

Four-Year Certification Update Report
for the
Watts Bar Nuclear Plant Unit 1 Simulator

Tennessee Valley Authority

Section 1 - Introduction

This report has been prepared and submitted in accordance with the requirements of 10 CFR 55.45 (b)(5)(ii) and (b)(5)(vi). In this report one may find the Tennessee Valley Authority's Watts Bar Nuclear Plant Unit 1 Simulator certification tests performed during the four year testing cycle, deviations from the tests, the test schedule for the next four year period, and any outstanding certification test problems with a schedule for correction.

All the tests as described in ANSI 3.5 are grouped into two time categories. One group must be performed every year during the cycle. The other group which includes simulator malfunction tests, plant general operating instructions, emergency operating instructions, and abnormal operating instructions are divided so that each item in the group is performed at least once within the four year test period.

The remainder of this report is divided into Sections. The contents of each Section are :

- Section 2 - Annual Tests
- Section 3 - Procedure Tests
- Section 4 - Malfunction Tests
- Section 5 - Certification Test Problem Reports
- Section 6 - Exception Reports
- Section 7 - Four Year Test Plan (1995 - 1998)

Section 2 - Annual Tests

Table 2.1 presents the test performed every year during the testing cycle.

Table 2.1
Annual Tests and Performance Dates

<u>Test</u>	<u>Description</u>	<u>Date</u>
1	Manual reactor trip from 100% power.	01/08/92 02/08/93 01/04/94 01/29/95
2	Simultaneous trip of all feedwater pumps.	01/08/92 02/08/93 01/04/94 01/29/95
3	Simultaneous closure of all MSIVs.	01/08/92 02/09/93 01/04/94 01/29/95
4	Simultaneous trip of all RCPs.	01/08/92 02/09/93 01/04/94 01/29/95
5	Trip of any single RCP.	01/08/92 02/09/93 01/04/94 01/29/95
6	Main turbine trip which does not result in an immediate reactor trip.	01/08/92 02/09/93 01/06/94 01/29/95
7	Maximum rate power ramp from 100% to approximately 75% and back to 100%.	01/08/92 02/09/93 01/06/94 01/29/95
8	Maximum size reactor coolant system rupture combined with a loss of all offsite power.	01/08/92 02/09/93 01/05/94 01/29/95
9	Maximum size unisolatable main steam line rupture.	01/08/92 02/10/93 01/05/94 01/29/95

Table 2.1 (cont.)
Annual Tests and Performance Dates

<u>Test</u>	<u>Description</u>	<u>Date</u>
10	Slow primary system depressurization to saturated condition using pressurizer relief valve stuck open. Inhibit activation of the high pressure Emergency Core Cooling Systems.	01/08/92 02/10/93 01/05/94 01/29/95
11	100% Power Null Transient, 60 minute duration	01/08/92 02/10/93 01/03/94 02/01/95
12	100% Power State Point	01/08/92 02/09/93 01/03/94 02/01/95
13	75% Power State Point	01/08/92 02/09/93 01/03/94 02/01/95
14	50% Power State Point	01/08/92 02/09/93 01/03/94 02/01/95
15	Simulator Real Time Test	07/26/91 01/05/93 03/04/94 02/01/95

Section 3 - Procedure Tests

Tables 3.1 through 3.4 present the tests performed during the indicated year of the four year test cycle.

Changes have been made to the procedure numbering system at Watts Bar since the original schedule was published. In addition, the original test schedule was revised to remove some unnecessary tests. Whenever a test was not performed this was indicated in the appropriate table with a N/P. A footnote has been added in each case to explain the reason for not performing that specific test. If a new test was added this was indicated with a footnote at the end of the affected table of tests. The test schedule found in Section 7, has been modified to reflect these facts. There has been no significant change in the test plan.

