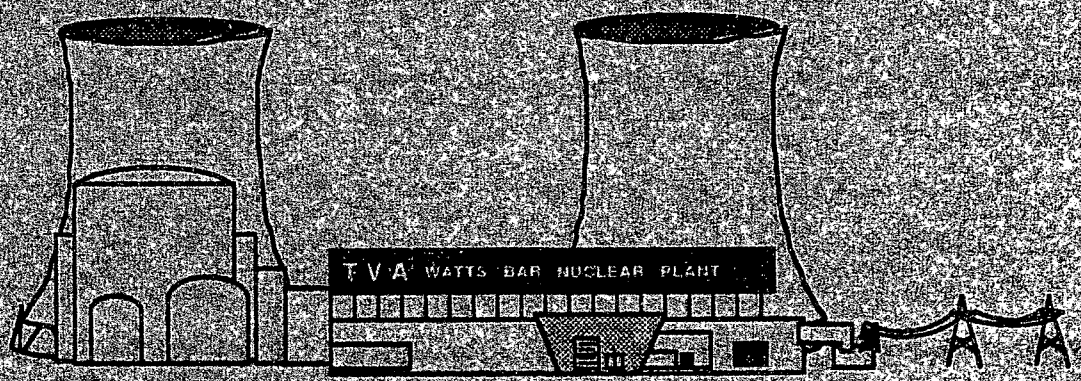
ENCLOSURE

50-390
9103120430
3/7/91

Watts Bar

Training Department



Initial Simulator Certification

9103120431 910307
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Docket # 50-390
Accession # 9103120430
Date 3/7/91 of Ltr
Regulatory Docket File

TABLE OF CONTENTS

1	NRC Form 474
2	General Overview
3	Exception Details
4	Transient Test Overview
5	Transient Test 1
6	Transient Test 2
7	Transient Test 3
8	Transient Test 4
9	Transient Test 5
10	Transient Test 6
11	Transient Test 7
12	Transient Test 8
13	Transient Test 9
14	Transient Test 10
15	Steady State Overview
16	100% Steady State Test
17	75% Steady State Test
18	50% Steady State Test
19	Steady State Drift Test
20	Procedures Test Overview
21	General Operating Instructions (1)
22	General Operating Instructions (2)
23	Emergency Operating Instructions
24	Abnormal Operating Instructions
25	Malfunction Testing
26	Test Schedule

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

U.S. NUCLEAR REGULATORY COMMISSION

SIMULATION FACILITY CERTIFICATION

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

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

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

FACILITY: Watts Bar Nuclear Plant Unit 1

DOCKET NUMBER: 50- 390

LICENSEE: Tennessee Valley Authority

DATE: 02/06/91

This is to certify that:

1. The above named facility licensee is using a simulation facility consisting solely of a plant-referenced simulator that meets the requirements of 10 CFR 55.45.
2. Documentation is available for NRC review in accordance with 10 CFR 55.45(b).
3. This simulation facility meets the guidance contained in ANSI/ANS 3.5, 1985, as endorsed by NRC Regulatory Guide 1.149.

If there are any exceptions to the certification of this item, check here [X] and describe fully on additional pages as necessary.

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

Watts Bar Nuclear Plant Simulator - Spring City, TN

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

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

See Attached at Tabs 4 through 25

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

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

See Attached at Tab 26

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

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

Initial Certification, not applicable

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

Initial Certification, not applicable

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: Nicholas C Kazanas

TITLE: Vice President, Operations Services

DATE: 02/06/91

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

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

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

SIMULATOR INFORMATION

A. General

The Watts Bar Nuclear Plant Unit 1 simulator is owned, operated, and maintained by TVA at the plant site. It is a Singer-Link Miles supplied, full-scope simulation of the Westinghouse 4-loop PWR being built there by TVA. The simulation facility, completed in May of 1988, features state-of-the-art reactor core and thermal-hydraulics modeling and a powerful, yet easy to use, instructor control station.

Initial certification testing was completed in January 1991, and the results are included here. The Watts Bar Simulator Services Staff used corporate Nuclear Training simulator certification test instructions (draft) to obtain the test data summarized in this submittal.

B. Physical Fidelity

The following items are maintained equivalent to or better than the certified conditions by periodic checks using procedures tests, photo comparisons, malfunction tests, student/instructor feedback and plant design change reviews:

- Control Room Physical Arrangement the simulator room layout was determined by actual measurements of plant control room layout. All simulated equipment is arranged so that the operator must walk or look in the same direction and with the same obstructions in the simulator room as in the plant control room.

- Panels/Equipment: the simulated panels and functionally or visually simulated equipment have been determined adequate to the extent necessary to perform the reference plant evolutions used in training and examinations.

- Simulator Control Room Environment: the simulator provides similar lighting, flooring, control room equipment sounds and annunciator alarm sounds by using equipment that is similar or identical to plant equipment. Annunciator horns and chimes, the process computer, and emergency response facility computers are identical to the plant equipment. No outside control room sounds are provided since no operator cues to plant conditions are determined by outside sounds.

A detailed photo comparison was done in December 1990. This involved taking close-up photos of the plant and comparing them to the simulator. This comparison provided a listing of any differences in location, labels, colors, etc. Each difference was evaluated by the simulator hardware engineer and operations training. There are no major differences in dimensions and arrangement of panels or equipment.

- Exception Summary: As a result of the above Physical Fidelity reviews, differences between the plant and the simulator were itemized. Evaluation of these differences against the ANSI 3.5 criteria resulted in the identification of twelve hardware exceptions. These exceptions are detailed at Tab 3 and are summarized below:

  1. Some recorders used in the plant are now obsolete. The newer simulator recorders closely match them and all indications are the same to the trainee.

  2. Some minor location differences exist due to differences in structural supports and panels that are not fully simulated. These differences do not cause the operator to take different actions than in the plant and he must still go to the same general location.

  3. Overhead lighting is similar to the plant but is not identical in operation during loss of power events. After a loss of offsite power, the simulator room A.C. lights do not return to power in the same configuration that would occur at the plant. This is because the existing simulator room lighting circuit does not duplicate the Standby Lighting array in the plant control room. The instructor does have the capability of operating the simulator room lights manually, if necessary. The simulator room D.C. lighting functions in the same manner as in the plant control room.

  Each of these detailed exceptions has been determined to have minimal impact on training.

C. Functional Fidelity

The simulator is designed to allow operation of all systems controlled from the plant control room during the use of normal, abnormal, or emergency plant instructions including the back-up control room panel, back-up diesel generator panel, and local auxiliary feedwater valve panels. When a system is normally operated by control manipulations from the plant control room, that capability exists on the simulator and produces similar integrated plant responses and indications. When a component is normally operated from outside the plant control room but requires operator direction, a remote function for local operator action (LOA) is available to the instructor. The periodic procedures tests verify that enough LOA's exist to allow performance of significant plant evolutions. Each LOA provides an appropriate integrated plant response. The operator communicates with the instructor in a manner similar to the reference plant, i.e., through the radio, telephone and paging systems.

The Watts Bar Simulator was tested for functional fidelity in four major categories:

1. computer real time
2. steady state and normal operations
3. transient performance
4. malfunction performance

There are no open discrepancies and no exceptions identified as a result of these performance tests. Abstracts or summaries are provided for each at Tabs 4 through 25. All test data collected will be maintained at the simulator site to satisfy the requirements of 10CFR55.45 (b) (5) (iii).

The Watts Bar plant-referenced simulator operates with the Singer-Link designed S3 software and all code is executed through control of the Real-Time Executives (RTEXEC). This executive allows a calculated maximum execution time for each software module and checks that limit 12 times each second. If any module exceeds its execution time in that 1/12 sec. or "frame", then a check flag is set. If, in the next frame, this occurs again, then RTEXEC will stop the simulator and alarm to the instructor that an overtime condition has occurred. If timing is normal, the check flag is cleared. A message is also stored so that software engineers can identify which module caused that overtime condition.

This RTEXEC control is sufficient to insure that simulation is always in real-time. We have also used a simple stop watch to verify timing. This check verified that all systems were in fact operating in real-time. Watts bar will generally rely on the RTEXECs to insure continued real-time.

D. Problem Reporting and Configuration Control

In accordance with Appendix A of ANSI 3.5 1985, administrative procedures exist, (draft) for the handling of reported simulator discrepancies and for the tracking of design changes in the reference plant that have not been incorporated into the simulator.

Instructors, students, and simulator maintenance personnel are encouraged to question the behavior and appearance of the simulator compared to the reference plant. When a suspected simulator problem is identified, a Problem Report is completed on a standard form and submitted to Simulator Services. The Problem Report process is used to document the course of investigation, corrective action, and post maintenance testing required to resolve a simulator problem.

Changes to the design of the reference plant are reviewed as they occur. If the changes affect the simulator, then another standard form, called a Simulator Design Change Request, is prepared and approved to authorize changes to the simulator. Simulator design changes are implemented through approved Work Plans which provide detailed work instructions and specify the requirements for post modification testing and for the updating of simulator design documents. Both the Problem Report and Simulator Design Change Request processes utilize electronic databases for the tracking and scheduling of work.

The Operations Training Group reviews industry events and LERs and determines if simulator training is applicable. If it is determined that simulator training is appropriate and that the present configuration or performance of the simulator will not support the training objective, then the Operations Training Group will request that modifications be made to the simulator. To date, none of the industry events and LERs reviewed by the Operations Training Group have required modification of the simulator.

E. Instructor Interface

The WBN simulator works with the state-of-the-art Third Generation Instructor Station (TGIS) revision that supports the Singer-Link Miles Advanced Man Machine Interface (AMMI). All functions are available from menus activated by touch-screens, mouse, or expert commands. There are 81 initial condition (IC) storage locations with 20 password protected initial conditions available. These protected ICs are changed only through administrative controls requiring operator training and simulator engineering approval.

