AmerGen Energy Company, LLC
Oyster Creek
US Route 9 South
P.O. Box 388
Forked River, NJ 08731-0388

AmerGen SM
An Exelon/British Energy Company

January 8, 2001
2130-01-20001

Director Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Certification of Oyster Creek Plant Referenced Simulator

In accordance with 10 CFR 55.45(b)(5)(ii), attached is NRC Form 474, "Simulation Facility Certification", and the requisite supporting documentation to certify the Oyster Creek Simulation Facility, consisting solely of a plant referenced simulator, meets the requirements of 10 CF 55.45.

If there are any questions regarding this matter, please contact Mr. John Solakiewicz, Simulator Analyst, at 609-971-4174.

Sincerely,

Ron J. DeGreggorio
Vice President, Oyster Creek

RJD/JJR
Attachments

cc: NRC Document Control Desk
Senior NRC Resident Inspector (w/o Attachments Volumes 1 and 2)
Oyster Creek NRC Senior Project Manager (w/o Attachments Volumes 1 and 2)

A001

AmerGen Energy Company, LLC
Oyster Creek
US Route 9 South
P.O. Box 388
Forked River, NJ 08731-0388

AmerGen SM

An Exelon/British Energy Company

December 15, 2000

Director Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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SUBJECT: Oyster Creek Nuclear Generating Station
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Sincerely,

Darryl LeQuia
Director Training

DL/jmf

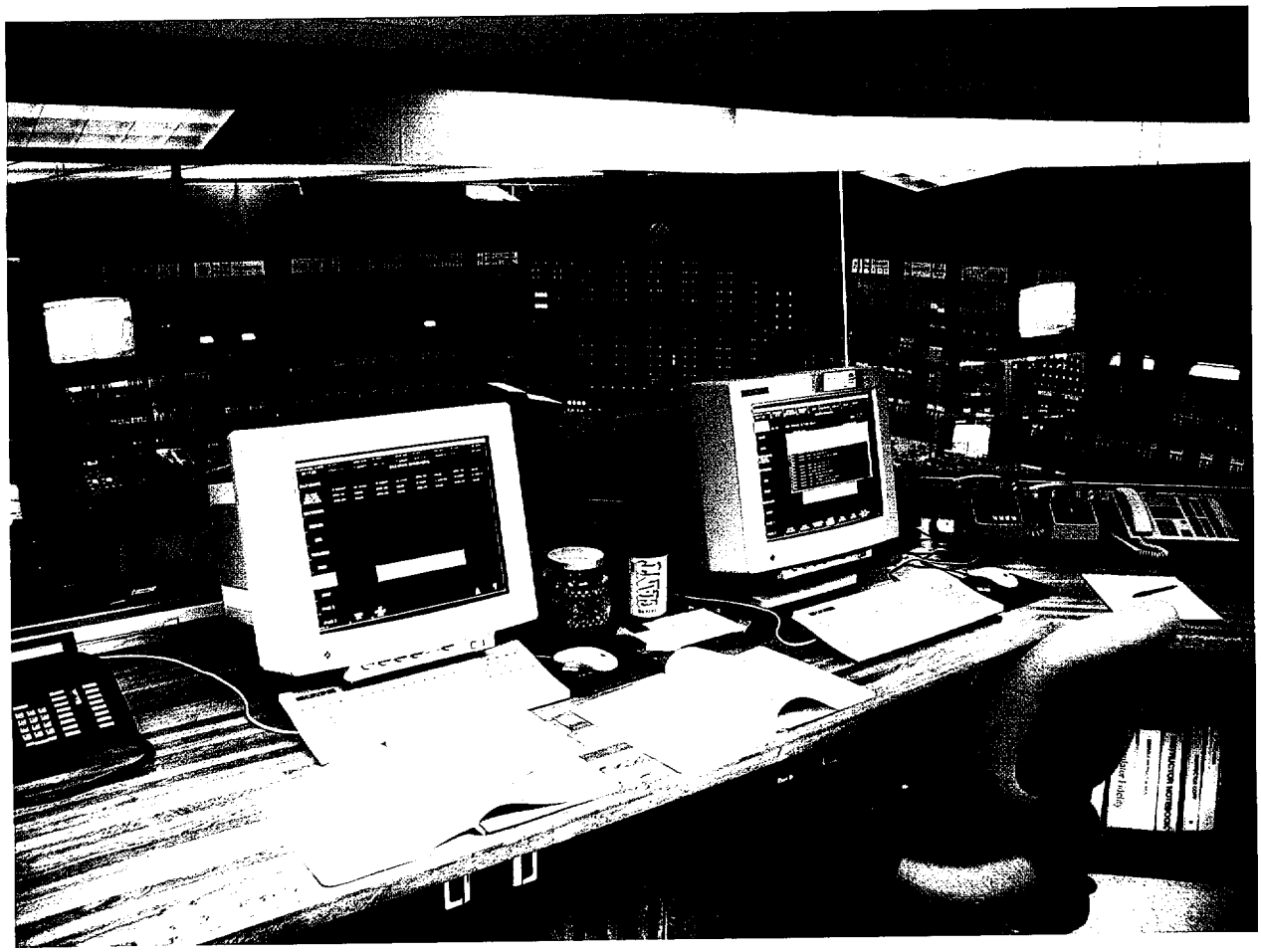
Attachment

cc: NRC Document Control Desk
Senior NRC Resident Inspector (w/o Attachments Volume 1 and 2)
Oyster Creek NRC Project Manager (w/o Attachments Volume 1 and 2)

m:word/memos/Simulator Facility Certification.doc

Oyster Creek
Training
Department

Replicate Simulator
Quadrennial Report
For Year 2000



Oyster Creek Generating Station

Forked River, New Jersey

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REPORT FORMAT

The Attachments in this report correspond to the Attachments of the Initial Certification Report issued in 1992 and in the first quadrennial report submitted in 1996. The format of this report follows the guidance in Appendix A (Guide for Documenting Simulator Performance) of ANSI/ANS-3.5-1985. This report emphasizes changes since the previous reports. Information previously submitted is not included.

NRC FORM 474 (8-1998) U.S. NUCLEAR REGULATORY COMMISSION

SIMULATION FACILITY CERTIFICATION

APPROVED BY OMB: NO. 3150-0138 EXPIRES: 09/31/2001

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 Records Management Branch (T-6F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0136), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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
AmerGen Energy Company, LLC	

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 percent 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
	Director Training	12-15-00

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

This report is submitted in accordance with 10 CFR 55.45(b)(5)(ii) on the anniversary of the second four year period since initial certification in December 1992.

The simulator has been tested and updated per the requirements of ANSI/ANS-3.5-1985 and USNRC Regulatory Guide 1.149, Revision 2. Approximately 118 scheduled certification tests were performed during the period. Fifteen of these were repeated in each of the four years.

Additional specific tests were performed for each modification and each corrected Trouble Report (TRs).

A total of 115 modifications were installed on the simulator during this four year period. A total of 182 TRs were closed or voided during the same period.

The Oyster Creek Simulator reached a level of maturity during this time. The results of the testing program indicate continuing improvements in simulator performance during the last four years. In the previous quadrennial report, 22 tests resulted in the issue of TRs. During this period, only 12 tests had associated TRs.

Modifications to the plant and to the simulator have dramatically decreased both in number and scope, due in part to the proposed shutdown and to completion of regulatory required modifications. The plant operated better during this period, offering few scrams or plant transients to benchmark the simulator.

Operator confidence in the simulator is strong. This is evidenced by frequent requests by operators and Operations Management to use the simulator for additional training. "Just-In-Time" training to prepare for planned plant evolutions and plant procedure verification has taken place in the simulator during the four year period. Also, infrequently performed tasks such as start-ups, shut downs, and placing major systems or equipment trains in or out of service, were performed to re-fresh operator skills. Oyster Creek continues to use the simulator for all Emergency Drills.

Testing and changes to prepare for potential Y2K problems with the simulator were implemented in 1999. To accommodate operating system limitations in the Encore and Sun computers, the simulator clock was set back twelve years. These efforts were successful in allowing continued use of the existing equipment.

Executive Summary (continued)

Aging of the simulator Encore computers and the limited availability of spare parts, particularly one of a kind computer interface equipment, is becoming more of a concern. Replacement of the computers with a PC based system was deferred during the early planning stages when permanent shutdown of the station appeared imminent. With the recent sale of the plant, replacement of the simulator computers has become an active project again. Completion of re-hosting is anticipated in 2001.

1.0 SIMULATOR INFORMATION

1.1 GENERAL

1.1.1 Owner/Operator/Manufacturer

The Oyster Creek full scope plant referenced simulator was owned by Jersey Central Power & Light Company and operated by GPU Nuclear Corporation until August 8, 2000. At that time, the Oyster Creek Nuclear Generating Station was sold to AmerGen LLC, a PECO/British Energy Company. Following the merger of Unicom and PECO into Exelon on October 17, 2000,, AmerGen LLC became an Exelon/British Energy Company. The resources of Exelon Corporation are now available to support simulator operation.

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 initial training, requalification training, and examination of Licensed Operators and Senior Licensed Operators of the Oyster Creek Nuclear Generating Station. Additional training and testing is performed in the simulator for Management personnel, Engineers, Maintenance Technicians, Radiation Protection Technicians, 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, Docket No. 50-219.

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 second 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 previous certification reports.

1.2.2 Panels/Equipment

Physical fidelity inspection of the panels was performed periodically during the last four years. These inspections verify that the simulator configuration agrees with the plant. Since construction, a total of 1466 discrepancies have been identified and disposed as follows:

- 600 were accepted as is, having minimal or no training impact.
- 715 were corrected.
- 141 were voided, primarily when equipment was replaced by modifications.
- 10 will be corrected as scheduled. This count includes physical differences due to planned modifications.

A large number of the discrepancies accepted as is are minor, cosmetic label differences. Some labels were replaced in the plant during the 18R Refueling Outage completed this past November. Duplicate labels for the simulator were purchased along with the plant labels. Labeling in the simulator will keep pace with the plant. Completion is expected by June 30, 2001 or as soon as practical after implementation in the plant.

1.2.2 Panels/Equipment (continued)

All control room panels and equipment are functionally simulated and are identical in size, shape, color and arrangement, with the exceptions noted here and in the previous certification reports. Attachments to this report are as follows.

- Details of changes to equipment differences since the last report are listed in Attachments A.1, A.2, and A.2.1. Attachment A.1 lists newly identified differences which were accepted and will not be corrected. A.2 contains a schedule for items to be corrected. A.2.1 contains items which were corrected or voided during the report period.

- As indicated in Attachment A.2.1, some equipment differences which were scheduled for corrective action were reclassified as accepted and will not be corrected. These differences have little training impact.

- Simulator testing continues to use plant procedures and model plant events to verify the simulator's ability to re-produce plant performance. The listing of tests performed and abstracts of the past four years of testing are found in Attachment B. Therefore, Attachment A.3 is omitted.

- The general procedure and processes for simulator discrepancy and resolution remain the same. Therefore Attachment A.4 is omitted.

- Modifications installed in the plant, which will be installed in the simulator, are listed in Attachment A.5. Future plant modifications to be installed on the simulator are listed in Attachment A.6.

A RAC Workstation (used for radiological release evaluation during Emergency Drills) was added to the control room.

1.2.3 Systems

Since the last certification report in 1996, the Local Operator Actions (LOA) for the Electrical Distribution System were upgraded by adding local manual operations capability for 4160V and 480V breakers and correcting Rack-Out capabilities. During this change, the Instructor Station menus for breaker operations were reorganized to aid the instructors.

The reactor level and steam flow instrumentation was tuned to match plant data from cold shutdown to full power operation.

Other upgrades to the simulator are shown on Attachment A.7.

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

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 previous certification reports.

1.3 INSTRUCTOR INTERFACE

1.3.1 Initial Conditions (ICs)

The simulator has 260 initial conditions, including 60 Backtrack and an additional 5 Snapshot ICs. Password protection for the ICs was re-allocated among the users. Initial Conditions are controlled by the users as needed. Therefore, the list of Initial Conditions identified in the Initial Certification Report dated December 31, 1992 is no longer valid.

The Cycle 15 core loading previously installed in the simulator is still in use for current Cycle 18 operations. The need to update the simulator core was addressed in subsequent Fuel Reload Evaluations. It was determined that the Cycle 15 Core is still valid.

1.3.2 Malfunctions

One new malfunction was added:

- Torus Suction Plugging

One malfunction, Loss of DFRCS LIL, cannot be reset. It requires shutdown and restarting of the simulator computers. After attempts to correct this problem, it was determined that DCC design constraints will not allow correction. Oyster Creek will attempt to correct this issue when the simulator computers are replaced. The issue has been identified in Trouble Report 3816.

1.3.3 Local Operator Actions

Local Operator Actions were added for the following:

- Lo-Med-Hi Range Switches for the Condensate Conductivity transmitters
- Standby Gas Treatment System Fan Breaker Rack Out
- 4160V and 480V Breaker Manual Operations
- 125V DC Static Charger Voltage Adjustment

1.3.4 Supplemental Features

The following changes to the instructor station were made since the last report.

- Plant Performance Parameters were added for Windy Conditions, Control Rod Drive Hydraulic Control Unit (HCU) Leakage, and Core Reactivity Adjustment Capability.

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

1.5 OTHER SIMULATOR IMPROVEMENTS

1.5.1 I/O System

The original ethernet was replaced with a more reliable 10 Base-T ethernet.

1.5.2 Y2K Issues

Portions of the Oyster Creek Simulator are not Y2K compliant. During 1999, the simulator time clock was set back 12 years to 1987 to allow continued operation after December 31, 1999. The decision to set the time back was made to avoid the substantial costs estimated to make the simulator computers Y2K compliant. At the time the decision was made, GPU was planning to decommission the Oyster Creek plant in the year 2000. Subsequently, a buyer was found and the plant was sold. All Y2K issues will be resolved when the simulator platform is changed.

1.5.3 Simulator Aborts and Stalls

The Digital Feedwater and Recirc Flow Control system failed several times (17 times from January to May 1998) with the message" DFCDRV became inactive" appearing. A DCC Caching Disk Controller was installed on June 5, 1998 eliminating the problem. Fragmented backtrack files were found to be the cause of the failures. The new Caching Disk Controller eliminated the need for the software to wait for disk write operations.

Simulator Stall events also began to occur in 1998. Ten events occurred between January and May, 1998. Board replacements were undertaken and the frequency changed to approximately once per quarter until March 2000. Since March 2000, events vary from approximately one every other week to several in one day. Most events show messages associated with C (Compute) Node (NSSS/Core Model computer) communication. Based on this trend, an action plan to determine the cause of the Simulator Stall events has been implemented. Hardware limitations are suspected, but the exact cause has not yet been identified. These stalls have resulted in some training delays, but have not had an adverse impact on the training provided.

1.5.4 Simulator Power Supply

The air conditioning system in the UPS room was upgraded. Premature failure of the UPS batteries as previously reported has been corrected.

Adjustments were made to the ground fault protection setting on the main circuit breaker supplying power to the simulator building. The adjustments significantly decreased nuisance trips of the power supply to the simulator during local thunderstorms.

1.5.5 Disk Storage

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

2.0 SIMULATOR DESIGN DATA

Status of Modifications:

A continuing review of plant modifications has been performed since the last certification report. Details of the review are shown in Attachments A.5, A.6, and A.7. A summary of the review is as follows:

504 Modifications were reviewed.

390 Modifications do not impact the simulator or have negligible effect on training. These will not be installed.

115 Modifications were installed since the last certification report (see Attachment A.7).

43 Modifications are planned for the simulator including some simulator upgrades, which are not plant modifications (see Attachments A.5 and A.6).

Administrative procedures define Priority 1, 2, & 3 modifications required for installation on the simulator. Priority 4 & 5 modifications are not required to support training but will be installed as time and resources permit. The time limits of ANS 3.5 – 1985 do not apply to the installation of Priority 4 & 5 modifications.

All of the modifications identified as required since the last report were installed or are scheduled for installation. In the past four years, 15 of the 115 modifications were installed more than 12 months after establishing the need for the modification. This was due to issues such as the complexity of operating systems supporting the simulator, re-prioritizing tasks, heavy simulator usage for training and examinations, Y2K preparation, and the plan to decommission the plant.

2.0 SIMULATOR DESIGN DATA (continued)

The Digital Feedwater and Recirculation Control System (DFRCS) is a stimulated system using virtually the same computer, controllers, and software as installed in the plant. As noted in the last report, 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 were considered but could not be implemented. During the scheduled upgrade of the simulator computers to a PC based system, the stimulated DFRCS system will be replaced with a simulated system. This is expected to restore most of the degraded features.

3.0 SIMULATOR TESTS

Simulator certification testing was performed per ANS 3.5 - 1985 and USNRC Regulatory Guide 1.149, Revision 2, according to the schedule included with the previous report, except as noted below. Details of the tests performed and the results are included in Attachments B to this report.

The following changes were made to the testing as presented in the Test Schedule in the previous report:

- NOT07 – Plant Shutdown to Hot Standby and NOT08 – Plant Cooldown from Hot Standby to Cold Shutdown were combined into a single procedure, NOT07 – Plant Shutdown. NOT08 will no longer be performed. This change was made in 2000 in accordance with procedure changes made in the plant.

- TTS34 – Loss of Power to DCCS (not implemented) was changed to Failure of Pressure Compensation Inputs to Feedwater Control System.

- NOT01 – Approach to Critical, NOT02 – Heatup to Hot Standby, and NOT03 – Plant Startup from Hot Standby to Rated Power will be combined into NOT01 – Plant Startup. This change will be made in 2001 in accordance with procedure changes made in the plant.

The results of the testing program indicate continued improvement in simulator performance during the last four years. In the previous report, 22 tests resulted in the issue of Trouble Reports (TRs). During this period, only 12 tests had associated TRs. TRs on 5 of these have been cleared or voided. In the previous report, test OES04 was listed as failed. It passed during this test period.

A program for annual testing per ANS 3.5 – 1985 and Regulatory Guide 1.149 – Revision 2 is shown in Attachment B. 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, the schedule may be altered, without NRC notification, while maintaining the approximately 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 Status of TRs is as follows:

Active TRs since last report		86
New TRs issued since the last report		131
	Subtotal=	217
TRs Closed or Voided since the last report	(minus -)	182
Current Active TRs (Active + Retest + Hold)	(Total =)	35

The matrix in Attachment A.3 shows the status of all Trouble Reports written since the start of the Factory Acceptance Test. Also included in Attachment A.3 is a listing of Active TRs and a separate listing of TRs on hold. The TRs on hold will be addressed during the computer replacement project.

5.0 SUMMARY OF PLANT OPERATING EXPERIENCE REVIEWS

Training personnel developed scenarios based on plant LERs and INPO SOERs, SERs, and OEs. The simulator was capable of performing the required training.

