95	02/06/99	2003	2007	2011	
TTS03	Reactor Safety Valve Fails open	09/22/95	09/16/99	2003	2007	2011	
TTS04	Loss of Instrument Air	12/21/93	11/14/97	2001	2005	2009	
TTS05	Loss of Offsite Power Sources	11/10/93	10/30/97	2001	2005	2009	
TTS06	4.16 KV Emergency Switchgear 1C and/or 1D Fault	09/05/96	09/24/00	2004	2008	2012	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS07	Emergency Diesel Generator Trip	12/10/93	11/14/97	2001	2005	2009	
TTS08	4.16 KV Bus 1A and/or 1B Fault	11/14/95	12/22/99	2003	2007	2011	
TTS09	Loss of 460 V Unit Substation	11/04/93	08/10/97	2001	2005	2009	
TTS10	Loss of 460 V MCC Train A	11/17/93	10/31/97	2001	2005	2009	
TTS11	Loss of Vital Panel Bus	06/15/95	05/22/99	2003	2007	2011	
TTS12	Loss of 120 V Continuous Instrumentation Panel CIP-3	10/23/96	05/21/00	2004	2008	2012	
TTS13	Loss of 125 V DC Panel	10/13/94	10/30/98	2002	2006	2010	
TTS14	Loss of 24 V DC Panel	06/15/95	05/22/99	2003	2007	2011	
TTS15	Loss of 460 V USS 1E1	09/04/96	09/24/00	2004	2008	2012	
TTS16	Loss of 120 V Protection System Panel	11/04/93	09/25/97	2001	2005	2009	
TTS17	Loss of Vital 460 V MCC	10/13/94	11/14/98	2002	2006	2010	
TTS18	Main Condenser Air Inleakage	11/17/93	10/30/97	2001	2005	2009	
TTS19	Hotwell Reject Level Controller Fails	10/13/94	10/30/98	2002	2006	2010	
TTS20	Service Water Pump Trip	09/06/96	12/22/00	2004	2008	2012	
TTS21	Shutdown Cooling Inadvertant Isolation	11/28/95	11/03/99	2003	2007	2011	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS22	RBCCW Pump Trip	09/21/95	09/27/99	2003	2007	2011	
TTS23	Loss of All Feedwater	09/13/96	01/07/00	2004	2008	2012	
TTS24	Control Rod Blade Stuck	11/15/94	09/24/98	2002	2006	2010	
TTS25	Control Rod Blade Uncoupled	09/21/95	09/25/99	2003	2007	2011	
TTS26	Control Rod Drifts Out	10/12/94	02/19/98	2002	2006	2010	
TTS27	Stuck and Uncoupled Control Rod	02/19/93	02/18/97	2001	2005	2009	
TTS28	Control Rod Maloperation @75% Power & at 100% FSAR Conditions	09/12/96	12/30/00	2004	2008	2012	
TTS29	CRD Flow Control Valve Fails	09/04/96	11/04/00	2004	2008	2012	
TTS30	Fuel Cladding Failure	10/18/94	10/02/98	2002	2006	2010	
TTS31	Main Turbine Trip	11/10/94	02/09/98	2002	2006	2010	
TTS32	Main Generator Trip	11/10/93	10/30/97	2001	2005	2009	
TTS34	Loss of Power to DCCS (Not Implemented)	09/21/95	09/26/99	2003	2007	2011	
TTS35	Isolation Condenser Return Valve Fails Open	10/19/94	09/17/98	2002	2006	2010	
TTS36	Steam Leakage Outside Containment on 30" Header	09/05/96	09/19/00	2004	2008	2012	
TTS37	Feedwater Line Rupture Outside Primary Containment	09/20/95	09/24/99	2003	2007	2011	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS38	Feedwater Line Rupture Inside Primary Containment	12/15/93	09/24/97	2001	2005	2009	
TTS39	SRM Fails	06/15/95	05/25/99	2003	2007	2011	
TTS40	IRM Fails	09/05/96	05/24/00	2004	2008	2012	
TTS41	LPRM Fails	11/03/93	03/12/97	2001	2005	2009	
TTS42	APRM Fails	10/12/94	03/11/98	2002	2006	2010	
TTS43	Reactor Vessel Level Transmitter Fails	09/05/96	11/12/00	2004	2008	2012	
TTS44	Reactor Vessel Pressure Transmitter Fails	11/03/93	09/18/97	2001	2005	2009	
TTS45	Feedwater Flow Transmitter Fails	09/04/96	09/23/00	2004	2008	2012	
TTS46	Drywell Pressure Transmitter Fails	10/12/94	05/26/98	2002	2006	2010	
TTS47	RMCS Timer Malfunction	09/06/96	11/01/00	2004	2008	2012	
TTS48	RCU Flow Control Valve Failure	10/12/94	06/12/98	2002	2006	2010	
TTS49	Partial/Total Failure of Control Room Annunciators	11/15/93	09/28/97	2001	2005	2009	
TTS50	Core Spray System Failure to Autostart	09/04/96	09/24/00	2004	2008	2012	
TTS51	ESW Pump Trip	10/12/94	06/29/98	2002	2006	2010	
TTS52	Containment Spray Pump Trip	09/20/95	10/13/99	2003	2007	2011	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS53	Emergency Diesel Generator Fails to Start	09/21/95	10/30/98	2002	2006	2010	
TTS54	Auto Scram Fails	11/17/93	02/21/97	2001	2005	2009	
TTS55	MPR Fails High/Low	10/28/96	10/03/99	2003	2007	2011	
TTS56	EPR Fails High/Low	02/17/93	02/16/97	2001	2005	2009	
TTS57	Any Turbine Bypass Valve Fails	10/12/94	09/21/98	2002	2006	2010	
TTS58	Loss of Extraction Steam to Feedwater Heaters	09/05/96	12/20/00	2004	2008	2012	
TTS60	Turbine Trip Without Bypass	11/02/95	12/31/97	2001	2005	2009	
TTS61	Reactor Recirculation Pump Seizure	09/06/96	11/15/00	2004	2008	2012	
TTS62	Recirc Pump Shaft Shear	11/17/93	11/02/97	2001	2005	2009	
TTS64	Uncontrolled Rod Withdrawl at Power	09/12/96	12/31/99	2003	2007	2011	
TTS65	Improper Startup of an Inactive Recirc Loop at 100 degrees F	10/28/96	10/29/00	2004	2008	2012	
TTS66	Recirc Flow Controller Malfunction	11/05/93	10/29/97	2001	2005	2009	
TTS67	ATWS (Failure to Scram, Turbine Trip w/o Bypass)	11/27/96	02/17/00	2004	2008	2012	
TTS68	Loss of All AC Power	10/13/94	12/23/98	2002	2006	2010	
TTS69	Manual Reactor Trip	09/13/96	02/07/97	1998	1999	2000	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS70	Simultaneous Trip of All Feedwater Pumps	09/13/96	12/19/97	1998	1999	2000	
TTS71	Simultaneous Closure of All MSIVs	09/13/96	12/19/97	1998	1999	2000	
TTS72	Simultaneous Trip of All Five Recirc Pumps	09/17/96	12/19/97	1998	1999	2000	
TTS73	Single Recirc Pump Trip (LER 50-219 87-09)	09/16/96	12/19/97	1998	1999	2000	
TTS74	Main Turbine Trip from 40% Power	09/16/96	12/30/97	1998	1999	2000	
TTS75	Max Rate Power Ramp from 100% to 75% and Back to 100%	09/16/96	12/19/97	1998	1999	2000	
TTS76	LOCA with Loss of Offsite Power	10/24/96	12/19/97	1998	1999	2000	
TTS77	Max Size Unisolable Main Steam Line Rupture	10/24/96	02/07/97	1998	1999	2000	
TTS78	Sim. Closure of All MSIVs/Stuck Safety, IC Fails, Loss of FW	10/24/96	02/25/97	1998	1999	2000	
TTS79	Loss of All AC Power with EMRV Failure to Close (PRA Scenario 3.2.1)	02/20/93	02/19/97	2001	2005	2009	
TTS80	MOOG Valve Fails	09/06/96	10/02/00	2004	2008	2012	
TTS81	Recirculation M-G Set Flow Controller Oscillation	11/21/95	09/20/99	1903	1907	1911	Added in 1995
TTS82	Main Feed Regulator Valve Fails	11/21/95	09/26/98	1902	1906	1910	Added in 1995

ATTACHMENT D.3

Test Abstracts

This attachment contains test abstracts for each certification test performed.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT01
14.4.1.1

TITLE: Approach to Critical

PREPARED BY/DATE: [signature] / 12/3/93

TEST DATE: 12/03/93

APPROVED BY/DATE: R Davidson / 12/6/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE1	3.1.1(1)	Plant Startup - Cold to Hot Standby
NE7	3.1.1(7)	Startup, Shutdown, & Operation with less than full recirc. flow

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3	A3.2(2)	Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations Test is used to take the simulator from sub-critical to critical.

This procedure was prepared from plant procedure 201.1, Approach To Critical. The steps in 201.1 which do not apply to simulator testing (precautions, administrative requirements, etc.) were omitted in order to simplify the test procedure.

The test starts with the simulator in IC-1, Cold Shutdown. The precritical checkoff sheets (Figures 201.1-2, 201.1-3, 201.1-4, 201.1-5, and 201.1-6), which are used to document system status prior to startup, were completed and attached. The NSS Pre-Startup checkoffs 301-1, 301-2, and 301-4 and SLC Lineup 304-3 and 304-4 were completed to the extent the systems are modeled. Other individual system lineups were not actually performed but rely on simulator system tests which were used to establish ICs.

Systems which are not operating are started using the applicable plant system operating procedures.

The SAR and a few recorder charts were attached for review.

Results:

Starting from an initial SRM count rate of 30 cps, and a reactor coolant temperature of 122.5 F, criticality was obtained on control rod 18-15 at notch 12. Reactor coolant temperature was 168 F at critical. As expected, criticality occurred shortly after the SRM Count Rate achieved 4 doublings.

No automatic data collection was used during the test. Data recorded in the procedure was obtained from instrument panel readings.

The IC appears to have some decay heat, as indicated by the increase from 122.5 to 168 F at the time of criticality.

The remainder of the procedure was completed successfully.

AVAILABLE OPTIONS:

There are no options available in this Normal Operations test procedure.

OPTIONS TESTED:

There are no options available for this Normal Operations test procedure.

INITIAL CONDITIONS FOR TEST:

IC-1, Cold Shutdown, BOL.

Initial SRM count rates were:

Chan 21	30
Chan 22	30
Chan 23	30
Chan 24	30

Initial Reactor Coolant Temperature was 122.5 deg. F

FINAL TEST CONDITIONS:

At the conclusion of this test, the reactor was critical at 50% of IRM Range 5. Reactor coolant temperature was less than 212 F and steady. The Mode Switch was in Startup. Reactor level was being maintained at 155 to 165 " TAF. Recirculation flow was 5.2 E4 gpm.

A Snapshot was written in IC-42 at the conclusion of this test for use in continuing the startup under NOT02.

Execution time was 8 Hours.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The ability to use Normal plant Operating Procedures is the primary reference used to evaluate the simulator performance during this test.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

All 3 FW Reg Valves had a slow stroke time. (6.3 to 6.6 seconds vs. 4 to 6 seconds limit). This was previously evaluated and a decision was made to accept the stroke time since adjustment could upset performance of the CFW model.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT02
14.4.1.2

TITLE: Heatup to Hot Standby

PREPARED BY/DATE: [signature] / 12/23/94

TEST DATE: 12/22/94

APPROVED BY/DATE: R W Davidson / 12/29/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE1	3.1.1(1)	Plant Startup - Cold to Hot Standby
NE5	3.1.1(5)	Operations at Hot Standby
NE6	3.1.1(6)	Load Changes
NE7	3.1.1(7)	Startup, Shutdown, & Operation with less than full recirc. flow

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3	A3.2(2)	Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations Test is used to take the simulator from critical at 50% in IRM Range 5 to 10% power in the Run Mode.

This procedure was prepared from plant procedure 201.2, Plant Heatup to Hot Standby. The steps in 201.2 which do not apply to simulator testing (precautions, administrative requirements, etc.) were omitted in order to simplify the test procedure.

The test starts with the simulator at 50% in IRM Range 5. It is a direct continuation of test NOT01 (14.4.2.1), using the IC shot at the end of NOT01. Operation of individual systems is performed using the applicable plant system operating procedures.

Results:

Since NOT01 was not run prior to this test, IC-2 was used as the starting point.

The turbine steam chest would not warm properly. A TR previously written on this problem is concurrently being tested on the development packs.

The Cleanup system tripped early in the heatup and could not be restarted. A TR was written. Level control during the heatup was somewhat more difficult than normal because cleanup letdown was not available.

The recently installed Digital Feedwater Flow Control system was run in manual until the end of the test. During the plant startup following the 15R Outage, the system was also operated manually do to large steam flow instrument errors at low flow.

The IRMs were noted to be reading low. Using plant procedure 1001.9, IRM Calibration to Reactor Power, the reactor power was calculated to be 11%, while the IRMs indicated 30-40% of Range 9 (3-4% Power). IRM Range 10 was used to allow APRM downscales to clear prior to the transfer to Run Mode.

The reactor heatup was accomplished per procedure.

AVAILABLE OPTIONS:

There are no options available in this Normal Operations test procedure.

OPTIONS TESTED:

There are no options available for this Normal Operations test procedure.

INITIAL CONDITIONS FOR TEST:

This test is written as a continuation of a normal plant startup which was begun using NOT01. The snapshot stored at the conclusion of NOT01 is specified as the Initial Condition (IC). Since NOT01 was not run this year, the test was started from IC-2, a similar condition.

FINAL TEST CONDITIONS:

At the conclusion of this test, the reactor is critical at 10% power in the Run Mode. Reactor pressure is greater than 980 psig but less than 1020 psig. One feedwater and one condensate pump are in operation with level control in auto (DFCS controlling) on the A Main Feed Reg Valve. The A FW Block Valve control switch is in manual. The A Low Flow Reg Valve is in manual and fully closed.

A Snapshot is written at the conclusion of this test for use in continuing the startup using procedure NOT03. Note that NOT03 is not scheduled for this year.

Execution time was 10 Hours.

The simulator passed this test with one new TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The ability to use Normal Plant Operating Procedures is the primary reference used to evaluate the simulator performance during this test.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The Cleanup System tripped and could not be restated. The system pressure went to a large negative number. Attempts to fill and pressurize the system were unsuccessful. A TR was written for resolution by February, 1995.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT03
14.4.1.3

TITLE: Plant Startup from Hot Standby to Rated Power

PREPARED BY/DATE: E J Mang / 11/29/95

TEST DATE: 10/26/95

APPROVED BY/DATE: R D Davidson / 11/29/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE2	3.1.1(2)	Nuclear Startup from hot standby to rated power
NE3	3.1.1(3)	Turbine Startup & Generator Synchronization
NE5	3.1.1(5)	Operations at Hot Standby
NE6	3.1.1(6)	Load Changes
NE7	3.1.1(7)	Startup, Shutdown, & Operation with less than full recirc. flow

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3	A3.2(2)	Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations Test is used to take the simulator from 10% power to 100% power.

This procedure was prepared from plant procedure 201.3, Plant Startup from Hot Standby to Rated Power. The steps in 201.3 which do not apply to simulator testing (precautions, administrative requirements, etc.) were omitted in order to simplify the test procedure.

A manual heat balance calculation was performed at approximately 42% power using plant procedure 1001.6, Core Heat Balance and Feedwater Flow Calculation.

The test starts with the simulator at 10% power using the Snapshot made during testing of the cycle 15 core modification and ends with the plant at 100% power.

The Sequence of Alarms (SAR) printout was attached.

Results:

The simulator was successfully brought to the full power condition using the test procedure. Operation of individual systems, where required, was performed using controlled copies of current plant procedures. No field changes to the procedure were required. The SAR printout was of limited use in review of the test results.

After putting the turbine on the line, test personnel noticed that extraction steam flow to the first stage reheaters did not develop as expected. Flow was established by opening the alternate drains for the reheat drain tanks. A TR was written.

AVAILABLE OPTIONS:

There are no options available in this Normal Operations test procedure.

OPTIONS TESTED:

There are no options available for this Normal Operations test procedure.

INITIAL CONDITIONS FOR TEST:

IC-20, Cycle 15, BOL

This test is a continuation of a normal plant startup which was begun using NOT01 and was continued using NOT02. Execution of NOT01 and Not02 was done as part of the on-line test of the cycle 15 core modification. The Snapshot stored at the conclusion of NOT02 is used as the Initial Condition (IC).

The reactor was critical at 50% of IRM Range 5. Reactor coolant temperature was 212 F. The mode switch was in Startup. Reactor Level was being maintained at 155 to 165 " TAF. Recirculation Flow was 48,000 gpm.

FINAL TEST CONDITIONS:

At the conclusion of this test, the reactor is operating at 100% of rated power.

Execution time was 12 Hours.

The simulator passed this test with one new TR written.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The ability to use Normal Plant Operating Procedures is the primary reference used to evaluate the simulator performance during this test.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The first stage reheaters did not develop extraction steam flow during the startup. TR 3612 was issued and is scheduled for resolution by 12/31/95.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT04
14.6.45.2

TITLE: Reactor Trip and Recovery

PREPARED BY/DATE: [signature] / 11/19/94

APPROVED BY/DATE: R Davidson / 12/6/94

TEST DATE: 11/09/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE4 3.1.1(4) Reactor trip followed by recovery to rated power

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF20 3.1.2(19) Reactor trip

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This procedure is used to certify that the simulator will allow performance of a reactor trip and recovery to full power in accordance with the reference plant procedures. The latest revision of the following plant procedures are used for this test:

1. 2000-ABN-3200.01, Reactor Scram
2. 2000-ABN-3200.10, Turbine Generator Trip
3. 201.1, Approach to Critical
4. 201.2, Plant Heatup to Hot Standby
5. 201.3, Plant Startup from Hot Standby to Rated Power
6. 202.1, Power Operation

AVAILABLE OPTIONS:

There are no options available for this test.

OPTIONS TESTED:

There are no options available for this test.

INITIAL CONDITIONS FOR TEST:

IC-15, 100% Power.

FINAL TEST CONDITIONS:

Run Time: 12 Hours

The reactor was scrammed and subsequently restarted and returned to full power. Power was returned to within 0.5% of the pre-trip value. The rod pattern and core flow conditions were reestablished to the pre-trip values. Due to problems with the Plant Computer System Versatec plotter and simulated TIP System, only one pretrip TIP trace could be compared and was found to match.

The latest revision to plant procedures were not used. The test was performed using the same revision used for initial certification in 1992. Revised Plant Procedures which include the DFCS installation were not issued as of the test date. The checkoff sheets contained in the plant procedures were not completed as part of this test as they were completed during the performance of Test Procedures NOT01 through NOT03 as were the pre-startup surveillances.

The simulator passed this test by achieving 1928MWt, the same rod pattern and core flow conditions as the pretrip condition. The simulator is capable of continued operation from these conditions.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Procedures are used as reference data to evaluate test results. In addition, TIP traces and power level at Xenon equilibrium are verified to
agree within 0.5% before and after the scram recovery.

DEFICIENCIES AND CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The DFCS intermittently stopped during this test. In addition, Recirc flow spikes were noted on setpoint changes.

These are a known problems and are being addresses as separate issues.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT06
14.6.45.4

TITLE: Power Operation With Less Than 5 Recirculation Pumps

PREPARED BY/DATE: [signature] / 11/8/93

TEST DATE: 11/05/93

APPROVED BY/DATE: R Davidson / 11/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE7	3.1.1(7)	Startup, Shutdown, & Operation with less than full recirc. flow

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3	A3.2(2)	Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This test is used to certify that the simulator will allow full power operation at rated recirculation flow with only four (4) of the five (5) recirculation pumps in service per reference plant procedures.

Using plant procedure 301, Nuclear Steam Supply System, an operating recirculation pump is removed from service while maintaining full power operation.

No automatic data collection is required by this procedure.

Results:

During the test it was noted that recirc flow can not be increased to 160,000 gpm without exceeding the M-G Set amp limit of 220 amps. The same condition exists in the plant.

The recirc pump bearing high temperature alarm was received with 4 pump operation. Lowering the RBCCW Temperature and increasing cooling water flow using LOAs was required to clear the alarm. This is acceptable.

The maximum pump speed achieved was slightly less than 55 Hertz. The certification procedure anticipates 55 to 56 Hertz. This result is acceptable.

AVAILABLE OPTIONS:

This test may be performed by removing any operating recirculation pump.

OPTIONS TESTED:

Recirculating Pump E was selected for this test

INITIAL CONDITIONS FOR TEST:

IC-15, 100% Power, Middle of Life

All 5 Recirc. Pumps in operation.

FINAL TEST CONDITIONS:

Run Time: 60 Minutes

At the conclusion of this test, the reactor is running at full power with 4 of the 5 Recirc Pumps in service. The simulator is capable of continued simulation. If required, the E pump could be returned to service per plant procedures.

The simulator passed this test with 1 TR remaining outstanding from the last performance of this test on October 27, 1992.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

Plant Procedure 301 is used as a reference to evaluate test performance.

Actual plant data from operation of the plant at several combinations of 4 and 5 pump operation is also attached to the test.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

During the last performance of this test on October 27, 1992,the Recirc M-G Set oil and Closed Cooling Water Temperatures did not decrease when the pump was removed from service as expected. The TR written at that time remains active.

Two additional TRs written while performing this test on 10/27/92 were cleared by March 17, 1993.

The remaining TR (No. 2284, priority 3) is scheduled for resolution during the warranty period.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT07
14.4.2.1

TITLE: Plant Shutdown to Hot Standby

PREPARED BY/DATE: [signature] / 11/5/96 TEST DATE: 10/23/96

APPROVED BY/DATE: R W Warrison / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE5 3.1.1(5) Operations at Hot Standby

NE6 3.1.1(6) Load Changes

NE7 3.1.1(7) Startup, Shutdown, & Operation with less than full recirc. flow

NE8 3.1.1(8) Plant shutdown from rated to hot standby and cooldown to cold shutdown

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations Test is used to take the simulator from 100% rated power to the Hot Standby condition.

This procedure uses plant procedure 203.1, Plant Shutdown to Hot Standby. The steps in 203.1 which do not apply to simulator testing (precautions, administrative requirements, etc.) were marked N/A in order to simplify the test procedure. Local Operator Actions (LOAs) used to perform remote functions are identified in the procedure.

Operation of individual systems is performed using the applicable plant system operating procedure.

Results:

The simulator was successfully brought to the Hot Standby condition by this procedure.

AVAILABLE OPTIONS:

There are no options available in this Normal Operations test procedure.

OPTIONS TESTED:

There are no options available for this Normal Operations test procedure.

INITIAL CONDITIONS FOR TEST:

IC-15, 100% Power

FINAL TEST CONDITIONS:

At the conclusion of this test, the reactor is at 10% power in Run Mode with the Turbine Generator off line and on turning gear.

Execution Time was 5 Hours, 15 Minutes.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The ability to use Normal Plant Operating Procedures is the primary reference used to evaluate the simulator performance during this test.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

After tripping the turbine, the unit took 2 hours, 20 minutes to slow down to turning gear speed. Approximately 40 minutes should be required to reach turning gear speed. A TR was written to correct this problem by July 1997.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT08
14.4.2.2

TITLE: Plant Cooldown from Hot Standby to Cold Shutdown

PREPARED BY/DATE: [signature] / 12/13/93

TEST DATE: 12/13/93

APPROVED BY/DATE: [signature] / 12/14/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE5	3.1.1(5)	Operations at Hot Standby
NE6	3.1.1(6)	Load Changes
NE7	3.1.1(7)	Startup, Shutdown, & Operation with less than full recirc. flow
NE8	3.1.1(8)	Plant shutdown from rated to hot standby and cooldown to cold shutdown

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3	A3.2(2)	Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations Test is used to take the simulator from Hot Standby (10% power in Run Mode, Turbine off line) to the Cold Shutdown condition.

This procedure was prepared from plant procedure 203.2, Plant Cooldown from Hot Standby to Cold Shutdown. The steps in 203.2 which do not apply to simulator testing (precautions, administrative requirements, etc.) were omitted in order to simplify the test procedure.

Operation of individual systems is performed using the applicable plant system operating procedure.

The SAR was attached but was of limited use in evaluating this test.

Results:

During the test, several additional maneuvers were performed to verify proper simulator response. These include flooding the reactor to ~230" and shutting down 4 recirculating pumps.

The procedure was executed with no TRs remaining open against this procedure.

The Auxiliary Cleanup Pump could not be started unless the simulator is reinitialized. This is a known problem for which a TR was previously written.

AVAILABLE OPTIONS:

There are no options available in this Normal Operations test procedure.

OPTIONS TESTED:

There are no options available for this Normal Operations test procedure.

INITIAL CONDITIONS FOR TEST:

This test uses the Snapshot saved at the conclusion of NOT07, Plant Shutdown to Hot Standby. In this initial condition, the reactor is operating in the Run Mode at 10% power. The Turbine Generator is off line.

FINAL TEST CONDITIONS:

At the conclusion of this test, the reactor is sub-critical with all control rods fully inserted. Power is in the SRM range. The Mode switch is in Shutdown and the Scram is reset. Reactor coolant temperature is less than 212 F, with the vessel head vented. Temperature is maintained using the Shutdown Cooling System.

Execution Time was 6 Hours.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The ability to use Normal Plant Operating Procedures is the primary reference used to evaluate the simulator performance during this test.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No new simulator problems were identified during this test. As stated above, the Auxiliary Cleanup pump could not be started until the simulator was initialized again. A TR exists on this problem.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT09
14.7.1

TITLE: Shutdown Margin Test

PREPARED BY/DATE: [signature] / 11/28/95

APPROVED BY/DATE: R Wanlson / 11/28/95

TEST DATE: 11/21/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE9 3.1.1(9) Core performance testing:
1. Heat balance
2. Shutdown margin measurement
3. Reactivity coefficient measurement
4. Rod worth measurement

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test is to demonstrate that local criticals can be achieved and that core reactivity and rod worth closely approximate that of the reference plant. This procedure also functionally tests the Rod Worth Minimizer (RWM) via loading and using the sequence used for the Cycle 15 Shutdown Margin Testing.

No data is recorded automatically during this test. Data is obtained directly from the simulator panels.

This test was previously performed with the Cycle 11 core on the simulator. The test was never successfully completed on the cycle 11 core.

Results:

The Rod Worth Minimizer sequence was successfully changed to the cycle 15 Shutdown sequence. The minimizer was then initialized to the sequence.

Control rods were pulled in accordance with the loaded rod worth minimizer sequence. The sequence was later verified to be the same as the plant shutdown margin sequence. The reactor went critical on the eighth control rod. The actual plant criticality occurred on the fifth rod withdrawn. While the reactivity or rod worth difference is significant, the training value of this activity is not significantly reduced.

Measurements of the stable negative period were made to verify that the negative period is limited to 80 seconds. Period indication on the SRM Period meters was noted to be 80 seconds. Calculations from observed changes in SRM count rate however, yielded a 46 second period.

AVAILABLE OPTIONS:

The selection of the control rods for use within the RWM limits is left to the discretion of test personnel.

OPTIONS TESTED:

Selected control rod patterns are documented in the procedure.

INITIAL CONDITIONS FOR TEST:

IC-51, Beginning of Life, Cycle 15 Core.
Reactor Coolant Temperature 178 F

FINAL TEST CONDITIONS:

Run Time: 2 Hours

At the conclusion of this test ,the reactor has been scrammed from the startup condition. The simulator is capable of continued simulation but IC reset is recommended before proceeding with other tests or scenarios. The RWM will automatically select the startup sequences for the cycle 15 core when the simulator is initialized to another IC.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

The test procedure was generated from plant procedures. Local critical data from the beginning of cycle 15 was used for comparison.

The Rod Worth Minimizer has the same sequence used in the plant for cycle 15.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The simulator required withdrawal of more control rods than the plant. The reviewers agreed that this is acceptable and that no corrective action is required.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT12
14.7.5

TITLE: SRM/IRM Response t. Control Rod Motion

PREPARED BY/DATE: [signature] / 12/3/93

APPROVED BY/DATE: R Davidson / 12/6/93

TEST DATE: 12/03/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE9 3.1.1(9) Core performance testing:
1. Heat balance
2. Shutdown margin measurement
3. Reactivity coefficient measurement
4. Rod worth measurement

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

TEST DESCRIPTION:

To verify proper SRM/IRM response to control rod motion for subcritical and critical conditions, including:

1. SRMs and IRMs near control rod motion respond more significantly than the other SRMs/IRMs.

2. Prompt jump and subcritical multiplication effects demonstrated in the SRM traces.

The four (4) Source Range Monitors (SRMs) level and period output are monitored via datapool trend monitoring on the instructor station.

Results:

A field change was made to the test procedure to use the trend plots in place of the 8 pen recorder.

The response of the simulator was quite good for both the SRMs and the IRMs.

AVAILABLE OPTIONS:

There are no options in this normal operations test procedure.

OPTIONS TESTED:

There are no test options in this procedure.

INITIAL CONDITIONS FOR TEST:

IC-2, Cold Startup (8 rods subcritical).

FINAL TEST CONDITIONS:

Run Time: 3.5 Hours

At the conclusion of this test, the simulator is capable of continued operation. IC reset is performed, however, since the simulator was operated with unusual control rod patterns.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Problems noted during the last execution of this procedure on November 17, 1992 have been corrected.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT14
14.6.45.5

TITLE: Recirc Pump Trip Circuit Test

PREPARED BY/DATE: [signature] / 11/9/94

APPROVED BY/DATE: R. Davidson / 12/1/94

TEST DATE: 10/12/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using procedures. A copy of the latest plant procedure 603.4.001, Recirculation Pumps Trip Circuitry Test, is obtained and is marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start). The procedure is then executed on the simulator.

No model variables are monitored during this test.

Results:

All alarms and indications were received as specified in the plant procedure. No unanticipated alarms were noted. All applicable steps in the procedure were completed .

AVAILABLE OPTIONS:

The procedure allows performing the test from any power IC provided that all recirc pumps are running and the surveillance test procedure prerequisites are satisfied.

OPTIONS TESTED:

The test was performed from IC-15, 100% Power.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Execution Time for this test: 15 Minutes

At the conclusion of this test, the equipment has been returned to the as found condition and the simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator deficiencies were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT15
14.6.45.6

TITLE: EMRV Operability Test

PREPARED BY/DATE: [signature] / 10/5/95

APPROVED BY/DATE: R Davidson / 11/29/95

TEST DATE: 09/25/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using the latest plant procedure. A copy of the plant procedure 602.4.003, Electromatic Relief Valve Operability Test, is obtained and is marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start).

The EMRV downcomer temperatures are monitored by test personnel using Datapool Monitoring. No automatic data recording is required.

Results:

The EMRVs opened and closed as required by the procedure. All annunciators expected alarmed and no unexpected alarms were reported.

In order to speed up testing, the simulator was reinitiated during the test. This action reset the EMRV discharge temperatures to the initial value.

A small leak was inserted on the B EMRV to verify proper response to a leaking valve.

AVAILABLE OPTIONS:

The certification test procedure allows this test to be performed from IC-11 or IC-12. Procedure 602.4.003 allows temperatures to be taken from the Isolation Condenser/EMRV Disc Temperatures recorder on panel 1F/2F or from the Safety Valve/EMRV temperature indicator in the reactor building.

OPTIONS TESTED:

Valves A, C, D, and E were tested without a malfunction.
Valve B was tested with a 0.1% leak using malfunction NSS-25B.

The variables for the local EMRV Discharge Temperature Indicators were used via datapool monitoring.

INITIAL CONDITIONS FOR TEST:

A low power IC-12 was used for this test

FINAL TEST CONDITIONS:

Procedure execution time: 3 Hours

At the conclusion of this test, The EMRV tailpipe temperatures are slightly higher than at the start (180 to 200 F vs. 126 F). The valves are closed and the reactor continues operating. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT16
14.6.45.7

TITLE: Isolation Condenser Valve Operability Test

PREPARED BY/DATE: [signature] / 9/26/96

TEST DATE: 09/09/96

APPROVED BY/DATE: R Wanbon / 11/2/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using the latest plant procedure. A copy of plant procedure 609.4.001, Isolation Condenser Valve Operability and In Service Test, is obtained and is marked-up to indicate steps which do not apply (Such as GSS permission to start). LOA CFW-52 is used for operation of valve V-11-41.

No model variables are monitored during this test.

Results:

One valve had a stroke time (10.1 seconds) greater than the maximum stroke time (10.0 seconds) in the test procedure acceptance criteria. An additional valve had a stroke time equal to maximum in the acceptance criteria.
A TR was written to adjust the stroke times.

Several steps in the procedure involve the removal and installation of test plugs in local Motor Control Centers. This is performed by plant electricians, and is done to restore overloads to service for the test to prevent valve damage. The overloads are bypassed during plant operation. This activity is not simulated.

Alarms are received during this test but are not identified in the procedure. No discrepancies in the alarms were reported.

AVAILABLE OPTIONS:

This procedure allows the test to be performed from any power IC provided that the Isolation Condensers are in normal standby condition. No other options are available.

OPTIONS TESTED:

This test was performed from IC-15, Full Power.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 70 Minutes.

At the conclusion of this test, all equipment has been returned to the pretest condition. The simulator is capable of continued simulation.

The simulator passed this test with 1 new TR.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

A copy of procedure 609.4.001 executed in the plant on June 19, 1991 was attached and used to evaluate simulator performance.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The stroke time of V-11-34 exceeded the maximum stroke time by 0.1 second (10.1 vs. 10.0). The stroke time of V-14-34 was found at the upper limit in the procedure. A TR was written to adjust the stroke time of these valves. The TR is scheduled for resolution by March, 1997.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT17
14.6.45.8

TITLE: Core Spray Pump Operability Test

PREPARED BY/DATE: [signature] / 11/11/93

TEST DATE: 11/09/93

APPROVED BY/DATE: R Davidson / 11/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using the latest plant procedure. A copy of the latest plant procedure 610.4.002, Core Spray Pump Operability Test, is obtained and is marked-up to indicate which steps do not apply (such as obtaining GSS permission to start). LOAs are used for operations performed outside the control room:

V-20-12 breaker	CSS-7
V-20-27 breaker	CSS-17
V-20-27 Keylock close	CSS-30
V-20-27 Keylock open	CSS-31
V-20-18 breaker	CSS-12
V-20-26 breaker	CSS-19
V-20-26 Keylock open	CSS-33
V-20-26 Keylock close	CSS-32

Steps to vent the Core Spray system are omitted.

Model variables for relief valve (V-20-24 & 25) leakage and system 1 & 2 Fill Pump speed are monitored using datapool monitoring.

Results:

The procedure was executed in its entirety and the results satisfied all acceptance criteria in the plant procedure.

AVAILABLE OPTIONS:

The procedure allows this test to be performed from any IC provided that the Core Spray System is in normal standby condition.

When performed with the reactor shutdown, additional valve operations are performed using LOAs.

OPTIONS TESTED:

The test was performed from IC-15, Full Power

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 62 Minutes.

At the conclusion of this test, all systems are returned to the pretest condition. The simulator is capable of continued simulation.

Since the last time this test was performed, several modifications were made to the simulator Core Spray system to include previous plant modifications. Differences in simulator and plant response were eliminated, resulting in flawless simulator performance.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria. Revision 26 of 610.4.002, issued November 25, 1993 was used for this test.

A copy of Procedure 610.4.002 executed in the plant on October 15, 1992 was attached and used to evaluate simulator performance.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

All problems noted in the last execution of this test on October 26, 1992 have been corrected. There were no problems during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT18
14.6.45.9

TITLE: CRD Pump Operability Test

PREPARED BY/DATE: [signature] / 11/8/94

APPROVED BY/DATE: R W Davidson 12/6/94

TEST DATE: 10/13/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using the latest plant procedure. A copy of the latest plant procedure is obtained and marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start). LOA CRD-31 is used to operate valve V-15-222, Flow Control Bypass.

The A & B CRD Pump Suction and Discharge Pressure model variables are monitored using Datapool Monitoring. The data is transferred from the CRT to the test procedure and no printout is obtained.

Results:

One field change was made to the procedure to correct a typo in variable names.

All required steps were completed and the simulator met the acceptance criteria of the plant procedure.

AVAILABLE OPTIONS:

The procedure allows this test to be performed from any IC provided that the CRD system is in normal operation.

OPTIONS TESTED:

The test was performed from IC-15, Full Power

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

During the test, the Cooling Water and Return to Reactor flows were found to be incorrect in the IC. Valves were operated to establish the correct flows.

FINAL TEST CONDITIONS:

Procedure execution time: 30 Minutes.

At the conclusion of this test, the CRD pump which was idle is now the operating pump. All other plant conditions are unchanged. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT19
14.6.45.10

TITLE: Anticipatory SCRAM Turbine Stop Valve Closure Test

PREPARED BY/DATE: [signature] / 10/3/95

APPROVED BY/DATE: R Davidson / 10/12/95

TEST DATE: 09/25/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using plant procedures. A copy of plant procedure 619.4.002 is obtained and is marked-up to indicate steps which do not apply to the simulator (such as GSS permission to start). The procedure is then executed on the simulator.

Model variables for eight RPS relays are monitored on the Instructor Station CRT screens. No printed copy of this data is required. Datapool monitoring is used because the RPS relays are photos on the simulator.

The Sequence of Alarms Recorder (SAR) printout and the PCS alarm printout were attached.

Results:

The procedure was executed in its entirety with no discrepancies indicated. All alarms expected by the procedure were received.

AVAILABLE OPTIONS:

There are no available options in this test procedure.

OPTIONS TESTED:

There are no available options in this test procedure.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 30 Minutes.

At the conclusion of this test, all equipment has been returned to the as found condition. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT20
14.6.45.11

TITLE: APRM Front Panel Check

PREPARED BY/DATE: [signature] / 10/16/96 TEST DATE: 09/10/96

APPROVED BY/DATE: R Davidson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using plant procedures. A copy of the latest plant

procedure 620.4.002, APRM Surveillance Test - Front Panel Check, is obtained and is marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start). The procedure is then executed on the simulator.

No model variables are monitored during this test. Panel indications are used for all parameter observations which are recorded in the procedure.

Results:

All applicable steps of the procedure were completed satisfactorily. All alarms specified in the plant surveillance procedure were received. No unexpected alarms were reported. A request to recalibrate two APRM meters found near the tolerance limits was submitted.

AVAILABLE OPTIONS:

The procedure allows this test to be performed from any power IC provided that the prerequisites of the surveillance test procedure are satisfied.

OPTIONS TESTED:

The test was performed from IC-15, 100% Power.

INITIAL CONDITIONS FOR TEST:

IC-15, 100% Power

FINAL TEST CONDITIONS:

Procedure execution time: 2 Hours

At the conclusion of this test, all equipment was returned to the as found condition and the simulator was capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

A copy of the actual plant data sheets for the test performed on July 30, 1991 was attached and compared to the simulator results.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator discrepancies were identified during this test. As stated above, a request to calibrate two APRM meters was submitted.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT21
14.6.45.12

TITLE: SRM Front Panel Test

PREPARED BY/DATE: [signature] 11/11/93

APPROVED BY/DATE: R Davidson 11/22/93

TEST DATE: 11/09/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION 3.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using plant procedures. A copy of plant procedure 620.4.004, Source Range Monitor Test and Calibration (Front Panel Test), is obtained and is marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start). The procedure is then executed on the simulator.

No model variables are monitored during this test. Panel indications are used for parameter observations which are recorded in the procedure.

Results:

All applicable steps in plant procedure 620.4.004 were executed.

It was noted that the SRM meter ramps too quickly to the 1E-1 position. The procedure requires that the reset switch be held in the ramp position. However the simulator SRM meter drops rapidly to 1E-1. A TR was written.

All alarms functioned as expected in the procedure. No other unexpected alarms were reported.

AVAILABLE OPTIONS:

There are no options available in this procedure.

OPTIONS TESTED:

There are no options available in this procedure.

INITIAL CONDITIONS FOR TEST:

IC-2, Cold Startup

FINAL TEST CONDITIONS:

Procedure execution time: 1 Hour, 32 Minutes.

At the conclusion of this test, all equipment was returned to the as found condition and the simulator was capable of continued simulation.

The simulator passed this test with one TR.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

A copy of the actual plant data sheets for the test performed on July 30, 1991 was attached and compared to the simulator results.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The SRM Meter response to ramp up and ramp down is too rapid. A TR was written and is scheduled for resolution by 12/31/94.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT22
4.6.45.13

TITLE: IRM Front Panel Check

PREPARED BY/DATE: [signature] / 10/3/95

APPROVED BY/DATE: R Davidson / 12/5/95

TEST DATE: 09/28/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using the latest plant procedure. A copy of plant procedure 620.4.005, Intermediate Range Monitor Test and Calibration (Front panel Test), is obtained and is marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start).

Sections of the procedure which remove a panel cover plate and install Weidmuller test plugs are replaced with activation of RPS Component Level Failures. (CLF/PCP/RPS/Relays/RPS-85 & RPS-86)

No model variables are monitored during this test. Panel indications are used for parameter observation.

Results:

All alarms and automatic actions occurred as specified in the plant surveillance procedure. The surveillance test was performed with no problems noted.

AVAILABLE OPTIONS:

The plant procedure allows this test to be performed with the reactor mode switch in any position. The alarms and actions expected vary with the mode switch position.

OPTIONS TESTED:

The test was performed in Startup Mode.

INITIAL CONDITIONS FOR TEST:

IC-36, 8 Rods Subcritical, Cycle 15, MOL.

FINAL TEST CONDITIONS:

Procedure execution time: 2 Hours.

At the conclusion of this test, all equipment is restored to the pre-test condition and the simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT24
14.6.45.15

TITLE: Diesel Generator Load Test

PREPARED BY/DATE: [signature] / 11/6/96 TEST DATE: 09/10/96

APPROVED BY/DATE: R Wanlson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using plant procedure 636.4.003, Diesel Generator Load Test. A copy of the latest plant procedure is obtained and is marked-up to indicate steps which do not apply to the

simulator (such as obtaining GSS permission to start). An LOA is used to operate V-36-19, Fuel Oil Tank Fill Valve. Steps are omitted for operation of equipment outside the scope of simulation, notably:

DG Lube Oil temperature & level
Lube Oil pressure & Turbo Lube Oil pressure
Cooling Water temperature
Fuel Oil pressure
34.5 KV Voltage Regulators
DG Breaker Counter
Checks for leaks, noise, etc.
All valves except V-36-19

The procedure attachment for refilling the fuel oil tank is replaced with a simple step to operate V-36-19 and monitor the model variable for tank level

The test is run for approximately 20 minutes on each Diesel Generator to save time. The plant procedure specifies 60 minute run time.

Three model variables are monitored using CRT Datapool Monitoring:

BDGNST	DG Fuel Oil Tank Level (Gal.)
SDGNRM	DG KW Load from switchgear
TATM	Outside Ambient Temperature

Results:

The LOA for V-36-19 which is used to refill the fuel oil tank does not work. A TR was written on the missing LOA.

Some discrepancies in the initial loading of the Diesel Generator outside the acceptance criteria in the procedure were noted. A TR was written to tune the model.

All other steps were completed successfully.

AVAILABLE OPTIONS:

The procedure allows this test to be performed from any power IC, provided that the Diesel Generators are in normal standby condition. Either Diesel or both may be tested.

OPTIONS TESTED:

Diesel Generator No. 1 test was performed from IC-15, Full Power.

Diesel Generator No. 2 test was performed from IC-79, Shutdown condition.

INITIAL CONDITIONS FOR TEST:

DG #1: IC-15, Full Power.

DG #2: IC-79, Shutdown.

FINAL TEST CONDITIONS:

Procedure execution time: 3 Hours.

The test should be concluded when the Fuel Oil Storage Tank has been refilled to the starting level and both Diesels have completed their timed shutdown idle. During this execution of the procedure, the oil tank has not been refilled.

The simulator is capable of continued simulation.

The simulator passed this test with 2 outstanding TRs.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

Copies of Procedure 636.4.003 executed in the plant on September 7, 14, 21, & 28, 1992 were attached and used to evaluate the simulator performance.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

As noted above, the LOA for filling the Diesel Oil Storage Tank is inoperable. A TR was written and is scheduled for resolution by November, 1997.