There are approximately 210 malfunctions and 400 remote functions available with variable rates when required. The capability exists to add or modify malfunctions as required.

Additional features exist for the instructor to display, trend, or obtain a hardcopy of any calculated variable used in the simulation models. Forty variables can be collected up to 0.25 second resolution.

F. Simulation Limits

The computer power and industry experience available to simulators now allows a very large scope of simulation for a reasonable cost. Because of this, the Watts Bar model has Singer-Link's state-of-the-art advanced core and thermal-hydraulics simulation along with very detailed systems coding. These facts make fewer simulation limits necessary than in the past. However, the following limits have been imposed on the Watts Bar simulator and each initiates an alarm message and automatically stops the simulation:

1. containment pressure exceeds design
2. fuel clad temperatures exceed clad melt point
3. turbine extraction lines flooded
4. turbine shaft seized

Each of these limits were established during the purchase and design of the simulator. Others may be added as needed.

G. Qualifications of Certification Team

The Watts Bar Simulator Services Section led the effort to prepare this certification submittal. This staff is composed of:

1 Section Manager

1 Software Engineer

1 Hardware Engineer

1 Configuration Management and Validation Engineer

3 Senior Instrument Mechanics

Data collection was primarily done by the Manager, Steve Michael, and the Configuration Engineer, Dale Kaulitz. In some instances, simulator training instructors helped with data collection and each person was a qualified RO or SRO at the Watts Bar and/or Sequoyah plant.

All data was reviewed by both the Simulator Services Section and the Operator Training Section for best estimate performance and for training impact. The following describes the qualifications of the individuals who principally prepared and reviewed this package:

Steve M. Michael, Simulator Manager

Mr. Michael has 14 years in the TVA nuclear program. This includes operations experience at each of TVA's nuclear plants with SRO certification at Bellefonte and Watts Bar and SRO simulator instructor experience at Bellefonte, Sequoyah and Watts Bar. Mr. Michael has a B.S. Degree in Physics.

Dale Kaulitz, Configuration and Validation Engineer

Mr. Kaulitz has approximately 11 years of experience in the nuclear power industry including five years of preoperational testing, one year of mechanical surveillance testing, one year of STA training, one year of SRO license training and two years of shift operations experience in the STA position. Mr. Kaulitz possesses a B. S. in Mechanical Engineering and holds a PE License.

Floyd Flynn, SRO Simulator Instructor

Mr. Flynn has 30 years in the nuclear industry and nine years with TVA as an SRO simulator instructor at Sequoyah and Watts Bar and Shift Operations Advisor at Sequoyah. Experience includes RO, SRO on the N.S. Savannah, SRO at the BONUS plant in Puerto Rico, SRO's at Palisades, D. C. Cook and Watts Bar. Mr. Flynn has a B. S. in Mechanical Engineering with a PE License.

J. Mike Earles, SRO Simulator Instructor

Mr. Earles has 13 years in the TVA nuclear program. This includes operations experience at Sequoyah and Watts Bar with an SRO at Watts Bar. Mr. Earles has worked as a SRO simulator instructor at Watts Bar for five years, part of which includes instructing on the Sequoyah simulator.

J. Fletcher Gibbs, TVA Corporate Simulator Programs Manager

Mr. Gibbs has over 10 years in the TVA simulator department and has worked as software engineer on all of TVA's simulators. He was responsible for specification development for the purchase of the Watts Bar plant-referenced simulator. Mr. Gibbs holds a M.S. in Nuclear Engineering and is involved in development of new computer systems for TVA's simulator programs.

William W. Thompson, Watts Bar Site Training Manager

Mr. Thompson has over 10 years of nuclear power experience and holds a B.S. in Nuclear Engineering. Related work experience includes assignments as a simulator engineer, simulator instructor, and Operations Training Manager. Previous qualifications include NRC SRO certification (B&W) and Navy Engineering Officer of the watch.

Qualification of Reviewers

The following describes the qualifications of the individuals who prepared and reviewed the transient descriptions for use in evaluating simulator performance.

Robert H. Bryan, Reviewer

Mr. Bryan has 17 years experience in the analysis of nuclear power plant accidents. This experience has focused both on reactor coolant system response as well as the containment response for both BWRs and PWRs. In positions held by Mr. Bryan, he has been responsible for the evaluation, review, and approval of the FSAR sections related to accident analysis for SQN and WBN. Specific accident analyses for which Mr. Bryan has been involved include the BIT removal at SQN and WBN, UHI removal at WBN and SQN, ECCS analyses at WBN and SQN. Mr. Bryan is also a member of the NSAC committee on Safety Analysis.

Mr. Bryan is currently the Manager of Nuclear Steam Supply Systems and Analysis in TVA Corporate Engineering in Knoxville.

Randall M. DeVault, Reviewer

Mr. DeVault has over 10 years of nuclear power plant experience primarily in the areas of design basis and beyond design basis analyses and their effects on equipment. Mr. DeVault has extensive experience in PWR accident analysis based on several years of work on Sequoyah and Watts Bar. Mr. DeVault is a recognized industry expert on the ice condenser containment.

Randall M. DeVault, Reviewer (Continued)

Mr. DeVault is currently a member of the Nuclear Steam Supply Systems and Analysis section in TVA Corporate Engineering in Knoxville.

K. D. Keith, Preparer

Mr. Keith has 12 years experience in the analysis of nuclear power plant accidents. This experience has focused on the response of the reactor coolant system for BWRs and PWRS for both design basis events and beyond design basis events. Mr. Keith is currently the Safety Analysis section manager in TVA Engineering and is responsible for WBN Chapter 15 analyses. Mr. Keith has served on industry committees related to ATWS, specifically analysis related issues.

John A. Vogel, Reviewer

Mr. Vogel has more than 30 years experience in the nuclear fluid systems at Westinghouse and TVA. Mr. Vogel's experience includes the fluid systems design for the Watts Bar and Sequoyah Nuclear Plants. Mr. Vogel is currently a staff specialist in TVA Engineering supporting both Watts Bar and Sequoyah as needed.

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-1
Date: 1/10/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: VARIOUS

Description of Exception: Recorders XR-57-107, FR-6-107, FR-27-98 and TR-27-99 are different than those installed at plant. Plant recorders are Model GE 520 recorders, Simulator is Model TRACOR S4E2. GE recorder is obsolete and therefore cannot be purchased.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: No negative impact to training and examinations. The same information is displayed and recorder face front similar in layout and color.

(*NOTE: Impact on certification and training must be justified.)

Approved: _____ 1/28/91
Manager, Simulator Services (Site) Date

Concurrence: _____ 1/28/91
Mananger, Operator Training (Site) Date

Concurrence: _____ 1/30/91
Mananger, Simulator Services (NT) Date

Closure Date: _____ Transferred to SDCR - _____ SPR- ___

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-2
Date: 1/10/91	Transferred from SDCR-N/A SPR-N/A	
IC #: N/A	Malfunction #: N/A	Panel #: VARIOUS

Description of Exception: Recorders P/TR-2-2, LR-2-12, FR-2-35, 1-TR-70-161, and 2-TR-70-161 are different than those installed at plant. Plant recorders are Model GE 520 recorders, Simulator is Model TRACOR D4E2. GE recorder is obsolete and therefore cannot be purchased.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: No negative impact on training and examinations. The same information is displayed on the recorder and face front simular in layout an color.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve Michael 1/28/91
Manager, Simulator Services (Site) Date

Concurrence: Lloyd E. Flynn 1/28/91
Mananger, Operator Training (Site) Date

Concurrence: J. Mather Catch 1/30/91
Mananger, Simulator Services (NT) Date

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-3
Date: 1/10/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: VARIOUS

Description of Exception: The following list of recorders are different than those installed at plant. Plant recorders are Model FOXBORO M64 recorders, Simulator is Model FOXBORO E20S. FOXBORO M64 recorder is obsolete and therefore cannot be purchased.

RECORDERS: PR-68-340, TR-68-2A, TR-68-2B, FR-62-23, FR-62-24, FR-62-49, FR-62-50
FR-62-139, TR-72-31, TR-72-6

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: No Negative impact to training and examinations. The same information is displayed on recorder. Recorder face front is simular to plant recorder.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve Michael
Manager, Simulator Services (Site) — Date 1/28/91

Concurrence: Lloyd E. Hyman
Mananger, Operator Training (Site) — Date 1/28/91

Concurrence: J. Kitchen
Mananger, Simulator Services (NT) — Date 1/30/91

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) — Date

Closure Concurrence: _____
Manager, Simulator Training (Site) — Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY	Report No. ER-4
Date: 1/10/91	Transferred from SDCR-N/A SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: VARIOUS

Description of Exception: The following list of recorders are different than those installed at plant. Plant recorders are Model L&N M recorders, Simulator is Model L&N 100. L&N M recorder is obsolete and therefore cannot be purchased.