Table 3.1
1991 Scheduled Tests and Performance Dates
General Operating Instructions

<u>Proc. I.D.</u>	<u>Revision</u>	<u>Performance Date</u>
GOI-1	11	01/03/92
SI-1.15	6	01/03/92
SOI-68.01	13	01/03/92
SOI-2	20	01/03/92
SOI-3.1	20	01/03/92
SOI-62.1	12	01/03/92
SI-4.11	8	01/03/92
SOI-68.2	8	01/03/92
SOI-74.1	14	01/03/92
SOI-1.01	12	01/03/92
SI-4	7	01/03/92
TI-4 part 1 ¹	2	N/P
SI-1.3	7	01/03/92
GOI-7	10	01/03/92
GOI-2	11	01/03/92
SOI-85.1	7	01/03/92
SI-1.12	7	01/03/92
TI-23	6	01/03/92
SI-1.5	8	01/03/92
SOI-62.2	7	01/03/92
SI-1.8	9	01/03/92
SOI-5	9	01/03/92
SOI-6.1	9	01/03/92
SOI-47.02	9	01/03/92
SOI-57.5	5	01/03/92
SOI-57.3	5	01/03/92
SOI-57.6	6	01/03/92
SI-2	18	01/03/92
SI-3	10	01/03/92
SI-4	7	01/03/92

Notes :

1. TI-4 part 1 contains the plant data curves and while useful is not tested explicitly.

Table 3.2
1992 Scheduled Tests and Performance Dates
General Operating Instructions

<u>Proc. I.D.</u>	<u>Revision</u>	<u>Performance Date</u>
GOI-5	10	01/20/93
SI-2.3	7	02/05/93
SI-2.1	6	01/26/93
SI-2.4	10	02/01/93
SOI-27.1	15	01/28/93
GOI-6	6	01/19/93

Table 3.3
1993 Scheduled Tests and Performance Dates
Emergency Operating Instructions

<u>Proc. I.D.</u>	<u>Revision</u>	<u>Performance Date</u>
E-0	6	02/06/94
ES-0.0 ¹	0	N/P
ES-0.1	4	02/06/94
ES-0.2	5	02/06/94
ES-0.3	4	02/06/94
ES-0.4	0	02/07/94
E-1	4	02/07/94
ES-1.1	4	02/07/94
ES-1.2	5	02/07/94
ES-1.3	3	02/07/94
ES-1.4	0	02/07/94
E-2	6	02/07/94
E-3	5	02/08/94
ES-3.1	4	02/10/94
ES-3.2	6	02/10/94
ES-3.3	4	02/10/94
ECA-0.0	3	02/09/94
ECA-0.1	3	02/09/94
ECA-0.2	3	02/09/94
ECA-1.1	2	02/09/94
ECA-1.2	0	02/09/94
ECA-2.1	2	02/10/94
ECA-3.1	2	02/08/94
ECA-3.2	2	02/08/94
ECA-3.3	0	02/08/94
FR-S.1	6	02/11/94
FR-S.2	3	02/06/94
FR-C.1	6	02/11/94
FR-C.2	3	02/11/94
FR-C.3	2	02/07/94
FR-H.1	6	02/08/94
FR-H.2	1	02/09/94
FR-H.3	2	02/08/94
FR-H.4	2	02/09/94
FR-H.5	1	02/07/94
FR-P.1	3	02/09/94
FR-P.2	1	02/09/94
FR-Z.1	5	02/07/94
FR-Z.2 ²	2	N/P
FR-Z.3	2	02/07/94
FR-I.1	3	02/08/94
FR-I.2	3	02/06/94
FR-I.3	3	02/07/94

Notes :

1. ES-0.0 does not involve simulator operations.
2. FR-Z.2 covers containment flooding and is out of simulation scope.

Table 3.4
1994 Scheduled Tests and Performance Dates
Abnormal Operating Instructions

<u>Proc. I.D.</u>	<u>Revision</u>	<u>Performance Date</u>
AOI-2	14	12/05/94
AOI-3	14	12/06/94
AOI-4	14	01/29/95
AOI-5	13	12/06/94
AOI-6	14	12/06/94
AOI-7 ¹	10	N/P
AOI-8 ¹	13	N/P
AOI-9 ¹	13	N/P
AOI-10	15	01/28/94
AOI-11	12	12/06/94
AOI-12	13	12/07/94
AOI-13	16	12/10/94
AOI-14	14	12/10/94
AOI-15	13	01/15/95
AOI-16	13	01/15/95
AOI-17	13	01/15/95
AOI-18	14	01/16/95
AOI-20	16	01/16/95
AOI-21.01	13	01/16/95
AOI-21.02	13	01/16/95
AOI-21.03	13	01/16/95
AOI-21.04	13	01/16/95
AOI-21.05 ²	3	N/P
AOI-21.06 ²	3	N/P
AOI-21.07 ²	3	N/P
AOI-21.08 ²	3	N/P
AOI-22 ¹	10	N/P
AOI-24	14	01/22/95
AOI-25.01	11	01/23/95
AOI-25.02	11	01/23/95
AOI-25.03	11	01/23/95
AOI-25.04	11	01/23/95
AOI-25.05 ²	3	N/P
AOI-25.06 ²	3	N/P
AOI-25.07 ²	3	N/P
AOI-25.08 ²	3	N/P
AOI-26	5	01/23/95
AOI-27	11	01/27/95
AOI-28	8	01/26/95
AOI-29 ¹	7	N/P
AOI-30 ¹	12	N/P