The initial loading of the diesels was low at 2554 kw while the procedure specifies 2750 +/- 50 kw. The difference may be due to a plant modification. A TR was written to tune the Diesel Generator model by November 1997.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT25
14.6.45.16

TITLE: Primary Containment Isolation Valve Operability Test

PREPARED BY/DATE: G Mowry / 11/11/93

TEST DATE: 11/09/93

APPROVED BY/DATE: R Davidson / 11/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using the plant procedure. A copy of the latest plant procedure 678.4.001, Primary Containment Isolation Valve Operability and IST, is obtained and is marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start).

No model variables are monitored during this test. Data required by the procedure was recorded directly from simulator panel instruments by test personnel.

Results:
The test procedure calls for locally locking and unlocking valves V-23-357 and V-23-358. Valves V-23-357 and V-23-358 are opened or closed fully with CNA LOAs and no locking device is modeled. Using the Expert Mode however, the valves can be set to any position, simulating locking the valve in any position.

Except as noted above, all steps of procedure 678.4.001 were completed and the results met the procedure acceptance criteria. No annunciators were expected by the procedure and none were observed on the simulator.

AVAILABLE OPTIONS:

The procedure allows this test to be performed from any power IC, provided that the Primary Containment is in normal standby condition.

OPTIONS TESTED:

The test was performed from IC-15, 100% power, MOL

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 35 Minutes.

At the conclusion of this test, all equipment has been returned to the pretest condition and the simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

A copy of procedure 678.4.001 performed in the plant on September 10, 1992 was attached. It was noted during the review that the simulator test was performed on Rev. 11 of the procedure dated March 22, 1993 while the plant test was performed on Rev. 8. The simulator data meets the revised acceptance criteria of Rev. 11.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator problems were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT26
14.6.45.17

TITLE: Alternate Shutdown Monitoring Instrument Channel Check

PREPARED BY/DATE: [signature] / 11/9/94 TEST DATE: 10/12/94

APPROVED BY/DATE: R Davidson / 12/22/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using the plant procedure. A copy of the latest plant procedure 680.4.001, Alternate Shutdown Monitoring Instrumentation, is obtained and is marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start).

The procedure requires collection of data from locations throughout the plant, an operation which would be performed by an equipment operator. This data is therefore obtained using Datapool Monitoring.

The following model variables are monitored using Datapool Monitoring:

RBCCW Pump 1 & 2 Discharge Pressures
RBCCW Hx 1 & 2 Inlet Pressures
RBCCW Suction Header Pressure
CRD System Flow to Reactor
Cond. Transfer Pump B Discharge Pressure
Cond. Transfer Header Pressure
Condensate Storage Tank Level
Service Water Pump 2 Discharge Pressure

No printout of the datapool monitoring was obtained. Data recorded in procedure 680.4.001 was obtained directly from the datapool display on an instructor station CRT.

Results:

Two field changes were made to the procedure to correct monitored variables.

No annunciators were expected or received during this test. All steps in the marked up procedure were completed on the simulator. The simulator met the acceptance criteria in procedure 680.4.001.

AVAILABLE OPTIONS:

There are no options available in this procedure.

OPTIONS TESTED:

There are no options available in this procedure.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 30 Minutes.

At the conclusion of this test, all equipment has been returned to the pretest condition. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

There were no problems identified during this test. Two field changes were made to the test procedure to correct model variables.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT27
14.6.45.26

TITLE: Standby Liquid Control System Functional Test

PREPARED BY/DATE: [signature] / 11/6/96 TEST DATE: 09/11/96

APPROVED BY/DATE: R Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using plant procedures. A copy of the latest plant procedure 612.4.002, Standby Liquid Control System Functional Test, is obtained and is marked-up to indicate steps which do

not apply to the simulator (such as obtaining GSS permission to start). Ten LOAs are used to operate local manual valves and switches.

Portions of the procedure used to drain and flush the system to remove Boron are replaced with steps to set the model variables for Boron concentration to zero.

Steps concerning tank manway cover removal and inspection of pump stuffing boxes were omitted.

Since this test was last performed, the plant added installation of a temporary modification to the procedure. The temporary modification changes the source of water pumped into the reactor from the test tank to the temporary source of demineralized water. The test cannot be fully executed without implementing the temporary modification as a new LOA on the simulator.

The steps used to replace the Squib valves and control fuses after the test firing were omitted. The simulator must be reset to an IC to recover the Squib valves. The step to perform surveillance procedure 612.4.001 after Squib replacement was likewise omitted.

The following model variables were monitored using Datapool Monitoring:

LSLCTTTK	Test Tank Level
JEDS6K22	Cleanup Syst. Isolation Relay
XSLCVSSL	Reactor Vessel Boron Concentration

Results:

All alarms expected in the procedure were received and no unexpected alarms were noted. All steps applicable to the simulation of this test were performed satisfactorily. Using the current version of the plant procedure, this test is more of an exercise for the test personnel than a test of the simulator.

AVAILABLE OPTIONS:

This procedure allows performing the test in any Cold Shutdown IC with all Control Rods inserted and the Reactor in Shutdown Mode.

OPTIONS TESTED:

The test was performed from IC-51, Cold Shutdown

INITIAL CONDITIONS FOR TEST:

The test was performed from IC-51, Cold Shutdown.

Flushing boron from the piping system to prevent injection into the reactor is performed as an instructor action by setting model variables and using LOAs. These operations are not performed from the control room.

FINAL TEST CONDITIONS:

Procedure execution time: 3 Hours

At the conclusion of this test, the Standby Liquid Control System Squib (explosive) Valves have been fired and will remain open until the simulator is reset to a new IC. The event is therefore not recoverable. (Any activation of the SLC Squibs is not recoverable). The simulator, however, is capable of continued operation with the SLC system out of service.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The simulator is lacking a LOA to install a temporary modification used in the plant procedure. The test therefore cannot be fully implemented on the simulator.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT28
14.6.45.27

TITLE: Air Ejector Off Gas Radiation Monitor Test

PREPARED BY/DATE: [signature] / 11/28/95

APPROVED BY/DATE: R Davidson / 11/29/95

TEST DATE: 11/21/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE10 3.1.1(10) Operator conducted surveillance testing on safety related equipment or systems

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A3 A3.2(2) Ability to operate with similar plant operating procedures

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This test was added to the certification test list in November 1995 to replace 14.6.45.14 (NOT23), Main Steam Line Radiation Monitor Test, which is no longer performed in the plant. A modification was made to the plant and the simulator to delete the Steam Line High Radiation isolation and scram functions. The Off Gas Radiation Monitor equipment is similar to the Steam Line Radiation Monitors.

This Normal Operations test procedure is used to demonstrate that a routine surveillance test can be performed on the simulator using plant procedures. A copy of the latest plant procedure 621.4.007, Air Ejector Off Gas Radiation Monitor Test, is obtained and marked-up to indicate steps which do not apply to the simulator (such as obtaining GSS permission to start). The procedure is then executed on the simulator.

Data required by the procedure was recorded by test personnel from simulator panel indications. The sequence of alarms recorder (SAR) printout was attached.

Results:
All alarms expected in the procedure were received and no unexpected alarms were noted. All steps in the plant procedure were completed satisfactorily.

AVAILABLE OPTIONS:

The test procedure allows performance from any power IC that meets the prerequisites of plant procedure 621.4.007.

OPTIONS TESTED:

The test was performed from IC-28, 100% Power.

INITIAL CONDITIONS FOR TEST:

IC-28, 100% Power, MOL, Cycle 15.

FINAL TEST CONDITIONS:

At the conclusion of the test, all equipment is returned to normal service and the simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The acceptance criteria in plant procedure 621.4.007 was used to evaluate simulator performance.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES01
14.8.11

TITLE: Inadvertent Scram on High Pressure (May 2, 1979 Lo-Lo-Lo Level Event)

PREPARED BY/DATE: [signature] / 12/3/93

APPROVED BY/DATE: R Davidson / 12/6/93

TEST DATE: 02/23/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF6	3.1.2(4)	Loss of forced coolant flow due to single or multiple pump failure
MF30	Spec. 2.3	Conditions resulting from isolation of all recirculation loops

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the High Pressure Transient which occurred on May 2, 1979.

On Wednesday, May 2, 1979, during the performance of the Isolation Condenser automatic actuation surveillance test, an inadvertent reactor high pressure scram occurred. The pressure spike initiating the scram was sensed on reactor pressure switches RE03A and RE03B after completion of surveillance testing on reactor pressure switches RE15A and B. During the verification of the excess flow check valve associated with these instruments being open, the pressure spike is suspected to have occurred. Concurrently, a recirculation pump trip occurred due to the pump trip logic associated with reactor high pressure. Subsequently, a turbine trip occurred on (low load) a loss of power to "B" and "D" 4160V buses associated with Bank 6 (S1B breaker) being out of service for inspections of its respective 4160V cabling. Diesel Generator #2 energized "D" 4160 bus in the fast start mode.

Because of the loss of power to 4160 Bus "B" (feedwater pumps B and C) and the failure of feedwater pump "A" to start on the "A" 4160 Bus, a continual water level decrease occurred as measured on the Yarway indication in the Control Room, resulting in a reactor low water level condition. A closure of the Main Steam line isolation valves was initiated by the operator prior to reaching reactor low-low water level, to prevent further loss in reactor water inventory. Subsequently, the Isolation condensers were manually initiated to provide reactor cooldown and pressure control. Further, the recirculation loop discharge valves associated with the isolation condensers were closed and, at this time, it is postulated that the discharge valves of the other recirculation loops were closed (the five 2" discharge bypass valves remained open).

At 2 minutes 52 seconds after the initiating event and coincident with the closure of the five (5) discharge valves, the triple low water level instrument trip point was reached. The triple low water level condition was verified locally at the instrument racks. Reactor cooldown continued utilizing the isolation condensers.

"C" recirculation pump was started 31 minutes 54 seconds after the initiating even with a subsequent 3 foot loss in indicated reactor water level. At this time, "A" reactor feed pump was started, subsequently establishing indicated reactor water level at a point 13' -8" above the top of the active fuel region. Realization occurred that the indicated water level and core water level may not have been the same when it was recognized that the five (5) recirculation loop discharge valves were closed. "A" recirculation pump was then placed in service, thus removing the disparity between water level measuring systems. A cooldown continued with the reactor isolated, utilizing the isolation condensers and shutdown cooling systems until a cold shutdown was achieved at 2228 that evening.

This test procedure is designed to cover the first 42 minutes of the transient when the "A" Recirculation Pump was placed into service.
Note: During the event "A" Reactor Feedwater Pump tripped on low suction pressure. This trip feature was modified after this event to incorporate a time delay. Since the pump would now not be expected to trip, it is tripped via CAE control.

Also, RBCCW Isolation on LO-LO-LO Level and REACTOR LEVEL SETDOWN are defeated since the modifications also occurred after this event.

Using the Validation Test Program, prepared comparison plots of simulator data versus plant data for the following parameters.

Plant Parameter	Simulator Variable
Total Recirculation Flow	T:FIA72C
Total Core Flow	
Reactor Level A (GMAC)	T:LID59A
Reactor Level (WR)	T:LIA12
Fuel Zone Level	LNSSMPA
Reactor Pressure (WR)	T:PIA92A
A Recirc Loop Suction Temp.	T:TE31A
B Recirc Loop Suction Temp.	T:TE31C
C Recirc Loop Suction Temp.	T:TE31E
D Recirc Loop Suction Temp.	T:TE31G
E Recirc Loop Suction Temp.	T:TE31J
A Recirc Loop Flow	T:FIA60A
B Recirc Loop Flow	T:FIA60B
C Recirc Loop Flow	T:FIA60C
D Recirc Loop Flow	T:FIA60D
E Recirc Loop Flow	T:FIA60E
Total Feed Flow	T:FFID75
Total Steam Flow	T:FSID75
Iso. Cond. A...B Steam Flow	(Later)
Iso. Cond. A...B Water Flow	(Later)
APRM 1 (% Neutron Flux)	T:XAPRM1
APRM 5 (% Neutron Flux)	T:XAPRM5

Results:

After a considerable amount of tinkering with the drill file, the test was performed with excellent correlation with the plant data. Except for the items identified in the problem section, all automatic actions and alarms actuated as expected.

AVAILABLE OPTIONS:

This test is designed to duplicate an actual plant event and therefore has no options.

OPTIONS TESTED:

The test has no options.

INITIAL CONDITIONS FOR TEST:

IC-15.

Remove "D" Recirculation Pump from service per Plant Procedure 301 while maintaining core thermal power at approximately 1900 MWt.

Establish the following conditions by adjustment of recirculation flow, control rod pattern, pressure control and level control, as necessary per Plant Procedures:

Power Level	1895MWt
Recirc flow	14.8E4
Pressure	1020 psig
Level	160"

Disable the "B" Startup Transformer by placing Breaker S1B control Switch to PULL TO LOCK.

Place the "B" RWCU Pump in service and remove the "A" RWCU Pump from service per procedure 303.

Confirm "A" CRD Pump is operating.

Confirm 1-2 RBCCW Pump is running.

Confirm 1-2 Service Water Pump is running.

Confirm "A" Air Compressor is lead A/C.

FINAL TEST CONDITIONS:

Run Time: The initial execution of this test took several days to adjust the drill file, primarily due to uncertainty in the timing of operator actions during the plant event.

At the conclusion of this test, the reactor is scrammed and isolated. Water level has recovered, and the C Recirc pump is operating. The simulator is capable of continued simulation, although instructor actions are required to clear malfunctions and overrides used to initiate the event.

The simulator passed this test with 2 outstanding TRs.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

Historical Data Package for High Pressure Scram, May 2, 1979.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The Reactor Lo Lo Lo Water Level alarm was received at 8 minutes, 40 seconds into the event on the simulator while the plant received the alarm at 2 minutes, 52 seconds. A TR was written to address this difference.

The individual Recirc loop temperature response differed from the plant response. It appears that the IC condensate return flow does not go through the annulus region and enter B, C, D recirc loops. A TR was written to resolve the difference.

Both TRs are scheduled for corrective action by November, 1993.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES02
14.8.12

TITLE: Reactor Isolation Scram (TAR-008)

PREPARED BY/DATE: [signature] / 2/16/93

TEST DATE: 02/16/93

APPROVED BY/DATE: [signature] / 2/18/93
for R. DAVIDSON

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF20	3.1.2(19)	Reactor trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely,

the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the transient evaluated in TAR-OC-008, Reactor Isolation Scram.

On June 25, 1985 at 09:38, the Oyster Creek Nuclear Generating Station experienced a Reactor Isolation Scram while at approximately full power (99.6%). The event was initiated when the Electric Pressure Regulator (EPR) malfunctioned causing a turbine bypass valve to open and reactor pressure to drop until the low reactor pressure MSIV closure setpoint was reached, resulting in a reactor scram.

Plant initial conditions were as follows:

a. The reactor was critical in the "RUN" mode at approximately 99.6% (1922.3 MWt) power. Reactor level and pressure were 160" and 1020 psig. Recirculation flow was approximately 15.7E4 gpm.

b. The turbine-generator was on line at 642 MWe.

c. The Reactor Water Cleanup System (RWCU) was out of service for resin replacement, but ready to be placed back in service.

d. All other major systems were lined up and operating to support full load.

Also during this event, the south Scram Dump Instrument Volume Drain valves failed to close causing reactor water/steam to leak to the Reactor Building Equipment Drain Tank and Reactor Building.

Since the occurrence of this transient two major changes to the Feedwater Control System have been made. These modifications, Reactor Level Setdown and Automatic Runout Protection Reset, are failed by malfunctions in this test to simulate the actual plant operating during the transient.

Using the Validation Test Program, prepare comparison plots of

simulator data versus plant data for selected parameters.

Data was collected for the following parameters:

Plant Parameter	Simulator Variable
APRM 1 - APRM 8	T:XAPRM1 - 8
Feedwater Flow (Total)	T:FFID75
Steam Flow	T:FSID75
Reactor Level A (GMAC)	T:LID59A
Reactor Level B (GMAC)	T:LID59B
Reactor Level (WR)	T:LIA12
Reactor Pressure A (Wide)	T:PIA92A
Reactor Pressure (NR)	T:PTID45
Recirculation Flow (Total)	T:FIA72C
Reactor Thermal Power	SRSXTOTL
Recirc Loop Flow A - E	T:FIA60A - E
Recirc Loop Temperature A- E	T:TE31A,C,E,G,J

Additional data collection: (8 Pen Recorder)

Turbine Steam Flow	WMSSNSS
Total Steam Flow	T:FSID75
Control Valve Position 1-4	RTCSCV(1)-(4)
Bypass Valve Position	RTCSBV(1)-(9)
Reactor Pressure	TT:PTID45

The SAR and PCS alarm printouts were also attached.

Results:

Five field changes were made to the procedure during execution to correct monitored variables, correct file listing (action steps), correct operator action, and correct alarm response.

Several attempts were made to reproduce the plant event as described in the TAR with little success. The simulator response was rather benign compared to the plant. After much investigation, test personnel recognized that the operators reduced recirc flow during the event, causing reactor pressure to drop. When this operator action was added to the test, the simulator responded the same as the plant.

In reviewing the plant event, it was also noted that the MSIVs closed prematurely on Steam Line Low Pressure, apparently due to noise. The drill file was changed to duplicate this response.

The plant event included failure of the Scram Discharge Volume to fully isolate. Although included in the test, the malfunction did not work and this portion of the event was not reproduced.

The APRM High alarms received in the plant event were not received on the simulator, probably because recirc flow was not reduced in exactly the same manner on the simulator. This was considered unimportant by the reviewers.

The PCS alarm log indicated that K Safety Valve opened briefly. This is a known problem for which a TR exists.

Except as noted, all alarms and automatic actions occurred as expected and no unwarranted alarms were received.

Comparison of plant data to simulator data shows very good agreement.

AVAILABLE OPTIONS:

This test was written to duplicate an actual plant event and therefore has no options.

OPTIONS TESTED:

There are no options for this test.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, Full Power Operation, establish temporary IC-24 as follows:

Remove the RWCU System from service per Plant Procedure 303, Section 4.0.

Adjust recirculation flow to 15.7E4 on Panel 3F recorder via master flow control on Panel 4F.

Adjust reactor power to approximately 1922 MWt using control rods in accordance with the pull sheets.

FINAL TEST CONDITIONS:

Run Time: 2 Hours Run Time; 7 Hours Total Time

At the conclusion of this test, the reactor has scrammed and isolated. The malfunctions used to initiate the event remain active but can be cleared. The simulator is capable of continued simulation of recovery operations.

The simulator passed this test with 1 outstanding TR.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

TAR-OC-008, Reactor Isolation Scram (June 12, 1985) dated July 18, 1985.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The PCS Alarm Log indicated that the K Safety Valve opened for a brief period. This is a known problem for which a TR was previously issued.

The malfunction used to fail a Scram Discharge Volume Drain Valve open did not work. A TR was issued with corrective action to be completed by February, 1994.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES03
14.8.13

TITLE: Rx Scram on M1A Main Transformer Failure (TAR 23)

PREPARED BY/DATE: E Mooney / 11/19/96 TEST DATE: 10/01/96

APPROVED BY/DATE: R Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF18 3.1.2(16) Generator trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the transient evaluated in TAR-OC-023, Reactor Scram on M1A Main Transformer Failure.

On June 25, 1989 at 12:08 a.m., the Oyster Creek Nuclear Generating Station experienced a main generator trip and subsequent reactor scram during normal full power operation. The cause of the generator trip was a phase differential due to a fault on the M1A main transformer. The fault caused a trip of the main transformer lockout relay which in turn tripped the generator and caused a turbine trip via MTS1. The reactor protection system received an anticipatory scram signal which shut down the reactor.

During the transient reactor pressure spiked (>1050 psig) as expected. This was a result of the sudden closure of the turbine control valves. As pressure increased, and the appropriate action points reached, the following occurred: a) automatic actuation of the isolation condensers; b) opening of the A and D electromatic relief valves; and c) an automatic trip of the reactor recirculation pumps. In conjunction with the reactor scram the pressure spike caused a shrink in reactor vessel level (<137" TAF). This resulted in the automatic initiation of the reactor level setdown program.

The consequences due to the plant transient were successfully mitigated and conditions stabilized in accordance with the appropriate procedure.

Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus plant data for the following parameters:

Plant Parameter	Simulator Variable
Total Recirculation Flow	T:FIA72C
APRM #1	T:XAPRM1
APRM #5	T:XAPRM5
Steam Flow	T:FSID75
Feed Flow	T:FFID75
Reactor Pressure (WR)	T:PIA92A
Reactor Level A (GMAC)	T:LID59A
Reactor Pressure (NR)	T:PTID45

The Sequence of Alarms Recorder (SAR) was also attached.

Results:

Two field changes to the procedure were made to correct the drill file and to account for modifications installed on the simulator since the last test.

The reference data and the previous simulator test show that all recirc pumps trip from high reactor pressure. A recent modification added a time delay too the trip of C and D recirc pumps. Therefore, only the A, B, and E pumps tripped.

The reactor level decrease following the scram was greater than the reference plant data (124" minimum vs. 136" minimum). In the previous test performed in January 1993, the simulator level response matched the plant quite closely. The differences are attributed to installation of the digital feedwater system and changes to the recirc pump trip installed since the last test.

The SAR missed several alarms which were verified as received by checking the alarm panels. A TR was written.

With the exception of the above, all alarms and automatic actions occurred as expected and no unexpected actions occurred.

AVAILABLE OPTIONS:

This procedure is written to duplicate an actual event that occurred at Oyster Creek and therefore has no options.

OPTIONS TESTED:

There are no options in this test procedure.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power Operation.

Adjust recirculation flow, control rods per the pull sheets and other controls as necessary to achieve the following plant conditions:

Reactor Power	1889 MWt
Recirculation Flow	14.8E4 gpm
Reactor Pressure	1020 psig
Reactor Level Setpoint	160"

After establishing the above conditions, a temporary IC was stored in IC-196.

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, the generator and reactor have tripped and the plant is in post-scram recovery. The simulator is capable of continuing the recovery operations. The malfunctions used to initiate the event can be cleared by the instructor.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

TAR-OC-023, Reactor Scram on M1A MAIN TRANSFORMER FAILURE (June 25, 1989) dated September 7, 1989. (OCS-5070).

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

The simulator results were also compared to the TAR data.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The SAR missed several alarms which were verified on the alarm panels. A TR was written for resolution by September 1997. The TR has no effect on this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES04
14.8.14

TITLE: Reactor Scram on Turbine Generator Trip (TAR-011)

PREPARED BY/DATE: [signature] / 12/9/96 TEST DATE: 10/07/96

APPROVED BY/DATE: R Warnson / 12/10/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF18 3.1.2(16) Generator trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator [illegible] the acceptance criteria of ANSI 3.5-1985, Section 4.2 for the transient evaluated in TAR-OC-011, Reactor Scram on Turbine Generator Trip.

On November 20, 1985 at 8:53 a.m., the Oyster Creek Nuclear Generating Station experienced a main generator trip and reactor scram during normal ascension in power following plant startup. The cause of the generator trip was trip of the Main Generator "B" Phase differential Relay initiated by a failure of a current transformer installed on the "B" phase of the main generator output. The generator trip initiated a turbine trip, which in turn signaled the Reactor Protection System to initiate a reactor scram. Subsequent to resetting the scram, and while inserting the Intermediate Range Neutron Monitoring (IRMs), an operator inadvertently picked up an IRM range switch range 10 contact with reactor pressure less than 850 psig. This action initiated a reactor isolation and another reactor scram. Following the isolation scram, operators utilized the isolation condenser to control reactor pressure and took appropriate actions to return the plant to a stable condition.

The initial conditions for this event were:

Power 1535 MWt (80%)
Recirc Flow 13.2E4 gpm
Pressure 1020 psig
Level 162 inches
Mwe 510 Mwe

Plant Parameter	Simulator Variable
Individual Recirc Flow	T:FIA60A-E
APRM #1	T:XAPRM1
APRM #5	T:XAPRM5
Reactor Pressure (Wide)	T:PIA92A
Reactor Level A (GMAC)	T:LID59A
Total Feedwater Flow	T:FFID75
Feedwater Temperature	T:TI47
Total Steam Flow	T:FSID75
Recirculation Loop A Temp	T:TE31A
Recirculation Loop B Temp	T:TE31C
Recirculation Loop C Temp	T:TE31E
Recirculation Loop D Temp	T:TE31G
Recirculation Loop E Temp	T:TE31J

Results:

Two field changes were made to the procedure to update the drill file for DFRCS and to correct monitored variables.

The test was run several times on September 30, 1996 and several times again on October 7, 1996. The results were found to differ. Inconsistent operation of the Isolation Condensers occurred on both occasions.

AVAILABLE OPTIONS:

None.

OPTIONS TESTED:

None.

INITIAL CONDITIONS FOR TEST:

IC-43.

Establish the following conditions by adjustment of recirculation flow, control rod pattern, pressure control and level control, as necessary per Plant Procedures:

Power Level 1535 MWt (80%)
Recirc flow 13.2E4 gpm
Pressure 1020 psig
Level 162"

Range all eight (8) IRMs to Range 9 at Panel 4F.

FINAL TEST CONDITIONS:

Run Time: 6 Hours

The simulator failed this test due to inconsistent Isolation Condenser operation.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

TAR-OC-011, Reactor Scram on Turbine Generator Trip (November 20, 1985) dated December 20, 1985

Power shape Monitoring system Historical Data.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The Isolation Condensers did not perform properly during this test. A TR was previously written for resolution by December 30, 1996.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES05
14.8.15

TITLE: Reactor Scram on Neutron Monitoring System (TAR-012)

PREPARED BY/DATE: [signature] / 11/18/94

APPROVED BY/DATE: [signature] / 12/22/94

TEST DATE: 11/02/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF20	3.1.2(19)	Reactor trip
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures
MF26	3.1.2(25)	Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the transient evaluated in TAR-OC-012, Reactor Scram on Neutron Monitoring System.

On December 15, 1985 at 7:43 a.m., the Oyster Creek Nuclear Generating Station experienced a Neutron Monitoring Scram during steady state operation at full power.

The scram was initiated by a loose wire in turbine control valve position transmitter DT-3 which provides feedback to the electrical pressure regulator. When this signal was lost the control valves immediately began to close resulting in a pressure spike. This pressure spike caused a void collapse which resulted in a high neutron flux. The Average Power Range Monitor (APRM) recorders showed a sharp flux increase on all channels to approximately 113 percent (Channels 1-4) and 118 percent (Channels 5-8). The flow biased scram setpoint at the time was approximately 113 percent. Following the scram, automatic and manual actions were taken to return the plant to a stable condition.

In order to simulate the turbine control system failure mode, malfunction TCS-15, EPR FAILS HIGH/LOW will be used to cause the control valves to start closing.

Additional actions are taken to prevent Level Setdown, prevent automatic Feed Reg Block Valve closure, and to prevent automatic runout reset since these features did not exist at the time of this event.

The transient will be terminated when reactor level goes offscale high.

The test is performed by executing a Drill File on the instructor station. The drill file inserts malfunctions, starts and stops equipment, etc. so that, when run from the same IC, repeatable performance is assured.

Using the Validation Test Program (VTP), comparison plots of simulator data versus plant data were prepared for selected parameters.

The following data was collected:

Plant Parameter	Simulator Variable
Total Recirculation Flow	T:FIA72C
Recirculation Flow A	T:FIA60A
Recirculation Flow B	T:FIA60B
Recirculation Flow C	T:FIA60C
Recirculation Flow D	T:FIA60D
Recirculation Flow E	T:FIA60E
Recirculation Temperature A	T:TE31A
Recirculation Temperature B	T:TE31C
Recirculation Temperature C	T:TE31E
Recirculation Temperature D	T:TE31G
Recirculation Temperature E	T:TE31J
Core Delta Pressure	T:PIA07
APRM #1	T:XAPRM1
APRM #2	T:XAPRM5
Steam Flow	T:FSID75
Feed Flow	T:FFID75
Reactor Pressure (WR)	T:PIA92A
Reactor Pressure (NR)	T:PTID45
Reactor Level A (GMAC)	T:LID59A
Reactor Level (Wide Range)	T:LIA12

The Sequence of Alarms (SAR) printout and the PCS alarm printout were also attached.

Results:
One field change was made to the procedure during execution to compensate for the Digital Feedwater Control System (DFCS) installed on the simulator since the last test.

During a previous performance of this test, it was noted that the pressure response is extremely dependent on the difference in setpoint between the EPR and the MPR (an operator adjusted value). The test was repeated several times to determine the necessary setpoints. This correctly models plant performance as procedures caution the operator to keep the difference at 8 - 10 % to prevent a scram on EPR failure.

All alarms and automatic actions occurred as expected and no unwarranted alarms or automatic actions occurred.

Comparison of plant to simulator data for the parameters plotted show excellent agreement.

AVAILABLE OPTIONS:

Since this is a reproduction of an actual plant event, no test options are available.

OPTIONS TESTED:

No options are available for this test.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, adjust recirculation flow, control rods per the pull sheets, and other controls as necessary to achieve the following conditions:

Reactor Power	1907 MWt
Recirculation Flow	15.6E4 gpm
Reactor Pressure	1020 psig
Reactor Level Setpoint	160"
APRMs adjusted to power	99%
MPR Relay Position	15% from EPR Relay Position

A snapshot was stored in IC-90 for the initial conditions.

FINAL TEST CONDITIONS:

Run Time: 20 Minutes

At the conclusion of this test, the reactor is in a post scram condition with several malfunctions and switch overrides still active. The drill file puts the simulator into freeze. The simulator is capable of continuing the recovery operations under operator control should the instructor need to do so.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

TAR-OC-012, Reactor Scram on Neutron Monitoring system (December 15, 1985) dated January 13, 1986 (OCS-4997) was used to prepare the test procedure and to evaluate the results. This is an engineering evaluation of the actual plant event.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES06
14.8.16

TITLE: Reactor Scram on Anticipatory Turb Trip Sig. (TAR-013)

PREPARED BY/DATE: [signature] / 12/21/94

TEST DATE: 12/06/94

APPROVED BY/DATE: R Wardson / 12/22/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF20	3.1.2(19)	Reactor trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the transient evaluated in TAR-OC-013, Reactor Scram due to Anticipatory Turbine Trip Signal.

On March 6, 1986 at 2:22 a.m., the Oyster Creek Nuclear Generating Station experienced an anticipatory scram during steady state operation at approximately 92% power.

The scram occurred while performing the Anticipatory Turbine Stop Valve closures Test" when two turbine stop valves were partially shut in accordance with the surveillance procedure and an intermediate open in the position limit switch on the #1 Turbine Stop Valve caused concurrent trips of both Reactor Protection System (RPS) channels.

After the scram, Main Steam Isolation Valve (MSIV) closure occurred due to the mode switch being left in the RUN position while main steam line pressure dropped below 850 psig after the scram. A high reactor water level condition (> 182" TAF) also existed for approximately 12 minutes after the scram which precluded the use of the Isolation condensers and required the use of Electromatic Relief Valves (EMRVs) for reactor pressure control. Subsequent manual actions were taken to return the plant to a stable condition.

Prior to event the plant was operating a approximately 92% power (1774 Mwth at a reactor pressure of 1020 psig and a reactor water level of 160"). The turbine Generator was on-line at 590 Mwe. Recirculation flow was set at 15.8E4 gpm.

Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus plant data for the following parameters:

Plant Parameter	Simulator Variable
Total Recirculation Flow	WNSSTKRT
Recirculation Flow A	T:FIA60A
Recirculation Flow B	T:FIA60B
Recirculation Flow C	T:FIA60C
Recirculation Flow D	T:FIA60D
Recirculation Flow E	T:FIA60E
Recirculation Temp. A	T:TE31B
Recirculation Temp. B	T:TE31D
Recirculation Temp. C	T:TE31F
Recirculation Temp. D	T:TE31H
Recirculation Temp. E	T:TE31K
Core Delta Pressure	T:PIA07
APRM #1	T:XAPRM1
APRM #5	T:XAPRM5
Steam Flow	WNSSTKST
Feed Flow	WNSSTKFT
Reactor Pressure (WR)	T:PID45
Reactor Level A (GMAC)	T:LID59A
Reactor Level B (GMAC)	T:LIA12
APRM #2	T:XAPRM2
APRM #3	T:XAPRM3
APRM #4	T:XAPRM4
APRM #6	T:XAPRM6
APRM #7	T:XAPRM7
APRM #8	T:XAPRM8
Average APRM Power	SNISAPRM
Reactor Pressure (WR)	T:PIA92A

The SAR and the PCS alarm printouts were not attached as the PCS was failed during this test.

Results:

Three field changes were made to the test procedure to account for installation of the Digital Feedwater Control System since the last test.

Comparison of simulator data to plant data from the March 6, 1986 event and to the previous run of this test on December 21, 1992 shows very good agreement. Some differences caused by the Digital Flow Control System were noted. The Feedwater Flow remains at or above the initial flow for approximately 20 seconds, as designed, and the Recirc Loop Temperatures decrease rapidly during this time. The response differences are expected considering the modifications made since the last test.

AVAILABLE OPTIONS:

There are no options in this test which was written to duplicate an actual plant event.

OPTIONS TESTED:

There are no options in this test procedure.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, Full Power, a special test snapshot was stored in IC-21 with the following:

Adjust recirculation flow, control rods in accordance with the pull sheet and other controls as necessary to achieve the following conditions:

Reactor Power	1774 MWt
Recirculation Flow	15.8E4 gpm
Reactor Pressure	1020 psig
Reactor Level	160"

FINAL TEST CONDITIONS:

Run Time: 3 Hours.

At the conclusion of this test, the reactor is scrammed and the turbine has tripped. The simulator is capable of continued simulation but the malfunctions must be cleared by the instructor or IC reset.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

TAR-OC-013, Reactor Scram due to anticipatory Turbine Scram signal (March 6, 1986) dated May 12, 1986 was used for test procedure preparation and for comparison to the simulator response. The test results were also compared to the previous test results of December 21, 1992.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES07
14.8.17

TITLE: Reactor Scram on Excessive Feedwater Injection (TAR-015)

PREPARED BY/DATE: E Mooney / 12/3/96 TEST DATE: 10/09/96

APPROVED BY/DATE: R Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

MF20 3.1.2(19) Reactor trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the transient evaluated in TAR-OC-015, Reactor Scram Due to Excessive Feedwater Injection.

On December 24, 1986 at 2:49 a.m., the Oyster Creek Nuclear Generating Station experienced a scram in the startup mode of operation while reducing reactor pressure from 1000 psig to 500 psig in preparation for repairs to the 1-1 Reheater.

The scram occurred due to an excessive amount of feedwater being injected into the vessel. The positive reactivity added by the colder feedwater caused a short positive reactor period and subsequent coincident Intermediate Range Monitor (IRM) Hi-Hi Reactor Protection System trip signals. The rapid feedwater addition occurred due to a combination of operator errors while operating the Feedwater Control System, and resulted in a high reactor water level condition. The GEMAC reactor water level indication exceeded 180 inches TAF for a period of approximately 2 minutes.

Prior to the event the plant was operating at approximately 65% in IRM Range 9 with one bypass valve approximately 80% open (reactor pressure = 1008 psig and reactor water level = 163" TAF). The feedwater control system was in automatic with "C" Feed Pump running, "A" and "B" Feed Pumps secured.

Control Room operators commenced reducing power and pressure by inserting control rods in accordance with Procedure 203.2, "Plant Cooldown from Hot Standby to Cold Shutdown."

Reactor water level increased from 163" TAF to 174" TAF due to the reduced steam flow and the feedwater control system in automatic and regulating valve leakage. The operator controlling reactor level placed the Master Feedwater Controller and the Individual Feedwater controllers to manual ("C" Feed Regulating Valve controller was inadvertently left in "balance" position) and closed Feedwater Heater String outlet valves.

Another operator noticed the "C" Feed Regulating Valve local controller was in the "balance" position. The operator controlling reactor level then placed the controller in the manual position. A Loss of Feedwater Flow Control Power alarm which indicates a "Lock-up" of the "C" Feed Regulating Valve was received but not noticed.

The Number 1 Bypass Valve appeared to be stuck open from operator observation of, 1) indicating lights (both the closed and open lights on), 2) Selsyn indicator reading 10% open, and 3) a cooldown rate of approximately 60 degrees F/hr. An operator was attempting to shut the bypass valve by gaining control of it on the Mechanical Pressure Regulator and cycling it.

When reactor level decreased to approximately 160" an operator partially opened "C" Feed Heater String Outlet Valve in preparation for later adding feedwater to vessel through Heater Outlet valve to mitigate inventory loss through bypass valve.

The Feedwater Pump Runout alarm (now an amber light) was received due to "C" Feed Regulating Valve in partial or full open position while opening "C" Feed Heater String Outlet Valve.

Due to the excessive feedwater injection the following rapidly occurred:

SRM short Period alarm received.

The operator commenced closing the "C" Feed Heater String outlet valve.

Reactor High Level alarm received at 170" TAF.

Turbine Trip on high reactor water level occurred at 175" TAF. (Turbine-Generator was not on line.)

Reactor Protection System channel 2 tripped on IRM Hi-Hi signal causing half-scram.

Reactor Protection System channel 1 tripped on IRM Hi-Hi signal initiating a full scram.

GEMAC reactor water level indication exceeding 180" TAF.

Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus plant data for selected parameters.

The SAR alarm printout was also attached.

Results:

Three field changes were made to the procedure to account for modifications installed on the simulator since the last performance of this test and to correct monitored variables. One of the changes added a manual action my the test operator to open, and later close, the C Feedwater Reg. Valve. This step was previously performed by the drill file using switch overrides.

The Turbine Trip, IRM Flux Scram, and reactor pressure decrease occurred as expected. Some differences in level response and feed flow are apparent on the traces, attributable to not exactly duplicating the operator actions in the plant.

All automatic actions and alarms occurred as expected and no unwarranted alarms were received.

AVAILABLE OPTIONS:

There are no options for this test.

OPTIONS TESTED:

This test is written to duplicate an actual plant event and therefore has no options.

INITIAL CONDITIONS FOR TEST:

Starting from IC-11, cold Turbine Start, a test IC was prepared as follows:

Secure turbine warming, if in progress, in accordance with Procedure 315.1, Main Turbine Operation and/or Trip the Main Turbine.

Adjust recirculation flow, control rods per the pull sheets and other controls as necessary to achieve the following conditions:

Reactor Power - IRMs in range 5 at 5-15% scale; All Turbine bypass Valves closed.

Cooldown rate of 60F/Hr

Recirculation flow - 11.2E4 gpm (4F)

Reactor Pressure - 900 psig (7F) (Actual Pressure = 875 psig)

Reactor Level - Setpoint - 160" (4F)

Feedwater Pump "C" running with reactor level control in automatic (4F, 5F/6F)

These conditions were stored in IC-41 for the test.

FINAL TEST CONDITIONS:

Run Time: 6 Hours

At the conclusion of the test, the reactor is scrammed and the turbine tripped. The simulator is capable of continued simulation of recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

TAR-OC-015, Reactor Scram due to Excessive Feedwater Injection (December 24, 1986) dated March 11, 1987.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator problems were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES08
14.8.18

TITLE: Reactor Scram on Neutron Monitoring System (TAR-017)

PREPARED BY/DATE: [signature] / 12/3/96 TEST DATE: 10/07/96

APPROVED BY/DATE: R Davidson / 12/9/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

MF20 3.1.2(19) Reactor trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the transient evaluated in TAR-OC-017, Reactor Scram on Neutron Monitoring System.

On January 16, 1987, the Oyster Creek Nuclear Generating Station experienced a neutron monitoring system scram while starting the "E" Recirculation Pump while at 84% power with recirculation flow initially at 100,000 gpm.

Plant initial conditions were as follows:

a. The reactor was critical in the "RUN" mode at approximately 84% (1621 MWt) power. The plant was operating 2 to 3% into the Power to Flow Rod Block line.

b. The Turbine-Generator was on line at 535 MWe. The in-plant electrical distribution system was lined-up for normal power operation, with in-plant loads being supplied by the main generator via the auxiliary transformer. Both Emergency Diesel Generators were available for use.

c. The A, B, C and D Recirculation Pumps were running with a total flow of about 100,000 gpm.

d. All Feedpumps were operating and supplying makeup to the reactor.

e. All Safety Systems were available.

f. "E" Recirculation MG set had been running for approximately one hour to warm up the fluid drive unit oil. The "E" Recirculation loop suction and bypass valves indicated open and discharge valve indicated shut on Panel 3F.

g. "E" recirculation discharge valve was partially open even though it indicated closed (up to 20% open) per TAR-017.

When "E" recirculation was started, recirculation flow increased rapidly causing a neutron flux spike and resultant reactor scram.

NOTE: As a result of this event, the position indication for the recirculation valves was modified. The modification no longer allows closed indication with a valve partially open.

Therefore, this test procedure will not accurately represent plant conditions with respect to "E" recirculation discharge valve position.

The test is executed using a drill file which starts the recirc pump and then places the mode switch to shutdown, following the scram, to prevent MSIV closure. Level setdown is defeated for this test since it was not installed in the plant at the time of the event.

Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus plant data for selected parameters.

The following parameters were recorded:

Plant Parameter	Simulator Variable
Total Recirculation Flow	T:FIA72C
APRM Flux	T:XAPRM1,2,3,4,5,6,7,8
Core delta pressure	T:PIA07
Reactor Level (GEMAC)	T:LID59A
Reactor Pressure (WR)	T:PIA92A
Reactor Pressure (NR)	T:PTID45
Recirc Loop Suction Temp	T:TE31A,C,E,G,J
Feedwater Flow	WNSSTKFT
Feedwater Temperature	T:TI47
Steam Flow	WNSSTKST
Recirc Loop Flow	T:FIA60A,B,C,D,E
Reactor Thermal Power	SRXSTOTL

The SAR alarm printout was also attached.

Results:

Two field changes were made to the procedure to revise the drill file, operator actions, and response to account for the DFRCS and Diesel Generator modifications.

All alarms identified in the revised procedure actuated. No unwarranted alarms were received. All automatic actions occurred as expected.

The Reactor water level increased rapidly and much higher than the reference data and .han occurred during the last test in 1992. This is attributed to failing the level setdown and to

leakage added to the feedwater regulating valves since the last test.

The individual recirculation pump flows for the simulator and the reference data did not plot properly. The total recirculation flow confirms the correct test results.

Comparison of the other simulator parameters to data recorded during the actual plant event shows very good agreement.

AVAILABLE OPTIONS:

Since this test is written to duplicate an actual plant event, no options are available.

OPTIONS TESTED:

There are no options in this test.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, Full Power.

Remove Recirculation Pump E from service per Normal Operations Procedure 301.

Activate Malfunction NSS6E, Recirculation Discharge Valve Leakage to 5 % severity.

Adjust recirculation flow to 10E4 gpm (3F recorder) using master flow control on panel 4F.

Adjust power level to 84% (1621 MW) with control rods per the withdraw (insert) pull sheets.

At panel 3F, place the E Recirc Pump Controller in manual and raise the setting (v) to the maximum. Wait until the scoop tube is at maximum as indicated in LOA RFC-10 on the instructor station.

At panel 3F start "E" Recirculation Pump MG set.

On a PCS CRT call up the APRM vs. flow plot and adjust APRM gains to achieve power 2-3% above the Rod Block. All APRM Hi lights should be lit.

When conditions are stable, store in IC-196 for use during this test.

FINAL TEST CONDITIONS:

Run Time: 2.5 Hours

At the conclusion of this test, the reactor has scrammed on APRM Hi Flux from the rapid increase in recirc flow. The malfunction and switch overrides are still active but can be reset from the instructor station. The simulator is capable of continued simulation of recovery operations.

The simulator passed this test.

B. BASELINE DATA USED TO EVALUATE TEST RESULTS:

Transient Assessment Report (TAR-OC-017),Reactor Scram on Neutron Monitoring System (January 16, 1987) dated March 23, 1987 (OCS-0555) was used to write the procedure and evaluate the simulator performance.