RECORDERS: 0-RR-90-102, 133, 101, 132, 118, 122, 134, 123, 125, 126, 225, 12A
1-RR-90-170, 120, 100, 112, 119, 106, 104
VR-3-63A/B, 77A/B
XR-47-151

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: No negative impact on training and examinations. Recorders display the same information as plants recorders with only a difference in face front apperance.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve Michael 1/28/91
Manager, Simulator Services (Site) Date

Concurrence: Lloyd E Flynn 1/28/91
Mananger, Operator Training (Site) Date

Concurrence: J. Fletcher [illegible] 1/30/91
Mananger, Simulator Services (NT) Date

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-5
Date: 1/12/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: M-11

Description of Exception: Only half of panel is simulated. Also VI-45-25, XI-46-23, 46, and XX-46-63A/B are mounted on side of panel on simulator. Mounted on second half of panel at plant.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: These items have little training value and no exam value. They are available though and are functionally simulated if the need arises. All information displayed at the plant is also displayed on identical equipment but equipment is located on side of panel instead of front.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve M. Michael
Manager, Simulator Services (Site) 1/28/91 Date

Concurrence: Lloyd E Flynn
Manager, Operator Training (Site) 1/28/91 Date

Concurrence: J. Hutchinson
Mananger, Simulator Services (NT) 1/30/91 Date

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-6
Date: 1/10/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: M-30,-23

Description of Exception: No camera equipment mounted at top of panels at plant.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: Camera equipment is located outside of horseshoe and is high enough to be of no impact to operator vision.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve Michael — Manager, Simulator Services (Site) — 1/28/91 Date

Concurrence: Lloyd E Flynn — Manager, Operator Training (Site) — 1/28/91 Date

Concurrence: J. Fletcher — Manager, Simulator Services (NT) — 1/30/91 Date

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-7
Date: 1/10/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: L-10

Description of Exception: Controllers LIC-3-148, -150, -164, -171 are installed on side of panel. At plant controllers are installed on panels L-11A and L-11B.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: Limited floor space forces this location and no negative training occurs. Operation of these controllers is generally just to verify (in automatic). To actually control level with these controllers the operator will take identical action as in the plant but must role play that he does not have <u>both</u> A and B train control side by side.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve Michael
Manager, Simulator Services (Site) 1/28/91 Date

Concurrence: Lloyd E Thyer
Manager, Operator Training (Site) 1/28/91 Date

Concurrence: J. Hutchison
Manager, Simulator Services (NT) 1/30/91 Date

Closure Date: _____ Transferred to SDCR - _____ SPR- ___

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-8
Date: 1/10/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: M-15

Description of Exception: Recoder LR-77-134 different in apperance than plant recoder. Plant has Robershall recorder and simulator has Fairchild. Both display the same information.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: Since same information is displayed on each recorder and difference is only in apperance of recorder, there is no impact on training or examination.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve M. Michael
Manager, Simulator Services (Site) — Date 1/28/91

Concurrence: Lloyd E Ilyn
Mananger, Operator Training (Site) — Date 1/28/91

Concurrence: J. Fletcher Cox
Mananger, Simulator Services (NT) — Date 1/30/91

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) — Date

Closure Concurrence: _____
Manager, Simulator Training (Site) — Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-9
Date: 1/10/91	Transferred from SDCR-N/A SPR-N/A	
IC #: N/A	Malfunction #: N/A	Panel #: M-27B

Description of Exception: Switches 0-HS-13-204 and 205 located in different location on simulator than plant. Switches located on different area of panel at plant. This portion of panel is not included on the simulator.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: Since location is in same general area and requires operator to walk to same general location as plant it is not prudent to add additional panel space. Training and exams are not impacted by this exception.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve M. Michael 1/28/91
Manager, Simulator Services (Site) Date

Concurrence: Lloyd E Flynn 1/28/91
Mananger, Operator Training (Site) Date

Concurrence: J. Fletcher [illegible] 1/30/91
Mananger, Simulator Services (NT) Date

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-10
Date: 1/10/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: M-30

Description of Exception: Pushbuttons on XA-55-30 different in apperance than thoses installed at plant. Plant pushbuttons are colored white. Simulator pushbuttons are colored black.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: Pushbuttons color on this equipment is not a visial device used to operate this equipment. Therefore the difference in color is not a impact to training.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve M. Michael — Manager, Simulator Services (Site) — 1/28/91 Date

Concurrence: Lloyd E Flynn — Mananger, Operator Training (Site) — 1/28/91 Date

Concurrence: J. Fletcher Orth — Mananger, Simulator Services (NT) — 1/30/91 Date

Closure Date: _____ Transferred to SDCR - ____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-11
Date: 1/10/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: M-8

Description of Exception: The following equipment is different in apperance than plant installed equipment. Same information is displayed on both plant and simulator equipment. See attached list for differences.

XX-47-121,131,141,151,161,166

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/91 End Date

Exception Justification: Differences in plant and simulator equipment is only in apperance and not in function. Therefore this exception has no negative impact on training.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve M. Mackel — Manager, Simulator Services (Site) — 2/5/91 Date

Concurrence: Floyd E Flynn — Mananger, Operator Training (Site) — 2/1/91 Date

Concurrence: J. Hilton (NT) — Mananger, Simulator Services (NT) — 2/5/91 Date

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

Execption Report 11

M-8	XX-47-121	LETTER SIZE ON DRAWER IS DIFFERENT
M-8	XX-47-121	SWITCH HANDLE DIFFERENT
M-8	XX-47-121	POWER LIGHT DIFFERENT
M-8	XX-47-121	NO WESTINGHOUSE INFO AT BOTTOM OF DRAWER
M-8	XX-47-131	LETTER SIZE ON DRAWER IS DIFFERENT
M-8	XX-47-131	SWITCH HANDLE DIFFERENT
M-8	XX-47-131	POWER LIGHT DIFFERENT
M-8	XX-47-131	NO WESTINGHOUSE INFO AT BOTTOM OF DRAWER
M-8	XX-47-141	NO WESTINGHOUSE INFO AT BOTTOM OF DRAWER
M-8	XX-47-141	POWER LIGHT DIFFERENT
M-8	XX-47-141	LETTER SIZE ON DRAWER IS DIFFERENT
M-8	XX-47-151	LETTER SIZE ON DRAWER IS DIFFERENT
M-8	XX-47-151	POWER LIGHT DIFFERENT
M-8	XX-47-151	NO WESTINGHOUSE INFO AT BOTTOM OF DRAWER
M-8	XX-47-161	DRAWER LETTERING SIZE DIFFERENT
M-8	XX-47-161	ALARM LIGHTS RED AT PLANT
M-8	XX-47-161	POWER LIGHT APPEARS DIFFERENT
M-8	XX-47-161	NO WESTINGHOUSE INFO AT BOTTOM OF DRAWER
M-8	XX-47-166	'GOVERNOR END' LETTERING TOO SMALL
M-8	XX-47-166	'GENERATOR END' LETTERING TOO SMALL
M-8	XX-47-166	POWER LIGHT APPEARS WHITE IN PHOTO
M-8	XX-47-166	NO WESTINGHOUSE INFO ON BOTTOM OF DRAWER

EXCEPTION REPORT
NT-3.02, Attachment 7
Appendix H

Originator: W.G. BOEGLY		Report No. ER-12
Date: 2/22/91	Transferred from SDCR-N/A	SPR-N/A
IC #: N/A	Malfunction #: N/A	Panel #: Various

Description of Exception: Simulator does not have the standby lighting installed as in the plant Control Room. The simulator overhead lights provide similar intensity but the flash off then on is not automatic when a loss of offsite power malfunction is used.

ANSI/ANS - 3.5 - 1985 - Reference

Exception Report Time Period: Start Date 1/1/90 End Date 1/2/90

Exception Justification: Addition of standby lighting in the simulator control room is not economically justified for the increase in simulator fidelity. To prevent impact to simulator training during a loss of offsite power simulator lighting will remain lit. Simulator instructors are able to turn off (or lower) simulator lighting manually. Problem Report #233 was used to evaluate training impact and there is no negative impact.

(*NOTE: Impact on certification and training must be justified.)

Approved: Steve M. Michal — Manager, Simulator Services (Site) — Date 2/5/91

Concurrence: Floyd E Flynn — Manager, Operator Training (Site) — Date 2/1/91

Concurrence: J. Hilton Cobb — Mananger, Simulator Services (NT) — Date 2/5/91

Closure Date: _____ Transferred to SDCR - _____ SPR- ____

Closure Approval: _____
Manager, Simulator Services (Site) Date

Closure Concurrence: _____
Manager, Simulator Training (Site) Date

TRANSIENT PERFORMANCE TESTS

The following ten abstracts summarize the simulated plant transient tests used to fulfill the requirements of ANSI 3.5 1985, Part 4.2.1 and Appendix B.2.

Prior to running the transient tests, a general qualitative description of expected plant response to the transients was developed by the Watts Bar Safety Analysis Engineering Group. This group of engineers is not trained on or otherwise familiar with this simulator and is, therefore, not biased by simulator experience.

The transient tests were then performed and data collected in accordance with the requirements of the standard. Plots of the appropriate plant parameters as a function of time were reviewed by simulator staff engineers and Operations Training Group simulator instructors. The reviewers compared the measured results against their own expectations and against the transient descriptions obtained from the Safety Analysis Engineering Group. It was concluded that the simulator modeled each of the required transients in an acceptable manner. Affected plant parameters were found to change in the correct direction and magnitude and were consistent with physical laws. During performance of the transient tests, the major anticipated alarms and automatic actions were observed to occur appropriately.

Transient performance data will be collected from the reference plant (when it becomes operational) and will replace the qualitative baseline data used in this initial certification.

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #1

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: _____ Date: 1/28/91

Reviewed By: _____ Date: 1/28/91

Approved By: _____ Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to a manual reactor trip. Malfunction #RP05A "manual reator trip signal" was used to initiate this test.

1.2 ANS 3.5 Reference: Section 3.1.2, 4.2, and Appendix A3.3 and B2.2.1.

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Start from IC #10 100% power, BOL, equilibrium.