Reactor Water Level and Steam Flow tuning changes were completed in April 1998. This simulator upgrade adjusted the response of level and steam flow instruments from the cold shutdown condition, through heatup and power ascension, to the full power condition. Large amounts of plant data were used for tuning. During testing, the simulator was compared to real time plant data using the Plant Performance Monitor (PPM) which displays Plant Process Computer data on a Local Area Network.

A major revision to plant radiation monitor alarm setpoints was installed in the simulator.

Many sessions of "Just-in-Time" training were conducted during the year in preparation for non-routine plant operating evolutions, including Y2K rollover contingencies.

The simulator was capable of replicating selected Operating Events.

ATTACHMENT A

Hardware and Software Known Deficiencies

Note: Items A.1, A.2, & A.2.1 are generated using the hardware deficiency database created during physical fidelity inspections. Item A.3 is generated using the Trouble Report (TRs) database. Item A.4, Simulator Discrepancy Program (Trouble Reporting) is demonstrated in item A.3 and is not reproduced here. Items A.5, A.6 & A.7 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 the last report.

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

A.4 Not included (see above).

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, and simulator upgrades.

A.7 Modifications installed on the simulator since the last certification report.

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
31/001	14R	Generator Shaft Voltage Meter	Shaft Voltage	The simulator Digital Voltage Indication is green. The plant has red indication	P31-0106	Accept as is. No training impact.

OYSTER CREEK REPLICA SIMULATOR
ADDITIONAL HARDWARE DEFICIENCIES
TO BE CORRECTED
ATTACHMENT A.2

BOM ITEM NO.	PLANT PANEL No.	DEVICE DESCRIPTION	TAG	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	TARGET DATE
01/019	1F/2F	Recorder Containment Spray/DW Cooler Temperatures	TR IP0001	Plant installed Tracor West. 2400 Simulator still has M5E	P01-0070	Leave as is per SRB See tracking No. F560	12/31/2001
22/024	9XR	Recorder - Turbine Bearing Metal Temperatures	TR 624-1040	Plant installed Tracor West. 3200 Simulator still has M11E	P22-0171	Leave as is per SRB See tracking No. F560	12/31/2002
22/059	9XR	Recorder - Environs Temperatures	TR 656-0001	Plant installed Tracor West. 2400 Simulator still has M5E	P22-0172	Leave as is per SRB See tracking No. F560	12/31/2001
22/059	9XR	Recorder - Environs Temperature	TR 656-0001	The position of Recorders TR656-001 and TR 624-1040 are interchanged on the simulator.	P22-0173	Plant interchanged recorder locations. Do not replace recorderd per SRB. See Tracking No. F560	12/31/2002
31/003	13R	Recorder - Hot Reheat/Steam Drains - Turb/Rx Bldg RBCCW Temperature	TR 13R-0006	Plant installed Tracor West. 3200 Simulator still has M11E	P31-0107	Leave as is per SRB See tracking No. F560	12/31/2002
31/004	13R	Recorder - Condensate/Feedwater - Circulating Water Temperatures	TR 13R-5	Plant installed Tracor West. 3200 Simulator still has M11E	P31-0108	Leave as is per SRB See tracking No. F560	12/31/2002
31/005	13R	Recorder - Turb Exhaust/Extraction/Hot Reheat Steam Pressure	TR 13R-4	Plant installed Tracor West. 3200 Simulator still has M11E	P31-0109	Leave as is per SRB See tracking No. F560	12/31/2002

OYSTER CREEK REPLICA SIMULATOR
HARDWARE DEFICIENCIES CORRECTED OR VOIDED
SINCE LAST REPORT IN 1996
ATTACHMENT A.2.1

PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
7F	Scale - Drn TNk Lvls 2nd RHTR 1-5 Left Meter	Control rm shows major subdivision have (6) increments, simulator has (12) on each major subdivision.	P05-0023	Replace scale to match control room.	01/27/1999	Replaced meter scale
7F	Indicator Light - Left RHTR Supp. FNS SW & Indicator Light	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.	07/27/1999	9/27/99: Changed to use as is.
7F	Lens - SJAE Drain Pumps Switch & Indicator Light	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	08/02/1999	8/02/99: Changed to use as is.
10F	Nameplate - Recorder RN-35 File Tag	The File Tag under Recorder RN-35 is black on white in the simulator. Plant tag is White on Black	P07-0032	Replace Nametag	12/02/1998	Inspected 12/2/98 - Tag has been replaced.
12F-2	Scale - 0 - 1029 Megawatts And Megavar Meter	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.	01/27/1999	Replaced Meter Scale
12F	Nameplate	All nameplates at the top rear of Panel 11F and 12F are missing from the simulator (12F-1, 12F-2, etc)	P09-0019	Accept as is. Cosmetic only. No training impact.	07/27/1999	7/27/99: Change to use as is
1R	Nameplate - RN12-B Key Tag	The key tag for RN12B says BA501 in the plant. The simulator tag says 7494	P11-0015	Accept as is. Cosmetic only. No training impact.	07/27/1999	7/27/99: Changed to use as is
8R	Nameplate - DFCS Power Panel	The entire panel needs to be relabled. Most of the tags are different from the plant.	P19-0022	Relable Panel.	08/02/1999	8/02/99: Changed to use as is.
9R	Nameplate - DCC X CPU Mode Selector	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	08/02/1999	8/02/99: Changed to use as is.
9R	Nameplate - CRT DCC X	The CRT DCC X Nameplate size and style is different on the simulator. Also 20/108	P20-0014	Replace Nameplate	08/02/1999	8/02/99: Changed to use as is.
9R	Nameplate - CPU DCC X	The CPU DCC X Nameplate size and style is different on the simulator. Also 20/110	P20-0015	Replace Nameplate	08/02/1999	8/02/99: Changed to use as is.

OYSTER CREEK REPLICA SIMULATOR
HARDWARE DEFICIENCIES CORRECTED OR VOIDED
SINCE LAST REPORT IN 1996
ATTACHMENT A.2.1

PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
9R	Plate - Moore 320 ICI for DCC X	The simulator has open slots for additional modules. The plant has green cover plates over empty slots.	P20-0016	Accept as is. Cosmetic only. No training impact.	08/02/1999	08/02/99: Change to use as is.
9R	Nameplate - Moore 320 ICI for DCC 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	08/02/1999	8/02/99: Changed to use as is.
9R	Label - Moore 320 ICI for DCC 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	08/02/1999	8/02/99: Changed to use as is.
9R	Nameplate - Plant Computer System Communications Link	The simulator has a nameplate on the MICOM faceplate. The plant does not have this nameplate	P20-0019	Remove nameplate	08/02/1999	8/02/99: Changed to use as is.
10R	Label - A Emerg Cond Shell HI/LO Alarm	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	07/27/1999	7/27/99: Changed to use as is.
11XR	Digital Generator Protection Panel	Lights L1/2, L3/4 are labeled 1/2 and 3/4 due to spacing errors	P28-0013	Accept as is. Cosmetic only. No training impact.	08/02/1999	08/02/99: Changed to use as is.
12XR	Nametag - N2 Purge & Makeup Flow Recorder	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	08/02/1999	8/02/99: Change to use as is.
14R	Generator Shaft Voltage Meter	The simulator Digital Voltage Indication is green. The plant has red indication	P31-0106	Accept as is. No training impact.	11/30/1999	
18R	Photo - 18R Rear, Nest 4	The Photo of 18R Rear Nest 4 is incorrect. Sim has RE05B but should have RE02C	P35-0024	Replace Photo	08/02/1999	08/02/99: Changed to use as is.
18R	Photo - 18R Front Nest 3	The simulator 18 R Front Nest 3 Photo is missing new alarm module	P35-0025	Update Photo for plant modification	08/02/1999	08/02/99: Changed to use as is.
18R	Photo - 18R Rear, Nest 3	The Photo of 18R Rear Nest 3 is missing new module installed in the plant	P35-0027	Replace Photo when installing modification	08/02/1999	08/02/99: Changed to use as is.
19R	Photo - 19R Front, Nest 3	The Photo of 19R Front Nest 3 is missing new	P36-0020	Replace Photo when installing modification	08/02/1999	08/02/99: Changed to use

OYSTER CREEK REPLICA SIMULATOR
HARDWARE DEFICIENCIES CORRECTED OR VOIDED
SINCE LAST REPORT IN 1996
ATTACHMENT A.2.1

PLANT PANEL No.	DEVICE DESCRIPTION	DIFFERENCE/ DEVIATION	DEVIAT. No.	DISPOSITION	COMPLETE DATE	WORK COMPLETED
		module installed in the plant				as is.
19R	Photo - 19R Rear, Nest 4	The Photo of 19R Rear Nest 4 is missing new module installed in the plant	P36-0021	Replace Photo when installing modification	08/02/1999	08/02/99: Changed to use as is.
19R	Photo - 19R Rear, Nest 3	The Photo of 18R Rear Nest 4 is incorrect. Sim has RE02C but should have RE05/19B	P36-0022	Replace Photo.	08/02/1999	08/02/99: Changed to use as is.
ENV	Switch - Halon Activation and Abort	Simulator is missing 3 Halon Activation and Abort switches next to Local Fire Alarm panel.	PEV-0004	Install missing switches.	08/02/1999	08/02/99: Changed to use as is.
ENV	Cover	Red electrical box cover under control room halon switches is missing. Simulator has open box.	PEV-0008	Install missing box cover.	08/02/1999	08/02/99: Changed to use as is.
ENV	Phone GSS Office	All phones are missing in the GSS Office.	PEV-0018	Install GOS phone at new desk. No phones needed in GSS/STA Office.	01/15/1999	Installed new phone
ENV	Sound - Sound Generator	The simulator sound generator is inoperable. Background noise (relay hum etc.) is needed.	PEV-0027	Repair sound generator and program applicable sounds.	08/02/1999	08/02/99: Changed to use as is.
ENV	Mimic - Chemistry Status	The mimic is missing on the simulator Chemistry Status Board	PEV-0031	Install missing mimic	01/25/1999	Removed Chemistry Status Board as done in plant.
ENV	Desk	The GOS Desk and Control Room Access routing differs from the plant.	PEV-0038	Modify GOS Desk. Install access control stanchions.	11/30/1999	11/30/99:Changed to accept asis
FP-1	Module	There are two blank Modules Missing in the bottom row on the simulator	PFA-0002	Install Missing Blank Fire Panel Modules.	07/27/1999	7/27/99: Changed to use as is.
OC	Nameplate	Engraved Nameplate above page phone (By the procedure rack) is missing on the simulator.	POC-0016	Install missing tag.	01/14/1997	Tag is no longer in the plant.
OC	Nameplate	Engraved Nameplate on the end of the console by the Centracom is missing on the simulator.	POC-0017	Install missing tag.	01/14/1997	Installed missing sign
OC	Phone	Phone cord on end of operator consol near procedure rack is too short.	POC-0022	Replace phone cord.	07/27/1999	7/27/99: Changed to use as is.
OC	Phone - All GPU Calls	The phone next to the Utility Display CRT is missing (All GPU)	POC-0027	Install missing All GPU phone. Auto ring to Instructor Station.	08/02/1999	08/02/99: Changed to use as is.

ATTACHMENT A.3

Outstanding Trouble Reports (TRs)

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:	12/6/00			Oyster Creek TR Status Summary				
Priority		1	2	3	4	5		Total
Active		0	4	20	3	0		27
Failed		0	0	0	0	0		0
Retest		0	0	0	0	0		0
Hold		0	2	4	2	0		8
Cleared		127	575	2419	291	14		3426
Void		12	65	262	29	7		375
Totals		139	646	2705	325	21		3836

OYSTER CREEK REPLICA SIMULATOR
OPEN TROUBLE REPORTS
BY PRIORITY

TR	PRIORITY	STATUS	SYSTEM		TITLE	TARGET DATE
3422	3	A	HWC	HYDROGEN WATER CHEMISTRY	HWC CONTROLLERS FOR V-567-71 AND V-567-73 SPAN/SETPT	06/15/2001
3683	3	A	MSS	MAIN STEAM SYSTEM	2ND STG R/H DRAIN TANKS/R/H/EXIT TEMP COOLS TOO SLOW	11/01/2001
3730	3	A	NIS	NUCLEAR INSTRUMENTATION	TIP MACHINE OFF POSITION	05/31/2001
3743	3	A	MOT	MOTOR/PUMP COMPONENT LOGIC	NEGATIVE TURBINE BUILDING FLOWS	12/01/2001
3756	3	A	RCP	REACTOR RECIRCULATION PUMPS	TBC RESPONSE TO RECIRC PUMP	11/15/2001
3760	3	A	RXS	REACTOR CORE	END OF LIFE IC DECAY HEAT	07/15/2001
3768	3	A	RCP	REACTOR RECIRCULATION PUMPS	RECIRC PUMP AMPS HIGH	11/01/2001
3769	3	A	RXS	REACTOR CORE	CORE HEATUP TOO SLOW	11/01/2001
3771	3	A	MSS	MAIN STEAM SYSTEM	STEAM SEAL REGULATOR CONTROL ABOVE 260 PSI	11/01/2001
3789	3	A	CRD	CONTROL ROD DRIVE	STUCK AND UNCOUPLED ROD MALFUNCTION INCORRECT	08/10/2001
3791	2	A	NSS	VESSEL AND RECIRCULATION	SIM HANGS WHEN REACTOR IS FLOODED	03/30/2001
3796	2	A	NIS	NUCLEAR INSTRUMENTATION	IRM CALIBRATION TO POWER	03/30/2001
3800	4	A	ICS	ISOLATION CONDENSER	IC VENT VALVES EOP JUMPERS ARE INCORRECT	06/30/2001
3801	2	A	EXI	EXITECH - NSS MODEL	SIMULATOR HUNG DURING EMERGENCY DRILL	07/01/2001
3805	3	A	RBC	REACTOR BUILDING CLOSED COOLING WATER	RBCCW Valve Stroke Times	08/15/2001
3806	4	A	MSS	MAIN STEAM SYSTEM	Steam Packing Exhauster Vacuum	11/01/2001
3807	3	A	TCS	TURBINE CONTROLS	REHEAT VALVE OPEN TIME TOO SHORT	11/01/2001
3818	3	A	RWM	ROD WORTH MINIMIZER	RWM RESPONSE TO LOSS OF CIP-3	03/03/2001
3819	3	A	RFC	RECIRCULATION FLOW CONTROL	DIGITAL RFC MISC. ERRORS	03/30/2001
3820	3	A	TCS	TURBINE CONTROLS	STOP VALVE CLOSED ALARM	03/30/2001
3825	3	A	FWC	FEEDWATER CONTROL	CLEANUP OCSCNHCD	12/31/2001
3826	3	A	PMP	PUMP HANDLER	TORUS/DRYWELL SAMPLE PUMPS ARE NOT WORKING CORRECTLY	12/31/2000
3831	2	A	CSS	CORE SPRAY SYSTEM	Core Spray RV-29 B&D are set at 140 reset at 90 psig vs Sims	12/31/2000
3833	4	A	TSI	TURBINE SUPERVISORY INSTRUMENTATION	CLF's Menu description for TSI has an error and title prob	04/17/2001
3834	3	A	DGN	DIESEL GENERATOR	NOT24 EDG Fuel useage	01/18/2001
3835	3	A		UNASSIGNED	Motor Thermal Overloads do not function correctly.	02/08/2001
3836	3	A		UNASSIGNED	Missed SAR alarms, OES11, Drill 21, IC 20 MSIV closure alarm	02/08/2001

OYSTER CREEK REPLICA SIMULATOR
OPEN TROUBLE REPORTS
HOLD STATUS

TR	PRIORITY	STATUS	SYSTEM		TITLE	TARGET DATE
3598	4	H	CFW	CONDENSATE AND FEEDWATER	CFW MODEL INSTABILITY DURING LOCA	07/15/2002
3667	2	H	NSS	VESSEL AND RECIRCULATION	NSS PLPs	07/15/2002
3668	3	H	ISS	INSTRUCTOR SYSTEM	IC Files Get Corrupted	07/15/2002
3703	3	H	NSS	VESSEL AND RECIRCULATION	ATWS RESPONSE INCONSISTENT	07/15/2002
3734	3	H	ISS	INSTRUCTOR SYSTEM	OVERRIDE STATUS DISPLAY MISSING INFORMATION	07/15/2002
3751	4	H	CFW	CONDENSATE AND FEEDWATER	NEGATIVE FEEDWATER FLOW SPIKES	07/15/2002
3786	2	H	RMS	RADIATION MONITORING	NUMAC OCCASIONALLY STOPS WORKING	07/15/2002
3816	3	H	DCC	DIGITAL CONTROL COMPUTER	DCC DEGRADES SIMULATOR FEATURES	07/15/2002

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	PR I	SCHEDULE FOR SIMFOR CHANGE	Plant Install Date
012-96	Cycle 15 Recorder Replacements - Simulator Phase 2	Replace Recorders TR-656-0001, 13R-4, & TR-IP0001	Revise as required	Revise as required	2	12/31/2001	07/31/1998
012-96	Cycle 15 Recorder Replacements - Simulator Phase 3	Replace Recorders TR-624-1040, 13R-5, & 13R-0006	Revise as required	Revise as required	3	12/31/2002	07/31/1998
328383	EDG RELAY PANEL MOD		Revise Function of relays, revise logic	Revise CLFs	4	12/05/2000	10/11/1996
356	Add Data Link PCS to Dry Fuel Storage	None	Add Dry Fuel Model and PCS Display	Controls on Monitors	5	/ /	03/27/1997
402880	SPENT FUEL STORAGE CAPACITY EXPANSION	None NOTE: Reviewed Security only	Add Temperature Monitoring to PCS Displays	None	4	/ /	09/30/1997
403060	Deaerating Steam System Retirement	Install New Labels	Defeat valve operation	Remove CLFs	5	11/01/2000	11/19/1996
403061	Retire Reheat Protection System Supply Side	None	Disable Fans and Valves	Remove overrides and CLFs	5	11/01/2000	11/19/1996
454	Change LPRM HI-1 limits from 90 to 97 watts/cm2	None	Revise setpoints	None	2	12/31/2000	10/13/1999

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 SIMFOR CHANGE	Plant Install Date
456	Description & Eng Units for EMRV & SRV Points	None	Change Units	None	2	06/30/2000	10/15/1999
459	Diff Between PPM & PCS 15 Min ave. Change setpoint	None	Change setpoint	None	2	12/31/2000	12/02/1999
461	SPDS Setpoint Change for H2 Conc. Entry Condition	None	Change Setpoint	None	2	12/31/2000	01/01/2000
464	Alarm CHK RAGEMS Points, Add High Range Mon	None	Change Alarm Setpoint	None	3	01/31/2001	02/23/2000
469	Lockups on 4F IDT/Touchscreen (RWM Computer)	None	Correct Lock-up of the RWM	None	2	12/01/2000	04/17/2000
470	Modify SAR file as a result of Biennial Review	None	Modify SAR File.	None	3	01/31/2001	04/17/2000
472	Display both core spray flows on 1 page of SPDS	None	Re-program the SPDS page	None	1	12/31/2000	04/18/2000
474	Send additional data points to PCS	None	Change Sim PCS to add points	None	3	03/31/2001	04/20/2000
475	Expand ragems link to add 18 additional points	None	Add additional 18 points for monitoring	None	3	03/31/2001	05/09/2000