Plant computer data from the actual event was loaded as reference data in the Validation Test Program.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES09
14.8.19

TITLE: Reactor Scram on High Water Level (TAR-018)

PREPARED BY/DATE: [signature] / 12/19/93

TEST DATE: 12/16/93

APPROVED BY/DATE: R Davidson / 12/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF17	3.1.2(15)	Turbine trip
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF20	3.1.2(19)	Reactor trip
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 -1985, Section 4.2 for the transient evaluated in TAR-OC-018, Reactor Scram on Reactor High Water Level.

On February 14, 1987 at 1:01 p.m., the Oyster Creek Nuclear Generating Station experienced an anticipatory reactor scram from a reactor high water level turbine trip during steady state operation at approximately 98.5% full power.

The scram occurred when a wire in the "A" feedwater flow loop was inadvertently pulled loose while routinely checking a temporary variation lifted lead in an adjacent wire harness. When the control loop circuit opened, the flow signal failed low. This caused a large flow mismatch in the reactor level control system, and the system properly responded by causing all three Feedwater Regulating Valves (FRV's) to open. The additional feedwater flow to the reactor increased vessel level to the turbine trip setpoint. The resultant turbine trip caused an anticipatory reactor scram on turbine stop valve closure.

The turbine stop valve closure produced a reactor pressure transient which led to a Reactor Recirculation pump trip, Electromatic Relief Valve lift, Isolation Condenser initiation, and turbine bypass valve opening in order to reduce reactor pressure.

During this event several operator actions involving feedwater control took place, including placing the A Feedwater Regulating Valve in Manual and reducing A feed flow rate slowly prior to the Turbine Trip and Reactor Scram.

Later in the transient feedwater pumps A and B were tripped and level was manually controlled using the C Feedwater Regulating Valve.

Since it is impossible to reconstruct manual control settings for the A and C Feedwater Regulating Valves, the following actions are substituted for testing purposes:

1. A Regulating Valve is placed in Manual but not manipulated.

2. A and B Pumps are tripped, but "C" Feedwater Regulating is left in automatic.

Justifications:

1. A Feed Regulating Valve stroke time was found to be excessive (30 sec. vs. 4-6 sec.).

2. After the scram and tripping of A and B Feedwater Pumps, the feed flow/steam flow mismatch was insignificant. Therefore, it is assumed that automatic control will approximate operator action.
   Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus plant data for the following parameters:

Plant Parameter	Simulator Variable
APRM #1	T:XAPRM1
APRM #5	T:XAPRM5
APRM #3	T:XAPRM3
APRM #7	T:XAPRM7
Feedwater Flow	WNSSTKFT
Steam Flow	WNSSTKST
Reactor Level A (NR)	T:LID59A
Reactor Pressure WR	T:PIA92A

The SAR was also attached.

Results:

Three field changes were made to the test procedure to delete the expected 1/2 scram, shorten the drill file run time, place the mode switch in shutdown, and clarify the response of one alarm.

All alarms identified in the procedure activated as expected.

The response to this event is significantly improved since the initial certification test. Previously, reactor high pressure and neutron flux scrams were received on the simulator while only a turbine trip scram was expected. During this test performance, the turbine trip scram clearly occurred first. No flux scram was received and the scram setpoint for reactor pressure was reached after the turbine trip and reactor scram.

AVAILABLE OPTIONS:

There are no options in this test procedure. It was written to duplicate an actual plant event.

OPTIONS TESTED:

There are no options in this test procedure.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, full Power Operations, special test snapshot was prepared and stored as IC-96.

Remove the "B" Recirculation per Procedure 301 while maintaining reactor power near rated (Approximately 1900 MWt). Test personnel neglected to perform this step but it has no effect on the test results.

Adjust Recirculation flow, control rods per the pull sheets and other controls as necessary to obtain the following conditions.

1.	Reactor Power	1893 MWt
2.	Recirculation Flow	15.1E4 gpm
3.	Reactor Level	160 inches
4.	Reactor Pressure	1018 psig

FINAL TEST CONDITIONS:

Run Time: 1 Hour.

At the conclusion of this test, the turbine is tripped and the reactor is scrammed. The simulator is capable of continued simulation of recovery operations. The malfunction can be cleared if desired.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

TAR-OC-018, Reactor Scram on High Water Level (February 14, 1987) dated April 15, 1987 (OCS-5001) was used to prepare the test procedure and to review the test results.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES10
14.8.20

TITLE: July 17, 1980 Blowdown Transient

PREPARED BY/DATE: [signature] / 2/10/93

TEST DATE: 02/06/93

APPROVED BY/DATE: [signature] for R. Davidson / 2/18/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF20	3.1.2(19)	Reactor trip
MF26	3.1.2(25)	Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the July 17, 1980 EMRV and Bypass Valve Blowdown Events which was recorded via the plant PSMS computer. These transients should be useful in establishing correct responses in reactor pressure and level to sudden changes in reactor steam flow at low power level.

On July 17, 1980 during a reactor startup, reactor pressure control via the MPR was lost when the #2 Vacuum Trip (Bypass Valve Trip) was inadvertently not reset due to equipment failure (indication showed RESET).

As a result an EMRV lifted while the reactor remained critical (setpoints were different in 1980) and then reseated after a 50 psig decrease in pressure.

The reactor again began to pressurize, but prior to reaching the EMRV setpoint, control rods were inserted to cause reactor pressure to slowly decrease from a maximum of about 1035 psig. Apparently because no bypass valves opened during the initial heatup and pressure increase, the MPR was left at a very low setting; assumed to be 900 psig for this transient.

When an operator in an attempt to regain pressure control pushed the #2 Vacuum Trip Reset button, the 9 Bypass Valves opened fully. Realizing that a blowdown was in progress, the #2 Vacuum Trip was manually inserted approximately 15 seconds

later. The reactor scrammed on low level due to void collapse and inventory loss when the valves closed.

During both the EMRV and Bypass Valve operations it was apparent that very brief indications of LO-LO-LO Water Level occurred.

During the EMRV operation RBCCW to the containment isolated with no other LO-LO-LO Level indication. (There was no LO-LO-LO/RBCCW isolation time delay at this time).

During the Bypass Valve Operation only a small blip on the old event recorder showed indication of LO-LO-LO Water Level.

These LO-LO-LO indications may or may not develop on the simulator. This test will determine the answer.

Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus plant data provided for the July 17, 1980, blowdown events for selected parameters:

The SAR and PCS alarm printouts were attached.

Results:

Five field changes were made to the procedure to correct monitored variables, correct the Drill File listing, Correct the Initial Conditions, include all operator actions in the drill file, and to trigger bypass valve operation from reactor pressure in the drill file.

The plant data could not be plotted on the instructor station using the validation test program. The plots therefore contain only simulator data. The simulator plots were compared to the original plant data plots.

The simulator results compare quite well with the plant results from this event, with the possible exception of the indicated recirculation flow response. The plant recirc flow response was considerably more dynamic than the simulator. The reference data report contains several discussions of the recirc flow response, most of which is speculative. Since the actual effects are not understood, the simulator response will be acceptable as is.

The Lo-Lo-Lo Level signal, which only momentarily actuated in the plant, was not received on the simulator. The cause of the Lo-Lo-Lo level in the plant is not fully understood, but is speculated to be the result of a shock wave. The simulator response is acceptable.

AVAILABLE OPTIONS:

There are no options in this test. The test was written to duplicate an actual plant event.

OPTIONS TESTED:

There are no options in this test.

INITIAL CONDITIONS FOR TEST:

Starting from IC-9, Approach to Critical, the following test conditions were achieved and stored in IC-48 for the test:

Recirculation Flow 5.24E4gpm

Main Turbine Warmup in Progress

#2 Vacuum Trip not rest

MPR Setpoint approximately 900 psig

EPR Setpoint approx. 1010 psig

Reactor Heatup Rate 70-75 degrees F/hr.

Reactor Level Control in Manual at 150 inches

Rod Worth Minimizer in service with full core display on the screen. (This was not accomplished)

Reactor Steam flow approx. 0.158E6 lb/hr

Reactor Pressure 1020 psig

FINAL TEST CONDITIONS

Run Time: 2 Hours

At the conclusion of this test, the reactor has scrammed from Low Reactor Water Level. Several malfunctions are active which prevent Reactor High Pressure Scram and Isolation Condenser Isolation. The simulator is capable of continued simulation of recovery events, but instructor action is required to clear the malfunctions.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

July 17, 1980 blowdown Events Transient Data Package, September 11, 1990.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Although there were differences in the simulator and plant observed response, no TRs were written on the test results. As stated above, the plant recirculation flow response is not well understood and the reason for the brief Lo-Lo-Lo Level signal in the plant is speculative. The Power, Level, and Pressure response of the simulator were quite good. The simulator response therefore is considered acceptable.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: OES11
14.8.21

TITLE: Generator Runback Scram - December 1995

PREPARED BY/DATE: [signature] / 12/2/96 TEST DATE: 11/27/96

APPROVED BY/DATE: R Davidson 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF8 3.1.2(6) Loss of service or cooling water to individual components

MF10 3.1.2(8) Loss of component cooling system or cooling to individual components

MF17 3.1.2(15) Turbine trip

MF18 3.1.2(16) Generator trip

MF20 3.1.2(19) Reactor trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5.

TEST DESCRIPTION:

The purpose of this test is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the transient evaluated in TAR-OC-034, Generator Runback Scram.

On December 18, 1995 at 04:37:04, the Oyster Creek Nuclear Generating Station shut down automatically as a result of a High Reactor Pressure condition during a Turbine Generator Runback. Generator protection initiated the runback when a high stator cooling temperature setpoint of 89 C was reached due to a failing temperature control valve (V-Y-7). The valve's feedback linkage slowly failed starting on December 15, 1995, allowing flow to bypass around the stator cooling system heat exchangers. The stator temperature steadily increased until the stator cooling outlet temperature reached 88C prior to performing post maintenance testing of the #1 TBCCW Pump at 04:30 on December 18. When the pump was started, the stator temperature control valve bypassed more flow causing the stator temperature to exceed the runback setpoint.

At 04:35:56, the STATOR COOLINC TROUBLE alarm was received and the CRO reported that temperatures had increased rapidly. The SRO ordered actions to mitigate the consequences of a generator runback. While in the process of reducing recirc pump flow, the automatic reactor scram occurred on high pressure. The plant response was as expected for the event. One control rod (30-11) settled at position "02" and was manually inserted to position "00".

The event is simulated using malfunction GEA-7, Loss of Stator Cooling Water. The malfunction and subsequent operator action of Mode Switch to Shutdown and tripping of feedpumps are performed using a drill file. Reduction of recirc flow was not simulated because the scram occurred prior to any effect from recirc flow changes.

Using the Validation Test Program (VTP), prepare comparison plots of simulator versus plant data for the following parameters:

Plant Parameter Variable	Simulator
Reactor Pressure	T:PIA92A
Reactor Pressure	T:PTID45
Reactor Level	T:LID59A
Reactor Level	T:LRE21A
Total Steam Flow	WNSSTKST
Total Feedwater Flow	WNSSTKFT
Reactor Power (APRM)	SNISAPRM

This is a new test added to the certification test program in 1996 to include recent plant event data.

Results:

Two field changes were made to the procedure to add additional comparisons to plant data and to record actual simulator response times.

Two alarms received in the plant, Battery Charger A Trip and Cleanup Disc. Press Lo were not received on the simulator. The Cleanup alarm in the plant was caused by a badly worn Pressure control valve which was later replaced. The alarm should not normally occur during this event.
The reviewers determined that this was not significant.

The simulator scrammed on High Neutron Flux from the APRMs while the plant scram was caused by High Reactor Pressure. The test was repeated on the simulator with the APRM scram blocked and the High Pressure scram occurred approximately two seconds later. On pressurization transients such as this, either pressure or flux may initiate the scram. The reviewers agreed that the simulator response is acceptable. An investigation will be performed to determine why the simulator flux rises slightly faster than the plant.

Except as noted above, all automatic actions occurred and all expected alarms were received. The simulator response matched the plant data extremely well both in magnitude and in timing.

This is the first significant transient to occur in the plant since installation of several major modifications (DFRCS, Generator Protection) to both the plant and the simulator. Comparison of the simulator to the plant data for this event should be given a high weighting factor. The excellent results confirm a high degree simulator fidelity.

AVAILABLE OPTIONS:

This test was designed to match an event that occurred in the plant. Therefore no options are available.

OPTIONS TESTED:

There are no options for this test.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, 100% Power, adjustments were made to achieve the following conditions:

Reactor Power:	1927.6MWt
Recirculation Flow:	15.27E4 gpm
Reactor Level:	160 inches

FINAL TEST CONDITIONS:

At the conclusion of this test, the turbine is tripped and the reactor is scrammed. The simulator is capable of continued simulation of recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

Transient Assessment Report TAR-OC-034, Automatic Reactor Scram caused by a Generator Runback was used for test procedure preparation and results evaluation. The event occurred at Oyster Creek on December 18, 1995.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: RTT01
14.11.2.1

TITLE: Gould Computer Spare Time Test

PREPARED BY/DATE: [signature] / 12/4/96 TEST DATE: 11/27/96

APPROVED BY/DATE: R Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A1 A3.1 Computer real time test

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

TEST DESCRIPTION:

To demonstrate that the spare duty cycle meets the contractual requirements, as stated in Section 8.3.5 of the Conformed Document.

The RESOURCE program will be used to measure the duty cycle at each second and print the results via the DUTYLOG tasks. Three separate tests will be performed.

The first test is LOCA with Loss of Offsite Power (14.8.8) composite Malfunction. All actions are setup in the system file called DUTYCY1.

The second test is Stuck Open EMRV with Stuck Open Vacuum Breaker (14.6.44.6) Composite Malfunction. All actions are setup in the system file called DUTYCY2.

The third test is Loss of Offsite Power, Failure of Turbine Trip, Loss of "A" 125V DC Battery (14.6.44.12) Composite Malfunction. All actions are setup in the system file called DUTYCY3.

Each test is run for 15 minutes and the duty cycle for each processor is printed out at 1 second intervals for the test duration.

Results:

One field change was made to the procedure to reduce the required spare processor time from 25% to 20% on any single Encore processor and from 45% to 35% average of both processors on any Encore computer. These changes are consistent with relief given to Westinghouse in contract negotiations.

The test was performed on November 15, 1996. During this test, IPU-2, although it met the required spare time requirements, was found to have excessive duty time of about 75% compared to the expected 50%. The cause of the change in duty cycle was investigated and a switch on an IPU-2 circuit board was found out of position. The switch may have been mispositioned during diagnostic testing of this processor the previous evening.

The test was repeated on November 27, 1996, and all processors met the revised acceptance criteria.

AVAILABLE OPTIONS:

There are no options available for this test.

OPTIONS TESTED:

There are no options available for this test.

INITIAL CONDITIONS FOR TEST:

100 percent power initial condition (IC-15).

No non-real time tasks active.

FINAL TEST CONDITIONS:

Run Time: 3 Hours

At the conclusion of each test, the simulator must be initialized to clear the malfunctions inserted to stress the simulator.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

As stated above, IPU-2 was found to have a high usage, within acceptance criteria. This was corrected and the test was repeated successfully.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: RTT02
14.6.45.1

TITLE: Simulator Real Time Test

PREPARED BY/DATE: [signature] / 9/26/96

TEST DATE: 09/06/96

APPROVED BY/DATE: R W Davidson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A1	A3.1	Computer real time test

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

TEST DESCRIPTION:

The purpose of this test is to certify that the simulator continues to run in real-time when stressed under transient conditions.

With the simulator initialized to full power, closure of the "E" Recirc. Pump Discharge valve is timed. While stroking the valve, the following events are used to stress the simulator:

a) Failure of Automatic SCRAM (ARI operable)
b) MSIV closure
c) Large Break LOCA
d) Loss of Off-Site power

The test is performed using Drill file RRT_02. This file inserts malfunctions and switch overrides in a preprogrammed, repeatable manner.

The stressed and non-stressed valve stroke times are compared.

The procedure does not require automatic data collection but the SAR printout was attached.

Results:

One Field Change was made to the procedure to add a trend plot of Encore CPU and IPU Duty Cycle.

The Recirc Pump Discharge valve closed in 117.8 seconds in the unstressed condition and 117.78 seconds in the stressed condition, well within the acceptance criteria for the test.

AVAILABLE OPTIONS:

No Options are applicable to this test.

OPTIONS TESTED:

There are no options available for this test.

INITIAL CONDITIONS FOR TEST:

IC-15 - 100% Power, Cycle 15 Core, MOL

A temporary IC (SNAP) was created with DG-2 running and supplying power to Bus 1-D.

Drill file RRT02 is run to initiate the transient and initiate Recirc. Discharge valve closure.

FINAL TEST CONDITIONS:

Run Time: 45 Minutes

At the conclusion of this test, reset to an IC is required to clear the malfunctions.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator.

The stressed and non-stressed valve stroke times must agree within 0.25 second and the simulator "Not In Real-Time" alarm must not actuate.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

Nore.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: SSP01
14.5.4

TITLE: 100% Steady-State Accuracy Test

PREPARED BY/DATE: [signature] / 11/4/96 TEST DATE: 10/21/96

APPROVED BY/DATE: R Davidson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE9 3.1.1(9) Core performance testing:
1. Heat balance
2. Shutdown margin measurement
3. Reactivity coefficient measurement
4. Rod worth measurement

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A2 A3.2(1) Steady state and normal operations tests (stability)

ANS 3.5 APPENDIX B REQUIREMENTS

B3 B1.1 Steady state stability 100% power

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

The simulator instrument error shall be no greater than that of the comparable meter, transducer and related instrument system of the reference plant.

Principal mass and energy balances shall be satisfied. Examples are:

a. Net NSSS thermal power to generated electrical power;
b. Reactor coolant system temperature to reactor pressure;
c. Feedwater flow to reactor thermal power
d. Mass balance of reactor.

The simulator computed values for steady state, full power operation with the reference plant control system configuration shall be stable and not vary more than +/- 2% of the initial values over a 60 minute period.

The simulator computed values of critical parameters shall agree within +/- 2% of the reference plant parameters and shall not detract from training. Critical parameters are identified in Attachment 5.

The Calculated values of non-critical parameters pertinent to plant operation, that are included on the simulator control room panels, shall agree within +/- 10% of the reference plant parameters and shall not detract from training.

TEST DESCRIPTION:

This test procedure is used to meet the ANSI/ANS 3.5 Appendix A, item A3.2 and Appendix B, item B1.1 for a 100% rated thermal power Steady State Performance Test.

Observation of parameter drift and comparison to calculated PEPSE data is done manually and by using a drift calculation computer program. After initial adjustments to the IC, no control board manipulations are permitted during this test.

A large number of simulator variables are monitored by activating monitoring file OCSDRIFTCD. This file includes the applicable variables identified in ANSI/ANS 3.5, Appendix B, item B1.1. Selected datapool printouts are retained with the test results.

The procedure also includes manual calculations of both primary and secondary mass and energy balances. Plant procedure 1001.6 is used for the manual heat balance.

Core performance calculations are also performed by taking TIP traces and executing the stimulated PSMS Forced state calculation.

Comparison of simulator control board meter and recorder displays to model calculated values is included.

Results:

Reactor Power was set to 1930 MWt which compares with the PEPSE benchmark power.

Overall, the agreement between the PEPSE analysis and simulator performance was excellent. Reactor power calculated using the manual method, PSMS, and the simulator all agreed within 0.06%. All energy is accounted for except 0.263%, which would correspond to secondary plant heat loss. Electrical power agreed with the PEPSE data within 2.5 MWe (0.38%).

The primary system showed a loss of 11.56 lbm mass during the 1 hour test, an incredibly small amount. The sumps and drain

tanks decreased 1066 lbm and transferred 1300 lbm mass to radwaste (which is lost). The mass difference 11.56 - (-1066 + 1300) = -222.44) is not accounted for. This difference (0.0024%) has no impact on training and is considered acceptable.

It was noted that there is zero leakage to both the drywell sump and the RBEDT. A PLP for drywell unidentified leak rate is scheduled as a simulator upgrade. Currently, NSS leakage can be addded but a malfunction must be activated, reducing the number of malfunctions that can be used. Initial Conditions could be adjusted to obtain some flow into the RBEDT by adjusting applicable system leakage PLPs.

Several variables were found to exceed the acceptance criteria for the difference between simulator and PEPSE data because of operator controlled parameters or Instructor controlled PLPs which were not set in the IC to match the PEPSE data. These were found to be acceptable.

Two individual Recirculation Pump Flow Indicators exceeded the allowable difference of 1% from the calculated value. A request for hardware maintenance was submitted.

The Total Recirculation flow matched the PEPSE data within 0.6%. Individual Recirc Loop flows, however, varied in excess of the 1% limit in the procedure, with a maximum difference of 3.14%. This condition is considered acceptable.

Several internal turbine enthalpies and flows were found to differ significantly from the expected values. Since these are minor flows (e.g. Liquid Flow from an Extraction Point), they were found to be acceptable.

A drift test was also performed in this procedure using an automatic data collection and evaluation program. The parameter drift was found to be acceptable. (Within +/- 2% or 10% as applicable)

AVAILABLE OPTIONS:

There are no options available in this procedure.

OPTIONS TESTED:

There are no options available in this procedure.

INITIAL CONDITIONS FOR TEST:

IC-15 Full Power, Cycle 15 Core, MOL

FINAL TEST CONDITIONS:

The final conditions for this test are identical to the initial conditions. The test is run for 60 minutes after the simulator has stabilized.

Actual execution time: 6 hours total time.

The simulator passed this test. Several control panel meters were found to differ from the calculated values by more than the 1% limit in the procedure. A request was made for hardware calibration of the meters.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The following documents were used for the acceptance criteria:

1. 100% Power PEPSE Heat Balance (10/12/90)
2. 100% Power Plant data:
   a. Control Room Logs 5/14-15/89
   b. 100% PCS computer dump 5/16/89
3. ANSI/ANS 3.5, Section 4.1.
4. Plant TIP Traces and Limits calculations from 9/28/95.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Several variables were found to exceed the acceptance criteria for the difference between simulator and PEPSE data as described above. These were found to be acceptable.

Two meters were found to differ from the calculated parameter value by more than 1%. The meters will be adjusted.

Other minor deviations are discussed in the results section above.

EXCEPTIONS TO ANSI/ANS 3.5-198[illegible] TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: SSP02
14.5.3

TITLE: 75% Steady-State Accuracy Test

PREPARED BY/DATE: [signature] / 11/12/96 TEST DATE: 10/21/96

APPROVED BY/DATE: R Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE9 3.1.1(9) Core performance testing:
1. Heat balance
2. Shutdown margin measurement
3. Reactivity coefficient measurement
4. Rod worth measurement

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A2 A3.2(1) Steady state and normal operations tests (stability)

ANS 3.5 APPENDIX B REQUIREMENTS

B2 B1.1 Steady state stability 75% power

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

The simulator instrument error shall be no greater than that of the comparable meter, transducer and related instrument system of the reference plant.

Principal mass and energy balances shall be satisfied. Examples are:

a. Net NSSS thermal power to generated electrical power;
b. Reactor coolant system temperature to reactor pressure;
c. Feedwater flow to reactor thermal power
d. Mass balance of reactor.

The simulator computed values for steady state, full power operation with the reference plant control system configuration shall be stable and not vary more than +/- 2% of the initial values over a 60 minute period.

The simulator computed values of critical parameters shall agree within +/- 2% of the reference plant parameters and shall not detract from training. Critical parameters are identified in Attachment 5.

The Calculated values of noncritical parameters pertinent to plant operation, that are included on the simulator control room panels, shall agree within +/- 10% of the reference plant parameters and shall not detract from training.

TEST DESCRIPTION:

This test procedure is used to meet the ANSI/ANS 3.5 Appendix A, item A3.2 and Appendix B item B1.1 for a 75% rated thermal power Steady State Performance Test.

Observation of parameter drift and comparison to calculated PEPSE data is done manually and by using a drift calculation computer program. After initial adjustments to the IC, no control board manipulations are permitted during this test.

A large number of simulator variables are monitored by activating monitoring file (OPS)DRIFTCD. This file includes the applicable variables identified in ANSI/ANS 3.5, Appendix B, item B1.1. Selected Datapool printouts are attached to the procedure.

The procedure also includes manual calculations of both primary and secondary mass and energy balances.

Core performance calculations are performed in this test by taking TIP traces and executing a PSMS Forced State calculation.

Comparison of simulator control board meter and recorder displays to model calculated values is included.

Results:

Overall, the agreement between the PEPSE analysis and the simulator performance was excellent. All energy is accounted for except 0.784%, which would correspond to secondary plant heat loss. Electrical power agreed with the PEPSE data within 1.2 MWE (-0.25%)

The stability of the simulator was excellent.

The Primary System showed a gain of 12.8 lbm during the 1 hour test. In addition, the sumps and drain tanks increased 449 lbm and transferred 1045 lbm to radwaste (which is lost). The mass increase (12.8+449+1045) = 1506.8 is not accounted for. This difference (0.037%) has no impact on training and is

considered acceptable.

Reactor Power calculated by the simulator model (parameter visible to the instructor only), the manual heat balance Methods 1 and 2 using simulator panel instruments for data, PEPSE, and the stimulated Plant Process computer, agreed within 0.18% at this power level.

Model variable comparison between the simulator and PEPSE showed excellent agreement for flow, temperature, pressure and enthalpy at inlet, outlet, extraction points and various drains within the secondary plant. With few exceptions, the data agreed within 1%.

It was noted that there is zero leakage to both the drywell sump and the RBEDT. A PLP for drywell unidentified leakage is planned as a simulator upgrade.

Several variables were found to exceed the acceptance criteria for the difference between simulator and PEPSE data because of operator controlled parameters or instructor controlled PLPs which were not set in the IC to match the PEPSE data. These were identified with an "IC" on the data sheet.

Other differences noted were previously identified in the 100% Steady-State Accuracy Test, SSP01 and will not be described in detail here. These include:

Feed Pump Suction and Discharge Pressure
Several internal turbine parameters.

A drift test was also performed in this procedure using and automatic data collection and evaluation program. The parameter drift was found to be acceptable. (Within +/- 2% or 10% as applicable)

Several turbine and feedwater heater flows and enthalpies differ significantly from the values obtained in the test one year ago. During the last year, significant improvements were made in the Feedwater Heater model to more closely match plant steady state and transient behavior.

AVAILABLE OPTIONS:

There are no options available in this procedure.

OPTIONS TESTED:

There are no options available in this procedure.

INITIAL CONDITIONS FOR TEST:

IC-16, 75% Power, MOL, Cycle 15.

The conditions are:

Reactor Power	1447.5 MWt
Reactor Pressure	1020 psig
Reactor Level	160 in. TAF
Circ. Water Temp.	60 F

Recirc flow was 89,000 gpm to more closely match the known cycle 15 operating conditions in the IC. The PEPSE calculations were performed with a recirc flow of 98,500 gpm.

FINAL TEST CONDITIONS:

The final conditions for this test are nearly identical to the initial conditions. The test is to be run for 60 minutes after the simulator has stabilized.

Actual execution time: 5 Hours.

Several control panel meters were found to differ from the calculated values by more than the 1% or 5% limit in the procedure. The meter calibration will be checked.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The following documents were used for the acceptance criteria:

1. 75% Power PEPSE Heat Balance (10/12/90)

2. 75% Plant data:
   a. Control Room Logs 5/14-15/89
   b. 75% PCS computer dump 5/14/89

3. ANSI/ANS 3.5, Section 4.1.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Several variables were found to exceed the acceptance criteria for the difference between simulator and PEPSE data as described above. These were found to be acceptable. A few minor differences in enthalpy and pressure within the turbine and feedwater heaters was observed but determined to be insignificant.

Five control panel meters were found to differ from the calculated parameter value by more than 1%. The meters will be adjusted.

Other minor deviations are discussed in the results section above.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None.

O C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: SSP03
14.5.1

TITLE: 39% Steady-State Accuracy Test

PREPARED BY/DATE: [signature] / 11/18/96 TEST DATE: 10/22/96

APPROVED BY/DATE: R Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

NE9 3.1.1(9) Core performance testing:
1. Heat balance
2. Shutdown margin measurement
3. Reactivity coefficient measurement
4. Rod worth measurement

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A2 A3.2(1) Steady state and normal operations tests (stability)

ANS 3.5 APPENDIX B REQUIREMENTS

B1 B1.1 Steady State Stability 25% power

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

The simulator instrument error shall be no greater than that of the comparable meter, transducer and related instrument system of the reference plant.

Principal mass and energy balances shall be satisfied. Examples are:

a. Net NSSS thermal power to generated electrical power;
b. Reactor coolant system temperature to reactor pressure;
c. Feedwater flow to reactor thermal power
d. Mass balance of reactor.

The simulator computed values for steady state, full power operation with the reference plant control system configuration shall be stable and not vary more than +/- 2% of the initial values over a 60 minute period.

The simulator computed values of critical parameters shall agree within +/- 2% of the reference plant parameters and shall not detract from training. Critical parameters are identified in Attachment 5.

The Calculated values of noncritical parameters pertinent to plant operation, that are included on the simulator control room panels, shall agree within +/- 10% of the reference plant parameters and shall not detract from training.

TEST DESCRIPTION:

This test procedure is used to meet the ANSI/ANS 3.5 Appendix A, item A3.2 and Appendix B, item B1.1 for a 25% rated thermal power Steady State Performance Test. The power level of 39% vs. 25% was selected to closely match existing PEPSE calculations for the plant. The only significant difference in the plant operating condition between 25% and 39% is that the Feedwater Heaters are in service at 39% but not at 25%.

Observation of parameter drift and comparison to calculated PEPSE data is done manually and by using a drift calculation computer program. After initial adjustments to the IC, no control board manipulations are permitted during this test.

A large number of simulator variables are monitored by activating monitoring file (OPS)DRIFTFILPWR. This file includes the applicable variables identified in ANSI/ANS 3.5, Appendix B, item B1.1.

The procedure also includes manual calculations of both primary and secondary plant mass and energy balances.

Comparison of simulator control board meter and recorder displays to model calculated values is included.

Core performance data is collected by running TIP traces and by forcing a PSMS Core State calculation.

Results:

The test was initially performed on October 22, 1996. In reviewing the test results, it was later discovered that several valves were in the wrong position in the IC. The Main Flash Tank vents and drains to the C High Pressure Heater were opened and the IP and HP Heater Alternate Drains were closed and the IC was resnapped. A portion of the test was repeated on November 13, 1996 to collect the data for the energy balance.

During the first attempt at this test on October 22, the Digital Feedwater System quit 50 minutes into the test. The

test was restarted. A TR was previously written on this problem.

With One exception, all of the monitored parameters were very stable, well within the required +/- 2% or 10%, as applicable. The second stage reheater drain tank enthalpy drifted down during the test. Since the second stage reheaters are out of service for this test, ambient heat loss from the drain tank is the apparent cause of the downward drift.

Several variables differed from the PEPSE values due to simulator initial conditions which are adjustable by the operator. Process variables affected by this difference were identified in the procedure.

The reactor power calculated using the plant procedure 1001.6 shows excellent agreement with both the simulator displayed value and the stimulated PCS calculation.

The energy into the condenser differs from the heat removed by circ water by more than 1% (actual difference -1.585%).

When compared to the last test performed on June 16, 1995, additional variables were found to differ from the expected values. This is attributed to tuning changes to the feedwater heater model. Stability of the simulator remains excellent.

AVAILABLE OPTIONS:

There are no options available in this procedure.

OPTIONS TESTED:

There are no options available in this procedure.

INITIAL CONDITIONS FOR TEST:

IC-48 39% Power

No Control Board manipulations are permitted after the power is adjusted to 39% at the beginning of the test, prior to collecting data.

FINAL TEST CONDITIONS:

The final conditions for this test are identical to the initial conditions. The test is to be run for 60 minutes after the simulator has stabilized.

Actual execution time: 5 Hours

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The following documents were used for the acceptance criteria:

1. 39% Power PEPSE Heat Balance.
2. 39% Power Plant Data.
   a. Control Room Logs 5/11/89
3. ANSI/ANS 3.5, Section 4.1.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Several of the turbine internal variables exceeded the procedure limit of +/- 1% or 5%, most likely attributable to the use of a more refined calculation in the simulator than in the PEPSE analysis. The differences have no impact on training.

Three control board instruments (the B and D Recirc Flow Meters and the CRD Flow indicator) were found to exceed the allowable error of +/- 2%. A Hardware Maintenance Request was issued to check the calibration.

The Total Steam Flow indication was found the exceed the +/- 1% limit. This is attributed to the data collection technique of the test personnel. The digital indication on the recorder fluctuates during steady state operation and was therefore recorded incorrectly.

Other discrepancies were identified in the results section above and in the 100% Power Steady State Test results.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS01
14.6.20.4

TITLE: Recirc Loop Rupture (Unisolable)

PREPARED BY/DATE: [signature] / 10/16/96 TEST DATE: 10/10/96

APPROVED BY/DATE: RDWainson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF1 3.1.2(1)(b) LOCA inside & outside containment

MF2 3.1.2(1)(c) Large & small reactor coolant breaks, including demonstration of saturated conditions

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Piping failure.

The selected recirc loop suction line will rupture, with the break size as selected by the instructor. The rupture is

unisolable. Maximum flow area = 671 square inches.

With the malfunction activated to the maximum leak size, the reactor water level will decrease to below the core and the drywell pressure and temperature will increase, as indicated by the various instruments in the control room. The LOCA will cause many control room panel annunciators to alarm, the primary ones are identified in the test procedure. Automatic actions are extensive, including:

Automatic Depressurization (ADS) - Depending on Leak Severity
Core Spray initiation
Containment Spray initiation
MSIV closure
Reactor isolation
Containment isolation
Reactor Scram
ARI initiation
Isolation Condenser initiation

The Following Data was recorded on the 8 pen recorders:

T:PIP08 Drywell pressure (Hi Range 0-75psig)
T:TPCNDVB Drywell temperature
T:PIP12 Torus pressure
T:TI43A Torus Bulk temperature
LNSSMPB Rx level (FZ)
T:PIA92A Rx pressure
T:LT37 Torus level
T:RI79 Containment radiation (CHRMS)
T:LIA1 Rx level (Wide Range)
SNISA RM Rx Power
T:FFID75 Total feedwater flow
T:LT15 Hotwell level (LT-15)
T:LI35 Condensate storage tank level
T:F27A Core spray system 1 flow
T:F27B Core spray system 2 flow
ZPCNDRH Drywell humidity
T:TE451 GEMAC Level ref. leg temp
RRTCLDMX Max fuel clad temperature
T:FID33A Main steam line A flow
T:FID33B Main steam line B flow
T:RN06A,B,C,D Main steam line radiation

RRWBREA(1) Flow rate from break
T:R1625 Stack Gas Radiation
PTBSNSS Turbine Building pressure
T:TTRNM Trunion room temperature
T:XHA223 Containment H2 Level
T:XOA231 Containment O2 Level

The SAR alarm printout was also attached.

Results:

One field change was made to the procedure to Correct monitored variables.

The procedure anticipates that the Lo Lo Lo Level switches will activate, initiating Automatic Depressurization (ADS). During this test, the Lo Lo Lo Level switches did not actuate. The test was repeated, but not documented, at reduced severity (20%) which resulted in activation of the Lo Lo Lo Level switches. Test personnel noted that improvements in the modeling of the level instrumentation were made since this test was last executed in 1993. When this malfunction is activated at 200%, the reactor depressurizes very rapidly, allowing Core Spray Injection which causes erroneously high level indication at the Lo Lo Lo Level switches. This response was judged to be correct.

Both Isolation Condensers Initiated from the Lo Lo Water Level signal then isolated from a high flow signal. During the previous test in 1993, the Isolation Condensers did not isolate.
All alarms and automatic actions identified in the procedure actuated as expected.

The procedure includes a mass and energy balance. This section of the procedure was not performed however, because many of the variables identified in the test procedure do not exist.

The Primary Containment response differed slightly from the response described in the procedure. The Torus temperature increased only 25 degrees, vs. 40 expected. The reviewer considers this response acceptable.

The overall response of the simulator was excellent.

AVAILABLE OPTIONS:

(1) Loop to fail NSS-4A Loop A
NSS-4B Loop B
NSS-4C Loop C
NSS-4D Loop D
NSS-4E Loop E

(2) Rupture size 0-200% (100% = 671 sq. in)
200% = Double Ended shear

(3) Ramp time 0-14,400 seconds

(4) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) NSS-4A Recirc loop A suction side rupture (unisolable)

(2) Leak size 200% Double ended shear

(3) Ramp time 0 seconds

(4) Delay time 0 seconds

A quick check of the malfunction for the other 4 Recirc Loops is performed without collecting data or verifying the detailed response.

INITIAL CONDITIONS FOR TEST:

IC-15 Full Power

Place H2O2 Monitors in service

Establish a monitored variable file for mass and energy calculations.

FINAL TEST CONDITIONS:

Run Time: 45 Minutes

Near the conclusion of this test, the plant is in a post-accident condition with core spray pumping from the torus to the reactor and leaking back to the torus. The simulator is capable of continued simulation of recovery events. The Emergency Operating procedures would eventually lead to Containment Flooding, a condition beyond the scope of this test.

At the end of the test, all injection of water into the reactor (Core Spray, Feedwater, CRD) has been terminated and fuel failure has occurred as indicated by increasing Hydrogen Concentration in the Drywell.

The malfunction is not recoverable, requiring IC reset to clear the pipe break.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

Technical Data Report TDR No. 716, Best-Estimate Analysis of OC DBA LOCA Containment Response, Rev. 3 was used in preparing the procedure.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS02
14.6.20.11

TITLE: Reactor Vessel Instrument Reference Leg Rupture

PREPARED BY/DATE: [signature] / 11/28/95 TEST DATE: 06/15/95

APPROVED BY/DATE: R Warnock / 11/29/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF1	3.1.2(1)(b)	LOCA inside & outside containment
MF2	3.1.2(1)(c)	Large & small reactor coolant breaks, including demonstration of saturated conditions
MF13	3.1.2(11)	Loss of protective system channel
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the

limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Reference leg rupture.

The selected reference leg will rupture inside containment.

Level transmitters and switches will fail high. Pressure transmitters and switches will fail low.

		LT	PT	LS	PS
NSS11A Leg from	Ref RE08A	RE02A RE02B RE05A RE05/19A			
NSS11B Leg from	Ref RE08B	RE02C RE02D RE05B RE05/19B			

NS11C Leg from	Ref IA15A	ID13A	622-1020 622-1008 622-1009 622-1018 IA90A IA901A IA92A	RE18A RE18C	IA83E
NSS11D Leg from	Ref IA15B	ID13B	RE03C RE03D RE15C RE15D ID45 IA90B 622-1010 IA91B 622-1011 IA92B 622-1019	RE18B RE18D	RE16B RE17B RE17D IA83C IA83D
		ID13C			

The following data was recorded on the 8 pen recorders:

T:FID33A T:FID33B	Total steam flow
T:FFID75	Feedwater flow
T:LRE21A T:LRE21B	Rx water level
T:TE451 T:TE450	Reference leg temp element (TE-130-451)
T:T102A T:T102B T:T102C T:T102D T:T102E	Drywell temperatures

The Sequence of Alarms Recorder (SAR) Printouts were also attached.

Results:

Three field changes were made to the procedure to: 1) Correct Variables, 2) Add new Feedwater Level Channel C, 3) Delete increase in CHRRMS readings.

All alarms and automatic actions identified in the procedure occurred as expected. Several SAR Alarms were found to be incorrect. All other alarms and automatic actions occurred as expected.

AVAILABLE OPTIONS:

(1) Reference leg to fail	NSS-11A Ref leg from RE08A NSS-11B Ref leg from RE08B NSS-11C Ref leg from IA15A NSS-11D Ref leg from IA15B

NSS-11E RPS A Side

(2) Ramp time	0-14,400 seconds
(3) Delay time	0-28,800 seconds

OPTIONS TESTED:

A. (1) NSS-11D Reference leg rupture
   (2) Ramp time 30 seconds
   (3) Delay time 0 seconds
   (4) Severity = 100%

B. (1) NSS-11A Reference leg RE08A fails
   (2) Ramp time 0 seconds
   (3) Delay time 0 seconds
   (4) Severity = 100%

C. (1) NSS-11B Reference leg RE08B fails
   (2) Ramp time 0 seconds
   (3) Delay time 0 seconds
   (4) Severity = 100%

D. (1) NSS-11C Reference leg IA15A fails
   (2) Ramp time 30 seconds
   (3) Delay time 0 seconds
   (4) Severity = 100%

INITIAL CONDITIONS FOR TEST:

(1) IC-15, power operation
(2) Select B Level for Feedwater Control for NSS11D
(3) Select A Level for Feedwater control for NSS11C

FINAL TEST CONDITIONS:

Run Time: 3 Hours

At the conclusion of this test, the plant has scrammed and isolated from an instrument line rupture. The rupture is not recoverable, requiring IC reset to continue normal operations. The simulator however, is capable of continued simulation of the recovery operations if desired.

The simulator passed this test with 1 new TR.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Several SAR Alarms did not agree with the actuated panel alarms. This is apparently due to modifications performed since the last test. TR 3560 was issued and was closed on 8/30/95.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS03
14.6.20.16

TITLE: Reactor Safety Valve Fails open

PREPARED BY/DATE: [signature] / 10/6/95

APPROVED BY/DATE: R Wainfort / 11/29/95

TEST DATE: 09/22/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF1 3.1.2(1)(b) LOCA inside & outside containment

MF3 3.1.1(2)(d) Failure of safety and relief valves (LOCA)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Safety valve setpoint spring failure

Primary Effects:

The selected safety valve opens.

With malfunction NSS-16A activated, the SV/EMRV NOT CLOSED annunciator on panel 1F/2F alarms, drywell pressure increases and turbine load decreases. The reactor scrams due to high drywell pressure.

The following data was recorded on the 8 pen recorders:

T:XAPRM1	RX power, APRM 1
T:XAPRM6	RX power, APRM 6
T:PT53	Drywell pressure
T:T102A	Drywell temperature
T:T101B	" "
T:PTID45	Rx pressure
T:LID53A	Rx level
T:FID33A	Steam Flow
T:FID33B	" "
T:FFID73	Feedwater flow
T:RI790	Containment radiation
T:XNR28H1	Safety valve (NR28H)
T:XNR28H1	Safety Valve (NR28H)

The Sequence of Alarms Recorder (SAR) printout was attached.

Results:

A field changes were made to the test procedure during execution to correct the model variable names to be monitored, clarify expected response, and to include changes for the Safety Valve Removal modification installed since the last test. All alarms identified in the procedure were received. Many additional alarms caused by the reactor scram, turbine trip and reactor isolation were also received. These

additional alarms are appropriate.

The Valve Monitoring System (VMS) response for NR28M was incorrect. A TR was issued.

AVAILABLE OPTIONS:

(1) Valve to fail open	NSS-16A NR28D	NSS-16B NR28E
	NSS-16C NR28F	NSS-16D NR28G
	NSS-16E NR28H	NSS-16F NR28J
	NSS-16G NR28K	NSS-16H NR28L
	NSS-16I NR28M	
(2) Delay time	0-28,800 seconds	

OPTIONS TESTED:

(1) NSS-16E Reactor safety valve NR28H fails open

(2) Delay time 0 seconds

The test was repeated in a brief manner for the remaining 8 safety valves. No data was recorded for these additional tests.

INITIAL CONDITIONS FOR TEST:

IC-15, power operation

FINAL TEST CONDITIONS:

Run Time: 45 Minutes

At the conclusion of this test, the reactor has scrammed, and the reactor & containment have isolated. Although the malfunction is recoverable, no attempt was made to clear the malfunction and perform a recovery

The simulator passed this test with 1 TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The incorrect response of the VMS monitor for NR28M was documented in TR 3588 which is scheduled for corrective action by January 30, 1996.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS04
14.6.2.1

TITLE: Loss of Instrument Air

PREPARED BY/DATE: [signature] / 12/21/93

APPROVED BY/DATE: R Davidson / 12/22/93

TEST DATE: 12/21/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF4	3.1.2(2)	Loss of instrument air to whole system or individual headers

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an

alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Weld failure

With the malfunction activated to 100% the instrument air pressure indication on panel 7F decreases. The following annunciators on 7F alarm:

CONTROL AIR PRESSURE LOW	H-1-a
SVC AIR DISCH VLV CLOSED	M-2-b
RCVR1 PRESS LO	M-3-a
RCVR2/INST AIR PRESS LOW	M-3-b

The standby air compressor starts. When the scram air header pressure drops, the control rods begin to drift in and then scram. The scram discharge volume isolates.