3.2 Test Duration and Final Condition: 60 minutes duration, final condition was approaching equilibrium RCS pressure and level and normal zero power SG levels and pressure.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1 (19 total parameters). Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time. Test data and the best-estimate analysis were compared by simulator instructors and simulator engineers.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: None

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #2

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kanitz Date: 1/28/91

Reviewed By: Lloyd E. Flynn Date: 1/20/91

Approved By: Steve M. Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to a simultaneous trip of all feedwater pumps. FW05A & B, FW06, FW07A & B malfunctions were inserted to stop all normal and auxiliary feedwater.

1.2 ANS 3.5 Reference: Sections 3.1.2, 4.2, and Appendix A3.3 and B2.2.2.

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from IC #10 100% power, BOL, equilibrium

3.2 Test Duration and Final Condition: 60 minutes duration, final condition was RCS stable but SG level decreasing proportional to steam required to remove decay heat. Steam generators were near 15% wide range level.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: None

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #3

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kanuff Date: 1/28/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve M Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to simultaneous closure of all MSIV's (manual closure from control board handswitches).

1.2 ANS 3.5 Reference: Sections 3.1.2, 4.2, and Appendix A3.3 and B2.2.3.

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from IC #10 100% power, BOL, equilibrium

3.2 Test Duration and Final Condition: 60 minutes duration, final condition was stable with RCS temperature and SG pressure slightly higher due to the SG PORV relief valve setpoint being higher than normal steam dump system setpoint.

3.3 Data Collection Description

3.3.1 Sample Rate: Two sample/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: None

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #4

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kanuckel Date: 1/28/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve M Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to simultaneous trip of all Reactor Coolant Pumps. Inserted malfunctions RCO2A, B, C, D to initiate this test.

1.2 ANS 3.5 Reference: Section 3.1.2, 4.2, and Appendix A3.3 and B2.2.1.

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from IC #10 100% power, BOL, equilibrium.

3.2 Test Duration and Final Condition: 60 minutes duration, final condition: Pressurizer pressure above normal because pressurizer sprays are not available, pressurizer level returning to normal, natural circulation established and steam generator pressures on a slow decrease.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: None

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #5

Procedure Title: Certifying Simulator - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kanitz Date: 1/28/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve M. Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to a trip of the Loop #2 Reactor Coolant Pump (RCP)

1.2 ANS 3.5 Reference: Section 3.1.2, 4.2, and Appendix A3.3 and B2.2.5.

2.0 Available and Tested Options

2.1 Description of Available Options: Malfunction RCO2 was used. This malfunction allows the tripping of any of the four (RCPs).

2.2 Description of Options Tested: Pump #2 was selected since this is the loop with the pressurizer surge line.

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from IC #10 100% power, BOL, equilibrium.

3.2 Test Duration and Final Condition: 60 minutes duration, final condition was stable with #2 SG pressure slightly less than other loops due to reverse flow in the affected steam generator.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #6

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kanitz Date: 1/28/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve M. Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to a manual turbine trip from a power level which does not result in an immediate reactor trip.

1.2 ANS 3.5 Reference: Section 3.1.2, 4.2, and Appendix A3.3 and B2.2.6.

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from a reactor power level <P9 (approximately 49%), BOL, steady state for two minutes.

3.2 Test Duration and Final Condition: 60 minutes duration, final plant conditions were Main Feedwater isolated, bypass feedwater flow established, reactor power stable at less than 1%, pressurizer pressure and level returning to program.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #7

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kantz Date: 1/28/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve M. Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to a maximum rate power ramp from 100% turbine power down to approximately 75% and back up to 100%.

1.2 ANS 3.5 Reference: Section 3.1.2, 4.2, and Appendix A3.3 and B2.2.7.

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from IC #10, 100% power, BOL, equilibrium.

3.2 Test Duration and Final Condition: 60 minutes duration, final condition was at 100% turbine power with all parameters returning to normal.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #8

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kantz Date: 1/28/91

Reviewed By: Floyd E Flynn Date: 1/28/91

Approved By: Steve M. Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to maximum size reactor coolant system rupture combined with loss of all offsite power.

1.2 ANS 3.5 Reference: Section 3.1.2, 4.2, and Appendix A3.3 and B2.2.8.

2.0 Available and Tested Options

2.1 Description of Available Options: Malfunction (TH02) RCS Cold Leg Break at reactor vessel nozzle with malfunction ED01 loss of all offsite AC (161kv and 500kv).

2.2 Description of Options Tested: Selected TH02A, Loop 1 cold leg.

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from IC #10, 100% power, BOL, equilibrium.

3.2 Test Duration and Final Condition: 60 minutes duration, final condition was ECCS supplying to all four loops and #1 steam generator pressure indicative of failed loop, containment temperature and pressure decreasing.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #9

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kantz Date: 1/28/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve M. Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to maximum size unisolable main steam line rupture.

1.2 ANS 3.5 Reference: Section 3.1.2, 4.2, and Appendix A3.3 and B2.2.9.

2.0 Available and Tested Options

2.1 Description of Available Options: Malfunction MS01 (Main Steam Line Break Inside Containment at selected severity where 100% = 3E6#/hr @ 750 PSID.)

2.2 Description of Options Tested: Selected MS01A, Loop 1 at 100% severity.

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from IC #10, 100% power, BOL, equilibrium.

3.2 Test Duration and Final Condition: 60 minutes duration, final condition was: containment pressure decreasing to normal, pressurizer pressure increasing to the PORV setpoint after the pressurizer goes solid, Loop #1 steam generator depressurized.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Transient Test #10

Procedure Title: Certifying Simulators - Simulator Transient Performance Test

Procedure Number: NT-P-7.3.1-8, Attachment 4

Scheduled Frequency: Annual

Prepared By: Dale Kantz Date: 1/28/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve M. Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: Transient response to slow primary system depressurization to saturated conditions using a failed open Pressurizer safety valve with no high pressure ECCs available.

1.2 ANS 3.5 Reference: Section 3.1.2, 4.2, and Appendix A3.3 and B2.2.10.

2.0 Available and Tested Options

2.1 Description of Available Options: Used malfunction TH04, mechanical failure of a Pressurizer Safety Valve, selectable between the three safety valves. The magnitude of the failure can be controlled between zero and 100% of total safety valve capacity at 2500 psid.

2.2 Description of Options Tested: Used TH04A to fail Pressurizer Safety Valve 68-563 at 100% open and defeated Centrifugal Charging Pump operation by insertion of malfunctions CV01A and B.

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Started from IC #10 100% power, BOL, equilibrium.

3.2 Test Duration and Final Condition: 60 minutes duration, final condition: pressurizer at 100% level, RCS saturated at no load RCS temperature.

3.3 Data Collection Description

3.3.1 Sample Rate: Two samples/second

3.3.2 Test Parameter Description: All items in ANS 3.5, Appendix B.2.1. Each parameter was plotted versus time and all were compared to the baseline performance description.

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: January 1991

4.0 Baseline Data Description: Best-estimate analysis by the Watts Bar Safety Analysis Engineering Group. No actual data available from the reference plant at this time.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

STEADY STATE TEST OVERVIEW

The following four tests meet the intent of ANSI 3.5 1985 part 4.1 for simulator accuracies at steady state conditions.

Prior to test performance, a collective effort by simulator engineers and operator training at both Sequoyah and Watts Bar produced a list of critical and non-critical parameters. These parameters were chosen using EPRI guidelines and the ANSI 3.5 critical parameter definition. Consideration was given to the minimum indications needed by the operator to make immediate decisions during normal and abnormal plant evolutions.

Each test was then performed by collecting simulator data for 38 critical parameters and 77 non-critical parameters. These simulator data values were compared to baseline values collected from WBN operating procedures, heat balance drawings, and best estimates. Where possible, actual plant data will always be used but since the reference plant has not operated, there is limited actual data.

The following is a list of the critical and non-critical parameters used on this initial certification.

PROCEDURES TEST OVERVIEW

The following four abstracts summarize the tests used to meet the intent of ANSI 3.5 1985 parts 3.1.1, 3.3.1, and 3.3.2. By testing the use of Normal and Abnormal instructions, the simulator capabilities for "Normal Plant Evolutions" and "Systems Simulated and The Degree of Completeness" can be validated.

The first two periodic tests validate normal operations where the simulator was taken from a cold shutdown condition to 100% power and then operated back down to cold shutdown. All operations were performed from the same initial condition (IC) and with actual plant instructions (controlled copies).

The remaining two tests validate Emergency and Abnormal Operating Instructions. Each instruction was validated by selecting the appropriate IC, malfunction, and/or local operator action to force the simulator response needed.

Instructors and operators validated that each associated instruction could be performed on the simulator and, as necessary, each indication, control switch, and dynamic response was available to the trainee. The instructor station was also verified to have all necessary "local operator actions" to allow performance of appropriate instruction steps.