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 SIMEOR CHANGE	Plant Install Date
477	Modify TFF Calc to remove 20% power on APRM's	None	Revise PCS to change 20% power conditioning on APRM	None	2	12/31/2000	05/25/2000
481	Send 12 additional points to PPM	None	Add PPM Points	None	3	06/30/2001	07/10/2000
482	Remove Parsippany IDT Display	None	REMOVE Parsippany IDT Display	None	3	12/31/2001	09/26/2000
486	Change ENVR Setpoint to 105.5 and Re-Alarm at 106	None	Change Sertpoint	None	3	06/30/2001	08/09/2000
488	Change Historical Deltas for Environmental Data	None	Change Historical Deltas	None	4	06/30/2001	07/27/2000
B746	Restoration of LPRMs 28-09 A&C and 36-09 A&C	Change Labels	Restore LPRMs swapped per REP-390-990329 (TA 1374)	Change Labels	1	12/31/2000	11/13/2000
F164	Exhaust Hood Hi Temp Trip Disable	None	Defeat TT from Exhaust Hood Temp	None	3	08/15/2001	10/28/2000
F184	Remove recorder TR-IA0014 on panel 3F	Remove recorder TR-IA0014 from panel 3F	Revise software	Delete overrides	3	03/31/2001	10/13/2000
F697	Rotary Inverter Control Logic Change	None	Modify Rotary Inverter Control Logic	None	3	06/30/2001	11/07/2000

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 SIMEOR CHANGE	Plant Install Date
G296	Remove dilution seal lube and cooling piping/wirin	None	Model delete pumps	None	3	06/30/2001	09/07/2000
G675	TBCCW HX Vent & Abandon Vacuum Priming System	Remove Alarm Windows K-7-f & K-8-f New Nameplate 7F	Remove Vacuum Priming Pump from service	Remove Vacuum Priming Pump	3	12/31/2000	03/31/1999
G845	Replace degraded voltage relays,4160v 1c & 1d	None	UV Pick-up Drop out setpoints set for new values.	None	3	03/31/2001	11/01/2000
G892	Relocation of DPI-821-001 to a Clean Location	Install New Pressure Instrument on 11R	New transmitter	CLFs amd Overrides	2	12/31/2000	04/19/1999
H118	Generator DPRS Wiring and Setpoint Change	None	Revise logic and setpoint for reverse power	None	2	03/31/2001	11/08/2000
H246	M-G Set Charger 'A' Trip Delay	None	Add time delay to trip. Also, verify 'B' Charger has time delay.	Add reset LOA	2	03/31/2001	10/27/2000
H319	Replace Hose Connection - Liquid Poison Drain Line	None	Add flow path for alternate poison injection	Add LOA	3	12/31/2001	07/07/2000

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 SIMEOR CHANGE	Plant Install Date
H369	New V-14-36 & V-14-37	None	Add 2 new valves revise stroke and stroke time of V-14-36 & 37	Add LOAs	1	12/31/2000	11/09/2000
H388	Feedpump A Cable Replacement	NOne	Verify pump flows are returned to normal, look at digital	None	1	12/31/2000	10/22/2000
H546	Addition of Turbine Bldg dp Gauge to ATC-P-17	None	None	Add to Plant Status Display	2	12/31/2000	11/16/1999
H617	Removal of Relief Valves V-20-0024,25	None	Remove valves and associated CLF/MALF/OVer	None	3	08/15/2001	10/28/2000
H777	Remove B Feedpump Min. Recirc Breakdown Orifice	None	Remove orifice and change valve characteristics	None	4	12/31/2001	11/03/2000
Setpoint	Setpoint change 4160v 1A OV alarm S-3-e	None	Simulator is to be set at 4410v from current 4340v	None	3	08/15/2001	03/16/2000

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
349-95	Replace TIP Drawer Lamps with Sockets	Replace TIP,SRM,& IRM Drawer Lamps to match the plant.	None	None	4	12/30/2000	/ /
476	Show values with bad ERDS data with asteriks	None	Add value checking of ERDS data	None	3	12/15/2000	05/23/2000
B473	Control Room Human Factors - Phase 3 Rear Panels	Rear Panel Human Factors Changes	None	None	2	03/31/2001	/ /
N/A	Torus Downcomer Break Malfunction	None	Add new malfunction	Add new malfunction	3	03/31/2001	/ /

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
SINCE LAST REPORT IN 1996
ATTACHMENT A.7

B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	PRI
012-96	Recorder 13R-003 Replacement	Ranges and alarms	Replace Recorder	06/04/1997	04/23/1998	3
012-96	Recorder 7F-0014 Replacement	Ranges and alarms	Replace Recorder	06/17/1997	07/29/1998	3
012-96	Recorder 7F-0015 Replacement	Ranges and alarms	Replace Recorder with 2 new recorders. Remove 3 alarm reset buttons	07/02/1998	11/11/1998	1
012-96	Recorder TR-IA0071 Replacement	Ranges and alarms	Replace Recorder	05/30/1997	07/29/1998	3
012-96	Recorder TR-IA70 Replacement	New Ranges	New recorder	12/10/1997	12/10/1997	2
012-96	Recorder TR-IG02 Replacement	New Ranges	New recorder	02/12/1997	12/10/1997	2
012-96	Recorder TR-RV0008 Replacement	Ranges and alarms	Replace Recorder	02/11/1998	07/29/1998	3
182849	V-16-2 HELB Modification	Revise Closing Logic for V-16-2	Install additional EOP jumper plug in Panel 3F	09/05/1997	08/04/1998	1
188753	Shutdown Cooling System Relay Modification	Change SDC Logic	New Switch	04/29/1998	07/21/1998	1
220	Install TDM on the Stimulated PCS	Install needed software	Install Monitoring Equipment	/ /	01/21/1998	3
244-96	RWCU Filter Inlet Valves Control Logic Mod	Revise RCU Filter Valve Logic	None	08/28/1996	11/18/1997	3
275-95	SDC Minimum Flow Valve Control	Revise valve controls	Add Switches behind 1F/2F	08/20/1996	12/04/1997	3
288	RWM Power Operations Mode Enhancement	Add additional RWM sequence	None	06/17/1997	02/20/1997	2
301201	Reactor Building Barometer Installation	Add new RB Barometer Transmitter and add to PCS Display	None	10/22/1998	10/06/1999	4
302	Add Weather Data Points to PCS/Emerg Prep Link	Add Weather Data to Link	None	08/18/1997	10/08/1997	2
311	Add Total Feedwater Flow on Cond System Display	Add FW Flow to PCS display	None	05/16/1996	04/27/1997	2
312	SAR Alarm Change Capability	Add Ability to add/delete Alarms & Checkpoint Alarms	None	06/03/1996	03/20/1997	2
312400	CIRCULATING WATER SYSTEM PIPING ENCASEMENT	Delete PS-119, CWP High Discharge Pressure	Remove Alarm Window K-3-e	07/11/1995	07/22/1997	3
312400	SBO CONTROL PANEL MOD	Change Power Supplies to SBO Meters from DPA1 to the SBO	None	01/30/1996	12/10/1997	2
312400	Telephone System Replacement	None	Replace Simulator Telephones	04/15/1997	07/01/1997	3

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
SINCE LAST REPORT IN 1996
ATTACHMENT A.7

B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
313001	CRD Pump Start Time Delay	Revise CRD Pump Restart Logic	None	08/08/1997	08/05/1998	1
313001	Removal of Valves to High Conductivity Tank	Spare Alarm K-8-c	Replace Alarm Window K-7-c/K-8-c	04/02/1998	09/30/1999	4
316	Expand PCS Dispatch Queue	Change PCS Dispatch Queue	None	07/15/1996	03/24/1997	3
316400	RAC Workstation in Control Room	Duplicate software used in plant installation	Add RAC Workstation	09/28/1996	09/15/1997	3
316400	Switchguard on Panel 10XF	None	Install Switchguard	02/10/1997	12/08/1997	3
319	RAGEMS Display Task Changes	Change RAGEMS Display on PCS	None	08/16/1996	04/17/1997	3
320005	Isolation Condenser Tube Bundle Replacement	Steam Line Temperatures lower due to operating changes & no leak	None	11/01/1998	12/09/1999	2
320008	Condensate Demineralizer Underdrain Replacement	Adjust demin pressure differential	None	11/08/1998	11/16/1999	2
325	Revise CSF #5, Pg 2 (SPDS) Display	Revise SPDS Display	None	09/11/1996	09/02/1997	2
328333	ESW ORIFICE RELOCATION	Revise Sim. Diagrams; Retune ESW flows	None	11/23/1994	01/10/1997	4
328395	N2 Makeup Flow Meter Relocation	Relocate flow transmitter to include N2 Compressors. Change range of Makeup Flow & Recorder	Mark Integrator with 30	10/07/1996	07/16/1997	3
328401	Circulating Water System Starting Logic	Add Interlock Relay to Pump Start Circuits	None	10/08/1996	07/16/1997	3
329-95	NRW Spare Annunciators	Spare Annunciator 10XF-2a	New Annunciator Window for 10XF-2-a	05/13/1996	12/19/1996	3
330	Fix Calculation for SPDS-97	SPDS Calculation	None	10/10/1996	09/02/1997	2
331	Add "Cycle Iso Cond" Message to Heat Balance	Add message to PCS Heat Balance	None	10/28/1996	12/19/1997	2
336	Do System Rebuild (ACEGEN) for PCS	PCS System Rebuild	None	10/16/1996	11/06/1997	2
340	DFRCS Cycle 16 Startup Changes	DFRCS Software	None	10/16/1996	11/24/1997	2
345	Add Two Stack RAGEMS Analog Inputs	Add RAGEMS Inputs	None	12/30/1996	11/26/1997	2
346	Fuel Zone Level Status - Use BKR Position vs Flow	Modify PCS	None	12/11/1996	09/02/1997	1
347	Misc. SAR and Database Corrections	Correct PCS Software	None	01/13/1997	11/26/1997	2

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
SINCE LAST REPORT IN 1996
ATTACHMENT A.7

B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
352	Change Directory Names for Compressed Files	Change File Names in Config File	None	03/17/1997	11/06/1997	2
355	Modify SPDS Radiation Control Display	Modify SPDS Display	None	03/03/1997	09/02/1997	1
359	Delete PCI Data from SPDS Displays	Modify SPDS Displays	None	05/15/1997	12/29/1998	2
360	Heat Balance Display Setpoint Changes	Revise PCS Displays	None	05/27/1997	09/08/1997	1
361	Eliminate Unnecessary PSMS Functions	Turn Off PSMS PCI Monitoring	None	06/03/1997	12/29/1998	2
363	Include Weather Data in Simulator PPM	Modify PPM	None	/ /	10/28/1997	3
364	EDG1KW & EDG2KW Point Conversion Corrections	Correct PCS Calculations	None	06/25/1997	11/26/1997	2
365	SAR Input 611 to 9XF-2-d	Update PCS	None	05/29/1997	12/04/1997	2
381	Install Changes to Plots & Trends per PCS-0306	Revise PCS Plots and Trends	None	10/07/1997	07/14/1998	2
383	Operations Near Rated Power Plot	Add plot	None	10/17/1997	11/30/1998	1
393	Change Scan Deltas on PCS Points TE47 & F4220001	Insatll change	None	04/14/1998	10/06/1999	3
400011	Fire Pond Pump Diesel Replacement	Change Start Setpoint, shutdown time delay, verify loss of Bus 1-D start signal	None	12/24/1997	07/30/1998	3
401	Correct RAGEMS Link/Display Timing Error	Correct error	None	07/10/1998	12/27/1999	3
402	Add Recirc Flow Setpoint to Ops Near Rated Power	Change Plot	None	08/12/1998	11/30/1998	1
403	Spare Out Two SAR Inputs on the PCS	SAR Alarms	None	08/26/1998	09/30/1999	2
403014	ABANDON LPRMs	Revise NIS model	Cover LPRM or 4F. Rearrange APRM Inputs. Blank TIPs	11/27/1994	01/30/1997	2
403063	HIGH RX RECIRC FLOW SCRAM LOGIC DELETION	Delete High Recirc Flow Scram	Replace Trip Status and Reset Modules	10/14/1996	01/29/1997	1
403079	MG-Set Charger B Auto Start Modification	Add auto restart of B Battery Charger	Replace 3 Position Control Switch with 2 Position Switch	10/19/1996	12/04/1997	2
404	Signal Validation for Bridge & Discharge Temp	PCS Changes	None	08/24/1998	12/27/1999	2

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
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B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
405	Change DCC X & Y Time Diff Alarm Pt.	PCS Alarms	None	09/15/1998	10/06/1999	2
407	Add Two Points to Periodic File 1	Add Points to File	None	08/26/1998	12/27/1999	2
408943	Replacement of OG Flow Transmitters FT-2,3,4	Add Total Air Ejector Flow	None	10/02/1996	12/09/1997	3
410	New SAR Alarms for RWCU HELB Mod	New SAR Alarms for D-1-d and D-2-d	None	10/26/1998	12/17/1998	1
416	Reactivity Monitoring Display	Revise Display	None	11/03/1998	11/15/1999	3
418	Install Reactor Building Barometric Pressure	Add Barometric Pressure	None	10/01/1998	10/06/1999	2
419	Add Second Lakewood IDT Emulation Terminal for EP	Software to drive	New Terminal	12/10/1998	01/25/1999	3
421	RWM YEAR ROLLOVER	RWM	None	12/01/1998	03/23/2000	2
432	Swap LPRM 28-09 with LPRM 36-09	Revise PCS	Name Tags	03/04/1999	04/22/1999	3
450	Add Alarm Criteria for MSL Rad Monitor X00560	New Alarm Criteria	None	08/17/1999	02/17/2000	3
453	Update SPDS as Entry Cond for Torus Temp is 95F	SPDS	None	08/31/1999	02/17/2000	2
462	Upgrade SCCD to Allow HSD Boards at Rev. C & D	None	None	02/15/2000	06/30/2000	4
47-96	RAGEMS I Linear Low Range Link to Plant Computer	Add Points to PCS		04/06/1996	11/26/1997	3
473	Revise Cycle 17 CPR limit 1.52 to 1.56	Revise CPR limit point from 1.52 to 1.56	None	05/02/2000	08/28/2000	1
484	Add PCS Spare Computer to Hardware SCCD	None	None	09/01/2000	06/30/2000	4
484-94	Reactor Vessel Thermocouples Abandonment	None	None	06/10/1996	11/03/1997	4
ASFOUND	TLO Lift Pump/Drive Motor Arrangement	Correct Motor/Pump correlation	None	02/23/1996	08/01/2000	4
C112810	RCU Low Flow Time Delay	Add Time Delay Relays R10A, R10B. Delay Low Filter Flow Isolation	None	03/10/1997	11/18/1997	3
C200125	Intake/Discharge RTD Power Supply	Change Power Supply From CIP3 to LP-1A31	None	05/02/1995	09/15/1997	4

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
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B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
C312275	Main Gen Protection - Turbine Steam Block Mod.	Disable Lo Gen Power Block for Turb Steam Cutoff	None	01/30/2000	03/06/2000	2
C484	480 Volt 'A' Switchgear Room Fan Control Mod.	Revise fan logic.	Install new switch	11/08/1998	11/24/1998	2
F916	Intake Low Level Alarm Addition	Add 2 Level Switches (Possibly New Transmitters); Modify Logic for Alarm K-5-f	None	10/02/1997	07/21/1998	2
G450	Stator Cooling Pump Logic Change	Delete pump trips from 86X2, 86A, 86G, 86T	None	10/30/1996	12/07/2000	2
G470	Control Room Phone Upgrade - Cycle 16	None	Install 2 Phone Jacks for Front/Back Panel Communication	12/22/1997	03/17/1998	2
G581	Main Battery Charger B Trip Alarm Modification	Revise alarm logic	None	02/10/1997	12/04/1997	2
G650	RWCU HELB Detection and Isolation	Add new isolation logic	New Alarm, Name Tags	10/26/1998	12/17/1998	1
H208	Battery Charger C1 & C2 Alarm Modification	Remove Low Current from Alarms U-4-f & U-5-f	None	06/25/1998	11/11/1998	2
H322	Centracom Radio Replacement	None	New Radio Console	09/13/1999	08/20/1999	3
H353	Reconfiguration of LPRMs 28-09 and 36-09	Reassign APRM inputs	Install new name tags	03/05/1999	04/20/1999	0
N/A	Add LOAs for Lo-Med-Hi Switch on the Cond. Meters	Add Condensate Conductivity Meter LOAs	None	/ /	07/13/2000	4
N/A	Add LOAs to Rack Out SGTS Fans EF-1-8 & EF-1-9	Add LOAs to Rack Out SGTS Fans EF-1-8 & EF-1-9		/ /	05/15/2000	3
N/A	Add New PLP for Windy Conditions	Revise SCN Model	None	/ /	09/08/1997	3
N/A	Adjust A Feed Pump Flow	Bias Feed Pump Flows	None	/ /	02/16/1999	2
N/A	Adjust Feed Reg Valve Characteristics	Change FRV Curve to match repaired A Valve	None	/ /	02/16/1999	2
N/A	Control Room Telephone Jacks	None	Install 2 Phone Jacks for Back Panel Communications	02/06/1998	03/17/1998	1
N/A	HCU Leakage PLP	Add adjustable HCU Leakage	None	/ /	10/22/1997	3
N/A	Install SCSI Tape Drive on Simulator	Install supporting software	Install SCSI Tape Drive	/ /	09/16/1997	3