Instrument Air auto isolation valve V-6-395 remains open.

Hotwell level increase.

CRD automatic flow control is lost, closing the FCV.

Feedwater regulating valves lock up.

Heater levels drop.

MSIVs close.

MG set scoop tube lock up.

RCU isolates.

Drywell sump and equipment drain tank valves close.

Isolation Condenser vent valves close.

Other valves fail as identified in the procedure.

To ensure that the automatic actions occur from loss of air pressure and not from RPS or other control ci: uits, the following are activated prior to the loss of a:r:

1. Malfunction RPS-6, Failure to Scram
2. LOA- CAS-21, ARI failure to initiate
3. CLF-Bistable-NSS-11 through 18, Fail MSIV Hi Flow Isolation.
4. Place Mode Switch in Shutdown to prevent Steam Line Low Pressure MSIV closure

The following data was recorded on the 8 pen recorders:

T:PT3	Instrument air supply pressure indicator (PI-7F52)
PCASISRM	Scram air header pressure
PCASSARD	Service Air Common Header Pressure
LCFWCST	Condensate Storage Tank Level

Results:

Six field changes were made to the test procedure to, clarify the steps, collect additional data, operate the mode switch with an override, and correct the response.

All alarms and automatic actions occurred as specified in the procedure after the field changes.

The MSIVs closed early in the event causing a reactor scram signal from High Neutron Flux and Reactor High Pressure at the same time. The reactor did not scram because of the active malfunctions. The EMRVs, Recirc Pump Trip, and Isolation Condensers actuated. Reactor safety valves apparently opened, causing Hi DW Pressure. The feedwater reg. valves locked in position and, with no operator action, the reactor vessel overfilled.

The control rods were observed to insert more slowly than during a normal scram, a condition indicative of loss of air pressure to the scram solenoids.

AVAILABLE OPTIONS:

(1) Leak size	0 - 100%
(2) Ramp time	0 - 14,400 secs
(3) Delay time	0 - 28,800 secs

OPTIONS TESTED:

Leak, 100%

Ramp time 300 sec

Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

1. IC-15, Full Power
2. Activate Malfunction RPS-6, RPS Failure to Scram
3. Activate LOA CAS-21, ARI Failure to Initiate
4. Activate CLFs Bistables NSS-11 to 18, MSIV Hi Flow Isolation Failure
5. Place Mode Switch to Shutdown Prevent Low Pressure MSIV Closure

FINAL TEST CONDITIONS:

Run Time: 2 Hours

At the conclusion of this test, the control air system is depressurized. The reactor is shutdown and isolated. The simulator is capable of continued simulation of recovery operations. Since the malfunction is not recoverable, IC reset is required to restore the air system and perform normal operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS05
14.6.21.3

TITLE: Loss of Offsite Power Sources

PREPARED BY/DATE: [signature] / 11/12/93

APPROVED BY/DATE: R Davidson / 11/22/93

TEST DATE: 11/10/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Protective relay action on breakers SD, NC, OC, OD, 5 and 6 causing breakers to open.

Transmission grid suffers severe heavy weather resulting in simultaneous relay action causing interties between OC substation and grid to open, resulting in loss of all off site power.

Primary Effects:

When severe weather causes protective relay action on the JCP&L and Atlantic Electric Substation grid, causing transmission line breakers to open simultaneously:

Turbine trips from fast closure of turbine control valves.
Generator OCB's open.
Reactor scram.
Both diesel generators fast start and energize Swgr 1C and 1D.
Turbine Bypass valve(s) open as indicated on Panels 7F and 13R to control pressure.

Indicators on Panel 12F:
N-1028 Line amps and megawatts decrease to zero
O-1029 Line amps and megawatts decrease to zero
S-2045 Line amps and megawatts decrease to zero
Transformer Bank 7 amps and megawatts decrease to zero
Transformer Bank 8 amps and megawatts decrease to zero
230 KV voltage decreases to zero
Gross Megawatts decrease to zero

Dilution plant annunciators on Panel 12-XR "DILUTION PLANT LOSS OF POWER" alarms and applicable dilution plant equipment annunciators alarm.

Running pond pump trips and both Fire Pumps start.

Generator and transformer temperature recorder on Panel 12XR show decrease.

Relays on Panel 12R for startup transformer trip.

Generator output recorder on Panel 12R shows decrease to zero.

All control rods fully inserted as indicated on Panel 4F.

Components supplied from 4160V Swgr 1C and 1D trip off if running and sequence back on after diesel generator output breaker closes.

Annunciators associated with equipment supplied from 460V MCC will alarm.

Loss of the following loads:

'1A Bus'
Circulating water 1-1 and 1-2
Condensate pump 1A
Recirc pump NG01-A, C, E
Reactor Water cleanup Pump ND02-A
Bus 1C
Feed pump 1A

'1B Bus'
Circulating water pumps 1-3, 1-4
Condensate pumps 1B, 1C
Feed pumps 1B, 1C
Recirc pumps NG01-B, D
Rx water cleanup pump ND02-B
Bus 1D

Bypass valves close on loss of condenser vacuum and isolation condenser initiation.

The following data was recorded on the 8 pen recorders:

SOEDMLNM	MNTOU & LRBE "N" VOLTS
SOEDMLOM	MNTOU & LRBE "O" VOLTS
SOEDAECM	ATLNTC ELEC CO. VOLTS
SOEDWTSM	WARETOWN "S" VOLTS
SOEDWTRM	WARETOWN "R" VOLTS
SOEDWTQM	WHITINGS 'Q" VOLTS
EEDSC	4160V BUS 1C VOLTAGE
EEDSD	4160V BUS 1D VOLTAGE
AEDSCM	4160V BUS 1C CURRENT
AEDSDM	4160V BUS 1D CURRENT

The Sequence of Alarms Recorder (SAR) was also attached.

Results:

Two minor Field changes were made to the test procedure to clarify the response.
Overall response of the plant was good. Except as noted here, all expected alarms and automatic actions occurred and no unwarranted alarms were received. The DC Emergency Lights did not come on. A TR was issued.

Problems reported during the last run of this test on October 30, 1992 did not recur. Notably, the RPS undervoltage trips worked properly and the SAR performed well.

AVAILABLE OPTIONS:

Delay Time 0-28,800

OPTIONS TESTED:

Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, full power.

FINAL TEST CONDITIONS:

Run Time: 1 Hour, 55 Minutes

At the conclusion of this test, the malfunction has been cleared and Offsite Power is restored. The plant remains in a post scram, isolated condition with AC power supplied by the Diesel Generators. The simulator is capable of continued simulation should the instructor wish to continue recovery operations.

The simulator passed this test with 1 TR outstanding.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The control room DC Emergency Lights did not illuminate as expected when normal lighting was lost. A TR was issued to be resolved by November 1994.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS06
14.6.11.2

TITLE: 4.16 KV Emergency Switchgear 1C and/or 1D Fault

PREPARED BY/DATE: [signature] / 12/4/96 TEST DATE: 09/05/96

APPROVED BY/DATE: R D Davidson 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5 3.1.2(3) Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: A fault on Bus 1C or 1D actuates 51N ground overcurrent relay tripping supply breaker 1C or 1D.

Primary Effects:
The following occurs following the trip of Bus 1D:

(1) Loss of Power annunciators:

Engraving	Location
MN BRKR 1D TRIP	T-1-e
MN BRKR 1D 86 LKOUT TRIP	T-2-e
BUS 1D VOLTS LO	T-3-e
BUS 1D VOLTS LO-LO (UV)	T-4-e

(2) Loss of Power Indications:

Indication	Location
4160 Bus 1D amps downscale	8F/9F
Half scram (due to loss of one RPS channel)	4F

(3) Trips Occur:

Bus 1D lockout (86-1D/HR)	12R
Bus 1D undervoltage (27-1D)	12R
460V breaker 1B1M	8F/9F
460V breaker 1B1P	8F/9F

(4) EDG No. 2 does not idle start due to lockout condition on Bus 1D.

The SAR printout was attached.

Results:

Five field changes were made to the procedure to delete recording of data on the strip chart recorder, include Diesel Generator modifications, and to add additional details.

All annunciators identified in the procedure alarmed. No unexpected alarms were noted. Automatic actions occurred as specified in the procedure.

During review of the test results, it was determined that a reactor scram should have occurred in a rather round about way. This is discussed further under the Deficiencies Found section.

AVAILABLE OPTIONS:

(1) EDS-2A	Bus 1C
EDS-2B	Bus 1D
(2) Delay time	0-28,800 sec

OPTIONS TESTED:

(1) EDS-2B Bus 1-D
(2) Delay Time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

Start Loads on 1B1 and 1B2 Unit Substations:
B CRD Pump
#2 Air Compressor

FINAL TEST CONDITIONS:

Run Time: 30 Minutes

At the conclusion of the test, the malfunction has been cleared and DG-2 has fast started to power 1-D Bus. All Unit Substations powered by 1-D Bus are energized.

The simulator is capable of continued simulation should the instructor wish to continue recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

During review of the test results, Operations personnel noted that this event should cause a loss of vacuum, resulting in a reactor scram and a turbine trip. The loss of power will cause both condensate transfer pumps to trip, removing seal water from the Auxiliary Flash Tank Pumps and from the Steam Jet Air Ejector Drain Pumps. The loss of seal water will allow air to leak into the condenser causing a scram in approximately 20 minutes. The reviewers recommended that this feature be added to the simulator. A request for a simulator upgrade was prepared.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS07
14.6.9.2

TITLE: Emergency Diesel Generator Trip

PREPARED BY/DATE: [signature] / 12/10/93

APPROVED BY/DATE: R Davidson / 12/14/93

TEST DATE: 12/10/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Spurious actuation of engine protection relaying PS-39-720(721)

Primary Effects:

With diesel generator paralleled to the 1C/1D bus, when the selected engine cooling water pressure switch actuates, the diesel engine trips:

INDICATIONS:

EDG 2 DISABLED annunciator T-4-f
EDG 2 KW indication decreases to zero
EDG 2 KVARS indication decreases to zero
EDG 2 Ammeter indication decreases to zero
EDG 2 Kilovolt indication decreases to zero
EDG 2 Unit IDLING light extinguished when DG Speed is < 200 RPM
Bus 1B Amps and KW increase
Bus 1D Amps increase

The following data was recorded on the 8 pen recorders:

OUTSET	VOLTG BUS D
SDGNRM(2)	EDS Real Load MW
ADGNM(2)	Diesel Gen current
VDGNM(2)	Diesel Gen Term voltage
ODGNM(2)	EDGN02 RPM (Speed)
AEDSDM	4160V Bus 1D Amps
AEDSUBM	4160V Bus 1B Amps
VEDSBM	4160V bus 1B KW

Results:

One field change was made to the procedure to correct monitored variables.

The single annunciator identified in the procedure alarmed and cleared as specified. One additional annunciator, EDG2 Control DC LO/LOST also alarmed and cleared, as would be expected. All automatic and instructor controlled actions occurred as required.

The plotted data shows that the simulator response is very realistic. Transfer of running loads from the B Bus to the DG and back properly affected amps and voltage on the monitored buses.

AVAILABLE OPTIONS:

(1) EDG1 DGN-2A
EDG2 DGN-2B

(2) Time delay 0 - 28,800 sec

OPTIONS TESTED:

(1) DGN-2B

(2) Delay Time 0 Seconds

INITIAL CONDITIONS FOR TEST:

(1) IC-15, Full Power

(2) Start diesel No. 2 and parallel to bus 1D

FINAL TEST CONDITIONS:

Run Time: 45 Minutes

At the conclusion of this test, the malfunction has been cleared and DG 2 is again paralleled to 1D bus as it was before the malfunction was activated. The DG can be stopped per normal operating procedures. The simulator is capable of continued simulation.

The simulator passed this test .

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS08
14.6.11.1

TITLE: 4.16 KV Bus 1A and/or 1B Fault

PREPARED BY/DATE: [signature] / 11/22/95 TEST DATE: 11/14/95

APPROVED BY/DATE: [signature] / 11/22/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power,including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Actuation of relay 51N, Ground Overcurrent.

Loss of power to either 1A/1B or both 4.16 KV bus due to supply breaker 1A/B tripping.

Assume the simulator is at IC-15, full power operation, when the fault occurs, tripping normal power supply breakers 1A/1B.

(1) Loss of Power Annunciators:

Engraving	Location
MN BRKR 1A TRIP	S-1-e
MN BRKR 1A 86 LKOUT TRIP	S-2-e
BUS 1A UV	S-4-e
LKOUT RELAY 86/S1A TRIP	S-1-b
BUS 1C VOLTS LO	T-3-a
MN BRKR 1C TRIP	T-1-a
BUS 1C VOLTS LO-LO (UV)	T-4-a
PROT SYS PNL 1 PWR LOST	9XF-3-a

(2) Loss of Power Indications:

Indication	Location
4160V Bus 1A volts downscale	8F/9F
Aux Bus 1A megawatts downscale	8F/9F
Aux Bus 1A main breaker 1A "CLOSED" light extinguished	8F/9F
Aux Bus 1A amps downscale	8F/9F

(3) Interlocks:

Main Breaker 1A trips -	Prevents S1A from closing	8F/9F
Trips 1C		8F/9F
Idle start of EDG No. 1		8F/9F

(4) Loss of equipment on undervoltage trip with associated indication and annunciators.

(5) Loss of Bus 1C equipment protected by undervoltage trips.

Diesel Generator No.1 fast starts after 3 seconds

USS-1A1 with its MCC's and loads

(6) Half scram signal to RPS on panel 4F

The following data was recorded on the 8 pen recorders:

EEDSA	4160 volt bus 1A voltg
EEDSC	4160 volt bus 1C voltg
AEDSUAM	4160 volt bus 1A current
AEDSCM	4160 volt bus 1C current
SEDSUAM	4160 bus 1A load

The following were monitored using datapool monitoring:

JEDSSA	4160 volt bus 1A status
JEDSSC	4160 volt bus 1C status

The Sequence of Alarms Recorder (SAR) was also attached.

Results:

One field change was made to the procedure to add a step to close Bank 8 OCB on recovery.

All alarms and automatic actions occurred as expected and no unwarranted actions occurred.

As expected, on loss of 1A bus, reactor power decreased from the trip of 3 recirc pumps. One Feedwater pump and one condensate pump also are lost, but the load reduction is enough to allow continued operation with 2 Feed Pumps. The generator did not trip during this test. Because the voltage regulator trips when Bus 1A is lost, the generator load reduction results in high excitation voltage. Depending on the initial voltage regulator settings, the generator may trip on overexcitation.

During recovery, Diesel Generator 1 tripped while trying to synchronize to Bus 1A. This occurred using automatic and manual synchronizing methods. A TR was written.

AVAILABLE OPTIONS:

(1)	EDS-1A	Bus 1A
	EDS-1B	Bus 1B
(2)	Delay time	0 - 28,800 sec

The response to option EDS-1B would be significantly different, resulting in a reactor scram.

OPTIONS TESTED:

(1) EDS-1A Bus 1A Breaker trip

(2) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-25, Full Power

Balance the Manual Exciter Field Rheostat control 70M (Panel 8F) with the output of the amplidyne. This will ensure the main generator will not trip on overexcitation when the amplidyne is lost.

FINAL TEST CONDITIONS:

Run Time: 60 Minutes

At the conclusion of this test, the 1A Bus fault malfunction has been cleared and power restored to the 1A Bus via the startup transformer. The reactor is operating at reduced power with 3 of 5 recirc pumps and 1 of 3 feedwater pumps tripped. As stated above, Diesel Generator #1, supplying the 1C Bus could not be paralled and connected to 1A Bus.

The simulator is capable of continued simulation of recovery events. Plant procedures, however, would require a manual scram.

The simulator passed this test with 1 outstanding TR.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

As noted above, Diesel Generator 1 tripped while attempting to synchronize 1A and 1C buses. A TR was issued and is scheduled for resolution by November, 1996.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS09
14.6.11.3

TITLE: Loss of 460 V Unit Substation

PREPARED BY/DATE: [signature] / 11/18/93

TEST DATE: 11/04/93

APPROVED BY/DATE: R Davidson / 11/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Ground on the 4160V feeder to the affected bus (the 50G device).

Relay 50G ground sensing actuates, tripping the 4160V feeder breakers 1A1P, 1A2P, 1A3P, 1B1P, 1B2P, or 1B3P/all.

Primary Effects:

The following occurs following the trip of USS1A1:

1. Loss of Power Alarms:

Engraving	Location
FDR TO 460V 1A1 TRIP	S-6-f
1A1 MN BRKR TRIP	U-1-a

(2) Loss of Power Indication:

Indication	Location
460 Bus 1A1 amps downscale	8F/9F
Main breaker 1A1M "CLOSED" indicating lights extinguished	8F/9F
Main breaker 1A1P closed indicating lights extinguished	8F/9F

(3) Loss of Loads (NOTE 1)

Air compressor 1-1
TBCCW pumps 1-1, 1-2
SP-A1
MCC-1A11, 1A12, 1A13
Fire Alarms (Trouble) Modules 2,3,5

NOTE 1: See Plant Electrical Load List for loss of loads.

The following data was recorded on the 8 pen recorders:

EEDSA1	480 volt bus 1A1 voltg
YEDSA1 (1)	480 volt bus 1A1 current
SEDSA1M	480 VOLT BUS 1A1 load
AEDSA11	480 volt MCC 1A11 load
AEDSA12	480 volt MCC 1A12 load
AEDSA13	480 volt MCC 1A13 load

Results:
One field change to the procedure was made to use the 8 pen recorder in lieu of the line printer. With the exception of USS 1A1 voltage, the variables monitored on the 8 pen recorder did not register properly. The missing data is not needed to evaluate the test results.

All alarms and automatic actions identified in the procedure operated as expected. Although many additional alarms were received, no unexpected alarms were reported.

AVAILABLE OPTIONS:

(1) EDS-3A	USS1A1
EDS-3B	USS1A2
EDS-3C	USS1A3
EDS-3D	USS1B1
EDS-3E	USS1B2
EDS-3F	USS1B3
(2) Delay Time	0 - 28,800 sec

OPTIONS TESTED:

(1) EDS-3A

(2) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

(1) IC-15, full power

(2) Verify the loads listed below are being supplied from USS1A1:
Turbine Bldg CCW pump 1-1
Turbine Bldg CCW pump 1-2

Air compressor 1-1
Ltg. Dist. Pnl A1
MCC 1A11
MCC 1A12
Mcc 1A13
Stator cooling Water pump 1-1
Gland Steam Exhauster Blower 1-1
Iso Phase Fan 1-1

FINAL TEST CONDITIONS:

Run Time: 55 Minutes

At the conclusion of this test, the malfunction has been cleared and power restored to USS 1A1.

The simulator is capable of continued simulation should the instructor wish to continue with recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator performance problems were identified during th test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS10
14.6.11.14

TITLE: Loss of 460 V MCC Train A

PREPARED BY/DATE: [signature] / 11/22/93

APPROVED BY/DATE: R Davidson / 12/6/93

TEST DATE: 11/17/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Short circuit on bus causing supply breaker to trip.

Failure of any/all of the 460V MCCs 1A11, 1A12, 1A13, 1A12A, 1A11A, 1A21, 1A21A, 1A21B, 1A22, 1A23, 1A245, 1A31

Short circuit develops on selected MCC bus causing MCC supply breaker to trip.

Primary Effects:

The following occurs for Failure of MCC 1A13:

(1) Control Room Indications:
Exhauster No. 1 Red and Green indicator lights out 7F

(2) Generator amplidyne stops

(3) Loss of electrical loads on affected MCC as identified in Plant Electrical Power supply Data. (All loads are not verified during this test)

(4) Main Transformer M1A CLG PWR Fail and M1A Trouble alarms (R-6-e & R-7-e) annunciate.

(5) Turbine Building Operating Floor radiation levels increase on R-014A-4.

The following data was recorded on the 8 pen recorders:

EEDSA13	480 VOLT MCC 1A13 VOLTG
AEDSA13	480 VOLT MCC 1A13 CURRENT
AFDSA1MM	XFORMER 1A1 Current
AEDUAM	Unit Aux XF A Ammeter

Results:

Field changes were made to the procedure to add annunciator R-7-e, M1A Trouble, and to specify that annunciator Q-8-c clears when power is restored.
All annunciators identified in the procedure alarmed.
Automatic operations occurred as expected.

AVAILABLE OPTIONS:

(1)

EDS-14A	MCC1A11
EDS-14B	MCC1A11A
EDS-14C	MCC1A12
EDS-14D	MCC1A12A
EDS-14E	MCC1A13
EDS-14F	MCC1A21
EDS-14G	MCC1A21A
EDS-14H	MCC1A21B
EDS-14J	MCC1A22
EDS-14K	MCC1A23
EDS-14L	MCC1A24
EDS-14M	MCC1A31

(2) Delay time 0-28,800 sec

OPTIONS TESTED:

(1) EDS-14E (MCC1A13)

(2) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 55 Minutes

At the conclusion of this test, the malfunction has been cleared and power returned to MCC1A13. Loads which require operator action to start have not been restored. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Field changes were made to the procedure as noted above.

No simulator response problems were identified.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS11
14.6.11.5

TITLE: Loss of Vital Panel Bus

PREPARED BY/DATE: [signature] / 10/16/95

APPROVED BY/DATE: R Davidson / 12/27/95

TEST DATE: 06/15/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: ATS output leads open causing power failure to the vital panel VLDP-1 or VACP-1 bus.

Primary Effects:
The following occurs after the failure of VACP-1

(1) Annunciators:

VACP-1 PWR LOST	9XF-3-b
FAP Trouble	K-6-e
Core Monitor	R-8-c

(2) Loss of Power Indications

Indication	Location
The following indicators fail downscale:	
SERVICE WATER HDR PRESSURE	5F/6F
CONDENSATE STORE TK LEVEL	5F/6F
INSTR AIR SUPPLY Pressure	7F
R.B. COOLING WATER HT EXCHR DISCH Pressure	13R
SEAL OIL PRESSURE	8F/9F
HYDROGEN PRESSURE & PURITY	8F/9F

(3) Control power lost to air Comp. 1-1 and 1-2 7F

(4) SGTS & RB Vent valves fail and lose position indication as specified in the procedure.

The following data was recorded using datapool monitoring:

SEDSVAC1(2)	120 VAC VITAL PWR PNL LOAD
YEDSVAC1(2)	120 VAC VITAL PWR PNL CURRENT
EEDSVAC1	120 VAC VITAL PWR PNL VOLTG
T:P1A18	RBCCW COMMON HX's OUTLET PRESSURE

Results:

Two field changes were made to the procedure during execution:
1) Indicate that valve V-28-19 is locked open.
2) Delete failure of Fuel Zone Pressure which was moved to PAIPP1.

The Cleanup System relief valve repeatedly popped open after isolation, causing the CU PRV DISCH PRESS HI alarm to cycle in and out. This is a known problem for which corrective actions are being tested.

All alarms and indications operated as expected in the procedure. Except as noted above,no unexpected alarms were reported.

AVAILABLE OPTIONS:

(1)	EDS-5A	Bus VLDP-1
	EDS-5B	Bus VACP-1
(2)	Delay Time	0-28,800 sec

OPTIONS TESTED:

(1) EDS-5B, Vital AC Panel 1 (VACP-1)

(2) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, the malfunction has been cleared and power restored to all buses. The Secondary Containment isolation signals have been reset and normal ventilation is in operation. The simulator is capable of continued simulation of recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS12
14.6.11.6

TITLE: Loss of 120 V Continuous Instrumentation Panel CIP-3

PREPARED BY/DATE: [signature] 11/6/96 TEST DATE: 10/23/96

APPROVED BY/DATE: R Davidson 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5 3.1.2(3) Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: ATS output leads open.

Loss of power to the 120 volt continuous instrument bus.

Primary Effects:

Annunciator:
CIP-3 PWR LOST 9XF-4-b

The following indicators fail downscale:

The indicators are listed in 200-OPS-3024.10f

The following recorders fail as is:

The recorders are listed in 200-OPS-3024.10f.

The following actions take place:

The actions are listed in 200-OPS-3024.10f.

The following alarms will be received:

The alarms are listed in 200-OPS-3024.10f.

The Following Data was recorded using datapool monitoring:

SEDSCIP3(1)	120 VAC CONT INST PNL 3 LOAD
YEDSCIP3(1)	120 VAC CONT INST PNL 3 CURRENT
EEDSCIP3	120 VAC CONT INST PNL VOLTG3

Results:

One field change was made to the test procedure to account for the Reg Guide 1.97 modifications which added 2 new 125V Instrument Panels and revised many instrument power supplies. The field change incorporated plant diagnostic and restoration

procedure 2000-OPS-3024.10f to identify the expected response.

Two of the alarms identified in 2000-OPS-3024.10f did not alarm because the malfunction is implemented as a broken ATS output lead. This response is correct.

All of the expected actions in procedure 2000-OPS-3024.10f occurred except the transfer of Feedwater control back to DCC X which is discussed below. The restoration actions in 2000-OPS-3024.10f were also implemented.

On loss of CIP-3, the DCC swaps from DCC X, the primary computer, to DCC Y, the backup computer. Since the DCC Y computer is not functional on the simulator, other indications are programmed to simulate that DCC Y has assumed control, while DCC X is actually controlling. On loss of CIP-3 for a period less than the backup battery life, DCC Y will remain in control until the operator boots DCC X. This is the simulator response that occurred.

If the loss of CIP-3 exceeds the 10 to 15 minute life of the backup battery, DCC X will reboot on restoration of CIP-3 and will take control after the reboot. During this test, CIP-3 was deenergized for 18 minutes but DCC X did not reboot. This response is considered acceptable.

AVAILABLE OPTIONS:

Delay time 0-28,800 seconds

OPTIONS TESTED:

Delay Time: 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run time: 1 Hour

At the conclusion of this test, the malfunction has been cleared and power restored to CIP-3. The loads lost in the trip are restored. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

Plant Diagnostic and Restoration Procedure 200-OPS-3024.10f was used to determine the acceptable response and for the appropriate actions to restore power.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS13
14.6.11.9

TITLE: Loss of 125 V DC Panel

PREPARED BY/DATE: [signature] / 11/9/94

APPROVED BY/DATE: R Davidson / 12/6/94

TEST DATE: 10/13/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3 5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Fault on selected system.

Primary Effects:
The following occurs after fault on Distribution Center B (EDS-9B):

Annunciators:

Engraving	Location
1B1 DC LOST	U-2-d
1B2 DC LOST	U-4-d
1B3 DC LOST	U-6-d
BAT CHG B TRIP	U-2-e
A/B BAT CHG DRV MOT TRIP	U-3-e
A-B STAT CHG TROUBLE	U-4-e
BUS B CNTRL DC LOST	T-5-c
BUS 1D CNTRL DC LOST	T-5-e
BUS A/B UV	9XF-1-d
BATTERY B BKR OPEN	9XF-6-e

Indication	Location
BATT B AMPS downscale	8F/9F
B BATTERY/CHARGER VOLTS downscale	8F/9F
CHARGER B AMPS downscale	8F/9F

Bus Loads Lost:

Continuous Instrument Bus #3 rotary inverter
Control power to
- Bus B
- Bus 1D
- USS-1B1, 1B2, 1B3
- Diesel Generator No. 2 switchgear (Backup)

125 VDC Power Panel D
125 VDC Power Panel E
MCC-DC-1
MCL-215-006 for V-16-2
MCL-215-007 for V-16-14

When the malfunction is cleared, the B & C Reactor Feed Pumps and the B Cleanup Recirc Pump trip as DC power is restored to the undervoltage devices.

The following Data was recorded on the 8 pen recorders:

EEDSDDB	125 VDC DIST CENTER B VOLTS
AEDSDDB	125 VDC DIST CENTER B CURRENT
SEDSDDB(2)	125 VDC DIST CENTER B LOAD

The Sequence of Alarms Recorder (SAR) printout was also attached.

Results:

Five field changes were made to the procedure:
1. Use strip chart, not line printer for data collection.
2. Add alarm for SBO modification.
3. Delete step per TR 1532 resolution.
4. Add Cleanup Pump trip from loss of 6K24 relay.
5. Delete step per TR 2300 resolution.

The 125VDC Dist Center B amps and load were negligible which caused no response in the recorded value of these 2 variables.

All expected alarms were received and no unwarranted alarms were recorded.

AVAILABLE OPTIONS:

EDS-9A	Dist. Center A
EDS-9B	Dist. Center B
EDS-9C	Dist. Center C
EDS-9D	Panel D
EDS-9E	Panel E
EDS-9F	Panel F
EDS-9G	MCC DC-1
EDS-9H	MCC DC-2
Delay Time	0-28,800 seconds

OPTIONS TESTED:

EDS-9B 125V Distribution Center B

Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

Manual and auto transfer switches aligned to normal supply.

FINAL TEST CONDITIONS:

Run time: 1 Hour

At the conclusion of this test, the malfunction has been cleared and power restored to the B 125 VDC Bus via the static charger. A reactor scram, a turbine trip, and a reactor isolation have occurred. The simulator is capable of continued simulation should the instructor wish to continue recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS14
14.6.11.10

TITLE: Loss of 24 V DC Panel

PREPARED BY/DATE: [signature] / 7/10/95

APPROVED BY/DATE: R Warnick / 11/29/95

TEST DATE: 06/15/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Trip of A-1 (B-1) battery/battery charger output breaker causes loss of power to a 24V DC Panel.

Primary Effects:
The following occurs - After the failure of 24V DC Panel A:

(1) Loss of Power Alarms:

Engraving	Location
24VDC PP-A PWR LOST	9XF-7-d
IRM HI-HI/INOP I	G-1-e
SRM HI/INOP	G-4-d

(2) Loss of Power Indications:

Indication	Location
IRMs 11 through 14 fail downscale	4F
Half scram from neutron monitors (if mode switch is in startup or refuel)	4F
Rod block (if mode switch is in startup or refuel)	
Process Liquid Monitor Downscale (10F-4-f)	10F
Auto initiation of SBGTS and reactor building ventilation isolation	11R

(3) Bus Loads Lost:

Liquid Process Radiation Monitor RN08B (Panel 1R)
Neutron Monitoring system (Panel 3R)

The following data was monitored using datapool:

EEDSDPA	24/48 VDC PNL A VOLTG
YEDSDPA	24/48 VDC PNL A CURRENT
SEDSDPA	24/48 VDC PNL A LOAD

Results:
All anticipated alarms as identified in the test procedure were received as expected and no unanticipated alarms were noted. Two field changes to the procedure were made to delete the loss of ARMs which are not powered from 24 VDC and to indicate that SBGTS trips when power is restored.

AVAILABLE OPTIONS:

(1)	EDS-10A	Panel A
	EDS-10B	Panel B
(2)	Delay time	0-28,800 sec

OPTIONS TESTED:

(1) EDS-10A 24/48 VDC Panel A
(2) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 1 Hour, 15 Minutes

At the conclusion of this test, the malfunction has been cleared and equipment affected by the malfunction is verified as returned to service. The Reactor Building Ventilation system was restarted by the operator per the test procedure. The simulator was capable of continued simulation.

The simulator passed this test with 1 new TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

For Malfunction EDS-10A, APRM Recorder indication for APRMs 1 & 3 went downscale. For EDS-10B, Recorders for APRMs 5 & 7 went downscale. Recorders should go downscale only when selected to IRM. TR 3558 was issued to correct this by February 15, 1996.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS15
14.6.11.12

TITLE: Loss of 460 V USS 1E1

PREPARED BY/DATE: [signature] 11/01/8/96

TEST DATE: 09/04/96

APPROVED BY/DATE: [signature] 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5 3.1.2(3) Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Supply breaker to effected bus trips causing loss of power to the selected 480 bus.

The following occurs after the trip of Bus 1E1:

(1) Loss of indication for Redundant Fire Pump. Panel 13R

(2) Loss of Radwaste service water pumps SW-P-001A and 001B which supply augmented off gas system cooling.

(3) Loss of MCC-1E13, MCC-1E14 and MCC-1E15.

NOTE: Loss of MCC-1E13 and MCC-1E14 effect the operation of the augmented off-gas system. The system is in operation at time of failure causing the following annunciators to alarm:

Off Gas Bldg Trouble	10XF-5-C
New Rad Waste Trouble	10XF-5-a
Augmented Off Gas ISOL	10XF-3-d
RECIRC FLOW LO/PWR LOST A/B	10XF-4-e/10XF-4-f

The following data was recorded using datapool monitoring:

SEDSE1(2)	480 Volt MCC IE1 Load
YEDSE1(2)	480 Volt MCC IE1 Current
EEDSE1	480 volt MCC IE1 Volts

The SAR Printout was also attached.

Results:

One field change was made to the procedure to delete operation of an automatic transfer switch per TR 2147 resolution.

All alarms and automatic actions occurred as specified in the test procedure. No unwarranted alarms were reported.

AVAILABLE OPTIONS:

(1) EDS-12 480V Bus 1E1

(2) Delay time 0-28,800 sec

OPTIONS TESTED:

(1) EDS-12A Loss of USS 1E1

(2) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power operation with augmented off gas (AOG) system in service.

FINAL TEST CONDITIONS:

Run Time: 30 Minutes

At the conclusion of this test, the malfunction has been cleared and power restored to 1E1. The simulator is capable of continued simulation.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS16
14.6.11.7

TITLE: Loss of 120 V Protection System Panel

PREPARED BY/DATE: [signature] / 11/8/93

APPROVED BY/DATE: R Davidson / 11/22/93

TEST DATE: 11/04/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)
MF13	3.1.2(11)	Loss of protective system channel

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Broken lead on output of transfer switch on panel 6R/7R fails.

Power loss to Protection System Panels No. 1/No. 2.

Primary Effects:

The following occurs after the RPS No 1 transfer switch fails:

(1) Annunciators

Engraving	Location
PROT. SYS PNL 1 PWR LOST	9XF-3-a
SCRAM CONTACTOR OPEN	G-1-C

(2) Loss of Power Indications

Indication	Location
Scram solenoid lights extinguished	6R and 4F
TRANS OUTPUT and GEN OUTPUT lights extinguished	6R
RPS MG set volts indicate zero	6R
Half scram	4F
IRMs 11 through 14 fail downscale	4F
APRMs 1 through 4 fail downscale	4F
LPRMs A and C fail downscale	4F
Rod block	4F

(3) Panel Loads Lost

Vacuum Breaker Alarm System Channel A

Fuel Zone Water level Instrument Channel A

Neutron Monitor sytem

Key Card system (Not simulated)

Steam Line Radiation Monitor

Scram solenoids and Logic

Vital Area Alarm System (Not simulated)

Panel 18R - Analog Trip system-High, Low, Low-Low RPV Level.

NOTE: With a loss of power from Prot. sytem Panel 1, Panel 18R will be supplied from DC Panel "F", Bkr #11, and DC Panel "D", Bkr #22, automatically.

The following data was recorded on the 8 pen recorders:

EEDSPSP1	120 VAC PROT SYS PNL 1 VOLTG
YEDSPSP1(2)	120 VAC PROT SYS PNL 1 CURRENT
SEDSPSP1(2)	120 VAC PROT SYS PNL 1 LOAD

The SAR printout was attached.

Results:
Two field changes were made to the procedure to correct the IRM response, correct annunciator windows, and to use the 8 pen recorder in lieu of the line printer.

With the exception of 125V Protection Panel 1 voltage, the variables monitored on the 8 pen recorder did not register properly. The missing data is not needed to evaluate the test results.

All alarms and automatic actions occurred as specified in the procedure. Although 17 additional alarms annunciated, they were all determined appropriate for this event.

AVAILABLE OPTIONS:

(1)	EDS-7A	Protection System Panel 1
	EDS-7B	Protection System Panel 2
(2)	Delay time	0-28,800 seconds

OPTIONS TESTED:

(1) EDS-7A, Protection System Panel 1

(2) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 65 Minutes

At the conclusion of this test, the malfunction has been cleared and power restored to the Protection Panel. All systems have been returned to the pretest condition and the simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator performance problems were identtified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS17
14.6.11.4

TITLE: Loss of Vital 460 V MCC

PREPARED BY/DATE: [signature] / 11/9/94

APPROVED BY/DATE: [signature] / 12/6/94

TEST DATE: 10/13/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Activation of the solid state overcurrent device trips supply breaker to vital MCC.

Primary Effects:

The following occurs following the trip of MCC1A2:

(1) Loss of Power Annunciators:

Engraving	Location
BAT CHG C1 TROUBLE	U-4-f
VLDP-1 PWR XFER	9XF-1-c
RPS MG SET 1 TRIP	G-2-c
PROT. SYS PNL 1 PWR LOST	9XF-3-a
SCRAM CONTACTOR OPEN	G-1-c
ROD BLOCK	H-7-a

(2) Reactor half scram signal due to loss of RPS 1

(3) Loss of power indication:

RPSMG-1 AC voltmeter downscale	6R
RPSMG-1 Motor RED light extinguished	6R
RPSMG-1 Generator output RED light extinguished	6R
APRM Recorders 1 throe 4 downscale	F

NOTE: If auto trans switch ACTS-1AB2 is selected to 1A2, the ACTS will transfer with accompanying alarm.

The following data was recorded on the 8 pen recorder:

EEDSV:A2	480 volt vital MCC 1A2 Volts
AEDSV:A2(2)	480 volt vital MCC 1A2 current

Results:

One field changes was made to the test procedure to delete an unnecessary step.

All annunciators and automatic actions occurred as specified in the procedure. The SAR also recorded C Battery room HVAC Trouble and multiple RPS alarms. The reviewer determined these alarms to be correct.

The test procedure was completed satisfactorily.

AVAILABLE OPTIONS:

(1) Selected Bus	EDS-4A	Vital MCC 1A2
	EDS-4B	Vital MCC 1B2
(2) Delay time	0-28,800 seconds	

OPTIONS TESTED:

(1) EDS-4A VMCC 1A2

(2) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-15 Full Power

FINAL TEST CONDITIONS:

Run Time: 60 Minutes

At the conclusion of this test, the malfunction has been cleared and all automatic trips are reset. RPS system 1 has been manually transferred to the backup transformer and is not returned to its normal power supply. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

One field change was made to the test procedure.

The RPS System 1 Volt Meter did not respond to the loss of power. The power supply to this meter was later found disconnected. The power supply was reconnected and the meter returned to service.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS18
14.6.3.17

TITLE: Main Condenser Air Inleakage

PREPARED BY/DATE: [signature] / 11/23/93

TEST DATE: 11/17/93

APPROVED BY/DATE: R Davidson / 12/8/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF7	3.1.2(5)	Loss of vacuum, including loss of hotwell level control

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an

alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Failure of the seal (boot) between the LP Turbine Exhaust and the main condenser.

A leak develops in the boot of the B LP Turbine. The amount of air inleakage is selected by the instructor with 100% equivalent to total failure.

Primary Effects:
With malfunction CFW-17 activated to 100% the following annunciators alarm:

COND VAC LO 25 INCHES
COND VAC TRIP 1 22 INCHES
COND VAC LO/TURB TRIP I
COND VAC LO/TURB TRIP II
COND VAC TRIP 2 10 INCHES

The main turbine will trip and the reactor will scram. The bypass valves will not open, reactor pressure will increase to 1060 psig where two EMRVs will open to control pressure. Isolation condensers will also initiate at 1050 psig.

The following data was recorded on the 8 pen recorders:

PCNDVACA	Main condenser vacuum indicators
PCNDVACB	(PI-24, 25, 26)
PCNDVACC	
RTCSSV(1)	Turb Stop valve position
RTCSSV(2)	
RTCSSV(3)	
RTCSSV(4)	
RTCSBV(1)-(9)	Turbine bypass valve pos.

The Sequence of Alarms Recorder (SAR) printout and the PCS Alarm printout were also attached.

Results:

One field change was made to the procedure to change the monitored variables for stop valve position.

All alarms identified in the procedure were received. Additional alarms received are expected for this event.

The procedure stated that the bypass valves would not open. All 9 bypass valves did open on the simulator then closed approximately 1.5 seconds later as #2 vacuum trip was received. Note that during the last performance of this test on October 30, 1992, the Bypass valves remained open for approximately 4 seconds. This response is acceptable. All automatic actions occurred correctly.

AVAILABLE OPTIONS:

(1) Amount of inleakage 0 - 100% (100%=complete boot rupture)

(2) Ramp time 0-14,400 secs

(3) Delay time 0-28,800 secs

OPTIONS TESTED:

(1) 100% Inleakage

(2) Ramp time 0 sec

(3) Delay time 0 sec

INITIAL CONDITIONS FOR TEST:

IC-15, full power

FINAL TEST CONDITIONS:

Run Time: 60 Minutes

At the conclusion of this test, the reactor has scrammed, isolation condensers have initiated, recirc pumps have tripped and the turbine stop & bypass valves are tripped closed on low vacuum. The simulator is capable of continued simulation of recovery events. The malfunction, however, is not recoverable, requiring IC reset to return to normal operation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator performance problems were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS19
14.6.3.2

TITLE: Hotwell Reject Level Controller Fails

PREPARED BY/DATE: [signature] / 11/9/94 TEST DATE: 10/13/94

APPROVED BY/DATE: [signature] / 12/8/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF7	3.1.2(5)	Loss of vacuum, including loss of hotwell level control
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic ction.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty Output from LC-12B

Primary Effects:
The reject level controller will go to the value selected by the instructor. If the output causes the reject valves to open, hotwell level will decrease.

Due to level decrease, the makeup valves will open to try and maintain the hotwell level, condensate flow will increase, condensate pressure will decrease, demin dp will increase, and COND DEMIN dp HI alarm may be received if dp increases to 60 PSID.

The Following Data was recorded on the 8 pen recorders:

T:LT15	Main Condenser B hotwell level indicator (LI-15)
T:FI1	Condensate flow indicator (FI-1)
T:dp1660	Condensate demin dp (dpI-1660)
T:PI34	Condensate pump header pressure indicator (PI-34)
T: XFVRB	Feedwater Reg. Valve B position indication
T:LI35	Condensate Storage Tank Level
R02235	Valve V-2-235 position
R0216	Valve V-2-16 position

The Sequence of Alarms Recorder (SAR) printout was also attached.

Results:

The Hotwell Level alarm was received and cleared during the test as expected. Two other alarms, which the procedure says MAY come in were not received because the process variables did not reach the alarm point. This response is correct. The APRM HI Alarm also came in and cleared.

Several of the plotted variables reached the full range selected for the recorder. In the future, when this test is repeated, the monitored range should be adjusted. The data obtained is sufficient to evaluate this malfunction.

The SRB questioned the reason for the APRM HI alarm during this test. The test was run again on December 6, 1994, without collecting data, to determine the cause for the alarm. During the rerun, the APRM Hi alarm was not received. It was noticed that a very minor level and power transient occurs which most likely which most likely caused an APRM to alarm at a lower transition point (i.e. Not all set high).

AVAILABLE OPTIONS:

1. Reject Controller Output : 0-100% (100% = Valves Open)
2. Ramp Time: 0-14,400 seconds
3. Delay Time : 0-28,800 seconds

OPTIONS TESTED:

1. Failure: 100%
2. Ramp time: 60 seconds
3. Delay time: 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run Time: 30 Minutes

At the conclusion of this test, the malfunction has been cleared and the plant is recovering from the event. The Hotwell Level alarm has cleared and the level is returning to normal. Due to the large volume of water displaced, full recovery of level cannot be achieved in a reasonable test time.
The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section. The Plant response is not severe, allowing complete recovery from this malfunction.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator problems were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

).C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS20
14.6.36.1

TITLE: Service Water Pump Trip

PREPARED BY/DATE: [signature] / 9/26/96

APPROVED BY/DATE: [signature] 11/12/96

TEST DATE: 09/06/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF8	3.1.2(6)	Loss of service or cooling water to individual components
MF10	3.1.2(8)	Loss of component cooling system or cooling to individual components

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance

criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Undervoltage Detector (52/UVD) opens sending a false undervoltage trip signal to the service water pump breaker.

Primary Effects:

Service water pump trips. SWS pump trip reduces SWS flow. RBCCW Heat Exchanger loses cooling flow, so RBCCW temperature increases, temperature of components cooled by RBCCW rise.