WATTS BAR NUCLEAR PLANT

CRITICAL PARAMETERS

Instrument Number	Parameter Description
EI-57-16A	MG Real Power (W)
TR-68-2BP02	TAVG Auctioneered
TR-68-2BP01	T Reference
NI-358	Normalized IR Output
LR-68-339	PRZ LVL. Trans. Table
PR-68-340	PRZ Press Trans. Table
FI-68-6	Reactor Coolant Flow SECO
FI-68-29	Reactor Coolant Flow SECO
FI-68-48	Reactor Coolant Flow SECO
FI-68-71	Reactor Coolant Flow SECO
LI-3-42	Stm Gen Level Table
LI-3-55	Stm Gen Level Table
LI-3-97	Stm Gen Level Table
LI-3-110	Stm Gen Level Table
POI-30-310	CH (Containment Pressure)
SC-CBDG-1&2	IRPR Rod Position (53)
FI-3-35A	FW Main Line Flow to SG
FI-3-48A	FW Main Line Flow to SG
FI-3-90A	FW Main Line Flow to SG
FI-3-103A	FW Main Line Flow to SG
FI-1-3	MS Total Flow from SG
FI-1-10	MS Total Flow from SG
FI-1-21	MS Total Flow from SG
FI-1-28	MS Total Flow from SG
NI-41B	P.R. #1 Combined Flux (%)
NI-42B	P.R. #2 Combined Flux (%)
NI-43B	P.R. #3 Combined Flux (%)
NI-44B	P.R. #4 Combined Flux (%)
EI-57-112	RCP-S.BUS-A Voltage
EI-57-113	RCP-S.BUX-B Voltage
TI-68-1	RC Hot Leg Table
TI-68-24	RC Hot Leg Table
TI-68-43	RC Hot Leg Table
TI-68-65	RC Hot Leg Table
TI-68-18	RC Cold Leg Table
TI-68-41	RC Cold Leg Table
TI-68-60	RC Cold Leg Table
TI-68-83	RC Cold Leg Table

WATTS BAR NUCLEAR PLANT

NON-CRITICAL PARAMETERS

Instrument Number	Parameter Description
LI-70-63	CC Surge Tank Level
LI-70-99	CC Surge Tank Level
PI-70-24	CC Pump Disch Hdr Pressure
H21-43-200	H2 Conc, TR A
TI-30-31	Containment LC Temperature
FI-62-93	Change flow to RC CL LP1
FI-62-82	LTDN Flow From RCS
EI-57-29A1	480V SB-BD-1A1 Voltage
EI-57-29A2	480V SB-BD 1A2 Voltage
EI-57-83A1	480V SD-BD 1B1 Voltage
EI-57-83A2	480V SD-BD 1B2 Voltage
EI-57-39	6.9KV SD-A from CSD Volt
EI-57-66	6.9KV SD-B from CSD Volt
EI-57-17	MG-Neutral Voltage
EI-57-18	MG-Main SFMR Volts
PI-1-33	STM HDR Pressure Trans
RM-90-101B	O-RI-90-101B Reading
RM-90-102	O-RI-90-102 Reading
RM-90-103	O-RI-90-103 Reading
RM-90-112B	1-RI-90-112B Reading
RM-90-112C	1-RI-90-112C Reading
RM-90-120A	1-RI-90-120A Reading
RM-90-121A	1-RI-90-121A Reading
RM-90-122A	O-RI-90-122A Reading
RM-90-125	O-RI-90-125 Reading
RM-90-132B	O-RI-90-132B Reading
RM-90-133A	O-RI-90-133A Reading
RM-90-134A	O-RI-90-134A Reading
RM-90-140A	O-RI-90-140A Reading
RM-90-170A	1-RI-170A Reading
RM-90-2	1-RI-90-2 Reading
RM-90-271	1-RI-90-271 Reading
RM-90-275	1-RI-90-275 Reading
RM-90-276	1-RI-90-276 Reading
RM-90-277	1-RI-90-277 Reading
RM-90-278	1-RI-90-278 Reading
RM-90-421	1-RM-90-422 Activity
RM-90-422	1-RM-90-423 Activity
RM-90-423	1-RM-90-423 Activity
RM-90-424	1-RM-90-424 Activity

WATTS BAR NUCLEAR PLANT

NON-CRITICAL PARAMETERS

Instrument Number	Parameter Description
RM-90-99	1-RI-90-99 Reading
FI-67-61	Flow Path #05, Flow
FI-67-62	Flow Path #28, Flow
FI-67-17	ERCW Train B HDR Press
PI-67-18	ERCW Train A HDR Press
TI-68-2E	Tavg Transm Table
TI-68-25E	Tavg Transm Table
TI-68-44E	Tavg Transm Table
TI-68-67E	Tavg Transm Table
TI-68-2D	Norm T WRT % PWR
TI-68-25D	Norm T WRT % PWR
TI-68-44D	Norm T WRT % PWR
TI-68-67D	Norm T WRT % PWR
TI-68-2A	Overpower Delta T Table
TI-68-25A	Overpower Delta T Table
TI-68-44A	Overpower Delta T Table
TI-68-67A	Overpower Delta T Table
TI-68-2B	OT T Table
TI-68-25B	OT T Table
TI-68-44B	OT T Table
TI-68-67B	OT T Table
LI-63-129	ACCUM TK Level
LI-63-109	ACCUM TK Level
LI-63-89	ACCUM TK Level
LI-63-82	ACCUM TK Level
LI-63-50	RWST Lev Low Range
LI-63-46	RWST Lev High Range
PI-63-108	ACC TK N2 Press
PI-63-128	ACC TK N2 Press
PI-63-88	ACC TK N2 Press
PI-63-62	ACC TK N2 Press
LI-68-300	PRT Level
LI-3-43P1	SG Wide Range Level
LI-3-43P2	SG Wide Range Level
LI-3-98P	SG Wide Range Level
LI-3-98P2	SG Wide Range Level
PI-68-301	PRT Display Pressure
TI-68-398	RV Vent Temperature
TI-68-309	PRT Temperature

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: 100% Steady State Test

Procedure Title: Certifying Simulators - Simulator Steady-State Test

Procedure Number: NT-P-7.3.1-8, Attachment 2

Scheduled Frequency: Annual

Prepared By: Dale Kanitz Date: 1/17/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 2
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: 100% Steady State Test, evaluate stability of IC and correctness of Initial Condition values.

1.2 ANS 3.5 Reference: Section 4.1, Appendix A3.2 and B2.1

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: IC #10 100% power, equilibrium

3.2 Test Duration and Final Condition: 100% power equilibrium for one minute then freeze simulation and collect all critical and non-critical parameters.

3.3 Data Collection Description

3.3.1 Sample Rate: One collection after one minute.

3.3.2 Test Parameter Description: Monitored the critical parameters and non-critical parameters listed under the Steady-State Overview tab.

4.0 Baseline Data Description: Baseline data derived from current revisions of Heat Balance drawings, Plant Instructions, FSAR, Instrument Tabs, and estimated values until actual plant data is available. Each data point was verified to be within 2% of simulated critical parameters and within 10% of simulated non-critical parameters.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: N/A

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: 75% Steady State Test

Procedure Title: Certifying Simulators - Simulator Steady State Test

Procedure Number: NT-P-7.3.1-8 Attachment 2

Scheduled Frequency: Annual

Prepared By: Dale Kantz Date: 1/17/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 2
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: 75% Steady State Test, evaluate stability and correctness of Initial Conditions values.

1.2 ANS 3.5 Reference: Section 4.1, Appendix A.3.2 and B.2.1

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: IC #23 75% power, equilibrium

3.2 Test Duration and Final Condition: 75% power equilibrium for one minute, freeze simulation and collect all critical and non-critical parameters.

3.3 Data Collection Description

3.3.1 Sample Rate: One collection after one minute.

3.3.2 Test Parameter Description: Monitored the critical parameters and non-critical parameters listed under the Steady-State Overview tab.

4.0 Baseline Data Description: Baseline data derived from current revisions of Heat Balance drawings, Plant Instructions, FSAR, Instrument Tabs, and estimated values until actual plant data is available. Each data point was verified to be within 2% of simulated critical parameters and within 10% of simulated non-critical parameters.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: N/A

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: 50% Steady State Test

Procedure Title: Certifying Simulator - Simulator Steady State Test

Procedure Number: NT-P-7.3.1-8, Attachment 2

Scheduled Frequency: Annual

Prepared By: Dale Kaulty Date: 1/17/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 2
Date Conducted: January 1991

1.0 Test Description and ANS 3.5 References.

1.1 Description: 50% Steady State Test evaluate stability and correctness of Initial Condition values.

1.2 ANS 3.5 Reference: Section 4.1, Appendix A.3.2, B.2.1

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: IC #9 50% power equilibrium

3.2 Test Duration and Final Condition: 50% power equilibrium for one minute, freeze simulation, and collect all critical and non-critical parameters.

3.3 Data Collection Description

3.3.1 Sample Rate: one collection after one minute.

3.3.2 Test Parameter Description: Monitored the critical parameters and non-critical parameters listed under the Steady-State Overview tab.

4.0 Baseline Data Description: Baseline data derived from current revisions of Heat Balance drawings, Plant Instructions, FSAR, Instrument Tabs, and estimated values until actual plant data is available. Each data point was verified to be within 2% of simulated critical parameters and within 10% of simulated non-critical parameters.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: N/A

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Stability Test (Drift)

Procedure Title: Certifying Simulators
Simulator Steady-State Test

Procedure Number: NT-P-7.3.1-8, Attachment 2

Scheduled Frequency: Annual

Prepared By: Dale Kantz Date: 1/17/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve Michael Date: 1/28/91

1.0 Test Description and ANS 3.5 References.

1.1 Description: Collect critical parameters for one hour and ensure simulated variables do not drift more than ± two percent. This should prove the stability of the initial condition.

1.2 ANS 3.5 Reference: Section 4.1

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: N/A

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: IC number 10, 100% power, equilibrium

3.2 Test Duration and Final Condition: 60 minutes duration with tested parameters in a final condition not more than ± two percent of initial condition.

3.3 Data Collection Description

3.3.1 Sample Rate: 1 sample/second

3.3.2 Test Parameter Description : All critical parameters monitored in steady-state test.

Performance Test Abstract

Procedure Number: NT-P-7.3.1-8, Att. 2

Date Conducted: January 1991

4.0 Baseline Data Description: Within ± 2 % of the initial condition values determined in the 100% steady-state test.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: General Operating Instructions (GOIs) [1]

Procedure Title: Certifying Simulators - Normal and Abnormal Operating Plant Instructions Test

Procedure Number: NT-P-7.3.1-8, Attachment 3

Scheduled Frequency: Four-year cycle (first year)

Prepared By: Dale Kanitz Date: 1/18/91

Reviewed By: Floyd E Flynn Date: 1/28/91

Approved By: Steve Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: March 1990

1.0 Test Description and ANS 3.5 References.

1.1 Description: To ensure all GOIs and associated plant instructions are capable of being performed on the simulator

1.2 ANS 3.5 Reference: Section 3, paragraph 1, section 3.1.1, Appendix A1.4 and A3.2(2).

2.0 Available and Tested Options

2.1 Description of Available Options: Identify and test all plant procedures that are used while performing normal plant evolutions and that have a simulator training value.