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B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
N/A	LOAs for 4160V & 480V breaker Manual Local Ops.	Add Local Manual Control	None	/ /	05/15/2000	4
N/A	Reactor Level and Steam Flow Tuning Changes	Revise Reactor Level and Steam Flow Indication	None	/ /	04/01/1998	3
N/A	Reorganize the EDS LOA Menu			/ /	05/15/2000	0
N/A	Replace NUMAC Computers with generic PC	Update files	Replace NUMAC Computers and Sorensen Power Supply	/ /	09/22/1997	3
N/A	Replace Thick Ethernet with 10 Base-T Ethernet	Update Files	Replace Simulator & Development Ethernet	/ /	09/22/1997	2
N/A	Static Charger Voltage LOA	Add new LOA	None	/ /	08/30/2000	3
N/A	Torus Suction Strainer Malfunction	Add new Malfunction	None	/ /	02/03/1999	2
SETPOINT	Area Radiation Monitor Setpoint Changes	Revise ARM Setpoints per SCRs	Remove Existing Setpoint Labels on Modules	04/20/1997	02/20/1998	2
SETPOINT	DW H2/O2 Analyzer Setpoint Change	Lower Setpoints	None	03/01/1999	09/27/2000	3
SETPOINT	Fire Diesel 2 Auto Start Setpoint Change	Change PS-811-0022 from 95 to 85 psi	None	/ /	09/30/1999	2
SETPOINT	Generator Output & Temperature Recorder	Change Gen Temps from F to Celsius scale	Reprogram Recorder	09/13/1996	12/09/1997	3
SETPOINT	RCU Surge Tank Level Setpoint	Revise Setpoint and Reset	None	08/27/1997	07/13/2000	4
SETPOINT	Radiation Monitor Setpoint Changes	Revise 4 Rad Monitor Setpoints	None	09/16/1997	02/20/1998	2
SETPOINT	Recirc Flow Upscale Rod Block Setpoint Change	Raise setpoint from 97% to 100%	None	06/19/1997	11/25/1997	2
SETPOINT	Setpoint - Fuel Pool Cooling HX Outlet Temp	Change setpoint	None	/ /	07/29/1998	3
UPGRADE	ADD Air Leak to Condenser via AFT & SJAE Pumps	Add air leak	None	/ /	04/27/1998	3
UPGRADE	Operator Controlled Global Alarm Silence Button	Alarm Software	New Button	/ /	03/25/1998	1
UPGRADE	Reactivity Adjustment Capability	Add capability to adjust core reactivity	None	/ /	10/06/2000	2
UPGRADE	Replace Encore System 2 Disk with	Move software to new drive	Replace Disk Drive	/ /	03/17/1998	3

MODIFICATIONS INSTALLED ON
OYSTER CREEK SIMULATOR
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B/A No.	Title	SOFTWARE CHANGE	HARDWARE CHANGE	Plant Install Date	SIMULATOR INSTALL DATE	P R I
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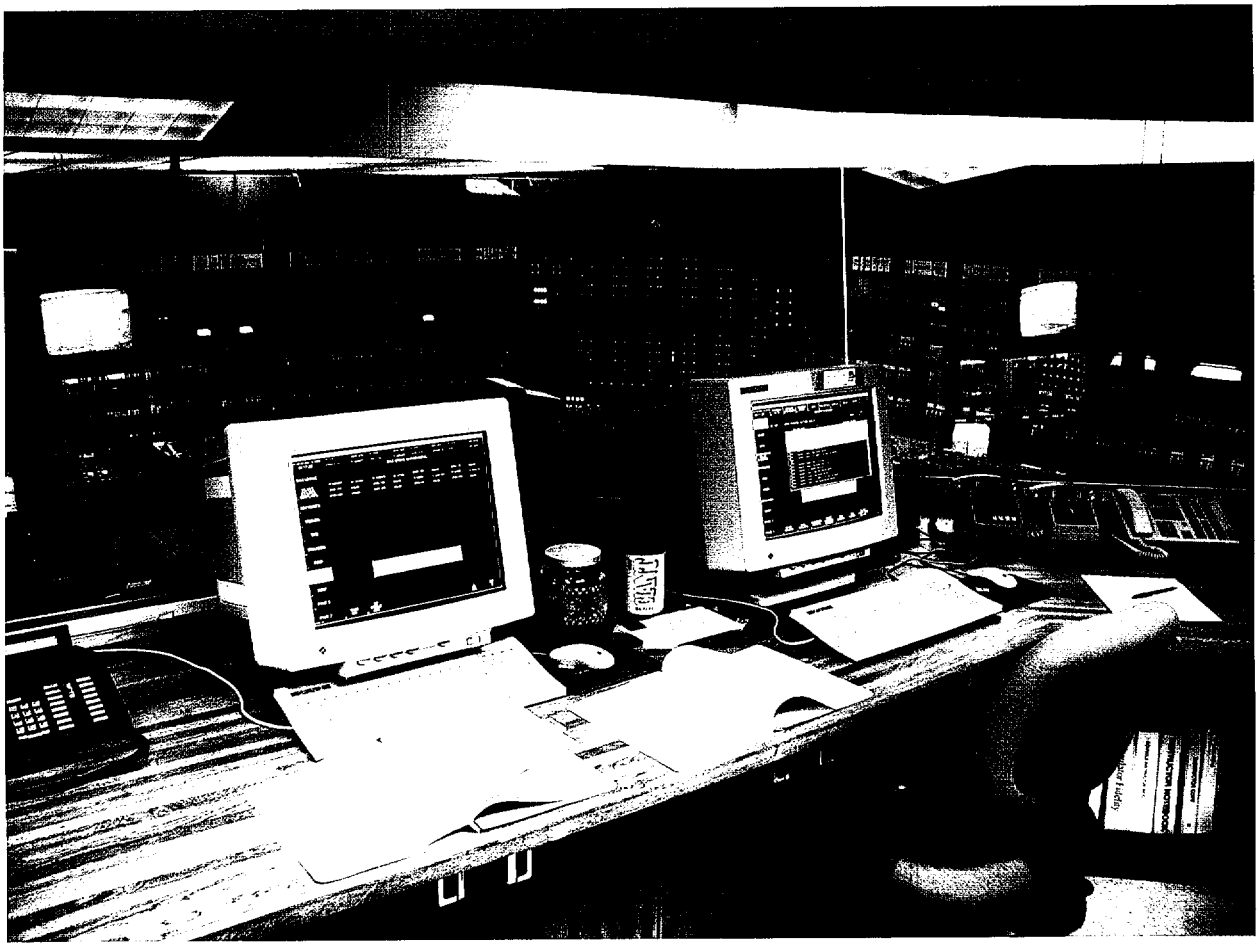
Oyster Creek
Training
Department

Replicate Simulator
Quadrennial Report
For Year 2000



Oyster Creek Generating Station

Forked River, New Jersey

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ATTACHMENT B

Testing Program

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.

Of the fifteen TRs written during the testing, one was voided, eight were cleared, five remain active, and one is on hold pending simulator platform upgrade.

This attachment also contains the test abstracts for each certification test performed.

OYSTER CREEEK SIMULATOR
CERTIFICATION TEST PROCEDURES
PERFORMED SINCE LAST REPORT

GPU PROC NUM.	TITLE	LAST TEST DATE	TR
NOT01	Approach to Critical	10/08/1997	.F.
NOT02	Heatup to Hot Standby	09/29/1998	.T.
NOT03	Plant Startup from Hot Standby to Rated Power	09/21/1999	.F.
NOT04	Reactor Trip and Recovery	09/10/1998	.T.
NOT06	Power Operation With Less Than 5 Recirculation Pumps	09/23/1997	.F.
NOT07	Plant Shutdown	06/23/2000	.F.
NOT08	Plant Cooldown from Hot Standby to Cold Shutdown	10/20/1997	.F.
NOT09	Shutdown Margin Test	07/14/1998	.F.
NOT12	SRM/IRM Response to Control Rod Motion	08/07/1997	.F.
NOT14	Recirc Pump Trip Circuit Test	07/13/1998	.F.
NOT15	EMRV Operability Test	07/21/1999	.F.
NOT16	Isolation Condenser Valve Operability Test	07/17/2000	.F.
NOT17	Core Spray Pump Operability Test	07/21/1997	.F.
NOT18	CRD Pump Operability Test	07/13/1998	.F.
NOT19	Anticipatory SCRAM Turbine Stop Valve Closure Test	07/06/1999	.F.
NOT20	APRM Front Panel Check	06/14/2000	.F.
NOT21	SRM Front Panel Test	07/16/1997	.F.
NOT22	IRM Front Panel Check	07/07/1999	.F.
NOT24	Diesel Generator Load Test	10/12/2000	.F.
NOT25	Primary Containment Isolation Valve Operability Test	07/21/1997	.F.
NOT26	Alternate Shutdown Monitoring Instrument Chanel Check	07/13/1998	.F.
NOT28	Air Ejector Off Gas Radiation Monitor Test	07/22/1999	.F.
NOT29	Standby Gas Treatment System Test	08/05/1997	.T.
OES01	Inadvertant Scram on High Pressure (May 2, 1979 Lo-Lo-Lo Level Event)	11/18/1997	.T.
OES02	Reactor Isolation Scram (TAR-008)	10/10/2000	.F.
OES03	Rx Scram on M1A Main Transformer Failure (TAR 23)	10/20/2000	.F.
OES04	Reactor Scram on Turbine Generator Trip (TAR-011)	10/25/2000	.F.
OES05	Reactor Scram on Neutron Monitoring Sys (TAR-012)	09/01/1998	.F.
OES06	Reactor Scram on Anticipatory Turb Trip Sig. (TAR-013)	09/01/1998	.F.
OES07	Reactor Scram on Excessive Feedwater Injection (TAR-015)	11/02/2000	.F.
OES08	Reactor Scram on Neutron Monitoring	11/01/2000	.F.

OYSTER CREEEK SIMULATOR
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GPU PROC NUM.	TITLE	LAST TEST DATE	TR
	System (TAR-017)		
OES09	Reactor Scram on High Water Level (TAR-018)	09/30/1997	.T.
OES10	July 17, 1980 Blowdown Transient	11/10/2000	.F.
OES11	Generator Runback Scram - December 1995	11/08/2000	.F.
RTT01	Gould Computer Spare Time Test	11/17/2000	.F.
RTT02	Simulator Real Time Test	08/17/2000	.F.
SSP01	100% Steady-State Accuracy Test	10/18/2000	.F.
SSP02	75% Steady-State Accuracy Test	10/13/2000	.T.
SSP03	39% Steady-State Accuracy Test	10/24/2000	.F.
TTS01	Recirc Loop Rupture (Unisolable)	11/16/2000	.F.
TTS02	Reactor Vessel Instrument Reference Leg Rupture	07/29/1999	.F.
TTS03	Reactor Safety Valve Fails open	07/29/1999	.F.
TTS04	Loss of Instrument Air	10/29/1997	.F.
TTS05	Loss of Offsite Power Sources	08/04/1997	.F.
TTS06	4.16 KV Emergency Switchgear 1C and/or 1D Fault	08/03/2000	.F.
TTS07	Emergency Diesel Generator Trip	08/04/1997	.F.
TTS08	4.16 KV Bus 1A and/or 1B Fault	07/29/1999	.F.
TTS09	Loss of 460 V Unit Substation	07/01/1997	.F.
TTS10	Loss of 460 V MCC Train A	08/04/1997	.F.
TTS11	Loss of Vital Panel Bus	08/04/1999	.T.
TTS12	Loss of 120 V Continuous Instrumentation Panel CIP-3	08/04/2000	.F.
TTS13	Loss of 125 V DC Panel	07/14/1998	.F.
TTS14	Loss of 24 V DC Panel	08/04/1999	.F.
TTS15	Loss of 460 V USS 1E1	07/20/2000	.F.
TTS16	Loss of 120 V Protection System Panel	07/31/1997	.F.
TTS17	Loss of Vital 460 V MCC	07/14/1998	.F.
TTS18	Main Condenser Air Inleakage	07/31/1997	.F.
TTS19	Hotwell Reject Level Controller Fails	08/10/1998	.F.
TTS20	Service Water Pump Trip	08/11/2000	.F.
TTS21	Shutdown Cooling Inadvertant Isolation	08/04/1999	.T.
TTS22	RBCCW Pump Trip	08/04/1999	.F.
TTS23	Loss of All Feedwater	06/28/2000	.F.
TTS24	Control Rod Blade Stuck	08/06/1998	.T.
TTS25	Control Rod Blade Uncoupled	08/04/1999	.F.
TTS26	Control Rod Drifts Out	08/05/1998	.F.
TTS27	Stuck and Uncoupled Control Rod	09/18/1997	.T.
TTS28	Control Rod Maloperation @75% Power & at 100% FSAR Conditions	10/20/2000	.F.

OYSTER CREEEK SIMULATOR
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GPU PROC NUM.	TITLE	LAST TEST DATE	TR
TTS29	CRD Flow Control Valve Fails	08/03/2000	.F.
TTS30	Fuel Cladding Failure	08/06/1998	.F.
TTS31	Main Turbine Trip	09/01/1998	.T.
TTS32	Main Generator Trip	10/06/1997	.F.
TTS34	Failure of Pressure Compensation Inputs to Feedwater Control System	08/05/1999	.F.
TTS35	Isolation Condenser Return Valve Fails Open	08/06/1998	.F.
TTS36	Steam Leakage Outside Containment on 30" Header	08/04/2000	.T.
TTS37	Feedwater Line Rupture Outside Primary Containment	08/05/1999	.F.
TTS38	Feedwater Line Rupture Inside Primary Containment	10/06/1997	.F.
TTS39	SRM Fails	08/05/1999	.F.
TTS40	IRM Fails	06/28/2000	.F.
TTS41	LPRM Fails	07/14/1997	.F.
TTS42	APRM Fails	08/05/1998	.F.
TTS43	Reactor Vessel Level Transmitter Fails	08/11/2000	.F.
TTS44	Reactor Vessel Pressure Transmitter Fails	10/06/1997	.F.
TTS45	Feedwater Flow Transmitter Fails	07/26/2000	.F.
TTS46	Drywell Pressure Transmitter Fails	08/05/1998	.F.
TTS47	RMCS Timer Malfunction	08/11/2000	.F.
TTS48	RCU Flow Control Valve Failure	08/05/1998	.F.
TTS49	Partial/Total Failure of Control Room Annunciators	11/05/1997	.F.
TTS50	Core Spray System Failure to Autostart	08/03/2000	.F.
TTS51	ESW Pump Trip	07/21/1998	.F.
TTS52	Containment Spray Pump Trip	08/05/1999	.F.
TTS53	Emergency Diesel Generator Fails to Start	09/15/1998	.F.
TTS54	Auto Scram Fails	07/14/1997	.F.
TTS55	MPR Fails High/Low	08/05/1999	.F.
TTS56	EPR Fails High/Low	07/14/1997	.F.
TTS57	Any Turbine Bypass Valve Fails	09/15/1998	.F.
TTS58	Loss of Extraction Steam to Feedwater Heaters	08/04/2000	.F.
TTS60	Turbine Trip Without Bypass	11/10/1997	.F.
TTS61	Reactor Recirculation Pump Seizure	08/16/2000	.F.
TTS62	Recirc Pump Shaft Shear	11/05/1997	.F.
TTS64	Uncontrolled Rod Withdrawl at Power	09/13/1999	.F.
TTS65	Improper Startup of an Inactive Recirc Loop at 100 degrees F	09/13/2000	.F.

OYSTER CREEEK SIMULATOR
CERTIFICATION TEST PROCEDURES
PERFORMED SINCE LAST REPORT

GPU PROC NUM.	TITLE	LAST TEST DATE	TR
TTS66	Recirc Flow Controller Malfunction	11/04/1997	.F.
TTS67	ATWS (Failure to Scram, Turbine Trip w/o Bypass)	10/20/2000	.F.
TTS68	Loss of All AC Power	09/15/1998	.F.
TTS69	Manual Reactor Trip	10/06/2000	.F.
TTS70	Simultaneous Trip of All Feedwater Pumps	10/11/2000	.F.
TTS71	Simultaneous Closure of All MSIVs	09/27/2000	.F.
TTS72	Simultaneous Trip of All Five Recirc Pumps	07/26/2000	.F.
TTS73	Single Recirc Pump Trip (LER 50-219 87-09)	07/24/2000	.F.
TTS74	Main Turbine Trip from Low Power - No Anticipatory Scram	09/27/2000	.F.
TTS75	Max Rate Power Ramp from 100% to 75% and Back to 100%	09/27/2000	.F.
TTS76	LOCA with Loss of Offsite Power	10/05/2000	.F.
TTS77	Max Size Unisolable Main Steam Line Rupture	09/29/2000	.F.
TTS78	Sim. Closure of All MSIVs/Stuck Open EMRV, IC Fails, Loss of FW	10/06/2000	.F.
TTS79	Loss of All AC Power with EMRV Failure to Close (PRA Scenario 3.2.1)	09/18/1997	.F.
TTS80	MOOG Valve Fails	08/16/2000	.F.
TTS81	Recirculation M-G Set Flow Controller Oscillation	09/21/1999	.F.
TTS82	Main Feed Regulator Valve Fails	09/14/1998	.F.