Table 3.4 (cont.)
1994 Scheduled Tests and Performance Dates
Abnormal Operating Instructions

<u>Proc. I.D.</u>	<u>Revision</u>	<u>Performance Date</u>
AOI-31	10	01/27/95
AOI-33	14	01/23/95
AOI-34	11	01/24/95
AOI-35	14	01/24/95
AOI-37	3	01/24/95
AOI-38	2	01/26/95

Notes :

1. AOI-7 - Maximum Probable Flood, AOI-8 - Tornado Watch or Warning, AOI-9 - Earthquake, AOI-22 - Break of Downstream Dam, AOI-29 - Dropped or Damaged Fuel, AOI-30 - Plant Fires are not simulated or do not apply to the simulator and were not performed.
2. AOI-21.05, AOI-21.06, AOI-21.07, AOI-21.08, AOI-25.05, AOI-25.06, AOI-25.07, AOI-25.08 all operate Unit 2 equipment which is not within the scope of simulation.
3. The plant procedures AOI-1, AOI-19, AOI-23, AOI-32, and AOI-36 found in the original test schedule were canceled in the plant and therefore not performed. These were omitted from Table 3.4 since they were canceled.

Section 4 - Malfunction Tests

Approximately 25% of the certified simulator malfunctions were tested each year as laid out in the original submittal. The tests performed and the year performed are listed in Table 4.1.

Table 4.1
Malfunction Test Schedule and Performance Date

Test Period	Index	Malfunction Description	Malf Name	ANS 3.5 Section 3.1.2	Date Performed
				Reference	
1991	1	VCT Level Transmitter Fails Hi	CV09	3.1.2(18)	01/06/92
	2	Steam Generator Tube Leak	TH05	3.1.2(1a)	01/06/92
	3	Letdown Line Break Inside Auxiliary Building	CV04	3.1.2(1b)	01/06/92
	4	LOCA Small Leak	TH03	3.1.2(1c)	01/06/92
	5	Pressurizer Safety Failure	TH04	3.1.2(1d)	01/06/92
	6	Stuck Rod	RD13	3.1.2(12)	01/06/92
	7	Loss of non-essential control air	IA02	3.1.2(2)	01/06/92
	8	Total Loss of Offsite Power	ED01	3.1.2(3)	01/06/92
	9	Loss of 6.9kv Shutdown Board	ED06	3.1.2(3)	01/06/92
	10	Loss of 480v Shutdown	ED08	3.1.2(3)	01/06/92
1992	1	Loss of 250 VDC Batt Bd	ED15	3.1.2(3)	02/23/93
	2	RCP Locked Rotor	RC01	3.1.2(4)	02/23/93
	3	RCCA Misalignment	RD05	3.1.2(12)	02/23/93
	4	RCW Pump Trip	RW02	3.1.2(6)	02/24/93
	5	RCW Heat Exchange Fouling	RW04	3.1.2(6)	02/24/93
	6	RHR Loop Suction Line Blockage	RH04	3.1.2(7)	02/24/93
	7	Reactor Trip Signal Failure	RP01	3.1.2(24)	02/25/93
	8	Component Cooling Pipe Break Inside Containment	CC04	3.1.2(8)	02/25/93
	9	Condensate Booster Pump Trip	FW02	3.1.2(9)	02/26/93
	10	Main Steam Line Break Inside Containment	MS01	3.1.2(20)	02/25/93
	11	Loss of <u>All</u> Feedwater			
		° Trip of Standby MFWP	FW06	3.1.2(10)	02/26/93
		° Trip of Turbine MFWP	FW05	3.1.2(10)	02/26/93
		° Trip of AFWP	FW07	3.1.2(10)	02/26/93