2.2 Description of Options Tested: Tested all instructions listed in the attached table. Each instruction tested was latest revision level.

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Depended on instruction. Evaluator initiated simulator at a condition representing the beginning of the procedure being tested and performed all possible steps.

3.2 Test Duration and Final Condition: Performance continued until the instruction ended or transitioned to another instruction.

3.3 Data Collection Description

3.3.1 Sample Rate: N/A

3.3.2 Test Parameter Description (1): N/A

Appendix D

Certification Test Abstracts

Procedure Number: NT-P-7.3.1-8, Att. 3

Date Conducted: March 1990

4.0 Baseline Data Description (2): Simulator instructors and simulator engineers assured that all necessary controls and indications were available to use all necessary procedures and instructions.

5.0 Test Evaluation(2)

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NOTE: (1) Attach list or refer to data base by category.

(2) Attach test review sheets if necessary or if judgment of panel of experts was used for base line data.

Table 2 - Specific Plant Instructions to be Performed as Part of Test #1 Table 1

Plant - Unit WBN-1

Item Number	Instruction Number	Revision Level	Date Performed	Name of Operator(s)
1	GOI-1	9	02/24/90	Steve Michael/Josh Bowman
2	SI-1.15		02/24/90	Steve Michael/Josh Bowman
3	SOI-68.1		02/24/90	Steve Michael/Josh Bowman
4	SOI-2 & 3.1		02/24/90	Steve Michael/Josh Bowman
5	SOI-62.1		02/24/90	Steve Michael/Josh Bowman
6	SI-4.11		02/24/90	Steve Michael/Josh Bowman
7	SOI-68.2		02/24/90	Steve Michael/Josh Bowman
8	SOI-74.1		02/24/90	Steve Michael/Josh Bowman
9	SOI-1.1		02/24/90	Steve Michael/Josh Bowman
10	SI-4		02/24/90	Steve Michael/Josh Bowman
11	TI-4		02/24/90	Steve Michael/Josh Bowman
12	SI-1.3		02/24/90	Steve Michael/Josh Bowman
13	GOI-7	7	02/24/90	Steve Michael/Josh Bowman
14	GOI-2	9	02/25/90	Steve Michael/Josh Bowman
15	SOI-2 & 3.4		02/25/90	Steve Michael/Josh Bowman
16	SOI-85.1		02/25/90	Steve Michael/Josh Bowman
17	SI-1.12		02/25/90	Steve Michael/Josh Bowman
18	TI-23		02/25/90	Steve Michael/Josh Bowman
19	SI-1.5		02/25/90	Steve Michael/Josh Bowman
20	SOI-62.2		02/25/90	Steve Michael/Josh Bowman
21	SI-1.8		02/25/90	Steve Michael/Josh Bowman
22	SOI-5 & 6.1		02/26/90	Steve Michael/Josh Bowman
23	SOI-47.2		02/26/90	Steve Michael/Josh Bowman
24	SOI-57.5		02/26/90	Steve Michael/Josh Bowman
25	SOI-57.3B		02/26/90	Steve Michael/Josh Bowman
26	SOI-57.6		02/26/90	Steve Michael/Josh Bowman
27	SI-2		02/26/90	Steve Michael/Josh Bowman
28	SI-3		02/26/90	Steve Michael/Josh Bowman
29	SI-4		02/26/90	Steve Michael/Josh Bowman

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: General Operating Instructions (GOIs) [2]

Procedure Title: Certifying Simulators - Normal and Abnormal Operating Plant Instructions Test

Procedure Number: NT-P-7.3.1-8, Attachment 3

Scheduled Frequency: Four-year cycle (second year)

Prepared By: Dale Kantz Date: 1/18/91

Reviewed By: Floyd E Flynn Date: 1/28/91

Approved By: Steve Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: March 1990

1.0 Test Description and ANS 3.5 References.

1.1 Description: To ensure all GOIs and associated plant instructions are capable of being performed on the simulator

1.2 ANS 3.5 Reference: Section 3, paragraph 1, section 3.1.1 Appendix A1.4 and A3.2(2).

2.0 Available and Tested Options

2.1 Description of Available Options: Identify and test all plant procedures that are used while performing normal plant evolutions and that have a simulator training value.

2.2 Description of Options Tested: Tested all instructions listed in the attached table. Each instruction tested was latest revision level.

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Depended on instruction. Evaluator initiated simulator at a condition representing the beginning of the procedure being tested and performed all possible steps.

3.2 Test Duration and Final Condition: Performance continued until the instruction ended or transitioned to another instruction.

3.3 Data Collection Description

3.3.1 Sample Rate: N/A

3.3.2 Test Parameter Description (1): N/A

4.0 Baseline Data Description (2): Simulator instructors and simulator engineers assured that all necessary controls and indications were available to use all necessary procedures and instructions.

5.0 Test Evaluation(2)

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NOTE: (1) Attach list or refer to data base by category.

(2) Attach test review sheets if necessary or if judgment of panel of experts was used for base line data.

Table 3 - Specific Plant Instructions to be Performed as Part of Test #2 Table 1

Plant - Unit WBN-1

Item Number	Instruction Number	Revision Level	Date Performed	Name of Operator
1	GOI-5	6	02/26/90	Josh Bowman
2	SI-2.3		02/26/90	Josh Bowman
3	SI-2.1		02/26/90	Josh Bowman
4	SI-2.4		02/26/90	Josh Bowman
5	SOI-27.1		02/26/90	Josh Bowman
6	GOI-6	5	02/27/90	Josh Bowman

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Emergency Instructions

Procedure Title: Certifying Simulators - Normal and Abnormal Operating Plant Instructions Test

Procedure Number: NT-P-7.3.1-8, Attachment 3

Scheduled Frequency: Four-year cycle (third year)

Prepared By: Dale Kaulk Date: 1/18/91

Reviewed By: Floyd E Flynn Date: 1/28/91

Approved By: Steve Michael Date: 1/28/91

Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: June 1990

1.0 Test Description and ANS 3.5 References.

1.1 Description: Ensure the Emergency Instructions, Emergency Contingency Actions and Functional Restoration Guidelines can be performed on the simulator.

1.2 ANS 3.5 Reference: Section 3, paragraph 1, section 3.1.2, Appendix A14 and A3.2(2).

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: All Emergency Instructions listed in the attached table were performed. The "ACTION/EXPECTED RESPONSE" steps and most "RESPONSE NOT OBTAINED" steps were performed for each Emergency Instruction.

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Most instructions were initiated by a malfunction entered from IC-10, 100% BOL equilibrium. Instructor/evaluator operated the simulator to obtain conditions applicable to the Emergency Instructions.

3.2 Test Duration and Final Condition: Each instruction was performed until completed and its final transition to another procedure was encountered.

3.3 Data Collection Description

3.3.1 Sample Rate: N/A

3.3.2 Test Parameter Description (1): N/A

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: June 1990

4.0 Baseline Data Description: Best estimate by simulator instructors and simulator engineers that all necessary controls were available to use all procedures and proper indications were observed.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: Local - Manual operation of seal injection isolation valves, ERCW to AFW suction valves and steam-dump cooldown valves was available only through component overrides. The preferred method would be thru a dedicated remote function. Although FR.0 and FR-C.1 can be entered and trained on the scope of simulation is not such to allow the incore thermocouples to rise above 400° F. This is not a training deficiency, but a Problem Report is written to determine the possibility of expanding simulation to allow further degraded core conditions. See PR# 424.

5.2 Corrective Action Plans/Dates: Added four remote functions. Simulator Design Change Requests #0041, #0042 and #0043 were implemented prior to 06/90.

5.3 Exceptions Taken: None

Table 4 - Specific Plant Instructions to be Performed as Part of Test #3 Table 1

Plant - Unit WBN-1

Item Number	Instruction Number	Revision Level	Date Performed	Name of Operator
1	FR-0	3	06/90	Mike Earles
2	FR-S.1	2	06/90	Mike Earles
3	FR-S.2	0	06/90	Mike Earles
4	FR-C.1	3	06/90	Mike Earles
5	FR-C.2	0	06/90	Mike Earles
6	FR-H.1	2	06/90	Mike Earles
7	FR-H.2	0	06/90	Mike Earles
8	FR-H.3	0	06/90	Mike Earles
9	FR-H.4	0	06/90	Mike Earles
10	FR-H.5	0	06/90	Mike Earles
11	FR-P.1	0	06/90	Mike Earles
12	FR-P.2	0	06/90	Mike Earles
13	FR-Z.1	2	06/90	Mike Earles
14	FR-Z.2	0	06/90	Mike Earles
15	FR-Z.3	0	06/90	Mike Earles
16	FR-I.1	0	06/90	Mike Earles
17	FR-1.2	0	06/90	Mike Earles
18	FR-1.3	0	06/90	Mike Earles
19	ECA-0.0	0	06/90	Mike Earles
20	ECA-0.1	0	06/90	Mike Earles
21	ECA-0.2	0	06/90	Mike Earles
22	E-0	3	06/90	Mike Earles
23	ES-0.1	2	06/90	Mike Earles
24	ES-0.2	2	06/90	Mike Earles
25	ES-0.3	2	06/90	Mike Earles
26	E-1	2	06/90	Mike Earles
27	ES-1.1	2	06/90	Mike Earles
28	ES-1.2	3	06/90	Mike Earles

Table 4 - Specific Plant Instructions to be Performed as Part of Test #3 Table 1

Plant - Unit WBN-1

Item Number	Instruction Number	Revision Level	Date Performed	Name of Operator
29	ES-1.3	1	06/90	Mike Earles
30	E-2	2	06/90	Mike Earles
31	E-3	2	06/90	Mike Earles
32	ES-3.1	2	06/90	Mike Earles
33	ES-3.2	2	06/90	Mike Earles
34	ES-3.3	2	06/90	Mike Earles
35	E-FOP	2	06/90	Mike Earles

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Abnormal Operating Instructions

Procedure Title: Certifying Simulators - Normal and Abnormal Operating Plant Instructions Test

Procedure Number: NT-P-7.3.1-8, Attachment 3

Scheduled Frequency: Four-year cycle (fourth year)

Prepared By: Dale Kantt Date: 1/18/91

Reviewed By: Floyd E Flynn Date: 1/28/91

Approved By: Steve Michael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Certification Test Abstracts
Procedure Number: NT-P-7.3.1-8, Att. 3
Date Conducted: July 1990

1.0 Test Description and ANS 3.5 References.

1.1 Description: Ensure the Abnormal Operating Instructions (AOIs) can be performed on the simulator. Verify all remote operations can be performed from instructor station.