ATTACHMENT B.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
NOT01	Plant Startup	10/08/1997	11/08/2001	2005	2009	2013	
NOT04	Reactor Trip and Recovery	09/10/1998	12/22/2002	2006	2010	2014	
NOT06	Power Operation With Less Than 5 Recirculation Pumps	09/23/1997	10/27/2001	2005	2009	2013	
NOT07	Plant Shutdown	06/23/2000	11/06/2004	2008	2012	2012	Title Changed
NOT09	Shutdown Margin Test	07/14/1998	10/19/2002	2006	2010	2014	
NOT12	SRM/IRM Response to Control Rod Motion	08/07/1997	11/17/2001	2005	2009	2013	
NOT14	Recirc Pump Trip Circuit Test	07/13/1998	10/08/2002	2006	2010	2014	
NOT15	EMRV Operability Test	07/21/1999	10/27/2003	2007	2011	2015	
NOT16	Isolation Condenser Valve Operability Test	07/17/2000	10/24/2004	2008	2012	2016	
NOT17	Core Spray Pump Operability Test	07/21/1997	10/26/2001	2005	2009	2013	
NOT18	CRD Pump Operability Test	07/13/1998	10/26/2002	2006	2010	2014	
NOT19	Anticipatory SCRAM Turbine Stop Valve Closure Test	07/06/1999	10/09/2003	2007	2011	2015	
NOT20	APRM Front Panel Check	06/14/2000	10/08/2004	2008	2012	2016	
NOT21	SRM Front Panel Test	07/16/1997	10/06/2001	2005	2009	2013	
NOT22	IRM Front Panel Check	07/07/1999	01/07/2003	2007	2011	2015	

ATTACHMENT B.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
NOT24	Diesel Generator Load Test	10/12/2000	10/26/2004	2008	2012	2016	
NOT25	Primary Containment Isolation Valve Operability Test	07/21/1997	10/27/2001	2005	2009	2013	
NOT26	Alternate Shutdown Monitoring Instrument Chanel Check	07/13/1998	10/27/2002	2006	2010	2014	
NOT28	Air Ejector Off Gas Radiation Monitor Test	07/22/1999	10/08/2003	2007	2011	2015	Added in 1995
NOT29	Standby Gas Treatment System Test	08/05/1997	10/28/2001	2005	2009	2013	Added in 1996
OES01	Inadvertant Scram on High Pressure (May 2, 1979 Lo-Lo-Lo Level Event)	11/18/1997	12/31/2001	2005	2009	2013	
OES02	Reactor Isolation Scram (TAR-008)	10/10/2000	02/16/2004	2008	2012	2016	
OES03	Rx Scram on M1A Main Transformer Failure (TAR 23)	10/20/2000	01/12/2004	2008	2012	2016	
OES04	Reactor Scram on Turbine Generator Trip (TAR-011)	10/25/2000	12/20/2004	2008	2012	2016	
OES05	Reactor Scram on Neutron Monitoring Sys (TAR-012)	09/01/1998	01/12/2002	2006	2010	2014	
OES06	Reactor Scram on Anticipatory Turb Trip Sig. (TAR-013)	09/01/1998	12/21/2002	2006	2010	2014	
OES07	Reactor Scram on Excessive Feedwater Injection (TAR-015)	11/02/2000	02/18/2004	2008	2012	2016	
OES08	Reactor Scram on Neutron Monitoring System (TAR-017)	11/01/2000	12/20/2004	2008	2012	2016	
OES09	Reactor Scram on High Water Level (TAR-018)	09/30/1997	12/21/2001	2005	2009	2013	
OES10	July 17, 1980 Blowdown Transient	11/10/2000	01/06/2004	2008	2012	2016	

ATTACHMENT B.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
OES11	Generator Runback Scram - December 1995	11/08/2000	02/18/2004	2008	2012	2016	Added in 1996
RTT01	Gould Computer Spare Time Test	11/17/2000	12/30/2001	2002	2003	2004	
RTT02	Simulator Real Time Test	08/17/2000	10/24/2001	2002	2003	2004	
SSP01	100% Steady-State Accuracy Test	10/18/2000	10/29/2001	2002	2003	2004	
SSP02	75% Steady-State Accuracy Test	10/13/2000	11/11/2001	2002	2003	2004	
SSP03	39% Steady-State Accuracy Test	10/24/2000	01/09/2001	2002	2003	2004	
TTS01	Recirc Loop Rupture (Unisolable)	11/16/2000	01/13/2004	2008	2012	2016	
TTS02	Reactor Vessel Instrument Reference Leg Rupture	07/29/1999	02/06/2003	2007	2011	2015	
TTS03	Reactor Safety Valve Fails open	07/29/1999	09/16/2003	2007	2011	2015	
TTS04	Loss of Instrument Air	10/29/1997	11/14/2001	2005	2009	2013	
TTS05	Loss of Offsite Power Sources	08/04/1997	10/30/2001	2005	2009	2013	
TTS06	4.16 KV Emergency Switchgear 1C and/or 1D Fault	08/03/2000	09/24/2004	2008	2012	2016	
TTS07	Emergency Diesel Generator Trip	08/04/1997	11/14/2001	2005	2009	2013	
TTS08	4.16 KV Bus 1A and/or 1B Fault	07/29/1999	12/22/2003	2007	2011	2015	
TTS09	Loss of 460 V Unit Substation	07/01/1997	08/10/2001	2005	2009	2013	

ATTACHMENT B.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS10	Loss of 460 V MCC Train A	08/04/1997	10/31/2001	2005	2009	2013	
TTS11	Loss of Vital Panel Bus	08/04/1999	05/22/2003	2007	2011	2015	
TTS12	Loss of 120 V Continuous Instrumentation Panel CIP-3	08/04/2000	05/21/2004	2008	2012	2016	
TTS13	Loss of 125 V DC Panel	07/14/1998	10/30/2002	2006	2010	2014	
TTS14	Loss of 24 V DC Panel	08/04/1999	05/22/2003	2007	2011	2015	
TTS15	Loss of 460 V USS 1E1	07/20/2000	09/24/2004	2008	2012	2016	
TTS16	Loss of 120 V Protection System Panel	07/31/1997	09/25/2001	2005	2009	2013	
TTS17	Loss of Vital 460 V MCC	07/14/1998	11/14/2002	2006	2010	2014	
TTS18	Main Condenser Air Inleakage	07/31/1997	10/30/2001	2005	2009	2013	
TTS19	Hotwell Reject Level Controller Fails	08/10/1998	10/30/2002	2006	2010	2014	
TTS20	Service Water Pump Trip	08/11/2000	12/22/2004	2008	2012	2016	
TTS21	Shutdown Cooling Inadvertant Isolation	08/04/1999	11/03/2003	2007	2011	2015	
TTS22	RBCCW Pump Trip	08/04/1999	09/27/2003	2007	2011	2015	
TTS23	Loss of All Feedwater	06/28/2000	01/07/2004	2008	2012	2016	
TTS24	Control Rod Blade Stuck	08/06/1998	09/24/2002	2006	2010	2014	

ATTACHMENT B.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS25	Control Rod Blade Uncoupled	08/04/1999	09/25/2003	2007	2011	2015	
TTS26	Control Rod Drifts Out	08/05/1998	02/19/2002	2006	2010	2014	
TTS27	Stuck and Uncoupled Control Rod	09/18/1997	02/18/2001	2005	2009	2013	
TTS28	Control Rod Maloperation @75% Power & at 100% FSAR Conditions	10/20/2000	12/30/2004	2008	2012	2016	
TTS29	CRD Flow Control Valve Fails	08/03/2000	11/04/2004	2008	2012	2016	
TTS30	Fuel Cladding Failure	08/06/1998	10/02/2002	2006	2010	2014	
TTS31	Main Turbine Trip	09/01/1998	02/09/2002	2006	2010	2014	
TTS32	Main Generator Trip	10/06/1997	10/30/2001	2005	2009	2013	
TTS34	Failure of Pressure Compensation Inputs to Feedwater Control System	08/05/1999	09/26/2003	2007	2011	2015	
TTS35	Isolation Condenser Return Valve Fails Open	08/06/1998	09/17/2002	2006	2010	2014	
TTS36	Steam Leakage Outside Containment on 30" Header	08/04/2000	09/19/2004	2008	2012	2016	
TTS37	Feedwater Line Rupture Outside Primary Containment	08/05/1999	09/24/2003	2007	2011	2015	
TTS38	Feedwater Line Rupture Inside Primary Containment	10/06/1997	09/24/2001	2005	2009	2013	
TTS39	SRM Fails	08/05/1999	05/25/2003	2007	2011	2015	
TTS40	IRM Fails	06/28/2000	05/24/2004	2008	2012	2016	

ATTACHMENT B.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS41	LPRM Fails	07/14/1997	03/12/2001	2005	2009	2013	
TTS42	APRM Fails	08/05/1998	03/11/2002	2006	2010	2014	
TTS43	Reactor Vessel Level Transmitter Fails	08/11/2000	11/12/2004	2008	2012	2016	
TTS44	Reactor Vessel Pressure Transmitter Fails	10/06/1997	09/18/2001	2005	2009	2013	
TTS45	Feedwater Flow Transmitter Fails	07/26/2000	09/23/2004	2008	2012	2016	
TTS46	Drywell Pressure Transmitter Fails	08/05/1998	05/26/2002	2006	2010	2014	
TTS47	RMCS Timer Malfunction	08/11/2000	11/01/2004	2008	2012	2016	
TTS48	RCU Flow Control Valve Failure	08/05/1998	06/12/2002	2006	2010	2014	
TTS49	Partial/Total Failure of Control Room Annunciators	11/05/1997	09/28/2001	2005	2009	2013	
TTS50	Core Spray System Failure to Autostart	08/03/2000	09/24/2004	2008	2012	2016	
TTS51	ESW Pump Trip	07/21/1998	06/29/2002	2006	2010	2014	
TTS52	Containment Spray Pump Trip	08/05/1999	10/13/2003	2007	2011	2015	
TTS53	Emergency Diesel Generator Fails to Start	09/15/1998	10/30/2002	2006	2010	2014	
TTS54	Auto Scram Fails	07/14/1997	02/21/2001	2005	2009	2013	
TTS55	MPR Fails High/Low	08/05/1999	10/03/2003	2007	2011	2015	

ATTACHMENT B.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS56	EPR Fails High/Low	07/14/1997	02/16/2001	2005	2009	2013	
TTS57	Any Turbine Bypass Valve Fails	09/15/1998	09/21/2002	2006	2010	2014	
TTS58	Loss of Extraction Steam to Feedwater Heaters	08/04/2000	12/20/2004	2008	2012	2016	
TTS60	Turbine Trip Without Bypass	11/10/1997	12/31/2001	2005	2009	2013	
TTS61	Reactor Recirculation Pump Seizure	08/16/2000	11/15/2004	2008	2012	2016	
TTS62	Recirc Pump Shaft Shear	11/05/1997	11/02/2001	2005	2009	2013	
TTS64	Uncontrolled Rod Withdrawl at Power	09/13/1999	12/31/2003	2007	2011	2015	
TTS65	Improper Startup of an Inactive Recirc Loop at 100 degrees F	09/13/2000	10/29/2004	2008	2012	2016	
TTS66	Recirc Flow Controller Malfunction	11/04/1997	10/29/2001	2005	2009	2013	
TTS67	ATWS (Failure to Scram, Turbine Trip w/o Bypass)	10/20/2000	02/17/2004	2008	2012	2016	
TTS68	Loss of All AC Power	09/15/1998	12/23/2002	2006	2010	2014	
TTS69	Manual Reactor Trip	10/06/2000	02/06/2001	2002	2003	2004	
TTS70	Simultaneous Trip of All Feedwater Pumps	10/11/2000	12/18/2001	2002	2003	2004	
TTS71	Simultaneous Closure of All MSIVs	09/27/2000	12/18/2001	2002	2003	2004	
TTS72	Simultaneous Trip of All Five Recirc Pumps	07/26/2000	12/18/2001	2002	2003	2004	

ATTACHMENT B.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS73	Single Recirc Pump Trip (LER 50-219 87-09)	07/24/2000	12/18/2001	2002	2003	2004	
TTS74	Main Turbine Trip from Low Power - No Anticipatory Scram	09/27/2000	12/29/2001	2002	2003	2004	
TTS75	Max Rate Power Ramp from 100% to 75% and Back to 100%	09/27/2000	12/18/2001	2002	2003	2004	
TTS76	LOCA with Loss of Offsite Power	10/05/2000	12/18/2001	2002	2003	2004	
TTS77	Max Size Unisolable Main Steam Line Rupture	09/29/2000	02/06/2001	2002	2003	2004	
TTS78	Sim. Closure of All MSIVs/Stuck Open EMRV, IC Fails, Loss of FW	10/06/2000	02/04/2001	2002	2003	2004	
TTS79	Loss of All AC Power with EMRV Failure to Close (PRA Scenario 3.2.1)	09/18/1997	02/19/2001	2005	2009	2013	
TTS80	MOOG Valve Fails	08/16/2000	10/02/2004	2008	2012	2016	
TTS81	Recirculation M-G Set Flow Controller Oscillation	09/21/1999	09/20/2003	2007	2011	2015	Added in 1995
TTS82	Main Feed Regulator Valve Fails	09/14/1998	09/26/2002	2006	2010	2014	Added in 1995

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	Plant Startup	10/08/1997	11/08/2001	2005	2009	2013	
NOT04	Reactor Trip and Recovery	09/10/1998	12/22/2002	2006	2010	2014	
NOT06	Power Operation With Less Than 5 Recirculation Pumps	09/23/1997	10/27/2001	2005	2009	2013	
NOT07	Plant Shutdown	06/23/2000	11/06/2004	2008	2012	2012	Title Changed
NOT09	Shutdown Margin Test	07/14/1998	10/19/2002	2006	2010	2014	
NOT12	SRM/IRM Response to Control Rod Motion	08/07/1997	11/17/2001	2005	2009	2013	
NOT14	Recirc Pump Trip Circuit Test	07/13/1998	10/08/2002	2006	2010	2014	
NOT15	EMRV Operability Test	07/21/1999	10/27/2003	2007	2011	2015	
NOT16	Isolation Condenser Valve Operability Test	07/17/2000	10/24/2004	2008	2012	2016	
NOT17	Core Spray Pump Operability Test	07/21/1997	10/26/2001	2005	2009	2013	
NOT18	CRD Pump Operability Test	07/13/1998	10/26/2002	2006	2010	2014	
NOT19	Anticipatory SCRAM Turbine Stop Valve Closure Test	07/06/1999	10/09/2003	2007	2011	2015	
NOT20	APRM Front Panel Check	06/14/2000	10/08/2004	2008	2012	2016	
NOT21	SRM Front Panel Test	07/16/1997	10/06/2001	2005	2009	2013	
NOT22	IRM Front Panel Check	07/07/1999	01/07/2003	2007	2011	2015	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
NOT24	Diesel Generator Load Test	10/12/2000	10/26/2004	2008	2012	2016	
NOT25	Primary Containment Isolation Valve Operability Test	07/21/1997	10/27/2001	2005	2009	2013	
NOT26	Alternate Shutdown Monitoring Instrument Chanel Check	07/13/1998	10/27/2002	2006	2010	2014	
NOT28	Air Ejector Off Gas Radiation Monitor Test	07/22/1999	10/08/2003	2007	2011	2015	Added in 1995
NOT29	Standby Gas Treatment System Test	08/05/1997	10/28/2001	2005	2009	2013	Added in 1996
OES01	Inadvertant Scram on High Pressure (May 2, 1979 Lo-Lo-Lo Level Event)	11/18/1997	12/31/2001	2005	2009	2013	
OES02	Reactor Isolation Scram (TAR-008)	10/10/2000	02/16/2004	2008	2012	2016	
OES03	Rx Scram on M1A Main Transformer Failure (TAR 23)	10/20/2000	01/12/2004	2008	2012	2016	
OES04	Reactor Scram on Turbine Generator Trip (TAR-011)	10/25/2000	12/20/2004	2008	2012	2016	
OES05	Reactor Scram on Neutron Monitoring Sys (TAR-012)	09/01/1998	01/12/2002	2006	2010	2014	
OES06	Reactor Scram on Anticipatory Turb Trip Sig. (TAR-013)	09/01/1998	12/21/2002	2006	2010	2014	
OES07	Reactor Scram on Excessive Feedwater Injection (TAR-015)	11/02/2000	02/18/2004	2008	2012	2016	
OES08	Reactor Scram on Neutron Monitoring System (TAR-017)	11/01/2000	12/20/2004	2008	2012	2016	
OES09	Reactor Scram on High Water Level (TAR-018)	09/30/1997	12/21/2001	2005	2009	2013	
OES10	July 17, 1980 Blowdown Transient	11/10/2000	01/06/2004	2008	2012	2016	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
OES11	Generator Runback Scram - December 1995	11/08/2000	02/18/2004	2008	2012	2016	Added in 1996
RTT01	Gould Computer Spare Time Test	11/17/2000	12/30/2001	2002	2003	2004	
RTT02	Simulator Real Time Test	08/17/2000	10/24/2001	2002	2003	2004	
SSP01	100% Steady-State Accuracy Test	10/18/2000	10/29/2001	2002	2003	2004	
SSP02	75% Steady-State Accuracy Test	10/13/2000	11/11/2001	2002	2003	2004	
SSP03	39% Steady-State Accuracy Test	10/24/2000	01/09/2001	2002	2003	2004	
TTS01	Recirc Loop Rupture (Unisolable)	11/16/2000	01/13/2004	2008	2012	2016	
TTS02	Reactor Vessel Instrument Reference Leg Rupture	07/29/1999	02/06/2003	2007	2011	2015	
TTS03	Reactor Safety Valve Fails open	07/29/1999	09/16/2003	2007	2011	2015	
TTS04	Loss of Instrument Air	10/29/1997	11/14/2001	2005	2009	2013	
TTS05	Loss of Offsite Power Sources	08/04/1997	10/30/2001	2005	2009	2013	
TTS06	4.16 KV Emergency Switchgear 1C and/or 1D Fault	08/03/2000	09/24/2004	2008	2012	2016	
TTS07	Emergency Diesel Generator Trip	08/04/1997	11/14/2001	2005	2009	2013	
TTS08	4.16 KV Bus 1A and/or 1B Fault	07/29/1999	12/22/2003	2007	2011	2015	
TTS09	Loss of 460 V Unit Substation	07/01/1997	08/10/2001	2005	2009	2013	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS10	Loss of 460 V MCC Train A	08/04/1997	10/31/2001	2005	2009	2013	
TTS11	Loss of Vital Panel Bus	08/04/1999	05/22/2003	2007	2011	2015	
TTS12	Loss of 120 V Continuous Instrumentation Panel CIP-3	08/04/2000	05/21/2004	2008	2012	2016	
TTS13	Loss of 125 V DC Panel	07/14/1998	10/30/2002	2006	2010	2014	
TTS14	Loss of 24 V DC Panel	08/04/1999	05/22/2003	2007	2011	2015	
TTS15	Loss of 460 V USS 1E1	07/20/2000	09/24/2004	2008	2012	2016	
TTS16	Loss of 120 V Protection System Panel	07/31/1997	09/25/2001	2005	2009	2013	
TTS17	Loss of Vital 460 V MCC	07/14/1998	11/14/2002	2006	2010	2014	
TTS18	Main Condenser Air Inleakage	07/31/1997	10/30/2001	2005	2009	2013	
TTS19	Hotwell Reject Level Controller Fails	08/10/1998	10/30/2002	2006	2010	2014	
TTS20	Service Water Pump Trip	08/11/2000	12/22/2004	2008	2012	2016	
TTS21	Shutdown Cooling Inadvertant Isolation	08/04/1999	11/03/2003	2007	2011	2015	
TTS22	RBCCW Pump Trip	08/04/1999	09/27/2003	2007	2011	2015	
TTS23	Loss of All Feedwater	06/28/2000	01/07/2004	2008	2012	2016	
TTS24	Control Rod Blade Stuck	08/06/1998	09/24/2002	2006	2010	2014	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS25	Control Rod Blade Uncoupled	08/04/1999	09/25/2003	2007	2011	2015	
TTS26	Control Rod Drifts Out	08/05/1998	02/19/2002	2006	2010	2014	
TTS27	Stuck and Uncoupled Control Rod	09/18/1997	02/18/2001	2005	2009	2013	
TTS28	Control Rod Maloperation @75% Power & at 100% FSAR Conditions	10/20/2000	12/30/2004	2008	2012	2016	
TTS29	CRD Flow Control Valve Fails	08/03/2000	11/04/2004	2008	2012	2016	
TTS30	Fuel Cladding Failure	08/06/1998	10/02/2002	2006	2010	2014	
TTS31	Main Turbine Trip	09/01/1998	02/09/2002	2006	2010	2014	
TTS32	Main Generator Trip	10/06/1997	10/30/2001	2005	2009	2013	
TTS34	Failure of Pressure Compensation Inputs to Feedwater Control System	08/05/1999	09/26/2003	2007	2011	2015	
TTS35	Isolation Condenser Return Valve Fails Open	08/06/1998	09/17/2002	2006	2010	2014	
TTS36	Steam Leakage Outside Containment on 30" Header	08/04/2000	09/19/2004	2008	2012	2016	
TTS37	Feedwater Line Rupture Outside Primary Containment	08/05/1999	09/24/2003	2007	2011	2015	
TTS38	Feedwater Line Rupture Inside Primary Containment	10/06/1997	09/24/2001	2005	2009	2013	
TTS39	SRM Fails	08/05/1999	05/25/2003	2007	2011	2015	
TTS40	IRM Fails	06/28/2000	05/24/2004	2008	2012	2016	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS41	LPRM Fails	07/14/1997	03/12/2001	2005	2009	2013	
TTS42	APRM Fails	08/05/1998	03/11/2002	2006	2010	2014	
TTS43	Reactor Vessel Level Transmitter Fails	08/11/2000	11/12/2004	2008	2012	2016	
TTS44	Reactor Vessel Pressure Transmitter Fails	10/06/1997	09/18/2001	2005	2009	2013	
TTS45	Feedwater Flow Transmitter Fails	07/26/2000	09/23/2004	2008	2012	2016	
TTS46	Drywell Pressure Transmitter Fails	08/05/1998	05/26/2002	2006	2010	2014	
TTS47	RMCS Timer Malfunction	08/11/2000	11/01/2004	2008	2012	2016	
TTS48	RCU Flow Control Valve Failure	08/05/1998	06/12/2002	2006	2010	2014	
TTS49	Partial/Total Failure of Control Room Annunciators	11/05/1997	09/28/2001	2005	2009	2013	
TTS50	Core Spray System Failure to Autostart	08/03/2000	09/24/2004	2008	2012	2016	
TTS51	ESW Pump Trip	07/21/1998	06/29/2002	2006	2010	2014	
TTS52	Containment Spray Pump Trip	08/05/1999	10/13/2003	2007	2011	2015	
TTS53	Emergency Diesel Generator Fails to Start	09/15/1998	10/30/2002	2006	2010	2014	
TTS54	Auto Scram Fails	07/14/1997	02/21/2001	2005	2009	2013	
TTS55	MPR Fails High/Low	08/05/1999	10/03/2003	2007	2011	2015	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS56	EPR Fails High/Low	07/14/1997	02/16/2001	2005	2009	2013	
TTS57	Any Turbine Bypass Valve Fails	09/15/1998	09/21/2002	2006	2010	2014	
TTS58	Loss of Extraction Steam to Feedwater Heaters	08/04/2000	12/20/2004	2008	2012	2016	
TTS60	Turbine Trip Without Bypass	11/10/1997	12/31/2001	2005	2009	2013	
TTS61	Reactor Recirculation Pump Seizure	08/16/2000	11/15/2004	2008	2012	2016	
TTS62	Recirc Pump Shaft Shear	11/05/1997	11/02/2001	2005	2009	2013	
TTS64	Uncontrolled Rod Withdrawl at Power	09/13/1999	12/31/2003	2007	2011	2015	
TTS65	Improper Startup of an Inactive Recirc Loop at 100 degrees F	09/13/2000	10/29/2004	2008	2012	2016	
TTS66	Recirc Flow Controller Malfunction	11/04/1997	10/29/2001	2005	2009	2013	
TTS67	ATWS (Failure to Scram, Turbine Trip w/o Bypass)	10/20/2000	02/17/2004	2008	2012	2016	
TTS68	Loss of All AC Power	09/15/1998	12/23/2002	2006	2010	2014	
TTS69	Manual Reactor Trip	10/06/2000	02/06/2001	2002	2003	2004	
TTS70	Simultaneous Trip of All Feedwater Pumps	10/11/2000	12/18/2001	2002	2003	2004	
TTS71	Simultaneous Closure of All MSIVs	09/27/2000	12/18/2001	2002	2003	2004	
TTS72	Simultaneous Trip of All Five Recirc Pumps	07/26/2000	12/18/2001	2002	2003	2004	