Table 4.1 (cont.)
Malfunction Test Schedule and Performance Date

Test Period	Index	Malfunction Description	Malf Name	ANS 3.5 Section 3.1.2	Date Performed
				Reference	
1993	1	LOCA Hot Leg	TH01	3.1.2(1c)	02/15/94
	2	Main Turbine Hi Vibes	TU02	3.1.2(15)	02/16/94
	3	Main Generator Trip	EG01	3.1.2(16)	02/16/94
	4	Loss of 120 VAC Inverter	ED10	3.1.2(3,11)	02/22/94
	5	T-avg. Control Signal Fails	RX18	3.1.2(17)	02/22/94
	6	Pzr pressure Transmitter Fails Hi	RX07	3.1.2(18)	02/22/94
	7	RHR Pump Trip	RH01	3.1.2(7)	02/22/94
	8	False Auto Reactor Trip Signal	RP05	3.1.2(19)	02/15/94
	9	Main Steam Line Break Outside Containment	MS02	3.1.2(20)	02/15/94
	10	Main Feedwater Line Break Inside Containment	FW23	3.1.2(20)	02/15/94
	11	Dropped Rod	RD07	3.1.2(12)	02/22/94
1994	1	Loss of 125 VDC Vital Bus	ED12	3.1.2(3)	01/27/95
	2	PR Channel Output Signal Failure	N107	3.1.2(21)	01/27/95
	3	#1 Feedwater Heater Level Control Fails Lo	FW12	3.1.2(22)	01/27/95
	4	Loss of Vacuum	FW09	3.1.2(5)	01/27/95
	5	Charging Flow Control Problem, Pressurizer level swing	CV15	3.1.2(22)	01/28/95
	6	Auto SI Initiation Signal Failure	RP02	3.1.2(23)	01/28/95
	7	Loss of Essential Control Air	IA03	3.1.2(2)	01/28/95
	8	Rods Fail to Move on Demand	RD08	3.1.2(13)	01/29/95
	9	Fuel Cladding Failure	TH09	3.1.2(14)	01/29/95
	10	Main Feedwater Line Break Outside Containment	FW20	3.1.2(20)	01/29/95
	11	Failure of Pressurizer PORV	RC07 ¹	3.1.2(1d)	07/26/94
	12	Loss of Emergency Generators	EG02 ¹	3.1.2(3)	07/25/94
	13	Loss of Condenser Level Control	FW36 ¹ FW37 ¹	3.1.2(5)	07/23/94

Notes :

1. Tests 11, 12, and 13 were added to the original test plan. These malfunctions are required by ANSI 3.5 and were inadvertently omitted from the original schedule.

Section 5 - Certification Testing Problem Reports

The following is a breakdown of the number of certification Problem Reports (PRs) written and closed during each test year from 1991 through 1994.

Table 5.1
Number of Certification PRs

<u>Year</u>	<u>Opened</u>	<u>Closed</u>	<u>Remaining</u>
1991	12	12	0
1992	8	8	0
1993	22	22	0
1994	27	10	17

The oldest of the 17 remaining certification problem reports was opened 01/06/95. A schedule for closing these 17 PRs may be found in Table 5.2.

Table 5.2
Outstanding Certification Testing Problem Reports
and Schedule for Correction

<u>Number</u>	<u>Description</u>	<u>Schedule</u>
1324	Potential problem in cooling the RCS to 200 °F	12/31/95
1326	Lack of pressurizer swell during ES-0.4 depressurization	10/31/95
1327	100% Cold leg LOCAs have unstable temps.	11/30/95
1367	Oscillations in the steam flow have been observed below 25% power	09/30/95
1369	AOI-13 needs additional break locations	08/31/95
1375	To complete AOI-24 a new simulator malfunction must be added	07/31/95
1377	Increasing primary system activity level appears to have no effect on containment rad. monitors	07/31/95
1386	Letdown valve 62-83 may be working backwards	05/31/95
1387	Power supplies associated with AOI-21.01 need review and correction if required	04/02/95
1388	Loss of 120VAC vital instrument power has wider impact than observed	04/30/95
1390	OT/OPΔT bistables are powered from the wrong source	04/02/95
1391	During Loss of Battery Board IV, 1-FIC-46-57 was still functional	04/02/95
1392	Several problems were encountered with the performance of AOI-27	04/30/95
1395	Annunciators 12E and 199E could not be reset	04/30/95
1397	The first out annunciator in loss of vacuum is incorrect	06/30/95
1400	Modify malfunction RD08 to meet ANSI 3.5 intent	05/31/95
1412	During a maximum LOCA with a loss of all offsite power an unexplained temperature spike occurs	12/31/95