1.2 ANS 3.5 Reference: Section 3, paragraph 1, section 3.1.2, Appendix A1.4 and A3.2(2)

2.0 Available and Tested Options

2.1 Description of Available Options: N/A

2.2 Description of Options Tested: All Abnormal Operating Instructions listed in the attached table were performed. The "ACTION/EXPECTED RESPONSE" steps and most "RESPONSE NOT OBTAINED" steps were performed for each Abnormal Operating Instruction.

3.0 Test Conditions and Parameters

3.1 Initial Condition Description: Most instructions were initiated by a malfunction entered from IC-10, 100% BOL equilibrium. The evaluator initiated the simulator in a condition representing the beginning of the procedure being tested and performed all possible instruction steps.

3.2 Test Duration and Final Condition: Performance continued until allowed by procedure to leave the AOI and return to normal instructions.

3.3 Data Collection Description

3.3.1 Sample Rate: N/A

3.3.2 Test Parameter Description (1): N/A

4.0 Baseline Data Description (2): Best estimate by simulator instructors and simulator engineers that all necessary controls were available to use all procedures and proper indications were observed.

5.0 Test Evaluation(2)

5.1 Deficiencies Found During Test: None

5.2 Corrective Action Plans/Dates: N/A

5.3 Exceptions Taken: None

NOTE: (1) Attach list or refer to data base by category.

(2) Attach test review sheets if necessary or if judgment of panel of experts was used for base line data.

Table 5 - Specific Plant Instructions to be Performed as Part of Test #4 Table 1

Plant - Unit WBN-1

Item Number	Instruction Number	Revision Level	Date Performed	Name of Operator
1	AOI-1 (Canceled)	7	05/90	Steve Michael
2	AOI-2	7	05/90	Steve Michael
3	AOI-3	6	05/90	Steve Michael
4	AOI-4	6	05/90	Steve Michael
5	AOI-5	5	05/90	Steve Michael
6	AOI-6	6	05/90	Steve Michael
7	AOI-7	7	05/90	Steve Michael
8	AOI-8	8	05/90	Steve Michael
9	AOI-9	8	05/90	Steve Michael
10	AOI-10	6	05/90	Steve Michael
11	AOI-11	6	05/90	Steve Michael
12	AOI-12	8	05/90	Steve Michael
13	AOI-13	8	05/90	Steve Michael
14	AOI-14	6	05/90	Steve Michael
15	AOI-15		05/90	Steve Michael
16	AOI-16	6	05/90	Steve Michael
17	AOI-17	6	05/90	Steve Michael
18	AOI-18	6	05/90	Steve Michael
19	AOI-19 (Canceled)	4	05/90	Steve Michael
20	AOI-20	8	05/90	Steve Michael
21	AOI-21.1	6	05/90	Steve Michael
22	AOI-21.2	6	05/90	Steve Michael
23	AOI-21.3	7	05/90	Steve Michael
24	AOI-21.4	6	05/90	Steve Michael
25	AOI-21.5	3	05/90	Steve Michael
26	AOI-21.6	3	05/90	Steve Michael
27	AOI-21.7	3	05/90	Steve Michael
28	AOI-21.8	3	05/90	Steve Michael
29	AOI-22	6	05/90	Steve Michael

Table 5 - Specific Plant Instructions to be Performed as Part of Test #4 Table 1

Plant - Unit WBN-1

Item Number	Instruction Number	Revision Level	Date Performed	Name of Operator
30	AOI-23	5	06/90	Steve Michael
31	AOI-24	7	06/90	Steve Michael
32	AOI-25.1	4	06/90	Steve Michael
33	AOI-25.2	4	06/90	Steve Michael
34	AOI-25.3	4	06/90	Steve Michael
35	AOI-25.4	4	06/90	Steve Michael
36	AOI-25.5	3	06/90	Steve Michael
37	AOI-25.6	3	06/90	Steve Michael
38	AOI-25.7	3	06/90	Steve Michael
39	AOI-25.8	3	06/90	Steve Michael
40	AOI-26	3	06/90	Steve Michael
41	AOI-27	8	06/90	Steve Michael
42	AOI-28	4	06/90	Steve Michael
43	AOI-29	3	06/90	Steve Michael
44	AOI-30	7	06/90	Steve Michael
45	AOI-31	3	06/90	Steve Michael
46	AOI-32	3	06/90	Steve Michael
47	AOI-33	6	06/90	Steve Michael
48	AOI-34	3	06/90	Steve Michael
49	AOI-35	6	06/90	Steve Michael
50	AOI-36	3	06/90	Steve Michael

MALFUNCTION TESTING OVERVIEW

The following abstract summarizes the test to meet the intent of ANSI 3.5 1985 part 3.1.2.

Since the Watts Bar plant reference simulator is relatively new, the malfunction set now available to instructors represents an effort by a group of operations instructors and simulator engineers to incorporate the knowledge gained at the Sequoyah simulator (a similar plant) related to adequate malfunctions for training and examinations. All Sequoyah simulator malfunctions were evaluated during the purchase specification development for the Watts Bar simulator and, if possible, made into site specific malfunctions. Additional malfunctions were made available based on the additional capabilities of this simulator model.

Each generic malfunction was developed from a baseline document called the "Malfunction Cause and Effect". This document, which was compiled using reference material from the simulator design database, gives a brief description of the cause of the problem and its effects from a particular initial condition. If the malfunction would cause different operator actions or different control room indications based on its severity, then that malfunction was tested at several severities.

NT-P-7.3.1-8

APPENDIX D

Form 2

TENNESSEE VALLEY AUTHORITY

CERTIFICATION TEST ABSTRACT

Simulator Name: Watts Bar

Test Name: Malfunction Testing

Procedure Title: Certifying Simulators - Instructor Interface Evaluation Test

Procedure Number: NT-P-7.3.1-8, Attachment 6

Scheduled Frequency: Four-Year Periodic (Four Annual Tests)

Prepared By: Dale Kanitz Date: 1/28/91

Reviewed By: Lloyd E Flynn Date: 1/28/91

Approved By: Steve M. Nichael Date: 1/28/91

NT-P-7.3.1-8
Appendix D
Procedure Number: NT-P-7.3.1-8, Att. 5
Date Conducted: 12/90

1.0 Test Description and ANS 3.5 References.

1.1 Description: A total of 43 malfunctions, representing at least one from each type required by ANSI-3.5, were tested.

Prior to each test the Malfunction Cause and Effects (MC&E) document was reviewed by test personnel to identify anticipated simulator responses and to consider appropriate operator actions. The simulator was then initialized in the Initial Condition specified in the MC&E and the malfunction was inserted. Test personnel observed the simulator responses and took actions where appropriate. Test results were documented on the attached Malfunction Testing Form, where test personnel addressed the various performance criteria established in the standard.

1.2 ANS 3.5 Reference: 1985 sections 3.1.2, 3.3, 3.4, 4.3, 4.4, and Appendix A3.

2.0 Available and Tested Options

2.1 Some of the tested malfunctions affect only one component, others can be selected to affect different or even multiple components of a redundant system, and many of the malfunctions can be selected to various degrees of severity.

2.2 When appropriate operator actions would be determined by the degree of of severity of the malfunction, the test was performed at two or more degrees of severity. Malfunctions which can be selected to affect different redundant components of a system were tested on one component. When annual retests are performed for this type of malfunction, a different component will be selected each year.

3.0 Test Conditions and Parameters

3.1 Each malfunction was inserted into the Initial Condition specified in the appropriate Malfunction Cause And Effect document.

3.2 Tests continued until the conditions stated in the Malfunction Cause And Effect document had been observed and pertinent plant parameters had stabilized.

3.3 Data Collection Description

3.3.1 Sample Rate: N/A

3.3.2 Test Parameter Description: N/A

4.0 Baseline Data Description: Baseline data consists of the Malfunction Cause And Effect document.

5.0 Test Evaluation

5.1 Deficiencies Found During Test: Questions and deficiencies affected 14 of the 43 selected malfunctions:

Two of the malfunctions were found to have no training value in their present configuration. One of them, the "Intermediate Range Failure" malfunction (NI04), will be invalidated by a planned plant modification which will install a new and different intermediate range nuclear instrumentation system. The other, a malfunction affecting automatic control of pressurizer level (CV15), was found to have subtle and undramatic effects which are too slow to be of training value.