ATTACHMENT D.2
OYSTER CREEK SIMULATOR
CERTIFICATION TEST SCHEDULE

NUMBER	TITLE	LAST DATE DONE	DATE DUE NEXT	FUTURE DATE	FUTURE DATE	FUTURE DATE	COMMENT
TTS73	Single Recirc Pump Trip (LER 50-219 87-09)	07/24/2000	12/18/2001	2002	2003	2004	
TTS74	Main Turbine Trip from Low Power - No Anticipatory Scram	09/27/2000	12/29/2001	2002	2003	2004	
TTS75	Max Rate Power Ramp from 100% to 75% and Back to 100%	09/27/2000	12/18/2001	2002	2003	2004	
TTS76	LOCA with Loss of Offsite Power	10/05/2000	12/18/2001	2002	2003	2004	
TTS77	Max Size Unisolable Main Steam Line Rupture	09/29/2000	02/06/2001	2002	2003	2004	
TTS78	Sim. Closure of All MSIVs/Stuck Open EMRV, IC Fails, Loss of FW	10/06/2000	02/04/2001	2002	2003	2004	
TTS79	Loss of All AC Power with EMRV Failure to Close (PRA Scenario 3.2.1)	09/18/1997	02/19/2001	2005	2009	2013	
TTS80	MOOG Valve Fails	08/16/2000	10/02/2004	2008	2012	2016	
TTS81	Recirculation M-G Set Flow Controller Oscillation	09/21/1999	09/20/2003	2007	2011	2015	Added in 1995
TTS82	Main Feed Regulator Valve Fails	09/14/1998	09/26/2002	2006	2010	2014	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] / 10/14/97

TEST DATE: 10/08/97

APPROVED BY/DATE: R Wanlon / 12/16/97

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.

A copy of plant procedure 201.1, Revision 79 dated 9/8/97, Approach To Critical, was made from the controlled set of plant procedures in the simulator control room. The steps in 201.1 which do not apply to simulator are marked as Not Applicable.

The test starts with the simulator in IC-51, Cold Shutdown. The precritical checkoff sheets (Figures 201.1-2, 201.1-3, 201.1-4, and 201.1-5), which are used to document system status prior to startup, were completed and attached. Other individual system lineups were not actually performed but rely on simulator system tests and instructor actions which were used to establish ICs.

After making adjustments to meet the starting conditions of procedure 201.1, IC-32 was shot and used for the starting point.

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

A former Oyster Creek control room operator performed some of the operations while conducting a QA audit on simulator fidelity.

Results:

Starting from an initial SRM count rate of 60 cps, and a reactor coolant temperature of 172 F, criticality was obtained on control rod 34-15 at notch 08. Reactor coolant temperature was 169 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.
Local Operator Actions (LOA) operations and data collection outside the control room panels were noted in the procedure.

The IC appears to have little decay heat, as indicated by the decrease from 172 to 169 F at the time of criticality.

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-51, Cold Shutdown, BOL, Cycle 15.

Initial SRM count rates were:

Chan 21	60
Chan 22	60
Chan 23	60

Chan 24 22

Initial Reactor Coolant Temperature was 172 deg. F

After making adjustments to meet the starting conditions of procedure 201.1, the Initial Conditions were stored in IC-32.

FINAL TEST CONDITIONS:

At the conclusion of this test, the reactor was critical at approximately 50% of IRM Range 5. Reactor coolant temperature was less than 169 F and steady. The Mode Switch was in Startup. Reactor level was being maintained at 155" TAF using Digital Feedwater and one Low Flow Regulating valve in auto and Cleanup Letdown Flow established. Recirculation flow was 5.3 E4 gpm.

Execution time was approximately 5.5 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:

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: NOT02
14.4.1.2

TITLE: Heatup to Hot Standby

PREPARED BY/DATE: [signature] / 10/14/98

TEST DATE: 09/29/1998

APPROVED BY/DATE: [signature] / 12/7/98

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 uses 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.) are marked as not applicable.

The test starts with the simulator at 50% in IRM Range 5. Operation of individual systems is performed using the applicable plant system operating procedures.

Results:

Procedure 201.2 was executed to bring the reactor from IRM Range 5 to Run Mode. Four TRs were written during the test,

none of which prevented proper execution of the procedure. The TRs are described in a later section of this abstract. As required by procedure 201.2, procedure 1001.9, IRM Calibration to Reactor Power, was also executed.

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:

Starting from IC-52, the initial conditions in the prerequisites section of 201.2 were established and saved as IC-28. The Initial Conditions are:

Coolant Temp	177 F
Level	155 to 165 in TAF
Power	50 to 100% IRM Range 5
Turbine	Tripped and on Turning Gear
Mode Switch	Startup
Recirc Flow	52400 GPM

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.

Execution time was 18 Hours.

The simulator passed this test with four new TRs issued.

BASELINE DATA USED TO EVALUATE
TEST RESULTS:

A copy of the current controlled plant procedure was used for the test.

DEFICIENCIES FOUND, CORRECTIVE

ACTION TAKEN OR PLANNED, AND
SCHEDULED DATE FOR COMPLETION:

Four minor problems were identified during execution of the test. TRs were issued to correct the identified problems.

TR 3793: Steam Flow Oscillations were noticed beginning at approximately 500 to 600 psi. The oscillations caused LPRM Downscale Indication to intermittently alarm and clear. The TR is scheduled for resolution by 11/28/98.

TR3794 The HP and IP Heater Reverse Ck Valve Trip alarms continuously alarmed and cleared. The TR is scheduled for resolution by 11/28/98.

TR 3795 Steam Flow oscillations occurred when Bypass Valves opened to control reactor pressure. This TR is scheduled for resolution by 11/28/98.

TR 3796 The IRM calibration checks in procedure 201.2 and 1001.9 show that the IRMs are reading significantly higher than reactor power. The TR is scheduled for resolution by 11/28/98.

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: [signature] / 10/6/99

TEST DATE: 09/21/1999

APPROVED BY/DATE: R Davidson / 11/30/99

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 extensively revised to remove specific steps and replaced with 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 marked as N/A.

The manual heat balance calculations specified in 201.3 were not performed as the heat balances were recently performed for the 39, 75, and 100% Steady State tests.

The test starts with the simulator at 10% power and ends with the plant at 100% power.

The Sequence of Alarms (SAR) printout was not attached.

Results:

A major field change was made to the procedure to replace the steps previously extracted from procedure 201.3 with the actual plant procedure.

The simulator was successfully brought to the full power condition using the latest plant procedure. Operation of individual systems, where required, was performed using controlled copies of current plant procedures.

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-21, Cycle 15, BOL

The prerequisite conditions of Procedure 201.3 were met.

FINAL TEST CONDITIONS:

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

Execution time was 7.5 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:

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: NOT04
14.6.45.2

TITLE: Reactor Trip and Recovery

PREPARED BY/DATE: [signature] / 9/16/98

TEST DATE: 09/10/1998

APPROVED BY/DATE: R Davidson / 12/7/98

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
7. 1001.6, Core Heat Balance and Feedwater Flow Calculation

Results:

Starting from a full power end of life (EOL) condition, the plant was manually scrammed. The reactor and turbine generator were stabilized using plant procedures 2000-ABN-3200.01, Reactor Scram and 2000-ABN-3200.10, Turbine Generator Trip.

Preparations were made for an immediate startup under hot, increasing Xenon conditions, an operation which is unlikely to occur in the plant due to administrative requirements following a scram. The criticality prediction could not be performed under these conditions. Procedure 201.1, Attachment 201.1-2, Pre-Critical Checkoff was completed. Attachment 201.1-1, Pre-Critical System Verification Checkoff was not completed since no systems were taken out of service following the scram. As expected under these conditions, the reactor went critical quite late in the rod withdrawal sequence at Group 8-1.

During the execution of Procedure 201.2, Plant Heatup to Hot Standby, the CST Low Level Alarm came in. The CST level continued to decrease while makeup water was added using LOAs to add Demineralized Water. A TR was written. It was necessary to place all IRMs in Range 10 prior to transfer to the Run Mode. Due to the high Xenon conditions, power in the core bottom was suppressed. The Steam Seal Regulator Bypass Valve could not be closed until 600 psi, while the procedure calls to close it at 260 psi. This was previously identified in TR 3771.
The IRM Accuracy Check using A BPV Correlation on Attachment 201.2-4 did not meet the procedure acceptance criteria. The BPV calculation indicated 10.5% power while the IRMs indicated 20% in Range 10. The allowable difference is 6.4% per the procedure. It was noted that the simulator power indicated on the instructor station was 15%. Since the difference may be related to the EOL, Hot, High Xenon condition, a TR was not

issued. This will be checked while executing Procedure NOT02, Heatup to Hot Standby.

Power level was then increased to 100% using Procedure 201.3, Plant Startup from Hot Standby to Rated Power. At the full power condition, Xenon was placed in fast time (800X) using the expert mode of the instructor station. The simulator was returned to the same Power, Recirc Flow, and Control Rod Pattern which existed prior to the scram. Tip Traces before and after verified the same power shape and core conditions.

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-30, 100% Power, End of Life (EOL).

FINAL TEST CONDITIONS:

Run Time: 24 Hours

The reactor was scrammed and subsequently restarted and returned to full power. Power was returned to within 0.5% of the pretrip value. The rod pattern and core flow conditions were reestablished to the pretrip values.

The simulator passed this test by achieving 1930MWt, 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 FOUND, CORRECTIVE ACTION TAKEN OR PLANNED, AND SCHEDULED DATE FOR COMPLETION:

TR 3792 was written concerning a decreasing Condensate Storage Tank (CST) level. The TR is scheduled for resolution by March 15, 1999.

The IRM Accuracy Check using A BPV Correlation on Attachment 201.2-4 did not meet the procedure acceptance criteria. A TR was not issued. This will be checked while executing Procedure NOT02, Heatup to Hot Standby.

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] / 10/23/97

TEST DATE: 09/23/97

APPROVED BY/DATE: R Davidson / 12/16/97

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.

The SAR was attached but appeared to fail during the test.

Results:

During a previous run of this 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. This was not confirmed during the current run.

The final pump speed achieved was 54.8 Hertz. Attachment 301.2-7 to procedure 301.2 limits the recirc pump speed to 56 Hertz.

The operation was completed successfully using procedure 301.2.

AVAILABLE OPTIONS:

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

OPTIONS TESTED:

Recirculating Pump C was selected for this test.

INITIAL CONDITIONS FOR TEST:

IC-15, 100% Power, Middle of Life

All 5 Recirc. Pumps in operation at 46.53 HZ.

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. Recirculation Pump speed is 54.8 HZ. The simulator is capable of continued simulation. If required, the C pump could be returned to service per plant procedures.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

Plant Procedure 301 is used to perform the test.

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:

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: NOT07
14.4.2.1

TITLE: Plant Shutdown to Hot Standby

TEST DATE:06/23/00

PREPARED BY/DATE: John Sollenberger / 6/26/00

APPROVED BY/DATE: Adam H. Casey / 9/14/2000

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 to Cold Shutdown
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 related to hot standby, cooldown, through 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 Cold Shutdown condition.

This procedure uses (recently modified) plant procedure 203, Plant Shutdown. The steps in 203 which do not apply to simulator testing (precautions, administrative requirements, notifications, etc.) were marked N/A in order to simplify the test procedure.

Local Operator Actions (LOA's) and Component Level Failures (CLF's) were used to perform remote functions and 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 Cold Shutdown 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-65, 100% Power

FINAL TEST CONDITIONS:

At the conclusion of this test, the reactor is at 0% power with the Reactor Mode Switch in the Shutdown position with the Turbine and Generator on turning gear and the reactor below 212 degree F and vented.

Execution Time was 19 Hours, 30 Minutes. This test had to be executed over a period of four days due to Operator Exams being given during the day shift. At the conclusion of each evening of testing a Snapshot of the Simulator conditions was taken for use for restart conditions the following day. IC 27 was used for these Snapshots.

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:

The Rod Worth Minimizer (RWM) was not interfacing with the Simulator Computer during the initial portion of this test (during the reduction in power). This was reported to the Computer Applications group and the units software was reloaded. After this the RWM function was recovered. The RWM was used to insert the last 15 to 20 groups of rods. No RWM performance problems were encountered. All rods were fully inserted following the RWM sequencing.

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] / 10/21/97 TEST DATE: 10/20/97

APPROVED BY/DATE: R Davidson / 12/6/97

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

While preparing the IC for this test, steam flow, bypass valve position, reactor pressure, and reactor power oscillations began after the turbine was tripped. A TR was written.

During the cooldown, the mechanical vacuum pump tripped several times for no apparent reason. A TR was written.

Shut down and cooldown to less than 212 F was completed using the plant procedure. The cleanup system was successfully transferred from the recirc pump operation to the auxiliary pump.

Procedure 203.2 contains several attachments used to jumper Reactor Mode Switch contacts and Reactor Protection Relays. The simulator does not have LOAs or physical contact points to perform these operations. Training personnel were requested to evaluate the need to simulate the jumper installation and removal.

AVAILABLE OPTIONS:

There are no options available in this Normal Operations test procedure. Plant procedure 203.2 contains several options depending on work to be performed while the plant is shutdown.

OPTIONS TESTED:

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

INITIAL CONDITIONS FOR TEST:

A new initial condition, IC-20 was established for this test. The reactor is operating in the Run Mode at 10% power. One Condensate Pump and one Feedwater pump are running with level control in automatic. 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 Refuel and the Scram is reset.

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.

A copy of plant procedure 203.2, Revision 58 dated 10/16/97, Plant Cooldown From Hot Standby to Cold Shutdown, was made from the controlled set of plant procedures in the simulator control room. The steps in 203.2 which do not apply to simulator are marked as Not Applicable.

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

The SAR was not attached.

Results:

During the test, purging of the drywell and torus was started but not completed. Purging is not required by the procedure.

Reactor coolant temperature is less than 212 F, with the vessel vented via the Isolation Condenser vents. Temperature is maintained using two loops of the Shutdown Cooling System. Containment purging is in progress.

Execution Time was 12 Hours.

The simulator passed this test with 2 new TRs 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:

While preparing the IC for this test, steam flow, bypass valve position, reactor pressure, and reactor power oscillations began after the turbine was tripped. TR 3747 was written with a scheduled completion date of 12/13/97.

During the cooldown, the mechanical vacuum pump tripped several times for no apparent reason. TR 3752 was written with a scheduled completion date of 1/19/98.

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] / 10/27/98

TEST DATE: 07/14/1998

APPROVED BY/DATE: [signature] / 10/7/98

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

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 worths 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.

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.

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 177 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.

NOT1

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: NOT12
14.7.5

TITLE: SRM/IRM Response to Control Rod Motion

PREPARED BY/DATE: E J Mary / 8/22/97

TEST DATE: 08/07/97

APPROVED BY/DATE: R Davidson / 12/15/97

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 alternate control rods, consistent with the Cycle 15 Core and Rod Withdrawl Sequence.

The response of the simulator was 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-52, Cold Startup (8 rods subcritical).

FINAL TEST CONDITIONS:

Run Time: 4 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:

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: NOT14
14.6.45.5

TITLE: Recirc Pump Trip Circuit Test

PREPARED BY/DATE: [signature] / 10/27/98

APPROVED BY/DATE: R Davidson / 12/7/98

TEST DATE: 07/13/1998

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

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 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.