The following data was recorded:

T:PI6	SW pump discharge press
TSWSHTXO(1)	SW Hx outlet temp
WSWSPUMP(1)	SW pump flow
AEDSA3MM	Bus 1A3 Current
T:T43	RBC Hx outlet temp

Results:

The alarms and values of process variables demonstrate that components cooled by RBCCW did indeed experience an increase in temperature and a subsequent decrease when the pump was restarted.

All steps in the procedure were completed satisfactorily. The procedure did not specify any expected alarms but the alarms received were appropriate.

Trend plots on the Instructor Station were used in place of the strip chart recorder and were attached to the procedure. The Sequence of Alarms (SAR) printout was also attached.

AVAILABLE OPTIONS:

(1) Pump trip SWS-1A SWS Pump 1-1
SWS-1B SWS Pump 1-2

(2) Delay time 0 - 28,800 seconds

OPTIONS TESTED:

(1) SWS-1A, Service Water Pump 1-1

(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power. (SW Pump 1-1 operating)

FINAL TEST CONDITIONS:

Execution Time: 60 Minutes

At the conclusion of the test, the malfunction has been cleared and the Service Water Pump manually restarted. The system temperatures are returning to normal. The Cleanup system has tripped from high temperature and requires operator action to return it to service. The Drywell temperature remains high but is decreasing.

The simulator is capable of continued simulation but requires operator action and run time to return to the original condition.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS21
14.6.33.3

TITLE: Shutdown Cooling Inadvertant Isolation

PREPARED BY/DATE: [signature] / 10/3/95

APPROVED BY/DATE: R Davidson / 12/5/95

TEST DATE: 11/28/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF9	3.1.2(7)	Loss of shutdown cooling
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those

expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Broken wire in panel 3F causes relays 6K15A and 6K15B to deenergize.

Primary Effects:
Inlet and outlet valves V-17-19 and V-17-54 close. Shutdown cooling flow stops. Cooldown will stop.

The following data was recorded on the 8 pen recorders:

T:PRV09A	SDC Pump A discharge press (PI-RV09A)
T:T45D T:T45A	SD cooling/fuel pool temp recorder and digital readout (TR-RV08 (Pts 1 and 4)
T:T43	RBC Hx Outlet Temp
T:TE31J	Recirc. Loop Temp

The Sequence of Events Recorder (SAR) printout was also attached.

Results:
All expected alarms were received.

The A SDC pump triped on low suction pressure. The last time this test was performed, the SDC Pump did not trip. Since the test procedure says the pump may trip, this is acceptable.

AVAILABLE OPTIONS:

Time delay 0 - 28,800 seconds

OPTIONS TESTED:

Delay time: 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-34, MOL Cycle 15 Core.

The Shutdown Cooling system was manually started since it is isolated in this IC.

FINAL TEST CONDITIONS:

Run Time: 40 Minutes

At the conclusion of this test, the malfunction has been cleared and the SDC System returned to operation. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator problems were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS22
14.6.24.1

TITLE: RBCCW Pump Trip

PREPARED BY/DATE: [signature] / 11/14/96

TEST DATE: 09/21/95

APPROVED BY/DATE: R W Wairdon / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF8 3.1.2(6) Loss of service or cooling water to individual components

MF9 3.1.2(7) Loss of shutdown cooling

MF10 3.1.2(8) Loss of component cooling system or cooling to individual components

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty overcurrent device trips RBCCW pump.

Primary Effects:
Pump trips causing a reduction in system flow and pressure. With two pumps running, the remaining pump may go to runout; if discharge pressure drops to <75 psig, the pump will runout, and receive an overcurrent trip (at 300a). Temperature of cooled components will increase.

The following data was recorded on the 8 pen recorders:

T:T43	RBC HX Outlet Temperature Recorder
LRBCSGTK	RBCSurge Tank Level
T:PIA18	RBC Pump Discharge Pressure Indicator
TRBCSW1I	RBC HX Inlet Temp
TRBCNRGO	NRHX Outlet Temp
T:T108	DW Temp (Supply)
T:PIP08	DW Press
WRBCPUMP(1)	RBC Pump flow
AEDSA2MM	RBC Pump Amps
T:TTEL10	NG01E No. 2 Seal Temperature
T:TTEL2	NG01A No. 2 Seal Temperature
T:TTEL6	NG01C No. 2 Seal Temperature
T:TTEM1	NG01A No. 1 Seal Temperature
T:TTEM3	NG01B No. 1 Seal Temperature
T:TTEM5	NG01C No. 1 Seal Temperature
T:TTEM7	NG01D No. 1 Seal Temperature
T:TTEM9	NG01E No. 1 Seal Temperature

Results:

During execution of this procedure, 3 field changes were made: 1) Clarify RBCCW Heat Exchanger Discharge Temperature response, 2) Correct the Recirc Pump Seal Temperature variables, and 3) Correct an additional monitored variable description.

The procedure indicates that the RBC Hx discharge temperature will decrease following the pump trip. The data indicates no change. Since the temperature will go to reactor building ambient temperature, this response is acceptable.

The Drywell Temperature and Pressure increased, resulting in a Hi DW Pressure Scram, Isolation and ECCS initiation. The strip chart apparently malfunctioned as it did not indicate any increase in drywell pressure.

All alarms identified in the procedure were received and no unwarranted alarms were noted.

AVAILABLE OPTIONS:

(1) Pump RBC-1A P-5-001
RBC-1B P-5-002

(2) Delay time 0 - 28,800 seconds

OPTIONS TESTED:

(1) RBC-1A P-5-001

(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power
1-1 RBCCW Pump running
1-2 RBCCW Pump off

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, the malfunction has been cleared and the pump restarted. The Reactor has scrammed and isolated and the Core Spray System is running. The simulator is capable of continued simulation should the instructor need to continue.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS23
14.6.45.18

TITLE: Loss of All Feedwater

PREPARED BY/DATE: [signature] / 10/16/96 TEST DATE: 09/13/96

APPROVED BY/DATE: R Davidson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF11 3.1.2(9) Loss of normal feedwater or normal feedwater system failure

MF12 3.1.2(10) Loss of all feedwater (normal and emergency)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This test is used to certify that the simulator will perform the Loss of Normal Feedwater Flow transient as described in

the FSAR Update - Section 15.2.7.

With the simulator at 100% power and Reactor level at a low 148 inches, the feedwater and condensate pumps are tripped. Following the Lo Level Scram, the Mode switch is placed in Shutdown to prevent MSIV closure on Steam Line Low Pressure. Reactor water level decreases to Lo Lo Level, causing Primary and Secondary Containment Isolation, Reactor Isolation, Recirc Pump Trip, Isolation Condenser Initiation, and Core Spray Initiation.

Simulation is continued until the Core Spray System returns Reactor Level to normal (>137 inches)

The following simulator control room chart recorders are collected and used to evaluate the test:

1. IA96, Fuel Zone Level
2. ID75, Feedwater/Steam Flow
3. ID14, Reactor Level/Pressure
4. IG02, Isolation Condenser/EMRV Discharge Temperatures
5. IA08, Core Delta P/Total Recirc. Flow
6. R105A, IRM/APRM (APRM Ch 1 & 2)
7. ID101, Feedwater Temperature

The Sequence of Alarms Recorder (SAR) alarm printout was also attached.

Results:

The Isolation Condenser/EMRV Discharge Temperature Recorder IG02 was not operable during this test. The chart was therefore not attached.

All alarms and automatic actions identified in the procedure occurred as expected. A review of the SAR indicates no unwarranted alarms.

AVAILABLE OPTIONS:

There are no options available for this test.

OPTIONS TESTED:

There are no options available for this test.

INITIAL CONDITIONS FOR TEST:

IC-15 Full Power

Reactor level is lowered to 148 inches using the master controller.

The feedwater and condensate pumps are manually tripped.

After the reactor scrams on low water level, the mode switch is placed in Shutdown, and the SRMs and IRMs are inserted.

FINAL TEST CONDITIONS:

Run Time: 2 Hours

At the conclusion of this test, reactor water level has been restored using the core spray system. No malfunctions or other instructor actions were used, so the simulator is capable of continued simulation of recovery actions.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

This is an FSAR transient. FSAR data is normally worst case conditions and may not reflect actual plant response. FSAR data is therefore used with caution.

Relap5 data for a total loss of feedwater prepared for test TTS70, Simultaneous Trip of all Feedwater Pumps, was also used to evaluate this test.

In 1992, a meeting was held with the person responsible for performing Relap5 analyses for Oyster Creek. Although this particular test procedure was not discussed, the analysis for 14.8.2, Total Loss of Feedwater, a very similar transient, was discussed. It is known that an unexpected increase in downcomer water level occurs in the Relap analysis at approximately 175 seconds. This increase was not present in the FSAR data used for comparison since the FSAR data stops at 125 seconds. The simulator did not exhibit a level increase until core spray was injected, the proper response.

The test procedure contains applicable acceptance criteria.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator deficiencies were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS24
14.6.6.7

TITLE: Control Rod Blade Stuck

PREPARED BY/DATE: [signature] / 11/19/94

TEST DATE: 11/15/94

APPROVED BY/DATE: R W Dawson / 12/6/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF14	3.1.2(12)	Control Rod Failure (stuck, uncoupled, drift, drop, & misaligned)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Mechanical binding

When the malfunction is activated, the control rod blade will not move using normal drive water pressure or scram accumulator pressure. If the CRDM is concurrently uncoupled from the blade, the CRDM will continue to move (in the withdraw direction), but will not be able to be inserted past the position at which the blade is stuck.

The procedure does not require the automatic recording of data.

The SAR printout was not attached as required by the procedure.

Results:

One field change was made to the test procedure during execution to correct a monitored variable.

All steps in the procedure were completed with 1 TR being written on the Rod Drop Speed. No alarms are expected in the test procedure and no unexpected alarms were reported. The Rod Overtravel and Rod Block alarms were received at the appropriate times during the test.

AVAILABLE OPTIONS:

(1) Control Rod blade stuck

CRD-7A (XX-YY) CRD-7D (XX-YY)
CRD-7B (XX-YY) CRD-7E (XX-YY)
CRD-7C (XX-YY) CRD-7F (XX-YY)

Where XX-YY indicates the core coordinates of the control rod to stick (e.g. 26-27).

A maximum of 6 rods can be selected to stick at any time.

The test procedure allows the test personnel to select any centrally located control rod that is withdrawn to any position between "08" and "40"

(2) Delay time 0 - 28,800 seconds

OPTIONS TESTED:

(1) CRD-7A Control Rod Blade 26-19 sticks at position 30, Delay Time = 0

(2) CRD-8A Control Rod Blade 26-19 is uncoupled, Delay Time = 0

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, the malfunction has been cleared and normal operation of the affected rod is verified. The simulator is capable of continued simulation.

The simulator passed this test with 1 new TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The Control Rod Dropped instantly when the stick malfunction was cleared. Rod speed should be limited by the velocity limiter.

The TR written is scheduled to be corrected by November, 1995.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS25
14.6.6.8

TITLE: Control Rod Blade Uncoupled

PREPARED BY/DATE: [signature] / 10/10/95

APPROVED BY/DATE: [signature] / 11/29/95

TEST DATE: 09/21/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF14	3.1.2(12)	Control Rod Failure (stuck, uncoupled, drift, drop, & misaligned)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an

alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Spurious uncoupling.

Primary Effects:
The control rod blade becomes uncoupled, but will follow the CRDM in the insert or withdrawn direction. If the CRDM is withdrawn to notch 48, and a coupling check is performed, the CRDM will go to the overtravel position, causing the "ROD OVERTRAVEL" annunciator to alarm on panel 5F/6F.

This procedure does not require the automatic recording of data.

Results:

All procedure steps were completed satisfactorily. One annunciator alarmed then cleared as expected.

AVAILABLE OPTIONS:

(1) Control Rod blade uncoupled	CRD-8A (XX-YY)	CRD-8D (XX-YY)
	CRD-8B (XX-YY)	CRD-8E (XX-YY)
	CRD-8C (XX-YY)	CRD-8F (XX-YY)

(This malfunction can be active for 1 to 6 rods at any time)

(2) Delay time	0 - 28,800 secs

OPTIONS TESTED:

(1) CRD-8A (26-31) Blade uncoupled

(2) Delay time: 0 Seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 15 Minutes

At the conclusion of this test, the malfunction has been cleared and verified as cleared. The simulator is capable of continued simulation, unaffected by the malfunction.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No problems were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION·

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS26
14.6.6.5

TITLE: Control Rod Drifts Out

PREPARED BY/DATE: [signature] / 11/8/94

APPROVED BY/DATE: R Wanlson / 12/22/94

TEST DATE: 10/12/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF14	3.1.2(12)	Control Rod Failure (stuck, uncoupled, drift, drop, & misaligned)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Broken collet fingers prevent the rod from seating on the index tube.

Primary Effects:
The control rod will tend to drift out until it reaches notch 48. If an insert signal is demanded, the control rod will insert to notch 00 and will stay there as long as the insert signal is present. If the insert signal is removed, the control rod will start to drift out again. Core neutron flux peaks will result from the control rod motion.

No data is collected automatically.

The SAR alarm printout was attached.

Results:

All alarms and automatic actions occurred as specified in the procedure. No unexpected alarms were recorded. It was noted that the control rod inserts to the Green-Green insert overtravel position. This response is correct.

AVAILABLE OPTIONS:

(1) Control Rod to drift drift out	CRD-5A (XX-YY)	CRD-5D (XX-YY)
	CRD-5B (XX-YY)	CRD-5E (XX-YY)
	CRD-5C (XX-YY)	CRD-5F (XX-YY)

Where XX-YY are the control rod coordinates.

Any combination of 1 to 6 control rods may be selected to fail.

(2) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) CRD-5C (18-27) Drifts out

(2) Delay time 0 sec.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 20 Minutes

At the conclusion of this test, the malfunction has been cleared and the simulator is capable of continued simulation. The procedure states that the malfunction is not recoverable, but that the malfunction can in fact be cleared by the instructor.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

Plant Abnormal Operating Procedure 2000-ABN-3200.06, Abnormal Control Rod Motion was used in preparing the test procedure.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS27
14.6.44.5

TITLE: Stuck and Uncoupled Control Rod

PREPARED BY/DATE: [signature] 2/19/93

TEST DATE: 02/19/93

APPROVED BY/DATE: [signature] 2/23/93
for R. DAVIDSON

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF14	3.1.2(12)	Control Rod Failure (stuck, uncoupled, drift, drop, & misaligned)
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those

expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Spurious uncoupling of the drive mechanism and mechanical binding of the control rod blade.

While the plant is in start up, a control rod blade becomes mechanically bound and uncoupled from its drive mechanism. The drive is then fully withdrawn, at which time the control rod frees itself and drops to the drive mechanism's current position.

As the drive is withdrawn to position 48, there should be no observable change in flux level on the neutron monitors.

When the drive reaches position 48 and a coupling check is performed, rod overtravel should be indicated.

When the control rod is unstuck, there should be a rapid increase in flux level observed on all channels of the IRMs.

IRM HIGH and HIGH HIGH indication and alarms should be observed.

Reactor scram should occur.

Fuel failure will occur as indicated by Main Steamline Radiation High and High High indication and alarms followed by the automatic isolation of the Main Steamlines.

The Following Data was recorded on the 8 pen recorders:

T:RN06A	MSL Rad Monitor A
T:RN06C	MSL Rad Monitor C
CRRXRHO	Core Reactivity
T:APRM1	APRM 1 Power Level
T:XIRM1	IRM 11 % Power
T:XSRM1	SRM 21 Counts Per Second
CRRXKEFF	K effective
ZCRDinch(69)	Rod Position (26-27)

The SAR and the PCS alarm printouts were also attached.

Results:

Two field changes were made to the procedure to correct variables and to select a higher worth control rod.

The test procedure was written to anticipate fuel failure and subsequent radiation monitor response. No fuel failure occurred on the simulator.

With the exception of no fuel failure, all alarms and automatic actions occurred as expected. No unwarranted alarms or automatic actions occurred.

AVAILABLE OPTIONS:

CRD-8A (xx-yy) and CRD-7A (xx-yy)
CRD-8B (xx-yy) and CRD-7B (xx-yy)
CRD-8C (xx-yy) and CRD-7C (xx-yy)
CRD-8D (xx-yy) and CRD-7D (xx-yy)
CRD-8E (xx-yy) and CRD-7E (xx-yy)
CRD-8F (xx-yy) and CRD-7F (xx-yy)

Delay time: 0-28,800 seconds

NOTE: From 1 to 6 control rods can be selected to stick and be uncoupled concurrently.

OPTIONS TESTED:

Control Rod 26-27 was selected for this test. To ensure high worth, an out of sequence rod was selected.

Delay Time: 0 seconds

INITIAL CONDITIONS FOR T

(1) IC-2, Cold Start up.

(2) Select malfunction:

  (1) CRD-7A: (xx-yy), where control rod (xx-yy) is an out of sequence high worth rod.

  (2) Delay time: 0 seconds

  (3) CRD - 8A: (xx-yy)

  (4) Delay time: 0 seconds and ACTIVATE malfunction.

(3) Other actions:

  (1) Withdraw control rod (xx-yy) to position 48 and perform coupling check, verify rod overtravel.

  (2) Delete malfunction CRD-7A (xx-yy).

FINAL TEST CONDITIONS:

Run Time: 5 Minutes; Setup Time: 4 Hours

At the conclusion of the test, the reactor has scrammed. One malfunction remains active but can be cleared by the instructor. The simulator is capable of continued simulation.

The simulator passed this test with 1 outstanding TR.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

Discussions were held with personnel who perform accident analysis for Oyster Creek. It was learned that some approved

methods of analyzing this event predict fuel failure while others predict no failure.

The reviewers agreed that the response of the model (no fuel failure) is acceptable.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

One previously written TR concerning the lack of fuel failure was cleared during this test.

A new TR was written concerning the incorrect rod position indication on the Rod Worth Minimizer CRT display with both malfunctions active.

The TR is scheduled for resolution by February, 1994.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS28
14.6.45.19

TITLE: Control Rod Maloperation @75% Power & at 100% FSAR Conditions

PREPARED BY/DATE: [signature] / 9/26/96 TEST DATE: 9/12/96

APPROVED BY/DATE: R W Wanson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF14 3.1.2(12) Control Rod Failure (stuck, uncoupled, drift, drop, & misaligned)

MF29 Spec. 2.3 Abnormal (excessive) control rod worth

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 M(function tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This test is used to certify that the simulator response to rod manual control system maloperation (operator error) is acceptable.

From 75% power, the maximum worth control rod is rapidly withdrawn until stopped by the APRM Rod Block. The malfunction used for this test, however, allows the control rod to continue out after the rod block is generated.

The change in neutron flux is evaluated using TIP traces.

No automatic data collection is required. Core performance data is obtained by test personnel using the stimulated Plant Computer System (PCS). Color plots from the PCS CRT and the Sequence of Alarms Recorder (SAR) printout were attached.

Results:

Until November 1995, previous attempts to perform this test were unsuccessful. The test was reported as not performed in the original simulator certification.

One field change was made to the procedure to delete the termination of rod motion by the rod block.

The expected Rod Block Annunciator alarmed and no unexpected alarms occurred. No automatic actions occurred as the malfunction prevents the rod block from stopping the control rod.

Core performance data trended in the right direction as indicated by the TIP traces and the following PCS limits display:

	Start	END
MCPR	70.81%	82.86%
MLHGR	60.50%	71.47%
MAPLHGR	61.56%	68.96%

Tip traces and the Reactivity/Power Distribution plots from the PCS CRT were printed and attached.

AVAILABLE OPTIONS:

There are no options applicable to this test.

OPTIONS TESTED:

There are no options applicable to this test.

INITIAL CONDITIONS FOR TEST:

IC-63 75% Power, Cycle 15 Core

FINAL TEST CONDITIONS:

Run Time: 60 Minutes

At the conclusion of this test, reactor power is approximately 120 mwt higher than at the start. The malfunction is still active and the control rod remains withdrawn.

The simulator is capable of continued simulation should the instructor need to continue. The malfunction can be cleared and the control rod position corrected.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains applicable acceptance criteria.

The event is similar to a postulated event described in the FSAR.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS29
14.6.6.1

TITLE: CRD Flow Control Valve Fails

PREPARED BY/DATE: [signature] / 11/5/96 TEST DATE: 09/04/96

APPROVED BY/DATE: R W Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF15 3.1.2(13) Inability to drive rods

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Failure of the associated E/P converter causes the selected CRD flow control valve to fail to the position selected by the instructor.

Primary Effects:
Failure of the FCV will cause the CRD System flow to respond as appropriate depending upon the valve position demanded by the instructor. If the flow is increased, the drive water and cooling water dPs will increase, causing control rod speeds to increase. If flow is sufficiently high, rods may drift in.
If the CRD system flow is decreased, the drive water and cooling water dPs will decrease causing slower (or no) rod motion. Additionally, a decreased system flow will reduce the cooling water flow which will cause the CRD mechanism temperatures to increase. If the temperatures increase to 250 degrees F, the "CRD HI TEMP" annunciator will alarm on panel 5F/6F.

In this test, the FCV is failed to the 100% open position, causing the effects noted above.

The following data was recorded on the Instructor Station Trend recorder:

T:FIRD15	CRD Flow
T:FIRD36	CRD Rc rn Flow to Reactor
T:FIRD42	CRD Cooling Water Flow
T:PIRD04	CRD Drive Water Pressure
T:PIRD05	CRD Cooling Water Pressure
T:PIRD19	CRD Charging Header Pressure

The Sequence of Alarms (SAR) printout was attached.

Results:

One field change was made to the test procedure to substitute the Instructor Station Trend Plots for the 8 Pen Recorder.

The procedure states that Control Rods may start to drift in if Cooling Water Pressure exceeds approx. 50 psi. During this test, the maximum Cooling Water Pressure was 26 psi. Rod drift, therefore, did not occur.
No alarms were anticipated in the test procedure. The Main Flash Tank HI/LO Level alarm came in and cleared several times during the test. This is a normal response to the load reduction caused by Control Rod insertion.

The Control Rod insertion time decreased from a normal 44.8 seconds to 39 seconds when the malfunction was activated.

AVAILABLE OPTIONS:

(1) Valve to fail	CRD-1A NC30A CRD-1B NC30B
(2) Position	0-100% (100%=Full Open)
(3) Ramp time	0-14,400 sec.
(4) Delay time	0-28,800 sec.

OPTIONS TESTED:

(1) CRD-1A FCV fails

(2) Position 100%

(3) Ramp time 30 secs

(4) Delay time 0 secs

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 20 Minutes

At the conclusion of this test, the malfunction has been cleared and system parameters have returned to normal. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator problems were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS30
14.6.31.1

TITLE: Fuel Cladding Failure

PREPARED BY/DATE: [signature] / 11/9/94

APPROVED BY/DATE: R Davidson / 12/6/94

TEST DATE: 10/18/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF16	3.1.2(14)	Fuel cladding failure and associated alarms

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty fuel causes fuel cladding failure.

Primary Effects:
Main Steam Line radiation monitors peg high. RAD HI-HI I and RAD HI-HI II alarm. MSIVs close resulting in Reactor Scram.

Off Gas radiation monitors indicate increasing radiation levels.

The following data was recorded on the 8 pen recorders:

T:RN06A	Steam Line Rad. Monitor
T:RN06B	(RN06A, B, C, D)
T:RN06C	
T:RN06D	
T:RN12A	Off Gas Rad Monitor
T:RN12B	(RN12A, B)
T:RN1615	Stack Gas Radiation Recorder
T:RN1624	(RN32A, B)

The Sequence of Alarms (SAR) printout was also attached.

Results:

All alarms identified in the procedure were received and no unexpected alarms were noted.

The Reviewer noted that since this test was performed on October 18, 1994, the Main Steam Line High Radiation Automatic actions (Scram, Isolation) have been removed in response to a plant modification.

AVAILABLE OPTIONS:

(1) % Fuel failure	0-100% (100% = 100 Micro Curie/cc)
(2) Ramp time	0 - 14,400 seconds
(3) Time delay	0 - 28,800 seconds

OPTIONS TESTED:

(1) 100% fuel failure

(2) Ramp time 60 seconds

(3) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15 - Full Power.

FINAL TEST CONDITIONS:

Run Time: 20 Minutes

At the conclusion of this test, the reactor is isolated and the steam line radiation levels are decaying off. The Offgas Radiation Monitors remain pegged high. The malfunction is not recoverable. The simulator is capable of continued simulation of recovery events, but the fuel cladding failure can be corrected by IC Reset only.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEJT, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS31
14.6.40.1

TITLE: Main Turbine Trip

PREPARED BY/DATE: [signature] / 11/19/94

APPROVED BY/DATE: [signature] 12/6/94

TEST DATE: 11/10/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF17	3.1.2(15)	Turbine trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an

alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty trip latch on the emergency governor.

The main turbine will trip.

With malfunction TCS-1 activated, note that the emergency governor red trip light on panel 7F is illuminated, the turbine stop valves, control valves, combined reheat valves and extraction steam isolation valves close. The reactor will scram.

The following data was recorded on the 8 pen recorders:

SRXSTOTL	Core Thermal Power
T:XAPRM4	APRM channel 4
PNSSTM(23)	30 inch Header Pressure
WNSSTKST	Total Steam Flow
RTCSCV(1)	Control Valve Position
RTCSCV(2)	
RTCSCV(3)	
RTCSCV(4)	
RTCSBV(1)	Bypass Valve Position
RTCSBV(2)	
RTCSBV(3)	
RTCSBV(4)	
RTCSBV(5)	
RTCSBV(6)	
RTCSBV(7)	
RTCSBV(8)	
RTCSBV(9)	
RTCSSV(1)	Stop Valve Position
RTCSSV(2)	
RTCSSV(3)	
RTCSSV(4)	
RTCSRHSV(1)	Reheat Stop Valve Position
RTCSRHSV(2)	

RTCSIV(1)	Intercept Valve Position
RTCSIV(2)	
T:T47	Feedwater Temperature
WNSSTKRT	Total Recirc Flow
OGENPU	Turbine Speed
VTSI(1)	Turbine Vibration
VTSI(5)	Turbine Vibration
VTSI(10)	Turbine Vibration
TTLOBOH	Turbine Oil Temperature
PTLOBOH	Turbine Bearing Oil Pressure
T:EPT1	Turbine Hydraulic Oil Pressure
PCNDVACA	Main Condenser A Vacuum
T:FID36A,B,C	Individual Feed String Flows

The SAR alarm printout was also attached.

Results:

With the exception of the relatively minor problems identified in the discrepancy section, all alarms and automatic actions occurred as specified in the procedure.

The reactor pressure and level response was excellent, with the Turbine Trip Anticipatory Scram shutting down the reactor, as expected, without receiving a neutron flux spike or scram. Two EMRVs opened to control reactor pressure as expected. The EMRVs remained open for a shorter time (7.3 seconds) than expected in the procedure. The shorter time is attributed to the recently installed DFCS which maintains feedwater flow for 20 seconds after a scram.

AVAILABLE OPTIONS:

Delay time 0-28,800 seconds

OPTIONS TESTED:

Delay time 0 seconds.

INITIAL CONDITIONS FOR TEST:

(1) IC-15, full power.

(2) Plant computer operating and set to print sequence of alarms (SAR).

FINAL TEST CONDITIONS:

Run Time: 8 Hours

At the conclusion of the test, the reactor has scrammed and isolated. The plant is in a post trip condition as would occur without any operator action. The simulator is capable of continued simulation of recovery operations.

The simulator passed this test with 1 new TR issued. All eight TRs active when this test was last run have been cleared.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

Two Plant Transient Assessment Reports, TAR-OC-018 and TAR-OC-013 were used to prepare the test procedure.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

One new TR was written during this test:

1. The Turbine Vibration Monitoring System did not respond to the trip and subsequent coast down.

This TR is scheduled for resolution by November, 1995.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS32
14.6.16.1

TITLE: Main Generator Trip

PREPARED BY/DATE: [signature] / 12/7/93

APPROVED BY/DATE: R Davidson / 12/8/93

TEST DATE: 11/10/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF18	3.1.2(16)	Generator trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely,

the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty 86G protective relay actuates causing Generator Trip.

Primary Effects:
Turbine trip and Reactor Scram. Turbine speed will increase immediately after trip.
Circuit Breakers GC1 and GD1 trip.
4160V Breakers 1A and 1B trip.
Auto Closure of 4160 Breakers S1A and S1B.
Diesel Gen. No. 1 and 2 start and come to idle speed.
Generator Field Breaker 41M trips.
Stator cooling water Pumps trip.
Annunciators on MCB 8F/9F alarm:

LKOUT Relay Trip	R-3-d
BRKR GD1 TRIP	R-1-c
BRKR GC1 TRIP	R-1-d
MAIN FIELD BRKR TRIP	R-5-a
Stator Clg Trouble	R-6-c

Indicators on MCB 8F/9F:
Gross megawatts go to zero
AC kilovolts decay rapidly
AC kiloamps decay rapidly
Exciter amps decay rapidly

The following data was recorded on the 8 pen recorders:

SGENR	Main Generator Real Power (Normalized)
SGENI	Main Generator Reactive Pwr MVAR (Normalized)
T:TURB	Turbine RPM
T:PIA92A	Reactor Pressure
RTCBV(1),(2),(3)	Bypass Valve Position
VTSI(9),(10)	Turbine Vibration
TGEAH2O	H2 Gas Temp
TGEACLRI	Stator cooling Water temp
TGEATDO2	Stator Winding temp
TTLOBDRN	Turbine LO Temp
EOEDMLN	230kv Bus voltage

The Sequence of Alarms (SAR) printout was also attached.

Results:

All annunciators expected in the procedure alarmed as required.
The MSIVs closed in approximately 18.5 seconds, faster than the 60 seconds expected in the procedure. This was noted to be faster than the 42 seconds recorded during the last test on October 30, 1992. A TR was written to correct the excessive rate of depressurization.

All steps in the procedure were completed satisfactorily.

The Turbine Generator response shows improvement since the last test . Both the Turbine speed and the Generator Winding Temperature decreased at a slower rate, a more realistic response.

The test was repeated on November 24, 1993 with the Isolation Condensers defeated to determine whether they were the cause of the early Steam Line Low Pressure isolation. This test concluded that the cause is the Turbine Bypass Valve operation.

AVAILABLE OPTIONS:

(1) Delay Time 0 - 28,800 seconds

OPTIONS TESTED:

Delay time 0 seconds.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 1 Hour, 30 Minutes

At the conclusion of this test, the malfunction has been cleared and the failed lockout relay reset and verified. The simulator is capable of continued simulation should the instructor want to continue scram recovery operations.

The simulator passed this test with one TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

Transient Assessment Report OC.011, Reactor Scram on Turbine Generator Trip, 11/20/85.

The test results were also compared to the results from the last test on October 30, 1992.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

As noted above, the Main Steam Isolation Valves closed from Main Steam Line Lo Pressure in about 18.5 seconds, faster than the expected 60 seconds. A TR was written to correct the excessive depressurization rate.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS34
14.6.13.9

TITLE: Failure of Pressure Compensation Inputs to Feedwater Control System

PREPARED BY/DATE: [signature] / 10/24/95 TEST DATE: 09/21/95

APPROVED BY/DATE: R Davidson / 12/27/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF11	3.1.2(9)	Loss of normal feedwater or normal feedwater system failure
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction cause: Broken wire at transmitter selected by the instructor.

Primary Effects:

Pressure transmitters ID46A or B or ID45 fails, causing a loss of signal. The following events occur as all 3 sensors are failed in sequence:

(1) On failure of ID46A, a DCC Trouble Alarm is received. DCC continues to control level, having selected B or C pressure sensor

(2) On failure of the second pressure sensor, ID46B, the DCC Trouble Alarm reflashes. Indicated Reactor Pressure (Recorder PTID45) increases slightly from Steam Line Pressure to Reactor Pressure, and reactor pressure is used by Feed Water control.

(3) On failure of ID45, the DCC Trouble Alarm again reflashes, and Recorder ID14 indicates a fixed 1020 psi pressure. The DCC continues to control feed water flow with a minor increase in reactor level.

NOTE: The above effects represent the response in the procedure as revised in the field.

The following data was recorded on the 8 pen recorders:

T:LID14	Rx level recorder ID14
T:FSID75	Steam flow recorder ID75
T:FFID75	Actual feedwater flow
T:FID38A	Main steam line A flow
T:FID38B	Main steam line B flow
WNSSTKSA	Actual steam flow A line
WNSSTKSB	Actual steam flow B line
T:PID14	Reactor pressure

The Sequence of Alarms Recorder (SAR) printout was attached.

Results:

A major field change was made to the test procedure to account for changes in response due to the Digital Feed Water Control system. During the last execution of this procedure on November 6, 1992, a reactor scram and isolation occurred and level dropped to below the Lo Lo Level setpoint. With the installation of Digital Feed Water control, the malfunction only causes a minor perturbation, even with all 3 pressure compensation signals failed. An additional field change was made to correct monitored variables.

AVAILABLE OPTIONS:

(1) Pressure transmitter ID46A FWC-10A
ID46B FWC-10B
ID45
FWC-10C

(2) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) All 3 pressure transmitters are failed in sequence. The simulator response is observed with each cumulating failure.

(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Test Time: 1.5 Hours

At the conclusion of this test, the malfunction is still active. The Digital Feed Water control system continues to control Reactor Level very well, in accord with the fault tolerant

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator performance problems were identified during this test. Procedure changes are identified above.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS35
14.6.17.4

TITLE: Isolation Condenser Return Valve Fails Open

PREPARED BY/DATE: [signature] / 11/17/94

TEST DATE: 10/19/94

APPROVED BY/DATE: R Dawson / 12/1/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF26	3.1.2(25)	Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the

simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Short in control switch on panel 1F/2F which sends open signal to valve actuator.

Primary Effects:
The Isolation Condenser Return Isolation Valve V-14-34 or V-14-35 selected by the instructor inadvertently fails open.

The following occurs when the Instructor Selected Valve fails open:

(1) Annunciator C-4-a Cond. A VLVS OFF NORMAL/C-4-b cond. B Valves OFF normal, annunciates.

(2) Annunciator C-7-b Inlet Pipe/shell Temp HI alarm.

(3) Selected valve opens as indicated by indicating lights changing from green to red.

(4) APRMs increase rapidly due to cold water injection when the valve opens.

(5) Reactor pressure decreases if a scram occurs.

(6) Reactor scram may occur due to hi flux.

The following data was recorded on the 8 pen recorders:

T:TTE37B	IC A Steam inlet temperature Pt. 1 (TE37B)
T:TTE37E	IC A Steam inlet temperature Pt. 2 (TE37E)
T:TTE37A	"A" shell side temperature Pt. 3 (TE37A)
T:LIG07A	Isolation Condenser "A" level indicator (LI-IG07A)
T:PID45	Reactor Pressure (PIT-ID45)
T:LID59A	Rx water level
SNSSAPRM	Rx power
SGENMWMT	Generator MWE
WNSSTKST	Rx steam flow
WNSSTKFT	Feedwater flow
T:FIA72C	Total Recirc Flow
T:FIA60A	Loop A Recirc Flow
T:TE31A	Recirc Pump A Suction Temp

Results:

A field change was made to the procedure to correct variable names and ranges for the 8 pen recorders. An additional field change was made to delete the reactor scram from the expected response per TR 2394 resolution.

The malfunction operated correctly in that the selected valve opened as expected. Reactor power increased approximately 5 % over a 10 second period. Shortly after initiation, the Isolation Condenser isolated from high flow in the condensate return line. The reviewer determined that this is the correct response when an IC is initiated at high recirc flow.

The Isolation Condenser temperature response was less than expected by the procedure and did not alarm. The reviewer determined that the recorder points were incorrectly spanned and that the temperature response was minimal since the IC isolated shortly after initiation.

AVAILABLE OPTIONS:

(1) Valve	ICS-4A V-14-34 ICS-4B V-14-35
(2) Delay time	0-28,800 seconds

OPTIONS TESTED:

(1) ICS-4A, V-14-34 (A Isolation Condenser)

(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of the test, the malfunction has been cleared and the valve has closed. With the malfunction cleared, the simulator is capable of continued simulation.

The simulator passed this test with no TRs.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

Test and review personnel recall plant events similar to this test which resulted in reactor scrams. The plant data from these events could not be recovered for evaluation of this malfunction. Test and review personnel also agreed that isolation of the IC is likely if recirc flow is at or near rated when the IC is initiated.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Several field changes to the procedure were made as noted above.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS36
14.6.20.19

TITLE: Steam Leakage Outside Containment on 30" Header

PREPARED BY/DATE: [signature] / 11/12/96 TEST DATE: 09/05/96

APPROVED BY/DATE: R D Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF1 3.1.2(1)(b) LOCA inside & outside containment

MF21 3.1.2(20) Main steam and main feed line breaks (inside & outside)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Piping failure.

A steam leak develops in the 30" header, with the leak rate selected by the instructor.

Primary Effects:
With the malfunction activated to the maximum leak rate, the MSIVs close and the reactor scrams. The following primary annunciators on panel 5F/6F will alarm:

MSIV CLOSED I AND MSIV CLOSED II
FLOW HI/MN STM LINE AREA TEMP HI HI I
FLOW HI/MN STM LINE AREA TEMP HI-HI II
MN STM PRESS LO I
MN STM PRESS LO II
FLOW MISMATCH
MN STM VLVS OFF NORMAL.

The following data was recorded on the Instructor Station Trend Plots:

T:FID33A	Main steam flow A
T:FID33B	Main steam flow B
T:PID76A	Rx pressure
T:LRE21A	Rx water level
T:FFID75	Feedwater flow
WNSSTKSA	Steamline flow A
WNSSTKSB	B
T:RN06A	Steamline radiation
T:RN06B	
T:PPT1	Steamline pressure
T:TIB13A,B,C,D	Steamline temperature
WNSSTK(89)	Leakage from break (NSS-19)
PTBSTOF	Turbine bldg pressure
T:R14A04	Turbine operating floor (ARM)

The Sequence of Alarms Recorder (SAR) printout was also attached.

Results:

One field change was made to the procedure to correct monitored variables.

All alarms identified in the procedure were received and no unexpected alarms actuated.

The MSIVs closed from High Flow, causing an MSIV closure scram.

In reviewing the data, it could not be verified that steam flow increased as much as anticipated in the procedure as all steam flow variables had improper ranges selected on the recorder. Leak flow peaked at 1200 lbm/sec (~50% of rated).

The response of area temperature monitors IB-13B, C, & D was inadequate, increasing to approximately 152 F. The procedure anticipated > 160 F. A TR was written.

AVAILABLE OPTIONS:

(1) Leak size 0-100% (100% = 30" double shear)

(2) Ramp time 0-14,400 seconds

(3) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) Leak size 100%

(2) Ramp time 30 seconds

(3) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, 100% Power Operation

FINAL TEST CONDITIONS:

Run Time: 1 Hour, 15 Minutes

At the conclusion of this test, the Reactor is scrammed and isolated, and the turbine has tripped. The simulator must be reset to any IC to repair the steam line break. The simulator is capable of continued simulation of recovery events.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The response of area temperature monitors IB-13B, C, & D was inadequate, increasing to approximately 152 F. The procedure anticipated > 160 F. A TR was written to be corrected by May 1997.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS37
14.6.3.12.02

TITLE: Feedwater Line Rupture Outside Primary Containment

PREPARED BY/DATE: [signature] / 10/13/95 TEST DATE: 09/20/95

APPROVED BY/DATE: [signature] / 11/29/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF11	3.1.2(9)	Loss of normal feedwater or normal feedwater system failure
MF12	3.1.2(10)	Loss of all feedwater (normal and emergency)
MF21	3.1.2(20)	Main steam and main feed line breaks (inside & outside)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the

simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty Weld.

A faulty weld causes rupture of feedwater header after the high pressure feedwater heaters in the turbine building.

Primary Effects:

For the option selected, feedwater will be discharged into the Turbine Building Heater Bay. The feed pumps go to runout. Reactor Level rapidly decreases and a Reactor Lo Level Scram occurs. Reactor Level continues to decrease, reaching Lo Lo Level, resulting in the following:

Reactor Isolation
Recirculation Pump Trip
Isolation Condenser Initiation
Primary Containment Isolation
Secondary Containment Isolation
Standby Gas Treatment System Initiation
Core Spray Pumps Start

Turbine Building Sumps fill rapidly.

The following data was recorded on the 8 pen recorders:

T:LID14	Rx Water Level
T:PTID45	Rx Pressure
T:FID36A	Feed Pump A Flow Indicator
T:FID36B	B
T:FID36C	C
T:LR37	Suppression Pool Level
T:TI43A	Suppression Pool Temperature
T:PIP08	Drywell Pressure
T:T101C	Drywell Temperature
LPCNS	Drywell Floor Drain Sump Level
LTBSSUMP(2)	1-2 Sump Level
LTBSSUMP(3)	1-3 Sump Level
LNSSMPA	Fuel Zone A Level
LNSSMPB	Fuel Zone B Level

Results:

Two field changes were made to the procedure to correct monitored variables and to revise the response per the Digital Feed Water System modification.

All anticipated alarms were received and no unwarranted alarms were noted. All steps in the procedure were completed satisfactorily following the field changes.

AVAILABLE OPTIONS:

1. Location	CFW-12A Inside Containment
	CFW-12B Outside Containment
2. Leak Size	0 - 100% (100%=rupture of 18" pipe)
3. Ramp Time	0 - 14,400 seconds
4. Delay Time	0 - 28,800 seconds

NOTE: Malfunction CFW-12 has 2 options, inside and outside containment. The test procedure, however, is specific to the outside leak.

OPTIONS TESTED:

1. Location	Outside Containment CFW-12B
2. Size	100%
3. Ramp Time	0 seconds
4. Delay Time	0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run Time: 90 Minutes

At the conclusion of the test, the Core Spray System is running but reactor pressure is still above 700 psi. Core Spray injection has not occurred. The simulator is capable of continued simulation of this event. The malfunction is unrecoverable, requiring IC Reset to correct the broken pipe.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

The response is similar to TTS70, Simultaneous Trip of All Feedwater Pumps. Expected results for TTS70 were calculated using RELAP5 Best Estimate Analysis (SIM-OC-323, OCS-5083). The RELAP analysis was performed at 2 setpoints for Lo Lo Level, 86" and 90". The 90" data was used for comparison. The simulator Reactor Level response was close to the RELAP analysis, with the low level setpoint reached at approximately 15 seconds and the Lo Lo reached at 35 seconds.

When compared to the last test performed on September 24, 1992, Reactor Level decreases slower, 15 seconds to Lo Level vs. 10 seconds. Previously, the reactor level decrease began immediately after the break. During this test, level remained constant for approximately 7 seconds, then decreased.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

As noted above, several field changes were made to the test procedure.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS38
14.6.3.12

TITLE: Feed Pump Discharge Header Rupture Inside Containment

PREPARED BY/DATE: [signature] / 12/9/93

TEST DATE: 12/15/93

APPROVED BY/DATE: [signature] / 12/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF11	3.1.2(9)	Loss of normal feedwater or normal feedwater system failure
MF12	3.1.2(10)	Loss of all feedwater (normal and emergency)
MF21	3.1.2(20)	Main steam and main feed line breaks (inside & outside)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the

simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty weld.

Primary Effects:
Feed flow with a temperature of 315 F will be discharged to the containment. Reactor coolant at saturation temperature will also discharge to containment. The feed pumps will go into runout as indicated by the amber runout lights for all three feedpumps on panel 5F/6F.
Reactor water level will decrease. At 146" the low level alarm comes in, at 138" the scram will occur, and at 90" ECCS will start
Primary containment temperature and pressure will rapidly increase. When drywell pressure reaches 1.4 psig, the alarm occurs. At 2.9 psig the scram, Isolation and ECCS starts.

The Following Data was recorded on the 8 pen recorders:

T:LID14	RX water level
T:PTIA92	RX Pressure (WR)
T:FID10A	Feed pump A flow indicators
T:FID10B	B
T:FID10C	C
T:LR37	Suppression Pool Level
T:TI43A	Suppression Pool Temp
T:PIP08	Drywell pressure
TPCNDVB	Drywell Bulk Temperature
LPCNS	Drywell floor drain sump level
LNSSMPA	Fuel Zone Level A
LNSSMPB	Fuel Zone Level B
WCSSSP1	Core Spray Flow System 1
WCSSSP2	Core Spray Flow System 2

The SAR printout was attached.