Two of the malfunctions tested (CC04 and RW02) were found to create invalid annunciator system alarms.

One malfunction (FW12) affecting feedwater heater level control failed to produce the expected result of isolating the appropriate heater string.

While testing the loss of 6.9 KV Shutdown Board malfunction (ED06), it was found the control power supply to the Diesel Generator ERCW MOVs was incorrect.

While testing the loss of Essential Control Air malfunction, (IA03) it was found that several control air supplies to components were incorrect.

Seven of the malfunction tests (CV09, RD07, RH01, RW02, TH01, TH03, and TH04) identified a need to revise the applicable Malfunction Cause and Effects document.

5.2 Corrective Action Plans/Dates: Revisions to the Malfunction Cause And Effects document for each of the seven tests referenced above are complete.

Corrective actions for the deficiencies involving invalid alarms, the feedwater heater level controls, the pressurizer level controls, the ERCW control power supplies, and the control air supplies will be complete by 4/1/90.

The Intermediate Range Failure malfunction will be modified and tested when plant and simulator modifications are complete.

5.3 Exceptions Taken: None

(NT-3.02, Attachment 6)

TABLE I - Malfunction List and Certification Test Schedule

PLANT - UNIT WBN-1

Baseline Data Source Malfunction Cause and Effects

Annual Test Period	Item No.	Malfunction Description		ANS 3.5 Section 3.1.2 Reference	Test Schedule	
		Malfunction Definition	Malf Name		Planned Completion	Actual Completion
1	1	VCT Level Transmitter Fails Hi	CV09	3.1.2(18)		12/10/90
	2	Steam Generator Tube Leak	TH05	3.1.2(1a)		10/18/90
	3	Letdown Line Break Inside Auxiliary Building	CV04	3.1.2(1b)		10/24/90
	4	LOCA Small Leak	TH03	3.1.2(1c)		10/17/90
	5	Pressurizer Safety Failure	TH04	3.1.2(1d)		10/22/90
	6	Stuck Rod	RD13	3.1.2(12)		12/15/90
	7	Loss of non-essential control air	IA02	3.1.2(2)		10/23/90
	8	Total Loss of Offsite Power	ED01	3.1.2(3)		12/08/90
	9	Loss of 6.9kv Shutdown Board -	ED06	3.1.2(3)		11/19/90
	10	Loss of 480v Shutdown	ED08	3.1.2(3)		11/19/90
2	1	Loss of 250 vdc Batt Bd	ED15	3.1.2(3)		12/08/90
	2	RCP Locked Rotor	RC01	3.1.2(4)		10/20/90
	3	RCCA Misalignment	RD05	3.1.2(12)		12/15/90
	4	RCW Pump Trip	RW02	3.1.2(6)		12/10/90
	5	RCW Heat Exchange Fouling	RW04	3.1.2(6)		12/10/90
	6	RHR Loop Suction Line Blockage	RH04	3.1.2(7)		10/24/90
	7	Reactor Trip Signal Failure	RP01	3.1.2(24)		12/15/90
	8	Component Cooling Pipe Break Inside Containment	CC04	3.1.2(8)		12/10/90
	9	Condensate Booster Pump Trip	FW02 a, b, c	3.1.2(9)		10/22/90
	10	Main Steam Line Break Inside Containment	MS01	3.1.2(20)		12/13/90
	11	Loss of All Feedwater ° Trip of Standby MFWP ° Trip of Turbine MFWP ° Trip of AFWP	FW06 FW05a,b FW07 a, b, c	3.1.2(10)		10/22/90

(NT-3.02, Attachment 6)

TABLE I - Malfunction List and Certification Test Schedule

PLANT - UNIT WBN-1

Baseline Data Source Malfunction Cause and Effects

Annual Test Period	Item No.	Malfunction Description		ANS 3.5 Section 3.1.2 Reference	Test Schedule	
		Malfunction Definition	Malf Name		Planned Completion	Actual Completion
3	1	LOCA Hot Leg	TH01	3.1.2(1C)		10/17/90
	2	Main Turbine Hi Vibes	TU02	3.1.2(15)		10/24/90
	3	Main Generator Trip	EG01	3.1.2(16)		12/10/90
	4	Loss of 120 VAC Inverter	ED10	3.1.2(3,11)		12/08/90
	5	T-avg. Control Signal Fails	RX18	3.1.2(17)		10/24/90
	6	Pzr pressure Transmitter Fails Hi	RX07	3.1.2(18) 3.1.2(25)		12/10/90
	7	RHR Pump Trip	RH01	3.1.2(7)		10/24/90
	8	False Auto Reactor Trip Signal	RP05	3.1.2(19)		12/13/90
	9	Main Steam Line Break Outside Containment	MS02	3.1.2(20)		12/13/90
	10	Main Feedwater Line Break Inside Containment	FW23	3.1.2(20)		12/15/90
	11	Dropped Rod	RD07	3.1.2(12)		12/15/90
4	1	Loss of 125 VDC Vital Bus	ED12	3.1.2(3(		12/08/90
	2	PR Channel Output Signal Failure	NI07	3.1.2(21)		12/15/90
	3	#1 Feedwater Heater Level Control Fails Lo	FW12	3.1.2(22)		12/15/90
	4	Loss of Vacuum	FW09	3.1.2(5)		10/22/90
	5	Charging Flow Control Problem, Pzr lvl Swing	CV15	3.1.2(22)		12/15/90
	6	Auto SI Initiation Signal Failure	RP02	3.1.2(23)		12/15/90
	7	Loss of Essential Control Air	IA03	3.1.2(2)		10/23/90
	8	Rods Fail to Move on Demand	RD08	3.1.2(13)		12/15/90
	9	Fuel Cladding Failure	TH09	3.1.2(14)		12/15/90
	10	Main Feedwater Line Break Outside Containment	FW20	3.1.2(20)		12/15/90

TENNESSEE VALLEY AUTHORITY
NT-P-7.3.1-8
Attachment 1
Table 1 - Simulator Certification Testing Schedule
Plant - Unit WBN-1

Initial Certification March 1991
Date Submitted

Four-year Test Period March 1, 1991/March 1, 1995
Date Start/Date End

Annual Test March 1, 1991/March 1, 1992
Date Start/Date End

Annual Test Period	Test Description		Test Date	
	Procedure Number	(A) Procedure Name (1) Procedure Type (a) Particular Test	Planned Start	Completed
1	NT-P-7.3.1-8 Attachment 2	A) Simulator Steady State Test	12/01/91	
	Attachment 3	B) Normal and Abnormal Operating Plant Instructions Tests. First year: General Operating Instructions	09/01/91	
	Attachment 4	C) Simulator Transient Performance Tests.	10/01/91	
	Attachment 5	D) Malfunction Tests. First 25% of certified malfunctions.	11/01/91	

TENNESSEE VALLEY AUTHORITY
NT-P-7.3.1-8
Attachment 1
Table 1 - Simulator Certification Testing Schedule
Plant - Unit WBN-1

Initial Certification March 1991
Date Submitted

Four-year Test Period March 1, 1991/March 1, 1995
Date Start/Date End

Annual Test March 1, 1992/March 1, 1993
Date Start/Date End

Annual Test Period	Test Description		Test Date	
	Procedure Number	(A) Procedure Name (1) Procedure Type (a) Particular Test	Planned Start	Completed
2	NT-P-7.3.1-8 Attachment 2	A) Simulator Steady State Test.	12/01/92	
	Attachment 3	B) Normal and Abnormal Operating Plant Instructions Tests. Second Year: General Operating Instructions	09/01/92	
	Attachment 4	C) Simulator Transient Performance Tests.	10/01/92	
	Attachment 5	D) Malfunction Tests. Second 25% of certified malfunctions.	11/01/92	

TENNESSEE VALLEY AUTHORITY
NT-P-7.3.1-8
Attachment 1
Table 1 - Simulator Certification Testing Schedule
Plant - Unit WBN-1

Initial Certification March 1991
Date Submitted

Four-year Test Period March 1, 1991/March 1, 1995
Date Start/Date End

Annual Test March 1, 1993/March 1, 1994
Date Start/Date End

Annual Test Period	Test Description		Test Date	
	Procedure Number	(A) Procedure Name (1) Procedure Type (a) Particular Test	Planned Start	Completed
3	NT-P-7.3.1-8 Attachment 2	A) Simulator Steady State Test.	12/01/93	
	Attachment 3	B) Normal and Abnormal Operating Plant Instructions Tests. Third Year: Emergency Instructions.	09/01/93	
	Attachment 4	C) Simulator Transient Performance Tests.	10/01/93	
	Attachment 5	D) Malfunction Tests. Third 25% of certified malfunctions.	11/01/93	

TENNESSEE VALLEY AUTHORITY
NT-P-7.3.1-8
Attachment 1
Table 1 - Simulator Certification Testing Schedule
Plant - Unit WBN-1

Initial Certification March 1991
Date Submitted

Four-year Test Period March 1, 1991/March 1, 1995
Date Start/Date End

Annual Test March 1, 1994/March 1, 1995
Date Start/Date End

Annual Test Period	Test Description		Test Date	
	Procedure Number	(A) Procedure Name (1) Procedure Type (a) Particular Test	Planned Start	Completed
4	NT-P-7.3.1-8 Attachment 2	A) Simulator Steady State Tests.	12/01/94	
	Attachment 3	B) Normal and Abnormal Operating Plant Instructions Tests. Fourth year: Abnormal Operating Instructions	09/01/94	
	Attachment 4	C) Simulator Transient Performance Tests.	10/01/94	
	Attachment 5	D) Malfunction Tests. Fourth 25% of certified malfunctions.	11/01/94	