The time delay for relays 6K11AA, 6K9AA, 6K12AA, and 6K10AA were found 0.1 to 0.2 seconds greater than the As-Left criteria but within the As-Found criteria in the procedure. This was found to be acceptable.

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: 60 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: E M Lamy / 7/21/99

TEST DATE: 07/21/1999

APPROVED BY/DATE: R Davidson 11/30/99

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 tail pipe and 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 E EMRV to verify proper response to a leaking valve. Malfunction NSS-25E was used at 0.1% for the leak.

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

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

INITIAL CONDITIONS FOR TEST:

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 (158 to 216 F vs. 118 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. 7.00

TITLE: Isolation Condenser Valve Operability Test

PREPARED BY/DATE: John Sellabrew / 11/3/00

TEST DATE: 07/17/2000

APPROVED BY/DATE: Adam H. Kozy / 11/6/00

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 is a normal Operations surveillance test procedure. It is used to demonstrate that a routine surveillance test can be performed on the simulator using current plant procedures and yield results meeting plant acceptance criteria. A current copy of plant procedure 609.4.001, Isolation Condenser Valve Operability and In Service Test, was obtained and marked-up to indicate steps which do not apply (Such as GSS permission to start). LOA (Local Operator Action) CFW-52 is used for operation of valve V-11-41.

No model variables are monitored during this test.

Results:

All valves met stroke time acceptance criteria.
Valves stroking in the 30 second range were within 1.1 seconds of the plant times. Valves stroking in the 15 to 20 second range were within 2.5 seconds of the plant. Valves stroking in the 2 to 5 second range were within 1.6 seconds of the plant. Finally valves stroking in the 0.9 to 2.5 second range were within 0.4 seconds of the plant.

Several steps in the procedure involve the removal and installation of test plugs in local Motor Control Centers. The installation of test plugs is done locally in plant. It is done to restore overloads to service for the test and prevent valve damage. The overloads are bypassed during normal plant operation. This activity was 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 Stand-by condition. No other options are available.

OPTIONS TESTED:

None.

INITIAL CONDITIONS FOR TEST:

IC-11, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 40 Minutes.

At the conclusion of this test, all equipment has been returned to its 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.

A copy of procedure 609.4.001, executed in the plant on April 11, 2000, is attached and was used to evaluate simulator performance.

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

All valve stroke times were within test criteria. All valves were within ~ 2 seconds of those tested in the plant this year.

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] / 7/23/97

APPROVED BY/DATE: R Windsor / 12/15/97

TEST DATE: 07/21/97

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:

Since the procedure was last executed in November 1993, several steps were added to the procedure because of the Minimum Flow Line modification. The modification was installed on the simulator, but simplifications do not permit execution of the following steps in the surveillance:

6.14.6/7.14.6 Relieve test line vacuum by opening V-20-262/V-20-261. These valves are not modeled nor is the response of PIT-RV03A/B to the vacuum condition.

6.12/7.12 Fill Pump Minimum Flow Valve V-20-101/V-20-103 operation under certain conditions. These valves are not modeled.

The System 2 Flow Meter RV-26B on panel 1F/2F was found to stick slightly and was out of calibration. The simulator did not meet the System 2 acceptance criteria for flow based on the observed meter indication. The flow variables however met the acceptance criteria.

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-65, Full Power

INITIAL CONDITIONS FOR TEST:

IC-65, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 90 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, modifications were made to the simulator Core Spray system to include recent plant modifications. As a result of simplifications made in installing the modification on the simulator, several steps in the surveillance cannot be performed on the simulator. These steps are of little training value.

The System 2 Flow Meter on Panel 4F was found to be defective. Since this is a hardware failure only and will be corrected, the test is not considered a failure.

The simulator passed this test.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria. Revision 33 of 610.4.002, issued October 24, 1996, was used for this test.

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

One meter was found to stick and was out of calibration as detailed above. A hardware maintenance request was initiated.

☐ 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] / 10/27/98

TEST DATE: 07/13/1998

APPROVED BY/DATE: R Davidson / 12/7/98

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 and include an additional variable added to the plant procedure.

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.

FINAL TEST CONDITIONS:

Procedure execution time: 60 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] / 7/13/99

TEST DATE: 07/06/1999

APPROVED BY/DATE: R Wamsley / 11/30/99

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 was not attached.

Results:

The procedure was completed satisfactorily.

One meter required replacement during the test.

The plant test procedure states that the Plant Computer Alarms SOE 41 and SOE 42 may or may not come in during the test. On the simulator, the alarms sometimes indicated properly and other times indicated "BAD". The "BAD" indication occurred while the stop valves cycled from 100% to 90% and cleared

several minutes after the valve cycling ended. While the valves cycle, the alarms continually come in and clear.

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-65, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 2 Hours (Including meter repair time).

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:

The 1/2 Stop Valve Selsyn indicator initially did not move when the valve cycled from full to 90% open but responded when the valve operated full stroke. The Selsyn indicator was replaced and the test completed satisfactorily.

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: John Salchow 6/14/00

APPROVED BY/DATE: Adam H. Mosey 9/14/2000

TEST DATE: 06/14/2000

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. Two other switches were found not to operate correctly and were cleaned during the testing period. APRM 6 was re-tested after switch repairs.

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-65, 100% Power.

INITIAL CONDITIONS FOR TEST:

IC-65, 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 March 9, 2000 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, however two switches were repaired during the test. One switch required re-running of APRM 6 testing to complete all aspects of the test. This was done satisfactorily.
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] / 7/26/97

APPROVED BY/DATE: R Wanlson / 12/16/97

TEST DATE: 07/16/97

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 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.

Although all meter indications on Panel 4F were found within the acceptance criteria of the procedure, a hardware maintenance request was initiates to adjust the zero and span of all SRM Count Rate and Period meters on Panel 4F. Two switches each on SRM 23 and 24 drawers were found to operate intermittently. A hardware maintenance request was submitted for these also.

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, 15 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.

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.

A licensed Control Room Operator temporarily assigned to training performed this test with a Simulator Management representative.

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

Hardware maintenance requests to calibrate eight meters and clean four switches were 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: NOT22
14.6.45.13

TITLE: IRM Front Panel Check

PREPARED BY/DATE: [signature] / 10/20/99

APPROVED BY/DATE: R Hamilton / 11/30/99

TEST DATE: 07/07/1999

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:

One field change was made to the procedure to use switch overrides in place of CLFs to simulate the installation of test plugs and jumpers. The CLFs did not bypass the correct relay contacts.

One meter was found to be slightly out of calibration and was corrected.

All alarms and automatic actions occurred as specified in the plant surveillance procedure. The surveillance test was performed with no additional 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: 6 Hours, including meter calibration time.

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:

One field change was made to the procedure as stated above.

IRM 15 meter as found reading was 122.5 in the 125% test. The acceptance criteria is 123 to 127. The meter was adjusted and read properly.

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. 6.45.15.00

TITLE: Diesel Generator Load Test

TEST DATE:10/12/2000

PREPARED BY/DATE: John Sokolowski 10/19/00

APPROVED BY/DATE: Adam H. Casey 10/24/00

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 surveillance procedure is obtained and is marked-up to indicate steps which do not apply to the simulator such as obtaining GSS permission to start, etc.) and steps as completed are signed off. 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 fuel storage tank level.)

This test was run for 60 minutes on each Diesel Generator as required by the surveillance. The plant procedure specifies the 60 minute run time. Diesel one (EDG1) was run under shutdown conditions and the other (EDG2) was run under full power operating conditions; the opposite of the last period's testing.

Five model variables are monitored using CRT Datapool Monitoring:

BDGNST	DG Fuel Oil Tank Level (Gal.)
SDGNRM	DG KW Load from switch gear
TATM	Outside Ambient Air Temperature
BPGNDT(1)	EDG1 fuel tank level
BDGNDT(3)	EDG2 fuel tank level

Results:

The LOA for V-36-19, which is used to refill the EDG's Main fuel oil tank, performed as expected. A Trouble Report (TR) was issued during the last period's test indicated that it did not perform correctly. The problem has been corrected.

No discrepancies in the initial loading of the Diesel Generator outside the acceptance criteria of the surveillance procedure were noted. A TR was written from the last periods test to tune the model. The problem has been corrected.

The tests were completed successfully.

AVAILABLE OPTIONS:

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

OPTIONS TESTED:

Diesel Generator No. 2 test was performed from IC-15, plant at Full Power.

Diesel Generator No. 1 test was performed from IC-79, plant at Shutdown conditions.

INITIAL CONDITIONS FOR TEST:

DG #2: IC-15, Full Power.

DG #1: IC-79, Shutdown.

FINAL TEST CONDITIONS:

Procedure execution time: 3 Hours.

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

The simulator is capable of continued simulation.

The simulator passed this test. A Trouble Report was issued for fuel oil consumption being about 15 to 25 gph low (surveillance step 6.19 "Note" reports the expected fuel oil use for this run at 230 to 240 gph. Our use for both EDG's showed around 215 gph). This is not part of the procedure's acceptance criteria.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The Plant Surveillance Test Procedure contains the applicable acceptance criteria.

The latest procedures, 636.4.003 rev. 61 and 636.4.013 rev. 2, applicable acceptance criteria were used to evaluate the simulator performance.

7.1.1 The diesel generator starts and automatically loads.
7.1.2 Load achieved is greater that 2600 KW for one hour.
7.12.11 The Diesel Generator operates as indicated in the instructions.

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

As noted above, the diesel fuel oil consumption is about 10% low. A TR was written and is scheduled for resolution as a priority 3 action.

The previous testing TR's appear to have correctly resolved the issues found with EDG loading and main fuel storage refill problems.

Six field changes were made during the execution of this Simulator test. All but one were minor changes or additions, the significant change was the addition of an Acceptance Criteria section to correspond to the plants surveillance acceptance criteria. All will be include in the upcoming revision 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: NOT25
14.6.45.16

TITLE: Primary Containment Isolation Valve Operability Test

PREPARED BY/DATE: [signature] / 7/24/97

TEST DATE: 07/21/97

APPROVED BY/DATE: [signature] / 12/15/97

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.

The Tip Purge Valves are logically modeled and have no stroke time. The red light which indicates that the solenoid is energized was used to determine stroke time.

Except as noted above, all steps of procedure 678.4.001 were completed and the results met the procedure acceptance criteria. No annunciators were identified in the procedure. Alarms observed on the simulator were appropriate. The SAR

Printout was not attached since it was not required by the test procedure.

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-65, 100% power, MOL

INITIAL CONDITIONS FOR TEST:

IC-65, Full Power.

FINAL TEST CONDITIONS:

Procedure execution time: 90 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.

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: G J Mary / 10/26/98

TEST DATE: 07/13/1998

APPROVED BY/DATE: R Dawson / 12/7/98

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

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:

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: 60 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.

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] 7/26/99

TEST DATE: 07/22/1999

APPROVED BY/DATE: [signature] 11/30/99

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

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-65, 100% Power.

INITIAL CONDITIONS FOR TEST:

IC-65, 100% Power, MOL, Cycle 15.

FINAL TEST CONDITIONS:

Procedure execution time: 1 Hour

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: NOT29
14.6.45.28

TITLE: Standby Gas Treatment System Test

PREPARED BY/DATE: [signature] / 9/3/97

TEST DATE: 08/05/97

APPROVED BY/DATE: R Davidson / 12/15/97

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. The test was added to the test schedule in 1996 and first performed in August 1997. A copy of plant procedure 651.4.001, Standby Gas Treatment System 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.

Local instrument readings are obtained by reading the following model variables with datapool monitoring:

WSCNSGTA + WSCNSGTB	System Flow (FI-28-9)
TSCN2324	System Temperature (TI-28-8) System 1
TSCN2728	System Temperature (TI-28-8) System 2
PSCNSGA	Up & Downstream HEPA dp (DPS-28-10,12)
PSCNSGB	Up & Downstream HEPA dp (DPS-28-11,13)
PSCN101	RB Vacuum (DPIT-822-1102,1103,1104,1105)

PSCNSGA and PSCNSGB are total train differential pressures. The SCN model does not calculate individual HEPA and Charcoal Filter pressure differentials.

Results:

The selected system DP/HTR FAIL alarm L-1-b (L-4-b) cleared immediately after start of the system. The control room

operator assisting with the test stated that the alarm should not clear until approximately 2 1/2 minutes after the system starts.

The individual HEPA filter pressure differentials are not modeled. A single variable is used for the differential pressure across the inlet HEPA, the Charcoal Filter, and the outlet HEPA filter. The total differential pressure measured therefore exceeds the acceptance criteria in the procedure for a single HEPA filter. This was found acceptable by the test personnel.

All other applicable steps in the procedure were completed satisfactorily.

AVAILABLE OPTIONS:

The surveillance procedure has an optional 10 hour run.

OPTIONS TESTED:

The 10 hour run was not performed on the simulator.

INITIAL CONDITIONS FOR TEST:

IC-65, 100% Power.

FINAL TEST CONDITIONS:

Run time: 2 Hours.

At the conclusion of this test, the system was restored to the pretest condition. The simulator is capable of continued operation.

The simulator passed this test with one new TR issued.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

The plant procedure contains the applicable acceptance criteria. An experienced Control Room Operator assisted in performing the test.

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

The selected system DP/HTR FAIL alarm cleared immediately when the system started. The alarm should not clear until 2 1/2 minutes after system start.

LOA SCN-3 and SCN4, Strip Heater Resets do not function. Since there are no indications in the control room for the heater reset or any change in system parameters, this is insignificant and no TR was issued.

TR 3736 was issued to correct the Heater Failure Alarm by December 2, 1997.

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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] / 12/1/97

TEST DATE: 11/18/97

APPROVED BY/DATE: R Davidson / 12/16/97

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:

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

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and core water level may not have been the same when it was

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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	RRWMIX(2)
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 Steam Flow	RRWMIX(33)
Iso. Cond. B Steam Flow	RRWMIX(36)
Iso. Cond. A Water Flow	RRWMIX(35)
Iso. Cond. B Water Flow	RRWMIX(38)
APRM 1 (% Neutron Flux)	T:XAPRM1
APRM 5 (% Neutron Flux)	T:XAPRM5

Results:

Two field changes were made to the procedure to accommodate modifications made to the plant and the simulator since the last test and to add additional operator actions.

The Reactor Lo Lo Lo Water Level alarm was received at 4 minutes, 32.25 seconds into the event on the simulator while the plant received the alarm at 2 minutes, 52 seconds. This was found to be acceptable.

The overall response of the simulator to this event was excellent.

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, 100% Power.
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: 8 Hours

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.

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 SAR missed a considerable number of alarms during the final run of this test. The SAR printout of an earlier run, when the recirc pump start was not completed properly, was included with the data. A TR was previously written on the SAR.

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. 0.00

TITLE: Reactor Isolation Scram (TAR-008)

PREPARED BY/DATE: [signature] / 11/14/00

TEST DATE: 10/10/2000

APPROVED BY/DATE: Adam H. Meerby / 11/14/00

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.

Test Description (cont'd)

Plant initial conditions were as follows. 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, respectively. Recirculation flow was approximately 15.7E4 gpm.

The turbine-generator was on line at 642 MWe.

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

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 major changes to the Feedwater Control System have been made. Reactor level setdown is failed using a malfunction to approximate the plant response at the time of the event.

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: (Trend Recorder)

Control Valve Position 1-4	RTCSCV(1)-(4)
Bypass Valve Position	RTCSBV(1)-(3)
30 Inch Header Pressure	T:TMSS25

The SAR PCS alarm printout is also attached.

Results:

Five field changes were made to the procedure during Execution. They update the response based on plant and simulator modifications since the last test and revise the drill file for the DFRCS modification. New steps were added to promote and show retention locations. Final changes for gross power adjustment via control rods, the fine adjustment using the recirculation system is not part of the procedure.

In reviewing the SAR, it was noted that the MS FLO HI/AREA TEMP HI HI 1 & 2 alarms were received as the MSIV's closed. This is caused by different closing times for the MSIV's. It was noted that the MSIV CLOSED 1 alarm came in 3.5 seconds before the MSIV CLOSED 2 alarm. This also occurred the last time the test was run.

The SDV failure to close malfunctions did not actuate and the SDV valves closed normally. The conditional actuation of these malfunctions in the drill file is the apparent cause. Since these are passive malfunctions, the conditional statement is not required for the test.

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:

None.

INITIAL CONDITIONS FOR TEST:

Starting from IC-15, Full Power Operation, establish temporary IC-11 as follows.

Remove the RWCU System from service per Plant Procedure 303, Section 5.0.

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: 3 Hours.

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.

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:

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: OES03
14. 8.13. 0.00

TITLE: Rx Scram on M1A Main Transformer Failure (TAR 23)

PREPARED BY/DATE: John Sallakenny / 10/30/2000

TEST DATE: 10/20/2000

APPROVED BY/DATE: Adam H. Dacy / 10/31/2000

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 evaluation of the transient assessment report 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 were reached, there was an automatic actuation of the isolation condensers, an opening of the A and D electromatic relief valves, and 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) comparison plots of simulator data versus plant data were prepared 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

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 to the trip of C and D recirc pumps. Therefore, only the A, B, and E pumps tripped in this test.

The reactor level decrease following the scram was greater than the reference plant data (126" minimum vs. 136" minimum). In the previous test performed in 1996, the simulator level response matched the plant quite closely. The differences can be attributed to installation of the digital feedwater system.

Also noted was a difference in reactor pressure response. During the plant event the isolation condensers were in service for a longer period of time, and the reactor feed pumps were removed from service at 04:30 and 05:30 minutes. The simulation had both pumps tripping at 06:15 minutes. While a longer simulation would lower pressure further, the extra minutes of 3 pumps delivering cold feed water flow could be enough to lower the reactor pressure 100 psig.

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 MWth
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:

No Trouble Reports were issued for 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. 0.00

TITLE: Reactor Scram on Turbine Generator Trip (TAR-011)

PREPARED BY/DATE: John Sabatowski / 11/3/00

TEST DATE: 10/25/2000

APPROVED BY/DATE: Adam H. Tuzzy / 11/06/00

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 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 Monitor's (IRM's), 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 MWth (80%)
Recirc Flow 13.2E4 gpm
Pressure 1020 psig
Level 162 inches
Generation 510 Mwe

Plant Parameter	Simulator Variable
Individual Recirc Flow	T:FIA60A to 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:

Four field changes were made to the procedure. These changes were to update the drill file for DFRCS, correct a monitored variable, reduce the drill period, and account for plant modifications.

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.

The drill file for this test was shortened to delete this portion of the transient from simulation since it appears operator actions can not be duplicated closely enough for simulation purposes.

The initiating events of the scram are modeled and tested. The simulator compared well with the actual event.

AVAILABLE OPTIONS:

None.