Results:

A major field change was made to the test procedure to change the detailed plant response from Option B (Outside Containment) to Option A (Inside Containment).

All alarms expected in the procedure were received and all expected automatic actions occurred. Many other additional alarms were received, as expected in response to a LOCA. All steps in the procedure were completed satisfactorily after the field changes.

Later in the event, reactor level recovered when the feedwater system exhausted the water supply in the hotwells and feed flow went to zero.

AVAILABLE OPTIONS:

Location	CFW-12A Inside containment CFW-12B Outside Containment
Leak Size	0-100% (100% = rupture of 18" pipe)
Ramp time	0-14,400 sec.
Delay time	0-28,800 sec.

OPTIONS TESTED:

CFW-12A Inside Containment

Leak size:	100%
Ramp time:	60 sec.
Delay time:	0 sec.

INITIAL CONDITIONS FOR TEST:

IC-15, full power

FINAL TEST CONDITIONS:

Run Time: Approx. 30 Minutes

This malfunction is not recoverable. At the conclusion of this test, the reactor is recovering from a feedwater line break inside the drywell. All ECCS systems have actuated. The

simulator is capable of continued simulation of recovery events not included in this procedure.

The simulator passed this test with 1 TR outstanding.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Late in the event, when feedwater flow stopped due to exhaustion of the inventory in the condenser hotwells, the reactor water level increased to above normal. This was accompanied by a decrease in torus level, indicating that the CSS system was filling the reactor. It appears that the flow from the reactor through this double ended break stops when feedwater flow stops. Leakage from the reactor should continue since the leak is on the reactor side of the feedwater check valves. TR 3062 was written to be corrected by November 1994.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS39
14.6.19.1

TITLE: SRM Fails

PREPARED BY/DATE: [signature] / 7/10/95 — TEST DATE: 06/15/95

APPROVED BY/DATE: R Warnick / 11/29/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF22	3.1.2(21)	Nuclear instrumentation failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Malfunction of the Log Count Rate (LCR) Amplifier.

Primary Effects:
The selected SRM fails to the percent of scale selected by the instructor.

With the Reactor in Cold Shutdown and the malfunction activated to 100%, the selected SRM will fail to 10E6 cps.

The SRM will indicate upscale on the count rate meter on 4F, and SRM drawer.

The following annunciators will alarm on panel 3 F:

SRM HI-HI
SRM HI/INOP

The UPSCALE HIGH and UPSCALE HIGH-HIGH lights on the SRM drawer will illuminate, as will the HIGH and HI-HI lights on panel 4F for the SRM channel selected.

A rod block signal will be generated by RMC causing a ROD BLOCK alarm.

The procedure does not require automatic recording of data.

Results:
The alarms expected were received. No unanticipated alarms were identified.
The SAR Alarm printout was not attached.

AVAILABLE OPTIONS:

(1) SRM Channel	NIS-1A Channel 21 NIS-1B Channel 22 NIS-1C Channel 23 NIS-1D Channel 24
(2) Failure position	0-100% (100% = 10E6 cps)
(3) Ramp time	0-14,400 seconds
(4) Delay time	0-28,800 seconds

OPTIONS TESTED:

(1) NIS-1A SRM 21 Fails
(2) Failure position: 100%
(3) Ramp time: 30 seconds
(4) Delay time: 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-1, Cold Shutdown

The initial SRM Count Rate was recorded as 14 cps.

FINAL TEST CONDITIONS:

Run Time: 20 Minutes

At the conclusion of this test, the malfunction has been cleared and all alarms and trips reset. The simulator was capable of continued simulation, unaffected by the malfunction.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator deficiencies were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS40
4.6.19.9

TITLE: IRM Fails

PREPARED BY/DATE: [signature] 10/18/96 TEST DATE: 09/05/96

APPROVED BY/DATE: R Davidson 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF22 3.1.2(21) Nuclear instrumentation failures

MF24 3.1.2(23) Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Malfunction of the DC amplifier.

Primary Effects:
The selected IRM fails to the percent of scale selected by the instructor (from 0% = 0% of scale on range 1, to 100% = 40% on range 10).

With the malfunction activated to 100%, the selected IRM will fail to 40% of scale (range 10).

The IRM will indicate upscale on the IRM/APRM recorder on 4F, and on the IRM drawer.

The following annunciators will alarm on panel 3F:

IRM HI-HI/INOP (I or II, depending on the IRM selected.)

The HIGH and HI-HI lights on 4F and the IRM drawer for the selected IRM will illuminate.

The procedure does not require the automatic recording of data.

Results:

The alarms expected were received and no unanticipated alarms were identified. All steps in the procedure were completed with no discrepancies identified.

The Sequence of Alarms (SAR) printout was attached.

AVAILABLE OPTIONS:

(1) IRM Channel	NIS-9A Channel 11
	NIS-9B Channel 12
	NIS-9C Channel 13
	NIS-9D Channel 14

NIS-9E Channel 15
NIS-9F Channel 16
NIS-9G Channel 17
NIS-9H Channel 18

(2) Failure position 0-100% (100% = 40% of scale on Range 10)
(3) Ramp time 0-14,400 seconds
(4) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) NIS-9B IRM 12 Fails
(2) Failure position 100%
(3) Ramp time 30 seconds
(4) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-79, Cold Startup

FINAL TEST CONDITIONS:

Run Time: 20 Minutes

At the conclusion of this test, the malfunction has been cleared and all alarms and trips reset. The simulator is capable of continued simulation, unaffected by the malfunction.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

NONE

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS41
14. 6.19.19

TITLE: LPRM Fails

PREPARED BY/DATE: [signature] / 11/5/93 TEST DATE: 11/03/93

APPROVED BY/DATE: R Davidson / 11/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF22	3.1.2(21)	Nuclear instrumentation failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely,

the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Malfunction of the flux amplifier.

Primary Effects:
The selected LPRM fails to a deviation selected by the instructor.

With the malfunction activated to 100%, the selected LPRM will fail to 125% scale.

The LPRM will indicate upscale on the full core display, the amber light next to the indicator, and the upscale light on the auxiliaries drawers on panel 3R or 4R will be illuminated.

LPRM HI annunciated. Possible rod block and half scram due to APRM HI and APRM HI-HI depending on initial reading of failed LPRM.

The following data was recorded on the 8 pen recorders:

T:XLP071	LPRM (20-49D)
T:XAPRM6	APRM Ch. 6

Results:
When the malfunction was activated, all anticipated alarms and automatic actions occurred. APRM HI, APRM HI-HI, Rd Block, and Half Scram all were received because the initial reactor power was 100%.

The test operator also verified the following related functions which all worked properly:

APRM Bypass Joy Stick on 4F
LPRM Alarm Bypass on 5R
APRM Input Bypass on 5R

AVAILABLE OPTIONS:

(1) LPRM to Fail (Where XXX corresponds to a string location and Z corresponds to the axial level of the LPRM). A maximum of 24 detectors can be selected to fail, each with its own individual output and time delay.

NIS 19A (XXXZ)	NIS 19M (XXXZ)
NIS 19B (XXXZ)	NIS 19N (XXXZ)
NIS 19C (XXXZ)	NIS 19O (XXXZ)
NIS 19D (XXXZ)	NIS 19P (XXXZ)
NIS 19E (XXXZ)	NIS 19Q (XXXZ)
NIS 19F (XXXZ)	NIS 19R (XXXZ)
NIS 19G (XXXZ)	NIS 19S (XXXZ)
NIS 19H (XXXZ)	NIS 19T (XXXZ)
NIS 19I (XXXZ)	NIS 19U (XXXZ)
NIS 19J (XXXZ)	NIS 19V (XXXZ)
NIS 19K (XXXZ)	NIS 19W (XXXZ)
NIS 19L (XXXZ)	NIS 19X (XXXZ)

(2) Output: 0-100% (0% = -125, 100% = +125)

(3) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) NIS-19 (001D) LPRM 20-49D
(2) Output: +125%
(3) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, full power.

FINAL TEST CONDITIONS:

Run Time: 30 Minutes

At the conclusion of this test, the malfunction has been cleared and the simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator deficiencies were identified.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS42
14.6.19.20

TITLE: APRM Fails

PREPARED BY/DATE: [signature] / 11/7/94

TEST DATE: 10/12/94

APPROVED BY/DATE: [signature] / 12/22/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF22	3.1.2(21)	Nuclear instrumentation failures
MF24	3.1.2(23)	Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Failure of the flux averaging amplifier.

Primary Effects:

The selected APRM will fail to the power level selected by the instructor (from 0% = 0% power to 100% = 150% power).

With the malfunction activated to 100% (150% power) the APRM indication on the IRM/APRM recorder on panel 4F reads 150%, the APRM HI-HI/INOP (I or II as appropriate), CHANNEL (I or II as appropriate) and APRM HI annunciators on panel 3F, the HI & HI-HI lights on 4F and the upscale light on the LPRM-APRM Auxiliaries drawer on 3R or 4R (as appropriate) are on.

Half scram and rod block occur.

The procedure does not require the automatic recording of data.

Results:

As suggested in Procedure TTS42, the option for APRM Channel 6 was selected. Field changes were made to the procedure to accommodate the response to a failure of APRM Channel 6. Channels 5 through 8 do not cause a Rod Block but the rod will be automatically deselected when rod withdrawal is attempted.

All steps in the procedure (as changed) were completed with no discrepancies identified. All alarms expected were received and no unexpected alarms were observed. The procedure specified APRM Channel 1 for the test but APRM Channel 6 was

used instead. Procedure TTS42 allows the use of alternate channels in performing the test.

AVAILABLE OPTIONS:

(1) APRM to fail - Any number of APRMs can be selected, each with individual output,ramp time, and time delay options.

NIS-20A APRM 1
NIS-20B APRM 2
NIS-20C APRM 3
NIS-20D APRM 4
NIS-20E APRM 5
NIS-20F APRM 6
NIS-20G APRM 7
NIS-20H APRM 8

(2) Failure position 0-100% (100% = 150% power)

(3) Ramp time 0-14,400 seconds

(4) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) NIS-20F - APRM Channel 6 Fails
(2) Failure position 100%
(3) Ramp time 30 seconds
(4) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run Time: 30 Minutes

At the conclusion of this test, the malfunction has been cleared. All trips and alarms have been reset. The simulator was capable of continued simulation, unaffected by the malfunction.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

NONE

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS43
14.6.20.7

TITLE: Reactor Vessel Level Transmitter Fails

PREPARED BY/DATE: JM Mowry / 11/13/96

APPROVED BY/DATE: R Dawson / 12/4/96

TEST DATE: 09/05/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF11	3.1.2(9)	Loss of normal feedwater or normal feedwater system failure
MF13	3.1.2(11)	Loss of protective system channel
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

PROCEDURE TTS43

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Failure of the level transmitter.

The selected level transmitter fails to the output determined by the instructor.

Primary Effects:

The following occurs after the level transmitter failure.
NSS 7A,B ID13A,B
If the channel failed high is selected for level control, Feed Reg valves will close, causing Rx Level decrease.

NSS-7C ID13
Indication will fail

NSS-7D,E,F,G RE05A,B RE05/19A,B
Failed High - Turbine Trip
Failed Low - Reactor scram

NSS-7H,I,J,K RE02A-D
Core Spray Initiation
Reactor Isolation
Recirc Pump Trip
SBGTS Initiation
Isolation condenser Initiation
D/G Start

NSS7L,M,N,O,P,Q,R,S IA90A,B IA91A,B 1008,9,10,11
Fuel Zone Level indication fails.

No data is recorded automatically .

Results:

Seven field changes were made to the procedure to add additional detail, revise severity levels and ramp time, include the DFRCS modification, include deletion of automatic Containment Spray, and to include the ROPS modification.

With the exception of Annunciator B-2-d, as reported below, all annunciators and automatic actions occurred as specified in the test procedure.

The SAR printout was attached as required.

AVAILABLE OPTIONS:

OPTION	Device	FUNCTION
NSS-7A	ID13A	
NSS-7B	ID13B	(FWC, NR Gemacs panel
NSS-7C	ID13	(WR Gemac on 5F)
NSS-7D	RE0519A	
NSS-7E	RE0519B	RPS (Yarways on 5F)
NSS-7F	RE05A	
NSS-7G	RE05B	RPS (Turbine trip input)
NSS-7H	RE02A	
NSS-7I	RE02B	
NSS-7J	RE02C	
NSS-7K	RE02D	(Core Spray input)
NSS-7L	IA90A	

NSS-7M	IA91A	(Fuel Zone A on 5F)
NSS-7N	IA90B	
NSS-7O	IA91B	(Fuel Zone B on 5F)
NSS-7P	1008	
NSS-7Q	1009	(Fuel Zone C on 5F)
NSS-7R	1010	
NSS-7S	1011	(Fuel Zone D on 5F)

(2) Instrument output — 0-100% of range

(3) Ramp time — 0-14,400 seconds

(4) Delay time — 0-28,800 seconds

OPTIONS TESTED:

OPTION	OUTPUT	RAMP	DELAY
NSS-7A	0%	30 sec	0 sec
NSS-7B	0%	30 sec	0 sec
NSS-7C	0%	30 sec	0 sec
NSS-7D	0%	30 sec	0 sec
NSS-7E	0%	30 sec	0 sec
NSS-7F	100%	30 sec	0 sec
NSS-7G	100%	30 sec	0 sec
NSS-7H	0%	0 sec	0 sec
NSS-7I	0%	0 sec	0 sec
NSS-7J	0%	0 sec	0 sec
NSS-7K	0%	0 sec	0 sec
NSS-7L	100%	30 sec	0 sec
NSS-7M	100%	30 sec	0 sec
NSS-7P	100%	30 sec	0 sec
NSS-7Q	100%	30 sec	0 sec
NSS-7R	100%	30 sec	0 sec
NSS-7S	100%	30 sec	0 sec

INITIAL CONDITIONS FOR TEST:

IC-15, full power, with CRD pump B in service.

FINAL TEST CONDITIONS:

Run Time: 90 Minutes.

Each Option of the malfunction can be cleared independently. Control actions may require IC reset to continue with additional sections of the test procedure. At the conclusion of this test, IC reset is required to continue.

In actual use, this malfunction can be cleared by the instructor.

The simulator passed this test with one new TR issued on a Core Spray System Alarm.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Three field changes were made to the procedure to add additional detail and to include two modifications installed since the test was last performed.

One new TR was issued during this test. The TR relates to the alarm logic in the Core Spray System, not specifically to this malfunction. The TR is scheduled for resolution by July, 1997.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS44
14. 6.20. 8

TITLE: Reactor Vessel Pressure Transmitter Fails

PREPARED BY/DATE: [signature] / 11/5/93

TEST DATE: 11/03/93

APPROVED BY/DATE: R Davidson / 11/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF13	3.1.2(11)	Loss of protective system channel
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures
MF24	3.1.2(23)	Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Failure of the pressure transmitter.

Primary Effects:
The selected pressure transmitter fails to the output determined by the instructor.

All options were tested using this procedure. The primary simulator response for each option is:

1. NSS-8A, 8B, 8C & 8D were tested individually resulting in a half scram for each.

2. NSS-8E, 8F, 8G & 8H were tested individually resulting in Isolation condenser initiation logic initiation.

3. NSS-8I & J were tested individually causing Fuel Zone Channel A & B) failure.

4. NSS-8K & L were tested individually causing Fuel Zone Channel C & D failure.

The procedure does not require automatic recording of any data.

The Sequence of Alarms Recorder (SAR) printout was attached.

Results:
Two field changes to the procedure were made to clarify the response when testing different options and to correct the expected meter response.

All alarms specified in the procedure actuated as expected. Additional alarms associated with the trip of all recirculation pumps were also received.

AVAILABLE OPTIONS:

(1) Instrument to fail	NSS-8A RE03A NSS-8B RE03B NSS-8C RE03C NSS-8D RE03D (Input to RPS) NSS-8E RE15A NSS-8F RE15B NSS-8G RE15C NSS-8H RE15D (Input to Isol conds.) NSS-8I IA92A NSS-8J IA92B NSS-8K 1018 NSS-8L 1019 (Input to Fuel Zone level, and press indicators on 5F)
(2) Instrument output	0-100% of range
(3) Ramp time	0-14,400 seconds
(4) Delay time	0-28,800 seconds

OPTIONS TESTED:

(1) NSS-8A, 8B, 8C, & 8D Transmitter RE03A, (B, C, D) fails
Output 100%
Ramp time 30 seconds
Delay time 0 seconds

(2) NSS-8E, 8F, 8G, 8H Transmitter RE 15A (B,C,D,) fails
Output 100%
Ramp time 0 seconds (Field change from 30 seconds)
Delay time 0 seconds

(3) NSS-8I,8J Transmitter IA92A fails
Output 0%
Ramp time 0 seconds (Field change from 30 seconds)
Delay time 0 seconds

(4) NSS-8K,L Transmitter 1018 fails
Output 0%
Ramp time 0 seconds (Field change from 30 seconds)
Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, full power.

FINAL TEST CONDITIONS:

Run Time: 40 Minutes

At the conclusion of this test, the malfunctions have been cleared and the simulation could be continued. The ability to clear each option available for this malfunction was included in the procedure.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

NONE

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS45
14.6.3.13

TITLE: Feedwater Flow Transmitter Fails

PREPARED BY/DATE: [signature] / 10/30/96 TEST DATE: 09/04/96

APPROVED BY/DATE: RDWanderson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

MF23 3.1.2(22) Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Detector failure

Primary Effects:
The selected feedwater flow transmitter will fail to the value selected by the instructor. With malfunction CFW-13A activated to 100%, note that the A feedwater flow indicator reads full scale. Also, FWC will close down on the feed reg valves causing reactor water level to decrease. A low water level scram will occur when the level decreases to 138".

RX LVL HI/LO alarm (H-7-e) annunciates at 146"
RX LVL LO alarms (H-5-e) + (H-6-c) annunciate at 138"

The following data was recorded on the Instructor Station Trend Plots:

T:LID14	RX Water Level Recorder (LI-A14)
T:FID10A	Feed Pump Flow Indicators
T:FID10B	(FI-ID10A, B, C)
T:FID10C	
T:PI38	Feed Pump Discharge Pressure
T:PI39	(PI-38, 39, 40)
T:PI40	

The SAR alarm printout was also attached.

Results:

Two field changes were made to the test procedure to: 1) Replace the 8 Pen Recorder with Instructor Station Trend Plots, and 2) Delete the Runout Alarm which was removed by a modification.

All expected alarms were received. Reactor Level decreased to 90 inches and then recovered. During the last execution of this test in September 1992, Reactor Level decreased to the Lo Lo Level setpoint, actuating additional safety systems. The difference in Level response is attributed to installation of the Digital Feedwater Control system since the last test.

AVAILABLE OPTIONS:

1.	Detector to fail	CFW-13A ID10A CFW-13B ID10B CFW-13C ID10C
2.	Detector output	0-100% 100%=3x10E6lbm/hr (0%=10 ma 100%=50 ma output)
3.	Ramp time	0-14,400 secs
4.	Delay time	0-28,800 sec

OPTIONS TESTED:

(1) CFW-13A

(2) 100% (50ma)

(3) Ramp time 0 seconds

(4) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15. Full Power

FINAL TEST CONDITIONS:

Run Time: 6 Minutes

At the conclusion of this test, the malfunction has been cleared and the simulator is capable of continuing the recovery operations. The reactor has scrammed and the Turbine Generator is tripped.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator deficiencies were identified during the test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS46
14.6.23.2

TITLE: Drywell Pressure Transmitter Fails

PREPARED BY/DATE: [signature] / 11/7/94 TEST DATE:10/12/94

APPROVED BY/DATE: RWaindson / 12/22/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty pressure transmitter.

Primary Effects:
When the selected pressure transmitter fails up scale:
Annunciator C-3-f, DW PRESS HI/LO alarms.

Pressure recorder 12XR6 on panel 12XR indicates full scale of 4.0 psig.

Computer point PT51 indicates full scale.

Panel 4F digital Display indicates full scale.

The following data was recorded on the 8 pen recorders:

T:PT51	Drywell Pressure PT51
T:PIP08	Drywell Pressure PTIP08
T:PT53	Drywell Pressure PT53
T:PT54	Drywell Pressure PT54

The Sequence of Alarms printout was also attached.

Results:
All steps in the procedure were completed. All anticipated alarms were received and no unexpected alarms were noted.

AVAILABLE OPTIONS:

(1) Pressure Transmitter:

PCN-2A	PTIP07
PCN-2B	PT53
PCN-2C	PT54
PCN-2D	PT51

(2) Select Failure 0 - 100% output

(3) Ramp Time 0 - 14,400 seconds

(4) Delay Time 0 - 28,800 seconds

OPTIONS TESTED:

(1) PCN-2D - Transmitter PT51

(2) 100% failure

(3) Ramp time 30 seconds

(4) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run Time: 40 Minutes

At the conclusion of this test,the malfunction has been cleared and all indications returned to normal. The simulator was capable of continued simulation, unaffected by the malfunction.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator deficiencies were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

C. C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS47
14.6.28.5

TITLE: RMCS Timer Malfunction

PREPARED BY/DATE: [signature] / 10/17/96 TEST DATE: 09/06/96

APPROVED BY/DATE: R Davidson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF14 3.1.2(12) Control Rod Failure (stuck, uncoupled, drift, drop, & misaligned)

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

MF23 3.1.2(22) Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: The timer motor winding opens.

Primary Effects:

The RMCS timer will stop during the signal (insert or withdraw) selected by the instructor.

With malfunction RMC-5A activated for the selected rod, insert the rod by momentarily placing the Rod control Switch in the ROD IN position. Note that the control rod continues to insert after the switch is released. Deactivate the malfunction and verify that rod motion stops. Activate malfunction RMC-5B and withdraw the rod by momentarily placing the Rod control Switch in the ROD OUT NOTCH position and note that the TIMER MALFUNCTION ROD BLOCK light on panel 4F lights and that rod motion stops.

The Sequence of Alarms Recorder (SAR) was attached.

Results:
The single alarm expected in this procedure was received and cleared as expected. No unexpected alarms were noted. The Rod Block functioned properly.

AVAILABLE OPTIONS:

(1) RMCS timer malfunction RMC-5A Fails during Insert
RMC-5B Fails during Withdraw

(2) Delay time 0 - 28,800 seconds

OPTIONS TESTED:

(1) Both RMC-5A and RMC-5B Timer malfunctions were tested during this test.

(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, full power.

FINAL TEST CONDITIONS:

Run Time: 15 Minutes

At the conclusion of this test, the malfunctions have been reset and normal control rod motion is verified. The simulator is capable of continued simulation, unaffected by this test.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator problems were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS48
14.6.26.8

TITLE: RCU Flow Control Valve Failure

PREPARED BY/DATE: [signature], 11/8/94

APPROVED BY/DATE: R Wanlson, 12/22/94

TEST DATE: 10/12/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty controller output (FC-IJ64)

Primary Effects:
Flow control valve (ND16) controller fails to output percentage selected by instructor.

With the malfunction activated to 0% (valve closed), note that the controller output is 0%, and that the CU FLOW annunciator on panel 3F alarms.

The following data was recorded on the 8 pen recorders:

T:FIJ13	RCU Demin Inlet Flow
XCNHIJ64	RCU Flow Controller Output
T:PIJ70	Pump Discharge Pressure

Discussion:

The RCU Flow controller is always operated in the manual mode and was in manual for this test.

Results:
During performance of the test, the FILTER FLOW LO alarm was not received and the Cleanup System did not isolate. A field change to the procedure was made to delete these steps. From previous discussions with plant operators, the reviewer determined that the cleanup Filter will sometimes go into hold on reducing flow conditions. The rate of flow decrease will determine whether the filter goes into hold or whether the low flow alarm is received. The simulator performance was acceptable. All other alarms activated as expected and no unexpected alarms were noted.

Since this test was last performed, the simulation of the filter hold logic has been improved. In addition, the Cleanup

Pressure Controller has been replaced per a plant modification.

AVAILABLE OPTIONS:

(1) Flow controller output	0-100%
(2) Ramp time	0-14,400 seconds
(3) Delay time	0-28,800 seconds

OPTIONS TESTED:

(1) RCU-8 RCU Flow control Valve Failure

(2) Flow controller output 0%

(3) Ramp time 30 seconds

(4) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

FINAL TEST CONDITIONS:

Run Time: 40 Minutes

At the conclusion of this test, the malfunction has been cleared and the affected flow control valve has been verified as operable. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

One field change to the procedure was made as identified above.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS49
14.6.43.7

TITLE: Partial/Total Failure of Control Room Annunciators

PREPARED BY/DATE: [signature] / 11/22/93 TEST DATE: 11/15/93

APPROVED BY/DATE: R Davidson / 12/6/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF23 3.1.2(22) Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if

the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Loss of annunciator lights due to contact failure in breaker at 125V DC Distribution Center E, circuits #1 and/or #5. Loss of audible horn and chime due to breaker failure at IP-4 circuit #13.

Primary Effects:

Total or partial loss of control room annunciator lights or loss of audible horn and chime.

MSC-7A DC-E Circuit 1

Annunciator lights and horn do not function on the following panels:

10XF	3F-E
10F	3F-F
1F/2F-B	3F-G
1F/2F-C	5F/6F-H
3F-D	5F/6F-J

MSC-7B DC-E Circuit 5

Annunciator lights and horn do not function on the following panels:

5F/6F-K	8F/9F-R
5F/6F-L	8F/9F-S
7F-M	8F/9F-T
7F-N	8F/9F-U
7F-P	9XF
7F-Q	12XR

MSC-7C IP-4 Circuit 13

All alarm windows will function normally except the horn and chime.

The test procedure checks each option for this malfunction by verifying that each alarm panel has the proper response to the malfunction. With the malfunction active, actions which cause an alarm on each panel are performed by the test personnel who

then verify proper response (or lack of response). The annunciator test switches are also checked for each option.

Results:

Four field changes were made to the procedure during execution.

The annunciator failure malfunctions were found to work correctly. All steps in the procedure were completed after the appropriate field changes.

AVAILABLE OPTIONS:

(1)	Loss of DC-E ckt 1	MSC-7A
	Loss of DC-E ckt 5	MSC-7B
	Loss of IP-4 ckt 13	MSC-7C
(2)	Delay time	0-28,800 seconds

OPTIONS TESTED:

All 3 options for this malfunction were tested.

Time delay: 0 sec.

INITIAL CONDITIONS FOR TEST:

IC 15, full power operation.

Record any annunciators lit prior to activation of the malfunction. No annunciators were lit at the start of this test.

FINAL TEST CONDITIONS:

Run Time: 3 Hours, 15 Minutes

At the conclusion of this test, the annunciator malfunctions have been cleared. The test demonstrates that the annunciator malfunctions can be cleared and simulation continued.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS50
14.6.7.7

TITLE: Core Spray System Failure to Autostart

PREPARED BY/DATE: T Kamy / 11/5/96 TEST DATE: 09/04/96

APPROVED BY/DATE: R Wanlson 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

MF24 3.1.2(23) Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Broken wire at actuation relay causes affected Core Spray System autostart failure.

Failure of a single relay will not result in loss of any core spray due to the redundant initiation logic.

Failure of 16K101A and C will result in System I failure to actuate.

Failure of 16K101B and D will result in System II failure to actuate.

The following data was recorded on the trend recorders:

T:P43A	Sys 1 Core Spray Press
T:P43B	Sys 2 Core Spray Press
T:F27A	Sys I Core Spray Flow
T:F27B	Sys II Core Spray Flow

The Sequence of Alarms Recorder (SAR) printout was also attached.

Results:

Two field changes were made to the procedure to 1) Substitute Trend Plots for Strip Charts, and 2) Delete the SYSTEM OVERPRESSURE alarm which was removed by a modification.

All steps in the procedure were completed with no discrepancies identified. All alarms expected by the procedure were received. Additional alarms recorded by the SAR were reviewed and found to be acceptable for the transient. It was noted that the SAR missed some alarms.

AVAILABLE OPTIONS:

(1) Failed relay:
CSS-7A 16K101A
CSS-7B 16K101B
CSS-7C 16K101C
CSS-7D 16K101D

(2) Delay time 0 - 28,800 sec

OPTIONS TESTED:

(1) CSS-7A and 7C

(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power

Initiate malfunction NSS-4A Recirc Loop Rupture (unisolable) at 100% severity.

FINAL TEST CONDITIONS:

Run Time: 60 Minutes

At the conclusion of this test, the simulator is in a post accident condition with Core Spray System 1 failed and Core Spray System 2 running. The procedure states that the malfunction is not recoverable. The simulator, however is capable of continued simulation of recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS51
14.6.5.1

TITLE: ESW Pump Trip

PREPARED BY/DATE: [signature] / 10/8/94

APPROVED BY/DATE: [signature] / 12/22/94

TEST DATE: 10/12/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF8	3.1.2(6)	Loss of service or cooling water to individual components
MF24	3.1.2(23)	Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause:
Motor ground develops tripping the 50 GS device, which in turn trips the motor breaker.

Test Actions and Primary Effects:
Start ESW pump 52A. Activate malfunction CNS-1A and note that the pump trips as indicated by the pump status lights, the pump ammeter indicates zero, and the dp for heat exchangers 50A and B goes to zero. The malfunction is then cleared and the pump restarted manually.

The procedure does not require recording of data.

Results:
One field change was made to the procedure to add the ESW Pump Trouble alarm. This change was caused by the deletion of the Containment Spray Auto Start since the last test.

The new alarm was received during this test. All steps in the procedure were completed satisfactorily.

Although not specifically required by the test procedure, the malfunction was also inserted prior to starting the ESW Pump. A TR was issued as described below.

AVAILABLE OPTIONS:

(1) Pump to trip	CNS-1A ESW pump 52A CNS-1B ESW pump 52B CNS-1C ESW pump 52C CNS-1C ESW pump 52D
(2) Delay time	0-28,8000 secs.

OPTIONS TESTED:

(1) CNS-1A ESW pump 52A trips
(2) Delay time 0 sec

Malfunctions CNS-1B, CNS-1C, and CNS-1D were also checked and found to perform the same way.

INITIAL CONDITIONS FOR TEST:

(1) Initialize to IC-15, full power
(2) Place Containment Spray System in Dynamic Test I
(3) Start ESW pump 52A

As noted above, the malfunction was also tried with no ESW Pump running.

FINAL TEST CONDITIONS:

Run Time: 15 Minutes

At the conclusion of this test, the malfunction has been cleared and the ESW pump was manually restarted. The simulator was capable of continued simulation, unaffected by the malfunction.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

One field change was made to the procedure to add an alarm resulting from a modification made to the simulator since the test was last performed.

When the malfunction was inserted prior to starting the ESW Pump, the Trouble alarm (B-6-a) immediately activated. This is inconsistent with the cause of the malfunction (motor ground) which would require the Pump Breaker to be closed and high current detected. TR 3403 was issued and is scheduled for corrective action by November 1995. The TR resolution will not require repeat of this test.

EXCEPTIONS TO ANSI/ANS 3.5-19[illegible] TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS52
14.6.5.1

TITLE: Containment Spray Pump Trip

PREPARED BY/DATE: [signature] / 10/10/95

APPROVED BY/DATE: R Wanson / 11/29/95

TEST DATE: 09/20/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF24	3.1.2(23)	Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely,

the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Faulty 52 UV device.

Primary Effects:

Activate the LOCA malfunction to 100% and manually start Containment Spray. Activate malfunction CNS-4A. Note that CNS pump 51A trips by observing the pump status lights, and that containment spray system 1 flow goes to zero.

The following data was recorded on the 8 pen recorders:

T:PDP6A	dPI-IP06A HX-1-1
T:PDP6B	dPI-IP06B HX-1-2
T:T40B	Sys I HX Outlet Temp
T:F03A	Sys I flow FI-IP04A
T:PIP08	Drywell Pressure
TPCNWPB1	Torus Bulk Temperature
T:T40A	Sys I HX Inlet Temp
TSCNBA23	Reactor Building 23' Area Temp

Results:

Since the last time this test was performed, the Auto Start Logic was removed from the Containment Spray system. The procedure had been revised to reflect the logic modification.

All alarms and automatic actions expected in the procedure were occurred.

AVAILABLE OPTIONS:

(1) Pump to trip	CNS-4A Cont Spray Pump 51A CNS-4B Cont Spray Pump 51B CNS-4C Cont Spray Pump 51C CNS-4D Cont Spray Pump 51D
(2) Delay time	0-28,800 secs.

OPTIONS TESTED:

(1) CNS-4A Containment Spray Pump 51A

(2) Delay time: 0 seconds

INITIAL CONDITIONS FOR TEST:

(1) Initialize to IC-15, Full Power

(2) Activate the LOCA NSS-4A to 100%

(3) Start Containment Spray System 1 in the Drywell Spray mode.

(4) After the Torus Spray valve opens, activate malfunction CNS-4A.

FINAL TEST CONDITIONS:

Run Time: 45 Minutes

At the conclusion of this test, the malfunction has been cleared and the pump restarted. The plant is in a post LOCA condition with Core Spray cooling the core. The reactor coolant is exiting the reactor vessel and returning to the torus. The test was ended before decay heat decreased below the capacity of Containment Spray heat removal. The simulator was capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

The test results were also compared to the last results of this test.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS53
14.6.9.3

TITLE: Emergency Diesel Generator Fails to Start

PREPARED BY/DATE: [signature] / 10/10/95

APPROVED BY/DATE: [signature] / 11/29/95

TEST DATE: 09/21/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)
MF24	3.1.2(23)	Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Fuel Line Blockage

Primary Effects:
Loss of power to Bus 1C if auto start signal is low voltage on Bus 1C.

NOTE: System annunciators associated with equipment powered by 1C will alarm.

The following data was recorded on the 8 pen recorders:

EEDSC	BUS 1-C Voltage
ODGNM(1)	EDG 1 RPM (Freq)
AEDSCM	4160V BUS 1-C current
AEDSA1MM	460V USS 1A1 current
AEDSA2MM	460V USS 1A2 current
AEDSA3MM	460V USS 1A3 current
ODGNPU(1)	EDG 1 Engine Speed

The Sequence of Alarms Recorder (SAR) printout was also attached.

Results:

Two field changes to the test procedure were made to add a variable for engine speed and to change the fast start after the malfunction is cleared to a normal start. All expected alarms were received and no unexpected alarms were recorded.

AVAILABLE OPTIONS:

(1) DGN-3A EDG1
DGN-3B EDG2
(2) Delay time 0 - 28,800 seconds

OPTIONS TESTED:

(1) DGN-3A, #1 Diesel Generator
(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

From IC-14, 50% power:

(1) Select the following equipment to run:
RBCCW pump 1-1
TBCCW pump 1-1
CRD pump NC08A
Drywell fans RF1, RF2, RF3
Air compressor 1-1

(2) Open normal feed breaker 1C for Emergency Bus 1C after inserting malfunction.

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, Bus 1-C is powered by Emergency Diesel Generator 1. All malfunctions are cleared and the simulator is capable of continued simulation. Recovery operations could be continued by the instructor if desired.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS54
14.6.30.5

TITLE: Auto Scram Fails

PREPARED BY/DATE: [signature] / 11/22/93

APPROVED BY/DATE: R Davidson / 11/22/93

TEST DATE: 11/17/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF13	3.1.2(11)	Loss of protective system channel
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF24	3.1.2(23)	Passive malfunctions in emergency systems
MF25	3.1.2(24)	Failure of the Automatic reactor trip system

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the

parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: K51 and K52 relay coils are "Hot Shorted" to the respective RPS power bus.

Primary Effects:

Any auto scram signal will not result in reactor scram. Manual scram will still work.

The test is performed by placing an APRM drawer for an APRM in each protection system to the Standby position.

All associated parameter annunciators come in. White RPS solenoid status lights stay on. Rods do not move.

The procedure does not require automatic recording of data.

Results:

All steps in the procedure were completed. All expected alarms were received and no unanticipated alarms or actions were noted.

AVAILABLE OPTIONS:

Time Delay 0 - 28,800 seconds

OPTIONS TESTED:

Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

(1) IC-15, full power.

(2) Initiate a neutron flux scram by turning the Operate Switch to Standby on one APRM drawer for an APRM in Channel I (1 through 4) and on one APRM drawer for an APRM in Channel II (5 through 8) on panel 3R and 5R.

FINAL TEST CONDITIONS:

Run Time: 15 Minutes

At the conclusion of this test, the reactor has been manually scrammed, demonstrating that the automatic scram fails and that the manual scram still functions. No attempt is made to clear the malfunction since the reactor has scrammed.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator deficiencies were identified during this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS55
14.6.40.8

TITLE: MPR Fails High/Low

PREPARED BY/DATE: [signature] / 11/5/96 TEST DATE: 10/28/96

APPROVED BY/DATE: R W Dairdson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

MF23 3.1.2(22) Process instrumentation, alarms, and control system failures

MF26 3.1.2(25) Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information, and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: MPR failure.

The MPR setpoint will go the value selected by the instructor.

With malfunction TCS-8 activated to 112 psig, the control valves open to the 100% load position, and the bypass valves open as indicated by the valve status lights on panel 7F. The reactor pressure decreases until about 854 psig, at which point the MSIVs close and a reactor scram occurs.

The following data was recorded on the 8 pen recorders:

RTCSCV(1)	Control Valve No. 1 Position
RTCSCV(2)	No. 2
RTCSCV(3)	No. 3
RTCSCV(4)	No. 4
RTCSBV(1)	Bypass Valve No. 1 Position
RTCSBV(2)	No. 2
RTCSBV(3)	No. 3
RTCSBV(4)	No. 4
RTCSBV(5)	No. 5
RTCSBV(6)	No. 6
RTCSBV(7)	No. 7
RTCSBV(8)	No. 8
RTCSBV(9)	No. 9
T:PRE03A	Reactor Pressure
PTCSPSP	MPR Setpoint
SGENMWMT	Main Generator Load MWe

The Sequence of Alarms Recorder (SAR) printout was also attached.

Results:

Previous attempts to perform this test were unsuccessful. During 1996, improvements were made to the Reheaters which resulted in successful performance of the test.

All steps in the procedure were completed successfully. The procedure does not specify the alarms expected, but a review of the SAR indicates all alarms activated are appropriate for the event.

AVAILABLE OPTIONS:

(1) Pressure setpoint 112-1084 psig

(2) Ramp time 0-14,400 seconds

(3) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) Activate to 112 PSIG

(2) Ramp time 120 seconds

(3) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

(1) IC-15, Full Power.

(2) Verify the EPR in control.

It was also noted that the Turbine Load Limit must be set at the High Speed Stop to allow full opening of the Control Valves.

FINAL TEST CONDITIONS:

Run Time: 90 Minutes

At the conclusion of this test, the Reactor is scrammed and isolated. The simulator is capable of continued simulation of recovery events. The malfunction is recoverable and can be cleared by the instructor. Operator actions are possible using this malfunction, with different options, which could prevent a scram and isolation, thus allowing the scenario to continue along a different path.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS56
14.6.40.10

TITLE: EPR Fails High/Low

PREPARED BY/DATE: [signature] / 2/17/93

TEST DATE: 02/17/93

APPROVED BY/DATE: [signature] for R. DAVIDSON / 2/18/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures
MF26	3.1.2(25)	Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant

startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: EPR failure.

The EPR setpoint will go to the value selected by the instructor.

With the MPR in control and malfunction TCS-10 activated to 890 psig, the EPR stroke increases until the EPR takes control. Steam line pressure will decrease until steam chest pressure is about 890 psig.

The following data was recorded on the 8 pen recorders:

T:XAPRM3	APRM Channel 3
T:PPT1	30 inch Header Pressure
T:FSID75	Total Steam Flow
RTCSCV(1)	Control Valve Position
RTCSCV(2)	
RTCSCV(3)	
RTCSCV(4)	
RTCSBV(1)	Bypass Valve Position
RTCSBV(2)	
RTCSBV(3)	
T:PTID45	Reactor Pressure
PTCSEPSP	EPR Setpoint
SMSS	Generator Load

The SAR and the PCS alarm printout were also attached.

Results:

Two field changes were made to the test procedure to correct monitored variables and add detail to the test setup.

No alarms were expected and none were received.

The Turbine Control System (TCS) responded properly, opening the control valves and 1 bypass valve fully, and 1 bypass valve partially. The reactor pressure and power response was incorrect in that the pressure did not drop sufficiently to cause the bypass and control valves to return to the normal positions.

Test personnel took actions to reduce reactor pressure and power by reducing recirc flow sufficiently to return the bypass and control valves to the original position. The malfunction was then cleared and control returned to the EPR. Again the reactor pressure and power response was incorrect and the valves did not return to the proper position.

Since the primary purpose of this procedure is to test the EPR malfunction and the response of the Turbine Control system, Control valves, and bypass valves to the failure, the reviewers classified this procedure as passed with TRs.

AVAILABLE OPTIONS:

(1) Pressure setpoint	890-1010 psig
(2) Ramp time	0-14,400 seconds
(3) Delay time	0-28,800 seconds

OPTIONS TESTED:

(1) Activate pressure to 890 psig

(2) Ramp time 60 seconds

(3) Delay time 0 seconds

PROCEDURE TTS56

INITIAL CONDITIONS FOR TEST:

(1) IC-15, Full Power.

(2) Place the MPR in control.

(3) Set EPR to 930 psig.

FINAL TEST CONDITIONS:

Run Time: 15 Minutes; Total time 1 Hour, 45 Minutes

At the conclusion of this test, the malfunction has been cleared and pressure control returned to the EPR. The plant conditions are essentially returned to the starting point and the simulator is capable of continued simulation.

The simulator passed this test with 2 outstanding TRs.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

Oyster Creek TAR-OC-008, Reactor Isolation Scram of June 12, 1985 was used by test and review personnel to evaluate this test.

Since the reactor response differed significantly from the procedure acceptance criteria, reliance on the judgement of test and review personnel was extensive.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The reactor pressure and power response was incorrect as stated above. One new TR was issued and 8 previous TR remain open concerning the pressure and power response to this and other similar events.

PROCEDURE TTS56

INITIAL CONDITIONS FOR TEST:

(1) IC-15, Full Power.

(2) Place the MPR in control.

(3) Set EPR to 930 psig.

FINAL TEST CONDITIONS:

Run Time: 15 Minutes; Total time 1 Hour, 45 Minutes

At the conclusion of this test, the malfunction has been cleared and pressure control returned to the EPR. The plant conditions are essentially returned to the starting point and the simulator is capable of continued simulation.

The simulator passed this test with 2 outstanding TRs.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

Oyster Creek TAR-OC-008, Reactor Isolation Scram of June 12, 1985 was used by test and review personnel to evaluate this test.

Since the reactor response differed significantly from the procedure acceptance criteria, reliance on the judgement of test and review personnel was extensive.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The reactor pressure and power response was incorrect as stated above. One new TR was issued and a previous TR remain open concerning the pressure and power response to this and other similar events.

The TRs are scheduled for corrective action by February, 1994.

EXCEPTIONS TO ANSI/ANS 3.5-1985
TAKEN AS A RESULT OF THIS TEST,
INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS57
14. 6.40. 6.00

TITLE: Any Turbine Bypass Valve Fails

PREPARED BY/DATE: [signature] / 11/5/94

TEST DATE: 10/12/94

APPROVED BY/DATE: R Davidson / 12/22/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF26	3.1.2(25)	Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause:

Valve sticks open:	Sticking pilot valve.
Valve ramps closed:	Leaking servo motor.
Valve ramps open:	Pilot leaking by.

Primary Effects:
The selected bypass valve will go to the position selected by the instructor.

For a severity of 100% from full power:
The bypass valve opens as indicated by the valve position indicator and the valve status lights on panel 7F and 13R. The control valves close down to compensate. Control and bypass valve position changes are seen on recorder on 14R.

The following data was recorded on the 8 pen recorders:

	WCNDBV(1)	Bypass Valve Flow Condenser A
	T:FSID75	Total Steam Flow
	RTCSCV(1)	Control Valve Position
	RTCSCV(2)	" " "
	RTCSCV(3)	" " "
	RTCSCV(4)	" " "
	RTCSBV(1)	Bypass Valve No. 1 Position
	T:FID38A	Steam Flow Loop A
*	T:FID38B	Steam Flow Loop B
*	SMSS	Generator Load
*	T:PEDPT1	Reheat Steam Flow 1st stage Right (1-1)
*	T:PEDPT2	Reheat Steam Flow 1st stage Left (1-3)

* The second 8 Pen Recorder was inoperable during this test. These variables were printed from datapool with the malfunction activated and after the malfunction was cleared.