OPTIONS TESTED:

None.

INITIAL CONDITIONS FOR TEST:

IC-40.

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

Power Level	1544 MWth (80%)
Recirc flow	13.2E4 gpm
Pressure	1020 psig
Level	162"

Range all eight (8) IRM's to Range 9 at Panel 4F.

FINAL TEST CONDITIONS:

Run Time: 6 Hours

The simulator passed this test for the scram occurring with initial and subsequent actions.

BASELINE DATA USED TO EVALUATE TEST RESULTS:

TAR-OC-011, Reactor Scram on Turbine Generator Trip (November 20, 1985) dated December 20, 1985 and power shape monitoring system historical data were used.

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 the 1996 and 1992 testing. A TR was written, changes were made, and the test was performed again. The second test also yielded inconsistent results. The test drill file was subsequently shortened to include the initiating scram events and alarms. They were verification in 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: OES05
14.8.15

TITLE: Reactor Scram on Neutron Monitoring Sys (TAR-012)

PREPARED BY/DATE: [signature] / 10/26/98

TEST DATE: 11/02/1994

APPROVED BY/DATE: R Davidson / 12/7/98

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 TCS15, 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 was attached.

Results:

One field change was made to the procedure during execution to compensate for modifications 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). 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-41 for the initial conditions.

FINAL TEST CONDITIONS:

Run Time: 60 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.

The results were also compared to the last test performed in November 1994.

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] / 10/22/98

TEST DATE: 09/01/1998

APPROVED BY/DATE: R Davidson / 12/7/98

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 printout was attached.

Results:

One field change was made to the test procedure to account for modification of the Diesel Generator Starting Logic.

Comparison of simulator data to plant data from the March 6, 1986 event and to the previous run of this test on December 6, 1994 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.

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-196 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: 1 Hour.

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 8, 1994.

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. 0.00

TITLE: Reactor Scram on Excessive Feedwater Injection (TAR-015)

PREPARED BY/DATE: John Saladnewicz / 4/8/00

TEST DATE: 11/02/2000

APPROVED BY/DATE: Adam H. Tenney / 11/08/00

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.

Just 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 the Feedwater Heater String outlet valves.

Another operator noticed the "C" Feed Regulating Valve local controller was in the "balance" position. That 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. Another operator was attempting to shut the bypass valve by gaining control of it using 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 alarm 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 and PCS (Plant Computer System) alarm printouts were also attached.

Results:

Major changes were made to the drill file to automate testing on the simulator and to correctly identify monitored variables. The changes removed the need for manual actions by 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 which have since changed due to plant modifications.

The test has the event use a start-up as initial conditions, which provides lower overall heat input and therefore we were unable to achieve a 60F degree cooldown rate. This may have also resulted in the lower final reactor pressures seen in addition to the reason noted below.

The Turbine Trip, IRM Flux Scram, and reactor pressure decrease occurred as expected. Some differences in level response were seen, but feed flow tracked very close to the actual plant event as seen on the traces. Due to limited data the ability to closely duplicate the operator actions in the event lead to the lower reactor pressures. During the scram there was one operator was working the MPR and controlling reactor pressure with one Bypass valve open, Using current plant procedures for setting the EPR and MPR our scenario saw 7 to 9 Bypass valves open and a lower reactor pressure.

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, hot Turbine Shutdown, a test IC was prepared as follows:

Secure turbine warming 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.

Steady or a Cooldown rate of 60F/Hr

Recirculation flow - 11.2E4 gpm (4F)

Reactor Pressure - 900 psig (7F) (Actual Pressure = 904psig)

Reactor Level - Setpoint - 160" (4F)

Feedwater Pump "C" running with reactor level control in automatic (4F, 5F/6F)

These conditions were stored in IC-197 for the test.

FINAL TEST CONDITIONS:

Run Time: 18 Hours

At the conclusion of the test, the reactor is scrammed and the turbine previous taken offline (but with a trip signal received). 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.

Also included are data charts depicting flow and pressure conditions which were used to re-write the automated drill file.

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. 0.00

TITLE: Reactor Scram on Neutron Monitoring System (TAR-017)

PREPARED BY/DATE: John Sollahan / 11/2/00

TEST DATE: 11/01/2000

APPROVED BY/DATE: Adam H. Berry / 11/06/00

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 MWth) 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 pump was started, total 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 a 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.

Test Description (cont'd.)

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 for an operator action and response to account for the Diesel Generator automatic start changes.

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 was higher than the reference data but, similar to the test data taken in 1992. This is attributed to failing the level setdown and to leakage added through the feedwater regulating valves simulated to actual plant conditions.

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 IAW normal Operations Procedure 301.

Activate Malfunction NSS6E, Recirculation Discharge Valve Leakage to 5% severity (20% flow).

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.(Note: Do not start the Recirc Pump - just the 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-19 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.

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] / 10/21/97

TEST DATE: 09/30/97

APPROVED BY/DATE: R Davidson / 12/16/97

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 (FRVs) 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. The Feedwater Regulating Valve handwheels are placed in Manual and opened to achieve runout flow.

2. A and B Pumps are tripped, but "C" Feedwater Regulating is returned to 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.

3. Instrument failures will not cause high feedwater flow with DFRCS.

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

Not all parameter plots were printed.

The SAR was also attached.

□

Results:

Two field changes were made to the test procedure to account for the installation of Digital Feedwater Control and the addition of a time delay in the high pressure trip circuit for Recirc Pumps C & D. While updating the procedure for Digital Feedwater, several instrument failures were tried as a substitute for the original equipment failure. The control system is now designed to detect and compensate for instrument failures and could not be failed in a manner to reproduce the plant transient. Use of an LOA to manually open the feedwater regulating valves was required to initiate the transient.

All alarms and automatic actions identified in the modified procedure activated as expected.

The response to this event changed since the previous test in 1993 due to modifications installed in the plant and the simulator. The reactor water level decreased to 115 in TAF, where the previous minimum level was 135 in TAF. The difference was found acceptable.

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-17.

Remove the "B" Recirculation per Procedure 301 while maintaining reactor power near rated (approximately 1900 MWt).

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: 3 Hours.

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 with 1 new TR issued.

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:

Following the trip of two feedwater pumps, a brief negative feedwater flow spike was noted on the plot of WNSSTKFT. A TR was written and is scheduled for correction by December 1998.

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. 0.00

TITLE: July 17, 1980 Blowdown Transient

PREPARED BY/DATE: John S Wakeman / 11/11/00

APPROVED BY/DATE: Adam H. Mabry / 11/14/00

TEST DATE: 11/10/2000

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. The 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. 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 heat-up 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. (Note: the data collection of 20 years ago was limited) However the data collected shows that level, initially stable at 150 inches (Top of Active Fuel) varied from 186 inches during bypass valve operation to a low of 122 inches (TAF).

During the EMRV operation RBCCW to containment isolated with no LO-LO-LO Level indication. There was no LO-LO-L0/RBCCW isolation time delay.

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 did not develop on the simulator.

Using the Validation Test Program (VTP), comparison plots of simulator data versus plant data provided for the July 17, 1980 blowdown event were prepared for selected parameters.

Test Description (cont'd)
The SAR and PCS alarm printouts are attached.

Results:

The plant data was plotted on the instructor station using the validation test program. The reference plant data plots extend for 7000 seconds of the event. The simulator drill established for this evaluation runs 480 seconds. Therefore, only the initial part of the plant event is evaluated. The simulator plots were compared to the original plant data TDR plots. The reference vs. TDR data plots do not correlate well.

The simulator results compare well with the plant in terms of level response and direction. Feedwater flow, while initially higher on the simulator, reduces to similar levels during the transient. Due to the Digital Feedwater system and no operator actions, simulator flow remains constant. It is hard to develop stable conditions during a start-up. This event occurred at around 8 to 9 percent power. The simulator used 6 to 7 percent as seen on the utility display. The result was more dramatic changes in power, 3% versus 1%, but response and direction are similar. Reactor pressure response is more varied. Initial response causes a EMRV valve to lift, yet reference scram data shows insufficient pressure to make this happen. The TDR Report graphs show an amazing similarity to the simulator data. Both charts clearly show a similar pressure event! The resultant pressure drop after opening is similar though the simulator drops to 990 vs 1004psig. The plant recirculation flow response was considerably more dynamic than the simulator. The reference data report contains charts of the individual pumps, which at best, appear to have only similar movements in size and direction.

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-55, Approach to Critical, the following test conditions were achieved and stored in IC-17 for the test.

Recirculation Flow 5.0E4 gpm

Main Turbine Warm-up in Progress

#2 Vacuum Trip not rest

MPR Setpoint approximately 900 psig

EPR Setpoint approx. 1010 psig

Reactor Heat-up 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.

Reactor Steam flow approx. 0.158E6 lbm/hr (actual .108E6 lbm/hr)

Reactor Pressure 1020 psig

Reactor Power 59 MWt (3%)

FINAL TEST CONDITIONS:

Run Time: 2.5 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.

The response was also compared to the plant computer curves from the original event. These are marginal at best. It is recommended they not be used, and that the charts and curves in Technical Data Report 239 be used in their place.

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. 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. 0.00

TITLE: Generator Runback Scram - December 1995

PREPARED BY/DATE: 11/11/00

TEST DATE: 11/08/2000

APPROVED BY/DATE 4/14/00

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 degrees 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 88 degrees C 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 COOLING 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 recirculation 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

Test Description (cont'd)

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:

Field changes were made to the procedure to add additional comparisons to plant data, record actual simulator response times, and automate the Drill file.

Two alarms received in the plant, Battery Charger A Trip and Cleanup Discharge Press Low were not received on the simulator. The Cleanup alarm in the plant reference data was caused by a badly worn Pressure Control Valve. The valve was later replaced. The reviewers determined that this alarm was not pertinent to this test. The step will be removed from the test.

The Generator Rotor Temperature High alarm was received, but did not clear as expected in the test procedure. This is a Malfunction activated by the Drill file and will remain until cleared. The step will be modified to show that it only actuates. Review of the data shows that some alarms were not on the SAR printout. A Trouble Report was written on the SAR.

The last alarm not received was the Battery Charger A Trip. This alarm is received if the MG set trips during too slow a bus transfer and on Generator Reverse Current Relay (BCT) activating. Neither event occurred. It appears to have been the result of plant conditions and not the transient. The reviewers determined that this was not significant. The step will be removed from the test.

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. This also occurred in the 1996 test.

On pressurization transients such as this, pressure or flux may initiate the scram. The reviewers agreed that the simulator response is acceptable.

Test Description (cont'd)

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 of 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 a Full Power IC, adjustments were made to achieve the following conditions.

Reactor Power:	1927.6MWt
Recirculation Flow:	15.27E4 gpm
Reactor Level:	160 inches

This was then saved as IC-20.

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. 1.00

TITLE: Gould (Encore) Computer Spare Time Test

PREPARED BY/DATE: 11/22/00

TEST DATE: 11/17/2000

APPROVED BY/DATE: Adam H. Heer 11/24/00

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:

Demonstrate that the spare duty cycle meets the contractual requirements as stated in Section 8.3.5 of the Conformed Document.

The RESOURCE program is used to measure the duty cycle each second and print the results via the DUTYLOG tasks. Three separate 15 minute tests are performed, each with multiple events.

The first test is LOCA with Loss of Offsite Power (14.8.8), composite Malfunctions. 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 Malfunctions. 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 Malfunctions. All actions are setup in the system file called DUTYCY3.

Results:

All processors met the acceptance criteria in the procedure.

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 other non-real time tasks active.

FINAL TEST CONDITIONS:

Run Time: 2 Hours

At the conclusion of each test, the simulator must be initialized to clear the malfunctions inserted to stress the simulator. The simulator is capable of continued operation to restore the plant.

Computer usage was as follows.

Test 1	Usage%	Test 2	Usage%	Test 3	Usage%
CPU1	66.3		62.1		68.4
CPU2	28.5		28.7		32.8
IPU1	54.9		56.2		56.3
IPU2	47.9		47.8		48.2
CNode	42.9		42.5		44.5

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:

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: RTT02
14. 6.45. 1.00

TITLE: Simulator Real Time Test

PREPARED BY/DATE: John Sokewicz / 8/28/00

TEST DATE: 08/17/2000

APPROVED BY/DATE: Adam H. Kesey / 9/14/2000

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:

4.2 Transient Operation

4.2.1 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 this standard.

TEST DESCRIPTION:

The purpose of this test is to certify that the simulator continues to run in real-time, even when stressed under transient conditions.

With the simulator initialized to full power, closure of the "E" Recirculation Pump Discharge valve is timed in an unstressed environment. Then 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 during the stroke time of the valve.

The stressed and non-stressed valve stroke times are compared.

The procedure does not require automatic data collection.

Results:

The acceptance criteria is set at 0.25 sec maximum deviation. (This time includes operator reaction in the operation of the stopwatch.)

For year 2000 two tests were run and averaged for both stressed and unstressed timing. The stressed condition recorded times of:
1:57:49s
1:57:59s Average = 1:57:54s
The unstressed condition showed run times of:
1:57:93s Average = 1:57:78s
1:57:63s

For 1999 the times were:
117.5s for the stressed condition
117.7s for the unstressed condition.

As can be seen the simulator variance is within the acceptance criteria and very similar to the previous year.

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 (40 - a 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: 60 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:

None.

O.C. SIMULATOR
TEST PROCEDURE ABSTRACT

PROCEDURE: SSP01
14.5.4

TITLE: 100% Steady-State Accuracy Test

PREPARED BY/DATE: [signature] 10/24/2000

TEST DATE: 10/18/2000

APPROVED BY/DATE: Adam H. Mussey 10/31/00

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 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 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.

The agreement between the PEPSE analysis and simulator performance was very good. Reactor power calculated using the manual method, PSMS, and the simulator all agreed within 0.017%. All energy is accounted for except 0.27%.

The primary system showed a gain of 1.14 lbm mass during the 1 hour test. The sumps and drain tanks decreased 415.3 lbm and transferred 2500 lbm mass to radwaste (which is lost). The mass difference -1.14 - (415.3 + 2500) = 2916.44) is not accounted for. This difference (0.032%) has no impact on training and is considered acceptable.

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.

Several internal turbine enthalpies and flows continue 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: 4 hours total time.

The simulator passed this test.

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.

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

The calculated Reactor Thermal Power displayed on the Instructor Station (SRXSTOTL) was 4 MWt higher than the heat balance and PCS calculations. This was previously identified in TR 3832 and was corrected on October 19, 2000 by correcting

the feedwater Enthalpy calculation.

Several variables continue to exceed the acceptance criteria for the difference between simulator and PEPSE data. These were found to be acceptable.

Seven meters were found to differ from the calculated parameter value by more than 1%. Computer maintenance personnel will check the meter calibration.

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: SSP02
14.5.3

TITLE: 75% Steady-State Accuracy Test

PREPARED BY/DATE: [signature] 10/25/2000

TEST DATE: 10/13/2000

APPROVED BY/DATE: Adam H Heezy / 10/31/00

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)DRIFTFILPWR. 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:

Reactor Power was set to 1447.5MWt which compares with the PEPSE benchmark power.

All energy is accounted for except 0.14%. The energy into the condenser differs from the heat removed by circ water by more than 1%.(actual difference -1.02%).

The stability of the simulator was excellent.

The simulator hung once during the test after running for 1 hour and 32 minutes. The computers were rebooted and the section of the test was restarted. Sim Hung events were previously identified in TR 3801 which is under investigation.

The Primary System showed a gain of 8.51 lbm during the 1 hour test. In addition, the sumps and drain tanks increased 966 lbm and transferred 1250 lbm to radwaste (which is lost). The mass increase 8.0+(966+1250) = 2224 is not accounted for. This difference (0.024%) has no impact on training and is considered acceptable.

The manual heat balance Methods 1 and 2 using simulator panel instruments for data, PEPSE, and the stimulated Plant Process computer, agreed within 0.157% at this power level. Reactor Power calculated by the simulator model, SRXSTOTL, a parameter visible to the instructor only, differed from the PCS and hand calculations by approximately 4 MWt (0.275%). This difference did not appear in the previous tests. A Priority 1 TR was written to correct the error.

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.

A drift test was also performed in this procedure using and automatic data collection and evaluation program. All parameters met the acceptance criteria for drift.

Several turbine and feedwater heater flows and enthalpies differ significantly from the expected values. Since many are minor flows and most of the parameters are not observable by the operator, they were found to be acceptable.

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	163.5 in. TAF
Circ. Water Temp.	60 F
Recirc Flow	98,5000 gpm

Reactor level in the PEPSE calculations was 160 in TAF. The IC was established by setting the Master Feedwater Controller at 163.5 inches which is the current level setpoint used in the plant.

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: 6.5 Hours.

The simulator passed this test with 1 new TR issued and subsequently cleared.

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:

The simulator hung once during the test after running for 1 hour and 32 minutes. The computers were rebooted and the section of the test was restarted. Sim Hung events were previously identified in TR 3801 which is under investigation.

Reactor Power calculated by the simulator model, SRXSTOTL, a parameter visible to the instructor only, differed from the PCS and hand calculations by approximately 4 MWt (0.275%). TR 3832, Priority 1, was written to correct the error. TR 3832 was cleared on October 19, 2000 by correcting the calculation of Feedwater Enthalpy from saturated conditions to compressed liquid conditions.

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.

Four control panel meters were found to differ from the calculated parameter value by more than 1%. Computer maintenance personnel will check the meter calibrations.

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. 0.00

TITLE: 39% Steady-State Accuracy Test

PREPARED BY/DATE: [signature] / 11/21/00

TEST DATE: 10/24/2000

APPROVED BY/DATE: [signature] / 4/29/00

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 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 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%. However, the Second Stage Reheaters are not in service.

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 (OCS.OPS)OCSDRIFTCD. 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:

With one exception, the monitored parameters were stable, well within the required +/- 2% or 10%, as applicable. The second stage reheater drain tank enthalpy drifted down during the test. Since the reheaters are out of service for this test, ambient heat loss from is the cause. This is not considered a failure.

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.

Reactor level and masses were well within the 1% limits over the 60 minute run period.

Results (cont'd)

The energy into the condenser differed from the heat removed by circulating water by more than 1% (actual difference -2.38%) over the 60 minute run time.

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-40 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: 3.5 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%. Seven Turbine drains have flows and enthalpies greater than the 5% allowed. These drains have no effect on operational parameters. The reason for this appears to be the use of a more refined calculation in the simulator than in the PEPSE analysis. The differences have no impact on training. The variables for Drywell and Torus Pressure were beyond the expected PEPSE readings. They could have been more closely set to the Pepse value in the initial adjustments. However, they varied by less than 0.2% during the test period. Overall there were less points out of specification than when this test was run in 1999.

Main Steam Flow and three Recirculation Flow meter instruments were found to exceed the allowable error of +/- 1%. Computer maintenance personnel will check the meters.

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

None