The Sequence of Alarms Recorder (SAR) printout was also attached.

Results:
All steps in the procedure were completed satisfactorily. No alarms were identified as expected in the test procedure. Two alarms were received which were not identified in the procedure. The APRM Hi and Rod Block alarms often come in when steam flow is changed. These alarms are appropriate for the test.

AVAILABLE OPTIONS:

(1) Bypass valve to fail	TCS-6A BPV #1 TCS-6B BPV #2 TCS-6C BPV #3 TCS-6D BPV #4 TCS-6E BPV #5 TCS-6F BPV #6 TCS-6G BPV #7 TCS-6H BPV #8 TCS-6J BPV #9
(2) Failure position	0-100% (100% = open)
(3) Ramp time	0-14,400 seconds
(4) Delay time	0-28,800 seconds

OPTIONS TESTED:

(1) TCS-6A, BPV #1

(2) Failure position: 100% open

(3) Ramp time: 60 seconds

(4) Delay time: 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run Time: 35 Minutes

At the conclusion of this test, the malfunction has been cleared and the plant returned to the approximate starting condition. The simulator was capable of continued simulation, unaffected by the malfunction.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

There were no problems identified during this test.

One field change was made to the procedure to correct a typo in a variable name.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

NONE

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS58
14.6.14.1

TITLE: Loss of Extraction Steam to Feedwater Heaters

PREPARED BY/DATE: [signature] / 10/18/96 TEST DATE: 09/05/96

APPROVED BY/DATE: R Waidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Wire to solenoid breaks causing solenoid to de-energize closing reverse flow check valve.

Reverse flow check valve closes causing loss of extraction steam to feedwater heaters

Primary Effects:
REVERSE FLOW CK VLV TRIP alarm will come on.

Associated moisture removal valve will open causing MRV OPEN alarm.

Heater level will decrease. HP A3 LEVEL HI/LO annunciator alarms.

Loss of heating steam will cause feedwater temperature to decrease causing power increase.

The following data was recorded on the Instructor Station Trends:

T:TE17	HP heater 1-A-3 Outlet Temp. (TR-13R05, PT18)
T:TI47	Feedwater Temp indicator (TI-47)
SNISAAVG(1)	APRM channel 1
T:LIA12	Wide Range Reactor Level

Results:

Two field changes were made to the procedure to 1) Add the possible opening of Heater 1A1 Moisture Relief Valve and 2) Delete the requirement to reset the 1A3 Extraction Valve since the valve closes but does not trip during this event.

All alarms and automatic actions identified in the procedure actuated as expected. The Main Flash Tank Hi/Lo Level Alarm repeatedly came in and cleared. This is an acceptable alarm.

The transient induced was rather mild due to the design characteristics of the plant. When the extraction steam valve is closed, a substantial steam flow to the heater occurs from the header connecting the two main flash tanks and the three high pressure heaters. The heater outlet temperature therefore drops only about 18 degrees and the feedwater temperature about 6 degrees. The power increase (Neutron Flux) was approximately 2%.

AVAILABLE OPTIONS:

(1) Failed valve	FWH-1A	V-1-87 (1A2)
	FWH-1B	V-1-88 (1A3)
	FWH-1C	V-1-89 (1B2)
	FWH-1D	**V-1-90 (1B3)**
	FWH-1E	V-1-91 (1C2)
	FWH-1F	V-1-92 (1C3)

(2) Delay time 0 - 28,800 seconds

OPTIONS TESTED:

(1) FWH-1B, V-1-88 (1A3)

(2) Time delay: 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run Time: 6 Minutes

At the conclusion of this test, the malfunction has been cleared, and the Heater Extraction Non-Return valve has reopened. The Main Flash Tank Hi/Lo Level alarm continues to alarm then clear. The test was terminated before the level alarm cleared permanently. All equipment has returned to the

pretest condition and the simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS60
14.6.45.20

TITLE: Turbine Trip Without Bypass

PREPARED BY/DATE: [signature] / 12/5/95

TEST DATE: 11/02/95

APPROVED BY/DATE: R Dawson / 12/27/95

ANSI/ANS 3.5 REFERENCES

This procedure satisries in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF17	3.1.2(15)	Turbine trip
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF20	3.1.2(19)	Reactor trip
MF26	3.1.2(25)	Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This procedure is used to certify that the simulator response to a turbine trip without bypass is acceptable.

The test is performed by executing a drill file on the instructor station. The drill file includes all required data collection.

Plots of simulator parameters were made using the validation test program:

Reactor Thermal Power	SRXSTOTL
Feedwater Flow	T:FSID75
Steam Flow	T:FFID75
Reactor Dome Pressure (NR)	T:PTID45
Reactor Dome Pressure (WR)	T:PID76
30 Inch Header Pressure	T:PNSSTN(23)
Reactor Level (WR)	T:LIA12
Reactor Level (NR)	T:LID59A
Turbine Steam Flow	T:PID09
Bypass Valve Flow	WNSSTK(95)
Feed Water Temperature	T:TI47
Total Recirc Flow	T:FIA72C
Recirculation Loop Temperatures	T:TE31A,C,E,G,J

Results:

Not all variable plots were printed.

The Reactor Wide Range Pressure variable did not plot correctly using Templegraph. The Reactor pressure peaked at approximately 1138 psig,as indicated by the 30 inch header pressure (Reactor and 30 inch header pressure peaks were the same in the last test). The Neutron Flux peaked at approximately 116%, approximately 4% higher than the last test.

This test was performed as part of the Cycle 15 Core Modification to verify that a major pressure transient response is correct. Since the last test on December 8, 1993, several other modifications were made to the simulator. The Feedwater response differs in the post scram condition because of Digital Feedwater Control and the addition of leakage through the Feedwater Reg Valves. The response differences, including a slightly higher minimum reactor water level, are consistent with these changes.

All automatic actions and alarms occurred as expected, including:

Anticipatory Scram
Recirc Pump ATWOS Trip
EMRV Operation
Isolation Condenser Initiation

AVAILABLE OPTIONS:

There are no options available for this test.

OPTIONS TESTED:

There are no options available for this test.

INITIAL CONDITIONS FOR TEST:

The test was performed from IC-30, Full Power, Cycle 15 Core, End of Life (EOL), all rods out.

FINAL TEST CONDITIONS:

Run Time: 15 Minutes

At the conclusion of the test, the reactor has scrammed from the turbine trip. The bypass valves remain failed in the closed position. The simulator is capable of continued simulation of recovery operations but the instructor must clear the active malfunctions.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains applicable acceptance criteria.

This is an FSAR analyzed event. FSAR analyses normally are based on worst case conditions and assumptions. Simulator performance and actual plant performance may be less severe.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS61
14.6.25.1

TITLE: Reactor Recirculation Pump Seizure

PREPARED BY/DATE: [signature] 10/17/96 TEST DATE: 09/06/96

APPROVED BY/DATE: R Davidson 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF6 3.1.2(4) Loss of forced coolant flow due to single or multiple pump failure

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Pump hydraulic bearing failure.

Reactor recirculation pump seizes.

(1) Pump vibration alarm annunciates due to increased vibration in pump immediately preceding pump seizure.

(2) M-G set for affected pump annunciators alarm.

(3) Pump indication for effected pump.
Indicated pump Delta P decreases then increases due to reverse Delta P.
Pump flow decreases then reverses direction.

(4) Total Recirc Flow recorder indicates decrease in total recirc flow then returns to approximately the initial value.

(5) Effected MG motor amps peg up scale then drop to zero when breaker trips.

(6) Reactor power decreases approximately 15 percent.

(7) Generator output decreases in ratio to decrease of reactor power.

(8) Recirc pump indication on bench board 4F changes state.

(9) The affected MG-set voltage, and current decrease.

The following data was recorded using datapool the Instructor Station Trends:

T:PIA07 Total core Delta P on Recorder IA08 (red pen)

T:FIA72D Total Recirc flow on recorder IA08 (green pen)

T:PIA50A Recirc Pump A dp

T:FA60A1 Recirc Pump A flow

The SAR alarm printout was also attached.

Results:

One field change was made to the procedure to substitute Trends for Strip Chart Recording.

The reactor level swing was approximately 4 inches while the procedure anticipated 12 to 14 inches. This is acceptable since the simulator has digital feedwater control.

The final power level was 15% below the initial power while the procedure anticipated a 7% power reduction. This was found acceptable.

All automatic actions and alarms occurred as expected.

Previous attempts to perform this procedure were unsuccessful because the Recirc Pump Drive Motor did not trip. This was corrected in March of 1993 under TR 1920 and TR 2021.

AVAILABLE OPTIONS:

(1) RCP to seize RCP-1A Pump A
RCP-1B Pump B
RCP-1C Pump C
RCP-1D Pump D
RCP-1E Pump E

(2) Delay time 0-28,800 seconds

OPTIONS TESTED:

(1) RCP-1A, Pump A

(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

FINAL TEST CONDITIONS:

Run Time: 45 Minutes

At the conclusion of this test, the reactor is operating at reduced power with 1 recirc pump seized. The malfunction is not recoverable but the simulator is capable of continued simulation of recovery actions and operation with 1 pump idle. IC reset is required to restore the pump to operation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS62
14.6.25.7

TITLE: Recirc Pump Shaft Shear

PREPARED BY/DATE: [signature] / 12/6/93

TEST DATE: 11/17/93

APPROVED BY/DATE: R Davidson / 12/6/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF6	3.1.2(4)	Loss of forced coolant flow due to single or multiple pump failure

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an

alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Shaft failure.

Primary Effects:
The shaft of the selected pump will shear, separating the pump from the motor, causing the following indications:

(1) PUMP DELTA P LO A annunciator E-1-d alarms.
(2) Indicated pump DELTA P decreases then increases and pump flow decreases and then increases due to reverse flow.
(3) MG Set A motor amps decrease to a no load value.
(4) Total recirc flow recorder indicates a decrease in total recirc flow.
(5) Reactor power decreases to a lower value on all APRM recorders.

(6) Reactor level will increase approx. 6 inches in 1 minute then decrease approx. 3 inches over the next 3 minutes.
(7) Total core dp on recorder IA08 will decrease.

The following data was recorded on the 8 pen recorders:

T:PIA07	Total core Delta P on recorder IA08 (DPIT-IA07, red pen)
T:FIA72D	Total recirc flow on recorder IA08 (FT-IA60A, B, C, D, E green pen)
T:FIA60A	Loop A Flow
RRWMIX(2)	Total Core Flow
T:PIA50A	Recirc Pump A delta P
SNISAPRM	Core Neutron Power
T:LID59	Reactor Level (GEMAC)
T:PID76	Reactor Pressure Narrow range

Results:

One Field Change was made to the procedure to delete the response of the KW Meter which does not function in the plant.

All Annunciators identified in the procedure activated. Additional Annunciators for MS Drain Tanks and Aux. Flash Tank Level were received and found acceptable.

The Reactor level response differed from that expected in the procedure. The increase was 4.75 inches with the level returning to normal in approximately 1 minute. This is an identified problem to be corrected by a TR written on procedure TTS73, Single Recirc Pump Trip.

The total indicated recirc. flow decreased as stated in the procedure but increased to slightly below the starting value. Since reverse flow in a loop is added in the summer as forward flow, this is the correct response.

The core delta P decrease was slightly less than predicted in the procedure. This was also found to be acceptable.

AVAILABLE OPTIONS:

(1) RCP to shear shaft	RCP-7A Pump A RCP-7B Pump B RCP-7C Pump C RCP-7D Pump D RCP-7E Pump E
(2) Delay time	0-28,800 seconds

OPTIONS TESTED:

(1) RCP-7A, Pump A

(2) Delay time 0 seconds

INITIAL CONDITIONS FOR TEST:

IC-15, full power.

FINAL TEST CONDITIONS:

Run Time: 60 Minutes

At the conclusion of this test, the pump shaft is still sheared. The simulator is capable of continued simulation should the instructor wish to continue recovery from this event. The shaft shear is not recoverable, requiring IC Reset to clear the malfunction.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No simulator problems were identified during this test. A TR previously written to correct the reactor level response to procedure TTS73 will correct the level response differences identified above.

A field change was made to the procedure to delete the KW Meter which does not function in the plant or on the simulator.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS64
14.6.45.22

TITLE: Uncontrolled Rod Withdrawal at Power

PREPARED BY/DATE: [signature] / 9/24/96

TEST DATE: 9/12/96

APPROVED BY/DATE: R W Davidson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF14	3.1.2(12)	Control Rod Failure (stuck, uncoupled, drift, drop, & misaligned)
MF29	Spec. 2.3	Abnormal (excessive) control rod worth

ANS 3.5 APPENDIX A REQUIREMENTS

A3	A3.2(2)	Ability to operate with similar plant operating procedures
A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the

physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This test is used to certify that the simulator will cause a Rod Block during a rod withdrawal error (Operator Error) at full power under the various APRM operability states without exceeding the MCPR limit.

Starting from full power with a limiting control rod pattern (MCPR of >90%), a maximum worth rod is continuously withdrawn until a Rod Block occurs. Core calculations are then performed to verify that the safety limit is not exceeded.

Results:

Four field changes were made to the test procedure to correct errors and to update the procedure for the Cycle 15 Core modification.

All steps in the revised procedure were completed successfully.

The Initial, interim, and final core conditions were calculated using the stimulated Power Shape Monitoring System (PSMS). Color plots of the PCS CRT displays were attached to the test procedure. The SAR printout was also attached to the test results.

AVAILABLE OPTIONS:

There are no options available for this test.

OPTIONS TESTED:

There are no options available for this test.

INITIAL CONDITIONS FOR TEST:

A special IC is created for this test with the following characteristics:

1. Core age is MOL
2. 100% Power
3. Recirculation flow 15.0X10E4 to 16.1X10E4 gpm
4. A limiting rod pattern is established with MCPR > 90% of the limit.
5. APRMs are calibrated to 100+/- 1%

FINAL TEST CONDITIONS:

Run Time: 90 Minutes

At the conclusion of the test, the reactor is operating closer to all thermal limits with some Nuclear Instrumentation bypassed. The simulator reactor controls may be manipulated to return to the starting conditions should the instructor desire to do so.

The simulator passed this test with no TRs issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains applicable acceptance criteria.

The stimulated Plant Computer System (PCS) was used to collect and evaluate the test data. The initial and final thermal limits were printed using the stimulated PSMS.

This event is analyzed in FSAR Update section 15.4.2. FSAR analyses normally consider worst case conditions, with more severe consequences than expected in the plant or on the simulator.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

Four field changes were made to the test procedure.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS65
14.6.45.23

TITLE: Improper Startup of an Inactive Recirc Loop at 100 degrees F

PREPARED BY/DATE: E Kay / 12/13/96 TEST DATE: 10/28/96

APPROVED BY/DATE: R Davidson / 12/13/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This test is used to verify that the simulator will cause a high neutron flux scram when a cold, inactive recirculation loop is returned to service at rated power.

The FSAR Update analysis assumed a 100 degree F loop water temperature. Since this is not possible with the drywell temperature at 150 degrees per normal plant conditions, the test is performed from a 150 degree loop temperature. In addition, the FSAR assumes that the discharge bypass valve is opened at the same time as the suction valve. To prevent cold water flow into the core during the 2 minutes, 20 seconds it takes to open the suction valve, the discharge bypass is opened after the suction valve.

The test is initiated using a CAEP file from the instructor station. The CAEP file contains the data collection requirements.

The initial condition was established by isolating the recirc loop and repeatedly setting the recirc pipe temperature to a low value to cool the water in the loop.

Primary Effects:

When an idle recirc pump with its loop cooled to 150 F is started, the cold water injection causes a High Neutron Flux (APRM) scram at 116% Power. The recirc flow continues to increase, causing an additional scram signal from the APRM Flow Converter units.

Results:

One field change was made to account for the installation of DFRCS since the test was last performed in 1992. The change includes substituting test personnel actions for actions previously performed using overrides.

The High Flux scram occurred as expected but the APRM Flow Converter scrams did not occur. It was noted that the MG Set Field Breaker tripped while the discharge valve was opening. The reviewers found this response acceptable.
The reviewers also noted that the plant has removed the High Recirc Flow Scram function. This modification is scheduled for installation on the simulator in 1997.

The Temple Graph data was collected but the plots were not printed. The reviewers determined that the plots were not needed to verify that the acceptance criteria were met.

The event described in the FSAR is not realistic and could not be duplicated in its entirety.

AVAILABLE OPTIONS:

There are no options available for this test.

OPTIONS TESTED:

There are no options available for this test.

INITIAL CONDITIONS FOR TEST:

IC-17 100% power was created for this test.

Recirculation Loop "D" is isolated and cooled to approximately 150 degrees F by artificial means which can only be done on the simulator. The loop was isolated and the pipe metal temperature repeatedly set to a low value to cool the loop.

FINAL TEST CONDITIONS:

Run Time: 3 Hours.

At the conclusion of this test, the reactor has scrammed and isolated.
The simulator is capable of continued simulation of recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains applicable acceptance criteria.

This event is analyzed in FSAR Update, section 15.4.4. FSAR analysis results are normally more severe than expected plant or simulator response.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS66
14.6.45.24

TITLE: Recirc Flow Controller Malfunction

PREPARED BY/DATE: T Hay / 11/8/93

TEST DATE: 11/05/93

APPROVED BY/DATE: R Davidson / 11/22/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the

physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This test is used to certify that the simulator responds correctly to recirculation Flow Controller malfunction as described in the FSAR Update, Section 15.4.5.

Primary Effects:

With the simulator operating at approximately 53.5% power and Recirculation Flow at approximately 42%, an individual recirculation m/a controller is failed to 100% setting causing maximum scoop tube rate of change.
The affected recirculation pump speeds up to 57.5 hz. and flow increases to 40000 gpm.

A CAEP file is used to initiate this transient from the instructor station. The CAEP file contains the data collection requirements.

Results:

Plots of Individual Recirc Pump Flows, Reactor Power Level, Feedwater Flow, and Steam Flow were attached.

The test procedure does not specify any expected alarms. Review of the SAR alarms indicates that the APRM Hi, Rod Block and several Feedwater Heater Level alarms were received. These alarms are proper for this event.

The simulator met the procedure acceptance criteria of recirc flow increase to ~40000 gpm and reactor power stabilizing at a higher level with no scram.
This test was compared to Updated FSAR data in which the flow increase occurred in 8 seconds. The design of the individual flow control stations limits the flow increase rate so the simulator exhibits a more realistic time of 75 seconds for the flow increase.

AVAILABLE OPTIONS:

Although the malfunction used for this test has several options, this procedure has no available test options because it is intended to closely match the FSAR event.

OPTIONS TESTED:

There are no test options available .

INITIAL CONDITIONS FOR TEST:

An IC with the following characteristics has been created for this test:

1. Reactor power 1032 mwt (53.5%)
2. Recirculation Flow 6.7E4 gpm (42%)
3. Middle of Life/Equilibrium Xenon
4. All automatic controls in automatic

This IC was stored in temporary location IC-37

FINAL TEST CONDITIONS:

Run Time: 1 Hour, 55 Minutes (Including setup time)

At the conclusion of this test, the panel override used to initiate the recirc flow increase is still active. The simulator is capable of continued simulation. The panel override can be cleared, allowing the instructor to continue recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains applicable acceptance criteria.

FSAR event 15.4.5 was used to prepare and to evaluate this test.
FSAR analyses normally consider worst case conditions.
The actual plant and the simulator response may be less severe than the FSAR results.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS67
14.6.44.3

TITLE: ATWS (Failure to Scram, Turbine Trip w/o Bypass)

PREPARED BY/DATE: E Jensen / 12/2/96 TEST DATE: 11/27/96

APPROVED BY/DATE: R Davidson / 12/9/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF13 3.1.2(11) Loss of protective system channel

MF15 3.1.2(13) Inability to drive rods

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

MF23 3.1.2(22) Process instrumentation, alarms, and control system failures

MF24 3.1.2(23) Passive malfunctions in emergency systems

MF25 3.1.2(24) Failure of the Automatic reactor trip system

MF26 3.1.2(25) Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction cause: Turbine trips on loss of vacuum due to a ruptured exhaust boot on "B" main condenser. Fused contacts on relays K21A, K51, and K52 cause RPS failure to scram. The Alternate Rod Injection (ARI) System fails.

An anticipated transient without a scram event. Turbine trips and bypass valves are interlocked closed. The Reactor Protection system fails to insert control rods. Automatic, manual and Alternate Rod Injection do not function. This places a severe pressure transient on the reactor.

Primary Effects:

Condenser vacuum decreases rapidly to zero as indicated on Panel 5F/6F. The Turbine trips with attendant indications and alarms, with the exception that the turbine bypass valves may open momentarily but close instantly as indicated on panel 7F.

Reactor Pressure increases rapidly as indicated on panel 5F/6F. A reactor scram does not occur as indicated by rod position indication remaining unchanged on panel 4F and reactor power increasing rapidly. The ARI System does not function.

Safety Valves and all EMRVs open as indicated by the acoustic monitors. Drywell pressure and temperature increase from the safety valve actuation.

ATWS Division I and II has actuated and all five recirculation pumps trip. Both Isolation Condensers initiate. Torus level and temperature increase.

As pressure and power decrease, EMRVs begin to close.

The procedure calls for recording a considerable amount of data on the 8 Pen Recorders, the Lineprinter and Analog Graphic Trending. The Line Printer data however, was not recorded.

The SAR alarm printout was attached.

Results:

Two field changes were made to the procedures to: 1) Correct the Malfunction and LOA Identification Numbers which changed due to modifications. 2) Account for Safety Valve Reduction modification.

As expected, the reactor did not scram and the Alternate Rod Injection system failed. Reactor pressure increased, opening the safety and relief valves. Reactor high pressure initiated both Isolation Condensers and tripped all five recirculation pumps which reduced reactor power to approximately 40%. Since the expected operator action of manually opening any cycling relief valves is not performed in this test, the relief valves cycled throughout the test. The cycling relief valves caused pressure and power swings consistent with the relief valve operation.

Late in the test, the Standby Liquid Control System (SLC) is manually initiated. After initiation, the Liquid Poison Flow On alarm was observed to repeatedly clear then alarm, in response to changes in reactor pressure. A TR was written.

All other automatic actions occurred as expected. All expected alarms were received and no unwarranted alarms actuated.

AVAILABLE OPTIONS:

This test procedure uses a combination of malfunctions and has no options. The simulator however has many options for ATWS events.

OPTIONS TESTED:

There are no options for this procedure.

INITIAL CONDITIONS FOR TEST:

(1) Initialize the Simulator to IC-15, Full Power.

(2) Activate Malfunction RPS-5 to prevent Automatic Scrams

(3) Activate LOA-CAS-20 to prevent ARI initiation

(4) Select the following Malfunctions and activate:
- (1) CFW-17, Main Condenser Air Inleakage
- (2) Severity-100%
- (3) Delay - 0 seconds

(5) Other actions:
When Torus temperature increases to 110 degrees F initiate standby liquid control system on panel 4F.

FINAL TEST CONDITIONS:

Run Time: 1 Hour, 30 Minutes

At the conclusion of this test, the reactor has failed to scram, the recirc pumps have tripped, and Boron is being pumped in the reactor with the Standby Liquid Control System. Reactor power level is cycling from EMRV operation but is trending down from Liquid Poison. The Core Spray system, initiated by Hi Drywell Pressure, is operating but reactor pressure is too high for injection. The simulator is capable of continuing the recovery activities. IC reset is required to resume normal operations since unrecoverable actions have occurred.

The simulator passed this test with one new TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The Standby Liquid Poison Flow alarm repeatedly cleared and came in during poison injection. This alarm should remain on.

A new TR was written to be corrected by February 19, 1997.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS68
14.6.44.1

TITLE: Loss of All AC Power

PREPARED BY/DATE: [signature] / 11/17/94

APPROVED BY/DATE: [signature] / 12/6/94

TEST DATE: 10/13/94

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause:
Main Generator trips due to a faulty 86 G relay actuation. S1A is out of service for relay testing and Diesel Generator 1 is out of service for maintenance. S1B fails to close in due to a faulty NORMAL AFTER TRIP switch contact. Diesel Generator 2 fails to auto close due to an electrical fault on 1D Bus.

Primary Effects:
Generator trips offline, startup transformers fail to close in causing loss of off site power. Emergency Diesel Generators will not be able to assume any load. This places the plant in a blackout condition. The reactor scrams and isolates. Instruments and loads supplied by CIP-3 remain operable due to shifting the rotary inverter to its DC motor. The Isolation Condensers initiate to control pressure following the scram and isolation. The DC Emergency Bearing Oil Pump and the Emergency Seal Oil Pump start.

The following DATA was recorded using DP Screen Print:

JGEN86G	86G Relay Status
JBKS1A	S1A Breaker Status
JBKS1B	S1B Breaker Status
JBKDG1	DG1 Breaker Status
JBKDG2	DG2 Breaker Status
JBKC	1C Breaker Status
JBKD	1D Breaker Status
EEDSC	4160 Bus 1C Volts
EEDSD	4160 Bus 1D Volts
EEDSCIP3	CIP-3 Volts
EEDSVLD	VLDP 1 Volts
RNR108A	EMRV A Position
RNR108B	EMRV B Position
RNR108C	EMRV C Position

RNR108D	EMRV D Position
RNR108E	EMRV E Position
PCASIPT3	Instrument Air Pressure
T:PIP08	Drywell Pressure
T:T102C	Drywell Temperature
T:TI42A	Torus Temperature
EEDSPMG1	RPS System 1 Volts
OEDSPSP1	RPS System 1 Frequency
EEDSPMG2	RPS System 2 Volts
OEDSPSP2	RPS System 2 Frequency
AEDSBTAM	125VDC Batt A Amps
VEDBTAM	125VDC Batt A Volts
AEDSBTBM	125VDC Batt B Amps
VEDBTBM	125VDC Batt B Volts
AEDSBTCM	125VDC Batt C Amps
VEDSBTCM	125VDC Batt C Volts

The following data was recorded on the 8 pen recorders:

T:PIA92A	Reactor Pressure (Wide Range)
T:PTID45	Reactor Pressure (Narrow Range)
T:LID59A	Reactor Water Level A
T:LIA12	Reactor Water Level B
T:FIA72C	Total Recirc Flow
SNISAPRM	Reactor Power (MWth)
T:FSID75	Total Steam Flow
T:FFID75	Total Feed Flow
* LNSSMPA	Fuel Zone Level A
* LNSSMPB	Fuel Zone Level B

* Data was not recorded due to recorder failure.

The Sequence of Alarms (SAR) Printout was also attached.

Results:
Six field changes were made to the procedure during execution - 1) Correct the Primary Effects 2) Correct light response for 69 Permissive 3) Correct detailed indicator response 4) Correct recorder response 5) Revise for installed condition of the simulator 6) Correct Instrument response.

All alarms identified in the procedure were received. Additional alarms noted in the SAR review were found to be appropriate. The Sar printout indicated 5 separate alarms tagged as "SPARE". A TR was written on the spare alarms. The control Room normal lighting went off as expected but the emergency lights did not come on. The lighting will be corrected under facility maintenance by July 1995.

All automatic actions occurred as expected.

AVAILABLE OPTIONS:

This procedure uses a combination of several malfunctions and Local Operator Actions to achieve a loss of AC power. There are no options given in the test procedure.

OPTIONS TESTED:

There are no options available for this test procedure.

INITIAL CONDITIONS FOR TEST:

(1) Initialize the Simulator to IC-15, Full Power.

(2) Set LOA EDS-250, Breaker S1A 69 Permissive Switch to Trip.
This will remove S1A from service

(3) Set LOA DGN-3, DG-1 Local Mode Switch to 0.
This will remove DG1 from service

(4) Activate malfunction EDS-13B.
This wil' prevent S1B breaker from closing

(5) Activate malfunction EDS-2B, Bus Fault.
This will put a fault on Bus 1D

After setting up the above conditions, initiate the transient by activating malfunction GEN-1, Generator Trip, with no delay time.

FINAL TEST CONDITIONS:

Run Time: 90 Minutes

At the conclusion of this test, the reactor remains isolated. All AC power except CIP-3 is deenergized. The procedure states that this malfunction is not recoverable and the test is terminated without commencing recovery operations. The simulator, however is capable of continued simulation and recovery is possible by clearing malfunctions and performing LOAs.

The simulator passed this test with 1 new TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

One TR was issued related to this procedure:

1. Several parameters spiked on the strip chart recorder.

One TR was issued which is not related to this test:

1. The SAR alarm printout has several alarms designated as "SPARE".

The above TRs will be corrected by November, 1995.

The failure of the DC Lighting will be corrected under Facility Maintenance by July 1995.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS69
14.8.1

TITLE: Manual Reactor Trip

PREPARED BY/DATE: [signature] / 11/19/96

TEST DATE: 09/13/96

APPROVED BY/DATE: R D Wainson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T1 Manual Scram

REQUIRED MALFUNCTIONS

MF20 3.1.2(19) Reactor trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

TP1 B1.2.1 Transient test parameter set TP1 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Wide Range Reactor Pressure
Narrow Range Reactor Pressure
Wide Range Reactor Water Level
Narrow Range Reactor Water Level (FW Control)
Generator Gross Electrical Power
Turbine Steam Flow
Total Core Flow
Total Recirculation Loop Flow

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the Manual Reactor Scram transient evaluated by the EPRI Best Estimate Thermal Analysis Package on 10/26/89.

The Manual Reactor Scram transient was predicted by a RELAP5 analysis using the following initial conditions: The reactor was at steady state hot full power (1930 MWth) with recirculation flow at 61.0E6 lbm/hr (16E4 gpm). Reactor steam dome pressure was 1020 psig and reactor level was controlled at 162 inches.

All control systems were in automatic.

A Drill File (hc_ttest_01) was prepared to initiate the transient using Switch Override and to automatically collect the required data.

Using the Validation Test Program (VTP), comparison plots of simulator data versus RELAP5 Best Estimate data were prepared for the following parameters:

Plant Parameter	Simulator Variable
Reactor Power % Flux	SNISAPRM
*Total Recirculation Flow	WNSSTKRT
Total Steam Flow	WNSSTKST
Total Feedwater Flow	WNSSTKFT
Reactor Dome Pressure (NARROW)	T:PTID45
Reactor Dome Pressure (WIDE)	T:PIA92A

Reactor Water Level (WIDE)	T:LIA12
Reactor Water Level (YARWAY)	T:LRE21A
Reactor Water Level (NARROW)	T:LID59A
Steam Header Pressure	RRPRESS(32)
Turbine Steam Flow	WMSSNSS
Bypass Valve Steam Flow	WNSSTK(95)
**Turbine Steam Flow(GROSS MWe)	SGENMWMT

* For this transient Total core Flow is equivalent to Total Recirculation Flow, Therefore total Core Flow is not plotted.

**RELAP5 does not calculate Gross MWe, Turbine Steam Flow will be compared to simulated MWE for validation purposes.

Not all of the VTP plots were printed.

The Sequence of Alarms Recorder (SAR) printout was attached.

Results:

All alarms and automatic actions occurred as expected and no unexpected alarms were received. Comparison with the Relap data showed very good correlation. Two parameters behaved differently on the simulator but were determined to be problems in the Relap analysis, with the simulator performance being more accurate. The simulator pressure decreased causing a steam line low pressure MSIV closure (and resultant lower steam header pressure). The simulator Reactor water level decreased further than the Relap analysis. Both are known problems in Relap results.

AVAILABLE OPTIONS:

There are no options in this test procedure.

OPTIONS TESTED:

There are no options in this test procedure.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power Operation.

Adjust recirculation flow, control rods per the pull sheets and other controls as necessary to achieve the following plant conditions:

Reactor Power	1930 MWth
Recirculation Flow	15.6E4gpm
Reactor Pressure	1020 psig
Reactor Level	160"

Actual Recirc Flow was 15.3E4 for this test.

The above condition was stored in temporary IC-196.

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, the reactor has scrammed and isolated. No operator action has been taken in response to the scram. The simulator is capable of continued simulation. The switch override used to simulate operator activation of the manual scram push buttons must be cleared before the scram can be reset. No malfunctions were activated.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

RELAP5 Best Estimate Analysis, OC R2P, Manual Scram (BE-01) dated 10/26/89. (OCS-5378)

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

A meeting was held in 1992 with the person responsible for performing the Relap analysis to discuss to differences noted. A letter was provided to document the known Relap deficiencies.

The DFCS was installed on the simulator since the RELAP5 analysis. Actual changes in post scram level control are not available for comparison to the simulator.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS70
14.8.2

TITLE: Simultaneous Trip of All Feedwater Pumps

PREPARED BY/DATE: [signature] / 11/6/96

TEST DATE: 09/13/96

APPROVED BY/DATE: R. Warlow / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T2 Simultaneous trip of all Feedwater pumps

REQUIRED MALFUNCTIONS

MF11 3.1.2(9) Loss of normal feedwater or normal feedwater system failure

MF12 3.1.2(10) Loss of all feedwater (normal and emergency)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

TP1 B1.2.1 Transient test parameter set TP1 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Wide Range Reactor Pressure
Narrow Range Reactor Pressure
Wide Range Reactor Water Level
Narrow Range Reactor Water Level (FW Control)
Generator Gross Electrical Power
Turbine Steam Flow
Total Core Flow
Total Recirculation Loop Flow

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 -1985, Section 4.2 for the Loss of Feedwater Transient evaluated by the EPRI Best Estimate Thermal Analysis Package on October 30, 1989.

The loss of feedwater transient was predicted by a RELAP5 analysis using the following initial conditions. The reactor was at steady state hot full power (1930 MWth) with recirculation flow at 61.0E6 lbm/hr (160,000 gpm). Reactor steam dome pressure was 1035 psia (1020 psig) and reactor level was controlled at 162 inches.

All control systems were in automatic and no operator actions were required.

The following data was collected:

Plant parameter	Simulator Variable
Reactor Power % Flux	SNISAPRM
*Total Recirculation Flow	WNSSTKRT
Recirculation Loop B Temp.	T:TE31C
Recirculation Loop D Temp.	T:TE31G
Total Steam Flow	WNSSTKST
Total Feedwater Flow	WNSSTKFT
Reactor Dome Pressure	T:PTID45
Reactor Water Level (Wide)	T:LIA12
Reactor Water Level (GMAC)	T:LID59A

Reactor Water Level (Yarway)	T:LRE21A
Turbine Steam Flow	WMSSNSS
Bypass Valve Steam Flow	WNSSTK(95)

*For this transient Total core Flow is equivalent to Total Recirculation Flow.

The Sequence of Alarms Recorder (SAR) printout was also attached.

The test is run using a drill file which inserts malfunctions and operator actions automatically based on time or parameter conditions. Data is automatically recorded into a file for plotting using the instructor station. This method of performing the test assures repeatable performance.

Results:

All alarms identified in the procedure were received and no unwarranted alarms were received. All automatic actions occurred as expected for Lo and Lo Lo Water Level conditions.

Comparison of the simulator response to Relap calculations shows good agreement for most parameters. The Relap5 data shows an increase in reactor downcomer level at approximately 175 seconds that does not appear on the simulator. In addition, the rate of reactor depressurization (cooldown) in the Relap results was slightly higher than the simulator. Both of these differences were previously evaluated and it was determined that the simulator response was more accurate.

AVAILABLE OPTIONS:

There are no options available for this test.

OPTIONS TESTED:

There are no options available for this test.

INITIAL CONDITIONS FOR TEST:

IC-15 - 100% Power, Cycle 15 Core

FINAL TEST CONDITIONS:

Run Time: 45 Minutes

At the conclusion of this test, the reactor has scrammed and isolated and ECCS systems have started from the Lo Lo Level signal. Core Spray injection has not yet started since Reactor Pressure is well above 300psi. The simulator is capable of continued simulation should the instructor need to do so.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

RELAP5 Best Estimate Analysis, OC R2P, LOFW WITH LL LVL S/P 90"
dated 10/30/89. (OCS-5377)

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

A meeting was held in 1992 with the person responsible for performing the Relap5 analyses to discuss the difference in level and cooldown response. Inaccuracies in the Relap analysis were identified and documented in a letter attached to the test procedure.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS71
14.8.3

TITLE: Simultaneous Closure of All MSIVs

PREPARED BY/DATE: [signature] / 11/19/96

TEST DATE: 09/13/96

APPROVED BY/DATE: R D Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T3 Simultaneous closure of all MSIVs

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

N/A

ANS 3.5 APPENDIX B REQUIREMENTS

TP1 B1.2.1 Transient test parameter set TP1 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Wide Range Reactor Pressure
Narrow Range Reactor Pressure
Wide Range Reactor Water Level
Narrow Range Reactor Water Level (FW Control)
Generator Gross Electrical Power
Turbine Steam Flow
Total Core Flow
Total Recirculation Loop Flow

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the Simultaneous Closure of All Main Steam Isolation Valves Transient evaluated by the EPRI Best Estimate Thermal Analysis Package on November 30, 1989.

The MSIV closure transient was predicted by a RELAP5 analysis using the following initial conditions. The reactor was at steady state hot full power (1930 MWt) with recirculation flow at 61.0 E6 lbm/hr (16E4 gpm). Reactor steam dome pressure was 1035 psia (1020 psig) and reactor level was controlled at approximately 163 inches.

All control systems were in automatic and no operator actions were required.

Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus RELAP5 Best Estimate data for the following parameters:

Plant Parameter	Simulator Variable
Reactor Power (APRM A)	SNISAPRM
Generator Electric Power	SGENMWMT
Total Steam Flow	WNSSTKST
Total Feedwater Flow	WNSSTKFT
Wide Range Reactor Pressure	T:PIA92A
Narrow Range Reactor Water Level (GEMAC)	T:LIA59A
Total Recirculation Loop Flow	WNSSTKRT

B Recirc. Temp	T:TE31C
D Recirc. Temp	T:TE31G
TOTAL EMRV STEAM Flow	WNSSTK(74)
	WNSSTK(73)

The SAR alarm printout was attached.

Results:

All alarms and automatic actions specified in the procedure occurred.

When compared to the Relap5 data, the simulator minimum reactor water level was lower. On the simulator, only two EMRVs opened to control pressure. Three EMRVs were predicted to open in the Relap5 analysis.

A meeting was previously (1992) held with the person responsible for the Relap calculations to evaluate the differences. It was determined that the reactor level response on the simulator was more realistic than the Relap results. A letter discussing the differences is attached to the test procedure. The reviewer found the identified differences acceptable.

AVAILABLE OPTIONS:

There are no options available in this test procedure.

OPTIONS TESTED:

There are no options available in this test procedure.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power Operation.

Adjust recirculation flow, control rods per the pull sheets and other controls as necessary to achieve the following conditions:

Reactor Power	1930 MWth
Recirculation Flow	16.0E4 gpm (49.25 HZ)
Reactor Pressure	1020 psig
Reactor level	163"

Note: Recirc Flow was 15.3E4 and Rx Level was 160" for this test.

After establishing the conditions, a test IC was established as IC-196.

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, The MSIVs are closed by switch override, and the reactor has scrammed. The simulator is capable of continued simulation of recovery operations but the MSIV closure override must be reset from the instructor station.

The simulator passed this test.

BASELINE DATA USED T J EVALUATE TEST RESULTS:

OC Replica simulator Transient Test Data Simultaneous closure of All Main Steam Isolation Valves November 30, 1989.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

A letter from the individual responsible for performing the Relap calculations is attached to the procedure.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS72
14.8.4

TITLE: Simultaneous Trip of All Five Recirc Pumps

PREPARED BY/DATE: E J Mary / 11/19/96 TEST DATE: 09/17/96

APPROVED BY/DATE: R D Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T4 Simultaneous trip of all recirc. pumps

REQUIRED MALFUNCTIONS

MF6 3.1.2(4) Loss of forced coolant flow due to single or multiple pump failure

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

TP2 B1.2.2 Transient test parameter set TP2 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Narrow Range Reactor Pressure
Narrow Range Reactor Water Level (FW Control)
Total Core Flow
Individual Recirculation Loop Flows
Individual Calibrated Jet Pump Flows (N/A for Oyster Creek)

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the Simultaneous Trip of All Five Recirculation Pumps Transient evaluated by the EPRI Best Estimate Thermal Analysis Package on March 21, 1990.

The Five Pump Trip transient was predicted by a RELAP5 analysis using the following initial conditions. The reactor was at steady state hot full power (1930 MWth) with recirculation flow at 61.OE6 lbm/hr. (16E4gpm). Reactor steam dome pressure was 1020 psig and reactor level was controlled at approximately 164 inches.

All control systems were in automatic and no operator actions were required.

The predicted downcomer level swell in the RELAP5 analysis is thought to be excessive. The turbine trip setpoint of 175" probably would not have been exceeded had the transient analysis started from 160".

Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus RELAP5 Best Estimate data for the following parameters:

Plant Parameter	Simulator Variable
*Reactor Power (%neutron flux)	SNISAPRM
*Total Steam Flow	WNSSTKST
*Total Feedwater Flow	WNSSTKFT
*Narrow Range Reactor Pressure	T:PTID45
*Reactor Water Level(narrow GEMAC)	T:LID59A
*Total Recirculation Flow(Core Flow)	T:FIA72D
*Recirculation Flow A	T:FIA60A
*Recirculation Flow B	T:FIA60B
*Recirculation Flow C	T:FIA60C

*Recirculation Flow D	T:FIA60D
*Recirculation Flow E	T:FIA60E

*ANS 3.5 required

The SAR alarm printout was also attached.

Results:

All five recirc pumps tripped simultaneously. The coastdown and final recirculation flow were close to that predicted by the Relap5 analysis. The level swell caused by the pump trip was lower than that predicted by Relap5 but errors were found in the Relap data. It is believed that the simulator response is correct for the conditions tested.

Some of the Templegraph plots appeared to have the wrong variables and were not used for evaluation.

All alarms expected were received, although some possible alarms did not come in. No unwarranted alarms were received.

AVAILABLE OPTIONS:

No options are available.

OPTIONS TESTED:

Since this test is designed to duplicate a Relap5 analyzed transient, no options are available.

INITIAL CONDITIONS FOR TEST:

IC-31, Full Power Operation, Cycle 15, BOL

Adjust recirculation flow, control rods per the pull sheets and other controls as necessary to achieve the following conditions:

Reactor Power 1930 MWth
Recirculation Flow 160,000 gpm
Reactor Pressure 1020 psig
Reactor Level 160"

After the adjustments were made, the conditions were stored in temporary IC-196.

FINAL TEST CONDITIONS:

Run Time: 60 Minutes

At the conclusion of this test, the reactor is operating on natural circulation flow. The malfunctions used are recoverable and the simulator is capable of continuing recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

O.C. Replica simulator Transient Test Data Simultaneous Trip of All Five Recirculation Pumps, March 21, 1990 (RELAP5 Data).

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS73
14.8.5

TITLE: Single Recirc Pump Trip (LER 50-219 87-09)

PREPARED BY/DATE: [signature] / 11/19/96

TEST DATE: 09/16/96

APPROVED BY/DATE: RDawdson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T5 Single recirc. pump trip

REQUIRED MALFUNCTIONS

MF6 3.1.2(4) Loss of forced coolant flow due to single or multiple pump failure

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

TP2 B1.2.2 Transient test parameter set TP2 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Narrow Range Reactor Pressure
Narrow Range Reactor Water Level (FW Control)
Total Core Flow
Individual Recirculation Loop Flows
Individual Calibrated Jet Pump Flows (N/A for Oyster Creek)

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the transient evaluated in Licensee Event Report 50-219-87-09.

On February 7, 1987 a loss of generator field on the "B" Recirculation Pump M/G Set caused the "B" Recirculation Pump coast down and stop. No trip alarms were received.

Control room operators noticed a decreased in main generator output and reactor power of approximately 10% on the APRMs. Recirculation flow in the operating loops increased due to lower core delta pressure and reverse flow in the B recirculation loop. Loop B indicated flow was significantly less than the other four loops.

After operating stably in this mode for approximately 45 minutes the "B" Recirculation Pump discharge valve was closed causing "B" Recirculation Loop flow indication to decrease to zero, total recirculation flow indication to decrease, and core delta pressure and reactor power to increase.

This test will deviate from the actual plant event in that the operator action of increasing recirculation flow slightly will not be performed.
The length of time between pump trip and discharge valve closure is also compressed. The malfunction used is a Recirc Pump Trip which causes annunciators to actuate that did not alarm in the plant event because an undervoltage device failed to trip.

The test is executed using a CAE File.

Using the Validation Test Program (VTP), prepare comparison plots of simulator data versus plant data for the following parameters:

Plant Parameter	Simulator Variable
Total Recirculation Flow	T:FIA72D
Recirculation Flow A	T:FIA60A
Recirculation Flow B	T:FIA60B
Recirculation Flow C	T:FIA60C
Recirculation Flow D	T:FIA60D
Recirculation Flow E	T:FIA60E
Steam Flow Line A	T:FID33A
Steam Flow Line B	T:FID33B
Feed Flow	T:F42201
Reactor Level A (GMAC)	T:LID59A
Reactor Pressure (Narrow)	T:PTID45
Reactor Power Watts APRM 1	T:XAPRM1

The Sequence of Alarms (SAR) printout was also attached.

Results:

One field changes was made to the test procedure to modify the drill file.

Some of the reference data was not plotted using the VTP.

All alarms and automatic actions occurred as expected.

All simulator parameters compared well with the actual plant data.

The results were also compared to the test results of 11/15/94 and 9/27/95. Changes to the feedwater heater model since the 1994 and 1995 tests caused differences in system alarms.

AVAILABLE OPTIONS:

This test is written to duplicate an actual event in the plant and therefore has no options available.

OPTIONS TESTED:

No options are available for this test.

INITIAL CONDITIONS FOR TEST:

Starting from IC-28, full Power, a special test IC was stored as IC-197 with the following conditions:

Reactor Power	1870MWt (97%)
Recirculation flow	153,500 gpm
Reactor Pressure	1020 psig
Reactor level	160"

FINAL TEST CONDITIONS:

Run Time: 1.5 Hours

At the conclusion of this test, the B Recirc pump is idle with the discharge valve closed. The malfunction is still active. The simulator is capable of continued operation. The instructor must clear the malfunction if the B pump is to be restarted.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

Historical Data Package "Loss of 'B' Recirc. Pump 2/7/87" (OCS-4940) Note: Includes LER 50-219 87-09.

Historical Data Package "Recirculation Pump 'B' Trip 2/7/87" (OCS-4941)

The test procedure contains the expected response of the simulator in the Detailed Plant Response section. The Historical Data Package was used to compare plant and simulator data.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS74
14.8.6

TITLE: Main Turbine Trip from 40% Power

PREPARED BY/DATE: [signature] / 11/18/96 TEST DATE: 09/16/96

APPROVED BY/DATE: P D Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T6 Turbine trip at maximum power w/o immediate SCRAM

REQUIRED MALFUNCTIONS

MF17 3.1.2(15) Turbine trip

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

TP1 B1.2.1 Transient test parameter set TP1 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Wide Range Reactor Pressure
Narrow Range Reactor Pressure
Wide Range Reactor Water Level
Narrow Range Reactor Water Level (FW Control)
Generator Gross Electrical Power
Turbine Steam Flow
Total Core Flow
Total Recirculation Loop Flow

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the Turbine Trip from 40% Power Transient evaluated by the EPRI Best Estimate Thermal Analysis Package on March 23, 1990.

The Turbine Trip Transient for 40% of rated power was predicted by a RELAP5 analysis using the following initial conditions:

Recirculation flow was approximately 36E6 lbm/hr (9.3E4gpm). Control rods were adjusted to achieve 40% rated neutron flux (772 MWth). Feedwater and steam flows were approximately at 37% of rated (825 lbm/sec, 2.67E6 lbm/hr). Reactor level was controlled at 162 inches and reactor pressure was at approximately 993 psig.

At this load, the second stage reheaters were assumed to be out of service (V-1-21, V-1-34, PRV2-R and PRV2-L all closed).

All control systems were assumed to be in automatic and no operator actions were assumed. A turbine trip was then initiated.

Using the Validation Test Program (VTP), prepare comparison plots of simulation data versus RELAP5 Best Estimate data for the following parameters:

Plant Parameter	Simulator Variable
*Reactor Power (%Neutron Flux)	SNISAPRM
*Total Feedwater Flow	WNSSTKFT
*Wide Range Reactor Pressure	T:PIA92A
*Narrow Range Reactor Pressure	T:PTID45
*Narrow Range Reactor Water Level(GEMAC)	T:LID59A
*Wide Range Reactor Water Level	T:LIA12
*Turbine Steam Flow	WMSSNSS
Bypass Valve Steam Flow	WNSSTK(95)
*Total Recirculation Loop Flow	WNSSTKRT
Core Void Fraction (Top)	VNSSAM(12)

* ANS 3.5 Appendix B Parameters

Generator Gross Electrical Power Data was collected but the plot was not printed.

The SAR alarm printout was also attached.

Results:

Three field changes were made to the procedure in response to a recent plant and simulator modification which changed the setpoint of PSH, the Turbine Trip Scram Bypass setting. The changes include simulator response and the initial conditions for the test.

All automatic actions and alarms occurred as expected during the test. No unwarranted alarms were received. Comparison to the reference data is difficult since the initial conditions and the plant response differ significantly due to modifications installed (Digital Feedwater, PSH Setpoint, Generator Protection).

AVAILABLE OPTIONS:

This test is written to duplicate a specific RELAP5 analysis and therefore has no options.

OPTIONS TESTED:

There are no options for this test.

INITIAL CONDITIONS FOR TEST:

IC 197, a temporary snap, was established for the test with the following conditions:

Reactor Power 501 MWth (26%)
26% on APRMs
Recirculation Flow 8.4E4gpm
Reactor Pressure 1014 psig
Reactor Level (Yarway) 160"
Second Stage Reheaters OFF
Turbine Steam Flow approx. 1.8E6 lbm/hr

This test was previously performed at 810 MWt, 40% Power.

FINAL TEST CONDITIONS:

Run Time: 2 Hours

At the conclusion of this test, the turbine is tripped and the reactor remains in operation with steam passing through the bypass valves which are approximately 60% open. Feedwater temperature has decreased causing an increase in reactor power. The simulator is capable of continued simulation should the instructor wish to continue recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

O.C. Replica simulator Transient Test Data Turbine Trip from 40% Power, March 23, 1990

This reference data is of limited use because of modifications installed on the plant and on the simulator since the analysis was performed.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS75
14.8.7

TITLE: Max Rate Power Ramp from 100% to 75% and Back to 100%

PREPARED BY/DATE: [signature] / 11/18/96 TEST DATE: 09/16/96

APPROVED BY/DATE: R W Davidson / 12/4/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T7 Maximum rate power ramp with recirc flow from 100% to 75% and back to 100%

REQUIRED MALFUNCTIONS

N/A

ANS 3.5 APPENDIX A REQUIREMENTS

N/A

ANS 3.5 APPENDIX B REQUIREMENTS

TP1 B1.2.1 Transient test parameter set TP1 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Wide Range Reactor Pressure
Narrow Range Reactor Pressure
Wide Range Reactor Water Level
Narrow Range Reactor Water Level (FW Control)
Generator Gross Electrical Power
Turbine Steam Flow
Total Core Flow
Total Recirculation Loop Flow

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the Maximum Rate Power Ramp from 100% to 75% to 100% Transient evaluated by a RETRAN_03 Best Estimate Thermal Analysis on February 9, 1990.

The power ramp transient was predicted by a RETRAN_03 analysis using the following initial conditions: Reactor power was 1930 MWth with recirculation flow at 57.2E6 lbm/hr (15.4E4gpm). Reactor steam dome pressure was 1020psig and reactor level was 162 inches.

In the analysis, the Recirculation flow demand setpoint was decreased in a step change to the demand corresponding to 75% power. Limiters in the recirculation flow control system then limited the flow (power) reduction to 15.9% per minute, resulting in reaching 75% power in about 90 to 100 seconds. At 110 seconds, the recirculation flow demand was step changed back to the original flow demand setpoint.

The test was performed on the simulator by manually adjusting the master recirc flow controller setpoint to the setting previously required to obtain the desired flow.

Using the Validation Test Program (VTP), comparison plots of simulator data versus RETRAN_03 Best Estimate were prepared for selected parameters.

The following parameters were recorded:

Plant Parameter	Simulator Variable
*Reactor Power (%neutron flux)	SNISAPRM
*Total Steam Flow	WNSSTKST
*Total Feedwater Flow	WNSSTKFT
*Wide Range Pressure	T:PIA92A
*Narrow Range Pressure	T:PTID45
*Wide Range Reactor Water Level(GMAC)	T:LIA12
*Narrow Range Reactor Water Level(GMAC)	T:LID59A
*Generator Gross Electrical Power	SGENMWMT
*Turbine Steam Flow	WMSSNSS
*Total Recirculation Loop Flow	WNSSTKRT

*ANS 3.5_1985 required.

The SAR alarm printout was also attached.

Results:

One field change was made to the procedure to account for changes to Recirculation Flow for the Cycle 15 Core.

The results of the transient were compared to the results of the test performed on the simulator in October 1994. Several significant differences were noted beginning in 1995:

1. The ramp rate from 75 to 100% was significantly faster than in earlier tests (50 seconds vs. 116 seconds). This rapid increase in recirculation flow resulted in a reactor scram from high neutron flux which had not previously occurred.

The procedure does not specify any alarms to actuate. During the test, numerous alarms were received associated with the reactor scram which occurred.

Since the test was performed in 1994, the plant changed the ramp rate of recirc flow and the change was subsequently installed on the simulator. The reviewers of the test concluded that the expected response to a rapid ramp up in power would be a reactor scram if performed at the maximum

ramp rate currently programmed in the controller. In 1995, the Manager Plant Operations was promptly notified of the results of this test by simulator test personnel.

AVAILABLE OPTIONS:

This procedure is written to duplicate an analysis performed using Retran and therefore has no options.

OPTIONS TESTED:

The test procedure has no options.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, Cycle 15 Core, MOL, full Power Operation, adjust recirculation flow, control rods in accordance with the pull sheets, and other controls as necessary to achieve the following conditions:

Reactor Power	1930 MWt
Recirculation flow	153300 gpm
Reactor Pressure	1020 psig
Reactor Level	160"

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, the reactor has scrammed and the turbine is tripped. The simulator is capable of continued simulation of recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

O.C. Replica simulator Transient Test Data Maximum Rate Power Ramp from 100% to 75% to 100%, February 9, 1990 (RETRAN_03) was used as the original baseline for this test. The test performed on September 27, 1995 was compared to the previous test performed 1 year ago.

The test procedure contains the expected response of the simulator in the Detailed Plant Response section. However, the simulator response was significantly different than described in the test procedure.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The differences in simulator performance from the expected results in the procedure and the results of previous tests is attributed to changes installed in the plant and the simulator digital recirculation control systems since 1994. No TRs were written as a result of this test.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS76
11.8.8

TITLE: LOCA with Loss of Offsite Power

PREPARED BY/DATE: [signature] / 12/13/96 TEST DATE: 10/24/96

APPROVED BY/DATE: R D Davidson / 12/13/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T8 Maximum size Reactor Coolant System Rupture with loss of offsite power

REQUIRED MALFUNCTIONS

MF1 3.1.2(1)(b) LOCA inside & outside containment

MF2 3.1.2(1)(c) Large & small reactor coolant breaks, including demonstration of saturated conditions

MF5 3.1.2(3) Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

TP3 B1.2.3 Transient test parameter set TP3 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Wide Range Reactor Pressure
Wide Range Reactor Water Level
Fuel Zone Water Level
Containment Temperature
Suppression Pool Temperature
Containment Pressure
Drywell Temperature
Drywell Pressure
Total Low Pressure Injection Flow
Total Low Pressure Core Spray Flow
Total High Pressure Injection Flow

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant

would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to demonstrate that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the Maximum Size Reactor Coolant System Rupture with Loss of All Offsite Power Accident evaluated by the EPRI Best Estimate Thermal Analysis Package on December 7, 1989 (for NSSS Response) and (for containment Response) by the CONTEMPT code on March 23, 1990.

The Nuclear Steam supply system (NSSS) response to the LOCA transient was predicted by a RELAP5 analysis with the following initial conditions:

The reactor was at steady state hot full power (1930 MWth) with recirculation flow at 61.OE6 lbm/hr (16E4gpm). Reactor steam dome pressure was 1035 psia (1020 psig) and reactor level was controlled at 162 inches. The initial liquid mass in the reactor vessel and recirculation loops was 427,000 lbm in the analysis.

There are differences between the simulation and the analysis as follows:

1. The break location of the RELAP5 analysis is on the lower plenum side of the flow venturi while the simulator break location is on the pump/valve side of the flow venturi. Therefore, break flows will be different.

2. In the RELAP5 analysis the containment volume is assumed to be infinite and pressure is constant at 14.7 psia (atmospheric). The simulator calculates containment pressure.

3. Core spray flow occurs instantaneously at 32 seconds (10 seconds for diesel startup and 22 seconds for valve opening stroke times). The simulator has a dynamic flow calculation.

These differences are expected to have an insignificant effect on the general behavior of responses between the simulation and analysis.

Since the break location in the RELAP5 analysis is on a loop with no other connections (ICS, SDC, RCU) the 'D' Recirculation Loop LOCA Malfunction will be used for the simulation. also, the RELAP5 analysis assumed that Core Spray System 2 has only a Core Spray Pump available. Therefore operation of Core Spray Booster Pumps B and D will be inhibited in the simulation.

The RELAP5 results were used as input to the containment response code, CONTEMPT, with Primary containment at the following initial conditions:

Drywell Pressure	1.3 psig
Drywell Temperature	135 degrees F
Torus Pressure	0 psig
Torus Water Temp.	70 degrees F
Torus Water Level	12 feet
Oxygen Concentration	N/A %

An extensive set of variables (67) were collected automatically by the drill file which also executed the required actions. Selected variables were plotted against the reference data for comparison.

The SAR alarm printout was also attached.

Results:

All alarms and automatic actions identified in the procedure occurred except as identified in the deficiency section below. As was noted in the past many unexpected alarms were recorded on the SAR as a result of instrument panel loss when large pumps started on diesel power.

Comparison of simulator data to predicted data shows good correlation. Because of the rapid rate of change of containment parameters, there are some large differences between simulator values and those predicted in the procedure for a specific time. These differences are not significant. In addition, since the analysis was performed, the Containment Spray Auto Start feature was removed by a modification. The containment response is therefore different.

As was noted during previous tests, the simulator fuel clad temperature is significantly lower than the analysis. This was previously evaluated and found to be acceptable.

AVAILABLE OPTIONS:

There are no options available in this test procedure.

OPTIONS TESTED:

There are no options in this test.

INITIAL CONDITIONS FOR TEST:

IC-31, full Power Operation, Beginning of Cycle 15 Core.

Adjust recirculation flow, control rods per the pull sheets and other controls as necessary to achieve the following conditions:

Reactor Power	1930 MWt
Recirculation Flow	16E4 gpm
Reactor Pressure	1020 psig
Reactor Level	160 inches
Drywell Pressure	1.3 psig
Drywell Temperature (Bulk)	135 degrees F (Actual = 128.2)

Torus Pressure	0 psig
Torus Water Temperature	76 degrees F (Actual = 75)
Torus Water Level	149 in. (Actual = 150.5)

After the adjustments are complete, the conditions are stored in temporary IC-196.

FINAL TEST CONDITIONS:

Run Time: 3.5 Hours

At the conclusion of this test, the Recirc Line Break has been isolated by closing the loop valves. The Reactor Level has recovered, filled by Core Spray flow. The Recirc. loop remains broken by an unrecoverable malfunction. The simulator is capable of continued simulation of recovery activities.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

OC Replica Simulator Transient Test Data Maximum Size Reactor Coolant System Rupture with loss of Offsite Power: NSSS Response December 7, 1989 (OCS-5091) (RELAP5)

OC Replica simulator Transient Test Data maximum Size Reactor coolant system Rupture with Loss of Offsite Power: PCN Response March 23, 1990 (OCS-5207) (Contempt)

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

The containment response from the above Contempt code is not applicable after the Containment Spray system starts since the auto start has been removed from both the plant and the simulator.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

As noted in previous tests, the Control Room DC lighting did not come on.

It was noted that the service lighting within the simulator panels does not go off on a loss of power. The need for corrective action is under consideration.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS77
14.8.9

TITLE: Maximum Size Unisolable Main Steam Line Rupture

PREPARED BY/DATE: [signature] / 12/3/96 TEST DATE: 10/24/96

APPROVED BY/DATE: R Davidson / 12/9/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

T9 Maximum size unisolable main stream line rupture

REQUIRED MALFUNCTIONS

MF1 3.1.2(1)(b) LOCA inside & outside containment

MF2 3.1.2(1)(c) Large & small reactor coolant breaks, including demonstration of saturated conditions

MF21 3.1.2(20) Main steam and main feed line breaks (inside & outside)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

TP3 B1.2.3 Transient test parameter set TP3 required at 0.5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Wide Range Reactor Pressure
Wide Range Reactor Water Level
Fuel Zone Water Level
Containment Temperature
Suppression Pool Temperature
Containment Pressure
Drywell Temperature
Drywell Pressure
Total Low Pressure Injection Flow
Total Low Pressure Core Spray Flow
Total High Pressure Injection Flow

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant

would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS3.5 - 1985, Section 4.2 for the Maximum Size Unisolable Main Steam Line Rupture transient evaluated by the EPRI Best Estimate Thermal Analysis Package on February 9, 1990 for the NSSS response and the CONTEMPT code on May 8, 1990 for the Primary Containment response.

The Maximum Size Unisolable Main Steam Line Rupture transient was predicted by RELAP5 and CONTEMPT analyses using the following initial conditions: The reactor was at steady state hot full power (1930 MWth) with recirculation flow at 61.0E6 lbm/hr (16E4 gpm). Reactor steam dome pressure was 1020 psig and reactor level was controlled at 162 inches.

The following assumptions/limitation are involved with this RELAP5 analysis.

1. The break location was at the Main Steam Line nozzle, upstream of the flow element, corresponding to Malfunction NSS17.

2. The containment is assumed of infinite volume and constant ambient pressure (steam at 14.7 psia).

3. The core region level measured the collapsed liquid level from the bottom of the core to the top of the steam dome. The level so calculated should have the same trend as

the fuel zone level instruments, but it is not an accurate representation, particularly for this transient which causes liquid to be carried into the steam dome. The actual fuel zone level instruments measure level only into the moisture separators and therefore, are insensitive to liquid carry over into the vessel dome.

The RELAP5 results are used as input to CONTEMPT to evaluate primary containment response. The primary containment initial conditions were as follows:

Drywell Pressure	1.3 psig
Drywell Temperature	135 degrees F
Torus Pressure	0 psig
Torus Water Temp.	70 degrees F
Torus Water Level	12.6 feet

Using the Validation Test Program (VTP), prepare selected comparison plots of simulator data versus RELAP5 Best Estimate data for the following parameters:

Plant Parameter	Simulator Variable
*Reactor Power (% neutron flux)	SNISAPRM
*Wide Range Pressure	T:PIA92A
*Wide Range Water Level	T:LIA12
*Fuel Zone Water Level	LNSSMPA
*Total Steam Flow	WNSSTKST
*Total Feedwater Flow	WNSSTKFT
*Torus Pressure	T:PIP12
*Torus Temperature	T:TI43A
*Drywell Pressure	T:PIP08
*Drywell Temperature (Bulk)	TPCNDVB
*Core Spray System I Flow	T:F27A
*Core Spray System II Flow	T:F27B
*Total Low Pressure Injection Flow	(Exception)
*Total High Pres. Injection Flow (CRD)	WCRDRD15
Total Recirculation Flow	WNSSTKRT
Recirculation Temp. A	T:TE31A
Recirculation Temp. B	T:TE31C
Recirculation Temp. C	T:TE31E
Recirculation Temp. D	T:TE31G
Recirculation Temp. E	T:TE31J
Steam flow A...B	RRWMIX(30),(31)
Feedwater Temperature	T:TI47

MS Header Pressure (30")	RRPRESS(32)
Fuel Centerline Temperature	RRTFUEL(4)
Clad Temperature	RRTCLAD(4)
Moderator Temperature	RRTBULK(6)
Core Void Fraction (Top)	RRVOID(10)
Core Void Fraction (Mdl)	RRVOID(6)
Core Void Fraction (Bot)	RRVOID(3)
RV Liquid Mass	RRMLVES(1)
RV Total Fluid Mass	RRMVES(1)
Isolation Condenser A...B Steam Flow	RRWMIX((33),(36)
Isolation condenser A...B Return Flow	RRWMIX(35),(38)
Containment Spray System I Flow	T:F03A
Containment Spray System II Flow	T:F03B
Break Steam Flow (Nozzle)	RRWBREA(1)
DW/Torus Vent Flow	WPCNV
Torus Water Level	T:LP09A
Rx DOWNCOMER Collapsed LVL	RRLEVABS

*ANSI/ANS 3.5 - 1985 required.

The SAR alarm printouts were also attached.

Results:

The reference data could not be accessed for plotting. Therefore only the simulator data was plotted. The results were compared to the previous test performed in June 1995.

The procedure was completed with all alarms and automatic actions occurring.

It was noted during review that instability of Isolation Condenser flows observed in previous tests has been corrected.

AVAILABLE OPTIONS:

There are no options in this test procedure since it is written to perform the required maximum size break test. The malfunction used has instructor selected severity, ramp time, and delay time.

OPTIONS TESTED:

The test uses a steamline break malfunction at 200% severity and no ramp or delay time.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power Operation.

Adjust recirculation flow, controls rods per the pull sheets and other controls as necessary to achieve the following conditions:

Reactor Power	1930 MWt
Recirculation flow	16.0E4 GPM
Reactor Pressure	1020 psig
Reactor Level	160 inches
Drywell Pressure	1.30 psig
Drywell Temperature (Bulk)	135 degrees F (actual = 127)
Torus Pressure	0 psig
Torus Water Temperature	70 degrees F
Torus Water Level	150 inches

FINAL TEST CONDITIONS:

Run Time: 1.5 Hour

At the conclusion of this test, the reactor and containment have isolated but the steam line rupture is not isolated from the containment. The steam line rupture is not recoverable. IC reset is required for continued simulation. The capability to continue simulation of recovery events was not evaluated.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

O.C. Replica simulator Transient Data, maximum size Unisolable Main Steam Line Rupture, September, 1990 (RELAP5 & CONTEMPT)

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

A meeting was held in 1992 with the individual responsible for the Rlelap5 calculations. It was pointed out that there are large uncertainties in the level response of the Relap5 calculations, particularly in predicting the plant instrument response.

The test results were also compared to the results of the 6/15/95 test. Differences observed are discussed above.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS78
14.8.10

TITLE: Sim. Closure of All MSIVs/Stuck Safety, IC Fails, Loss of FW

PREPARED BY/DATE: [signature] / 12/13/96 TEST DATE: 10/24/96

APPROVED BY/DATE: R W Davidson / 12/13/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B 1.2)

T10 Simultaneous closure of all MSIVs with a single stuck open Relief valve

REQUIRED MALFUNCTIONS

MF3 3.1.1(2)(d) Failure of safety and relief valves (LOCA)

MF11 3.1.2(9) Loss of normal feedwater or normal feedwater system failure

MF12 3.1.2(10) Loss of all feedwater (normal and emergency)

MF24 3.1.2(23) Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

TP3 B1.2.2 Transient test parameter set TP3 required for 5 seconds:

Reactor Power (% Neutron Flux)
Total Steam Flow
Total Feedwater Flow
Wide Range Reactor Pressure
Wide Range Reactor Water Level
Fuel Zone Water Level
Containment Temperature
Suppression Pool Temperature
Containment Pressure
Drywell Temperature
Drywell Pressure
Total Low Pressure Injection Flow
Total Low Pressure Core Spray Flow
Total High Pressure Injection Flow

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant

would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

The purpose of this test procedure is to prove that the simulator meets the acceptance criteria of ANS 3.5 - 1985, Section 4.2 for the Simultaneous Closure of All Main Steam Isolation Valves combined with A Single Stuck-open Electromatic Relief Valve, Failed Isolation condensers, and Loss of Feedwater evaluated by the EPRI Best Estimate Thermal Analysis Package on January 15, 1990.

This MSIV closure transient was predicted by RELAP5 analysis using the following initial conditions: The reactor was at steady state hot full power (1930 MWth) with recirculation flow at 61.OE6 lbm/hr (16.E4 gpm). Reactor steam dome pressure was 1038 psia (1023 psig) and reactor level was controlled at approximately 163 inches.

All control systems were assumed to be in automatic, except that operation of the Isolation Condensers was inhibited, a single EMRV was stuck open, and the Feedwater Pumps were tripped.

The following data was recorded and selected plots of simulator and Relap5 data were printed.

Plant Parameter	Simulator Variable
*Reactor Power (%neutron flux)	SNISAPRM
*Wide Range Pressure	T.PID76A

*Wide Range Water Level	T:LIA12
*Fuel Zone Water Level	LNSSMPA, LNSSMPB
*Total Steam Flow	WNSSTKST
*Total Feedwater Flow	WNSSTKFT
*Drywell Bulk Temperature	TPCNDVB
*Drywell Pressure	T:PIP08
*Torus Bulk Temperature	T:TI43A
*Torus Pressure	T:PIP12
*Total Low Pressure Injection Flow	exception
*Total Low Pressure Core Spray Flow	T:F27A, T:F27B
*Total High Press. Injection Flow (CRD)	WCRDRD15
Total Core Thermal Power	SRXSTOTL, CRQCORE
Total Recirculation Flow	WNSSTKRT
Recirculation Temp A	T:TE31A
Recirculation Temp B	T:TE31C
Recirculation Temp C	T:TE31E
Recirculation Temp D	T:TE31G
Recirculation Temp E	T:TE31J
Steam Flow A...B	RRWMIX(30),(31)
Fuel Centerline Temp.	RRTFUEL(4)
Clad Temp.	RRTCLAD(4)
Moderator Temp.	RRTBULK(6)
Core Void Fraction (Top)	RRVOID(10)
Core Void Fraction (Mdl)	RRVOID(6)
Core Void Fraction (Bot)	RRVOID(3)
RV Liquid Mass	RRMLVES(1)
RV Total Fluid mass	RRMVES(1)
Iso. cond. Steam flow	RRWMIX(33), (36)
Narrow Range Reactor Level	T:LID59B

*ANS 3.5 - 1985 required.

The SAR alarm printout was also attached.

Results:

The SAR printout was missing some alarms. Test personnel verified the missing alarms were actually received on the panels.

All alarms and automatic actions identified in the procedure occurred. Some differences in predicted vs. simulator parameter values were observed but found to be acceptable.

No unwarranted alarms or automatic actions occurred.

As expected, the reactor scrammed from the MSIV closure and 2 EMRVs opened to relieve pressure. The stuck open relief valves caused torus temperature to increase at 2 degrees per minute, while the procedure stated 3 degrees per minute was expected.

Some differences in Recirculation Flow and reactor void response since the last test were noted. The difference is caused by a recent modification to the High Reactor Pressure Recirulation Pump Trip logic which now trips three instead of five pumps during this event. The remaining two pumps trip later when Lo Lo level occurrs.

The simulator response was found acceptable.

AVAILABLE OPTIONS:

This test was written to satisfy the required ANS 3.5 transient and therefore has no options. The malfunctions used to initiate the transient have options of equipment to fail, ramp time, and delay time.

OPTIONS TESTED:

The A EMRV was chosen to stick open since both the A and D EMRVs are expected to open on an MSIV closure event.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, Full Power Cycle 15 Operation, adjust recirculation flow, control rods per the pull sheets and other controls as necessary to achieve the following conditions:

Reactor Power	1930 MWth
Recirculation flow	16E4 gpm
Reactor Pressure	1023 psig
Reactor Level	164 Inches

The established condition was stored in IC-197 temporarily.

A Drill File was established to automatically collect data and insert the selected malfunctions.

FINAL TEST CONDITIONS:

Run Time: 1.5 Hours

At the conclusion of this test, reactor level has stabilized and pressure is decreasing due to the stuck open relief valve. The simulator is capable of continuing the scenario. The malfunctions can be cleared by the instructor to continue recovery operations.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

OC Replica simulator Transient Test Data Simultaneous closure of All MSIV's combined with a single Stuck-Open EMRV, Failed Iso-Condensers and LOFW: NSSS Response, January 17, 1990 (OCS-5117) (RELAP5)

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

Relap data was available for only a few parameters.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

No TRs were written during this test. The differences between the simulator and Relap5 data were within the ability of Relap to predict plant response.

A TR was previously written to address the missed SAR alarms.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS79
14.6.45.25

TITLE: Loss of All AC Power with EMRV Failure to Close (PRA Scenario 3.2.1)

PREPARED BY/DATE: [signature] / 2/22/93

TEST DATE: 02/20/93

APPROVED BY/DATE: [signature] / 2/23/93

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF3	3.1.1(2)(d)	Failure of safety and relief valves (LOCA)
MF5	3.1.2(3)	Loss or degraded electrical power, including loss of offsite, loss of diesels, loss to plant buses, & loss to instrument buses (A.C & D.C.)
MF12	3.1.2(10)	Loss of all feedwater (normal and emergency)
MF16	3.1.2(14)	Fuel cladding failure and associated alarms
MF24	3.1.2(23)	Passive malfunctions in emergency systems

ANS 3.5 APPENDIX A REQUIREMENTS

A3	A3.2(2)	Ability to operate with similar plant operating procedures
A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This procedure is used to verify simulator response to a loss of offsite power with stuck open Electromatic Relief Valves (EMRV). This event was selected because of the contribution to core damage probability, as determined by plant specific Probabilistic Risk Assessment (PRA) studies. This single event constitutes 22.69% of the total core damage frequency.

Passive Malfunctions are activated for both Diesel Generators and two EMRVs:

DGN-3A	DG 1 Fails to Start
DGN-3B	DG 2 Fails to Start
NSS-24A	EMRV A Sticks Open
NSS-24D	EMRV D Sticks Open

Malfunction OED-3, Loss of Offsite Power Sources is then activated to initiate the transient.

Primary Effects:

With no AC power, the EMRVs will open to control pressure following Reactor and containment isolation. The malfunctions will cause 2 EMRVs to remain open. Reactor level is expected to decrease to 0 in. TAF (i.e. to the top of active fuel) in approximately 37 minutes. Drywell temperature and pressure increase significantly. Fuel damage is expected.

The following variables are monitored using Datapool Monitoring:

RRTFUEL(1)-(8)	Core average Fuel Temperature
RRTCLAD(1)-(8)	Fuel Cladding Temp.
LNSSMPA - D	Fuel Zone Level
T:LP09B	Torus Level
RRMSVMR(1)	CHRMS Containment Radiation
PPCND	Drywell Pressure
TPCNDVB	Drywell Temperature (Bulk)

The SAR and the PCS alarm printouts were also attached.

Results:

The test was run two times. The first run was allowed to proceed with no core cooling. The second run included injection of fire water when reactor pressure decreased to < 137 psig.

Malfunctions DGN-1A and DGN-1B were used to fail the diesels because malfunctions DGN-3A and DGN-3B do not work, as identified on a previous TR.

During the first run, level decreased to approximately -120 inches (120 inches below Top of Active Fuel) in about 70 minutes. Fuel cladding temperature did not exceed 400 F on steam cooling. Fuel failure was expected but did not occur.

Note: At the conclusion of the test, test personnel closed the EMRVs and Isolated the Isolation Condensers to check fuel response. The cladding temperature increased rapidly to approximately 1300 F before terminating the transient, indicating that steam cooling was working very well.

The Containment High Range Radiation Monitor (CHRMS) looses power during this event, removing the operator's primary indication of fuel failure.

The analysis indicates that reactor water level will decrease to below core top before reactor pressure is low enough to inject fire water. The simulator pressure however, reached 137 psi while the core was still fully covered.

All alarms and automatic actions occurred as expected and no unwarranted alarms were received.

AVAILABLE OPTIONS:

This procedure is written to duplicate a specific analysis and therefore has no options.

OPTIONS TESTED:

There are no options available in this procedure.

INITIAL CONDITIONS FOR TEST:

IC-15, Full Power.

Passive Malfunctions are activated for EMRVs and Diesel Generators.

FINAL TEST CONDITIONS:

Procedure execution time: 90 Minutes for each of 2 runs.

Run 1:
At the conclusion of this test, reactor water level was 120 inches below the top of the active fuel. The simulator is capable of continuing the recovery operations.

Run 2:
At the conclusion of this test, the reactor has been flooded by injecting Firewater with the Core Spray System. The simulator is capable of continuing the recovery operations.

The simulator passed this test with 1 new TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test is based on an Oyster Creek Plant specific PRA analysis.

The test procedure contains the expected simulator response.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The fuel temperature did not increase and cause fuel failure when anticipated. A TR was written previously against a different procedure.

The C and D Fuel Zone Level instruments did not track well. Level differences of 30 or more inches occurred throughout the transient. A TR was written.

The above TRs are scheduled for corrective action by February, 1994.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS80
14.6.40.15

TITLE: MOOG Valve Fails

PREPARED BY/DATE: E Mowry / 10/17/96 TEST DATE: 09/06/96

APPROVED BY/DATE: R Davidson / 11/12/96

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19 3.1.2(17) Control system failure affecting reactivity and core heat removal (including bypass valve failure)

MF23 3.1.2(22) Process instrumentation, alarms, and control system failures

MF26 3.1.2(25) Reactor pressure control system failure (including bypass valve failure)

ANS 3.5 APPENDIX A REQUIREMENTS

A4 A3.4 Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;
b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Malfunction Cause: Failure of the Moog Valve.

The EPR Moog valve fails such that the EPR servo continues in the decreasing or increasing direction, or stays as-is as determined by the instructor.

With the malfunction activated in the decrease direction, the EPR position indicator will increase. Control valves open to 100%. Number 1 Bypass Valve will fully open and Number 2 Bypass valve will partially open until the steam flow limit is reached. Operation of the EPR power switch on panel 7F has no effect. Steam line pressure decreases to 850 psi, causing MSIV closure and a reactor scram.

The following data was recorded using the instructor station trend screens:

T:XAPRM3	APRM Channel 3
WNSSTKST	Total Steam Flow
RTCSCV(1)	Control Valve Position
RTCSCV(2)	
RTCSCV(3)	
RTCSCV(4)	
RTCSBV(1)	Bypass Valve Position
RTCSBV(2)	
RTCSBV(3)	
T:PIA92A	Reactor Pressure
T:PD76X	Reactor Pressure (Wide Range)
T:F42201	Total FW Flow
T:PPT1	Throttle Pressure
T:LRE21A	Reactor Level (Yarway)
T:LRE05A	Reactor Level (Yarway)
T:LIA12	Reactor Level (Wide Range)

The Sequence of Alarms Recorder (SAR) printout was attached.

Results:

The Turbine Control System functioned correctly, causing the control valves to open fully followed by the full opening of # 1 Bypass Valve and partial opening of # 2 Bypass Valve.

With the control and bypass valves opened to the maximum permitted by the flow limit, reactor pressure decreased to the Steam Line Low Pressure setpoint, closing the MSIVs. This resulted in an automatic reactor scram from MSIV Closure. All expected automatic actions and alarms occurred.

The Reactor scram occurred approximately 25 seconds after the malfunction was inserted. When this event occurred in the plant on June 12, 1985, approximately 4 minutes elapsed between the failure and the reactor scram. A TR was written to correct the timing.

Prior to 1996, the reactor pressure response to this failure was incorrect in that pressure would not decrease enough to close the MSIVs on Steam Line Low Pressure. Significant model improvements to the Feedwater Heaters and Reheaters made a substantial improvement in the test results.

AVAILABLE OPTIONS:

Failure Mode:	OPTION 1	Sticks in decreasing pressure direction
	OPTION 2	Sticks in increasing pressure direction
	OPTION 3	Sticks as-is

Delay Time: 0-28,800 sec.

OPTIONS TESTED:

This test was performed using OPTION 1, Sticks in decreasing pressure direction.

INITIAL CONDITIONS FOR TEST:

IC-15, 100% Power (MOL)

FINAL TEST CONDITIONS:

Run Time: 1 Hour

At the conclusion of this test, the reactor is in a post scram condition. The malfunction is not recoverable and remains active. The simulator is capable of continuing the recovery operations but IC reset is required to clear the malfunction.

The simulator passed this test with one new TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected response of the simulator in the Detailed Plant Response section.

A similar event occurred in the Oyster Creek Plant on June 12, 1985. This event is described in Transient Assessment Report TAR-OC-008. TAR-OC-008 was used as a reference when preparing the test procedure.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

The Main Steam Line Low Pressure occurred in approximately 25 seconds following the failure on the simulator while approximately 4 minutes elapsed in the plant event of June 12, 1985. TR 3680 was written to correct the timing. Corrective action was completed and the TR was cleared on November 13, 1996.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS81
14.6.27.5

TITLE: Recirculation M-G Set Flow Controller Oscillation

PREPARED BY/DATE: [signature] / 11/28/95

TEST DATE: 11/21/95

APPROVED BY/DATE: R Wanderer / 11/29/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

This test was added to the Certification Test List in November 1995 to replace 14.6.27.4 (TTS33), Recirculation Master Controller Fails. The "Recirculation Master Controller Fails" Malfunction (RFC-4) became inoperable with installation of the Digital Recirc Flow Control System in 1994. RFC-4 is not considered a credible failure following installation of the Digital Recirc Flow Control System.

Malfunction Cause: Mechanical binding in the Bailey causes the positioner to "hunt".

The recirculation M-G flow controller develops oscillations in response to the positioner binding.

Primary Effects:

1. Oscillations in selected M/A station deviation meter.
2. Oscillations in selected M/G speed (frequency) indication, Panel 3F.
3. Oscillations in selected M/A station output indication, Panel 3F.
4. Oscillations in M-G amp, volt, and motor amp indication, Panel 3F.
5. Oscillation in flow indication, Panel 3F, 4F.
6. Oscillations in reactor power level for severe oscillations, Panel 4F.

The following data was recorded on the 8 pen recorder:

T:FIA72D	Total Recirc Flow
T:PIA07	Core delta p
T:FIA60B	Recirc Pump B flow indicator
T:XMGBHZ	B Recirc Pump frequency
T:XMGBV	B Recirc Pump volts
T:XMGBA	B Recirc Pump amps

Results:

One field change was made to the procedure to revise the initial conditions for the full power cycle 15 core changes. No alarms were actuated during the test. Plant parameters responded as described in the procedure but the magnitude was not severe, even with the malfunction at 100%. The period was found to be 29 seconds peak to peak which differs from the 10 seconds identified in the procedure. These differences were found acceptable.

AVAILABLE OPTIONS:

(1)	Faulty Controller	RFC-5A - NG13A RFC-5B - NG13B RFC-5C - NG13C RFC-5D - NG13D RFC-5E - NG13E
(2)	Magnitude	0 - 100% 100% = 10% of the current setpoint.
(3)	Ramp Time	0 - 14,400 seconds
(4)	Delay Time	0 - 28,800 seconds

OPTIONS TESTED:

(1)	Malfunction:	RFC-5A, Recirc Pump A
(2)	Magnitude:	100%
(3)	Ramp Time:	60 seconds
(4)	Delay Time:	0 seconds

INITIAL CONDITIONS FOR TEST:

IC-28, 100% Power, MOL, Cycle 15 Core

FINAL TEST CONDITIONS:

Run Time: 30 Minutes

At the conclusion of the test, the malfunction has been cleared and the simulator returned to steady state operation at 100% power. The simulator is capable of continued simulation.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the anticipated effects in the Detailed Plant Response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: TTS82
14.6.13.3

TITLE: Main Feed Regulator Valve Fails

PREPARED BY/DATE: [signature] / 11/27/95

APPROVED BY/DATE: RDavidson / 11/29/95

TEST DATE: 11/21/95

ANSI/ANS 3.5 REFERENCES

This procedure satisfies in whole or in part the following requirements:

REQUIRED NORMAL EVOLUTIONS

N/A

REQUIRED TRANSIENTS (SECTION B.1.2)

N/A

REQUIRED MALFUNCTIONS

MF11	3.1.2(9)	Loss of normal feedwater or normal feedwater system failure
MF19	3.1.2(17)	Control system failure affecting reactivity and core heat removal (including bypass valve failure)
MF23	3.1.2(22)	Process instrumentation, alarms, and control system failures

ANS 3.5 APPENDIX A REQUIREMENTS

A4	A3.4	Malfunction tests (each generic malfunction)

ANS 3.5 APPENDIX B REQUIREMENTS

N/A

THIS PROCEDURE IS SUBJECT TO THE FOLLOWING PERFORMANCE CRITERIA SPECIFIED IN ANSI/ANS 3.5:

Tests shall be conducted to prove the capability of the simulator to perform correctly during the limiting cases of those evolutions identified in 3.1.1 (Normal Plant Evolutions) and 3.1.2 (Plant Malfunctions) of ANSI/ANS 3.5-1985. Acceptance criteria for these tests shall:

a. Where applicable, be the same as plant startup test procedure acceptance criteria;

b. Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.
c. Require that the simulator shall not fail to cause an alarm or automatic action if the reference plant would have caused an alarm or automatic action, and conversely, the simulator shall not cause an alarm or automatic action if the reference plant would not cause an alarm or automatic action.

Malfunctions and transients shall be tested and compared to best estimate or other available information and shall meet the following acceptance criteria:

Require that the observable change in the parameters correspond in direction to those expected from a best estimate for the simulated transient and do not violate the physical laws of nature.

TEST DESCRIPTION:

Test Procedure 14.6.13.3 was originally titled Individual Feedwater Control M/A Station Fails. The title and implementation of the malfunction were changed following installation of the Digital Feedwater Control System (DFCS). The DFCS was installed in the plant and the simulator in 1994.

This procedure was added to the Certification Test Procedure list in November, 1995 to replace 14.6.13.1 (TTS59), Master Feedwater Controller Fails. The Master Feedwater Controller Malfunction FWC-1 was made inoperable during the DFCS modification. FWC-1 is not considered a credible failure for the new system.

Malfunction Cause: Faulty Feedwater Reg Valve Positioner.

The plant is operating with feedwater control in automatic when a feed reg valve fails.

Primary Effects:

Assume the simulator is at 100% power when a feed reg valve fails:

A. Failed Closed:

1. Flow in affected loop decreases to zero.
2. Remaining pumps increase flow to flow limit.
3. Reactor level decreases to scram setpoint.

B. Failed in intermediate position:

1. Feedwater flow in affected pump remains constant.

2. Remaining pumps control feedwater flow within range of zero flow to the flow limit.

C. Failed Open:

1. Flow in affected pump increases above the flow limit.

2. Remaining pumps decrease flow to control reactor level.

Results:

A field change was made to the procedure to incorporate changes to the malfunction caused by installation of the Digital Feedwater Control System (DFCS) modification. All alarms and automatic actions occurred as specified in the modified test procedure.

The Sequence of Alarms Recorder (SAR) printout was attached.

AVAILABLE OPTIONS:

(1)	Faulty Reg valve	FWC-3A FWC-3B	A FW Reg Valve B FW Reg Valve
(2)	Severity	0 - 100%	0% = Full Closed 100% = Full Open
(3)	Ramp Time:	0 - 14,400 seconds	
(4)	Delay Time:	0 - 28,800 seconds	

OPTIONS TESTED:

FWC-3A:	A FW Reg Valve Fails
Severity:	0%
Ramp Time:	0 seconds
Delay Time:	0 seconds

INITIAL CONDITIONS FOR TEST:

IC-28, 100% Power, MOL, Cycle 15.

FINAL TEST CONDITIONS:

At the conclusion of the test, the reactor has scrammed on low level. Automatic actions caused by low and low low level have occurred and water level has increased above these setpoints.

The simulator is capable of continued simulation should the instructor need to continue recovery operations.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The test procedure contains the expected results in the detailed plant response section.

DEFICIENCIES FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

None.

EXCEPTIONS TO ANSI/ANS 3.5-1985 TAKEN AS A RESULT OF THIS TEST, INCLUDING JUSTIFICATION:

None.