Section 6 - Exception Reports

During the 1991-1994 test period two new exceptions were noted in addition to the twelve detailed in the original submittal. They are denoted as ER-13 and ER-14. It was determined that neither resulted in negative training. They were reviewed and concurred with by the Manager of Operations for WBN and the Manager of WBN Operator Training.

ER-13

Panel ECB-4 is not included in the scope of the simulation. At the time of simulator procurement this panel was a blank section approximately four feet in length. Due to space limitations this empty panel was deleted from the physical simulation. In January, 1993 plant modification DCN-19899 was implemented to relocate various alarms from a panel located on the operator's desk to two annunciator boxes to be located on ECB-3 and ECB-4. The annunciator acknowledge switch was located on ECB-4. In the simulator the annunciator boxes have been located at ECB-2 and ECB-3 with the acknowledge switch at a vacant position between ECB-2 and ECB-3 due to the absence of panel ECB-4.

ER-14

The simulator has replaced the original Whittaker mechanical step counters with electronic units made by SAIC. The units are similar in appearance and sound to the originals. The mechanical thumbwheels are replaced with LCDs with small pushbuttons for the pulse up, down, and reset functions. Labels have been affixed to these pushbuttons as operator aids.

Section 7 - Four Year Test Plan (1995 - 1998)

The four-year test plan is presented in the tables found within this section. The contents of each table is listed below.

- Table 7.1 - Annual Tests
- Table 7.2 - 1995 General Operating Instructions
- Table 7.3 - 1996 General Operating Instructions
- Table 7.4 - 1997 Emergency Operating Instructions
- Table 7.5 - 1998 Abnormal Operating Instructions
- Table 7.6 - 1995 - 1998 Malfunction Test Schedule

Table 7.1
Annual Tests

<u>Test</u>	<u>Description</u>
1	Manual reactor trip from 100% power.
2	Simultaneous trip of all feedwater pumps.
3	Simultaneous closure of all MSIVs.
4	Simultaneous trip of all RCPs.
5	Trip of any single RCP.
6	Main turbine trip which does not result in an immediate reactor trip.
7	Maximum rate power ramp from 100% to approximately 75% and back to 100%.
8	Maximum size reactor coolant system rupture combined with a loss of all offsite power.
9	Maximum size unisolatable main steam line rupture.
10	Slow primary system depressurization to saturated condition using pressurizer relief valve stuck open. Inhibit activation of the high pressure Emergency Core Cooling Systems.
11	100% Power Null Transient, 60 minute duration
12	100% Power State Point
13	75% Power State Point
14	50% Power State Point
15	Simulator Real Time Test

Table 7.2 - 1995 General Operating Instructions

<u>Procedure ID</u>	<u>Description</u>
GOI-1	Plant startup from cold shutdown to hot standby
GOI-2	Plant startup from hot standby to minimum load
GOI-5	Normal plant operations, Sections 6.1,6.4
1-SI-0-11	Estimated critical position
1-SI-0-5	Verification of predicted critical rod position,Tavg,and shutdown banks
TI-21	Inverse count rate ratio monitoring for approach to criticality

Note : All supporting SIs, SOIs, TIs, and GOIs required for the performance of these procedures will be performed and recorded.

Table 7.3 - 1996 General Operating Instructions

<u>Procedure ID</u>	<u>Description</u>
GOI-3	Plant shutdown from minimum load to cold shutdown
GOI-5	Normal power operations, Sections 6.2,6.3
GOI-6	Administrative shutdown
1-SI-0-10	Shutdown margin
TI-6	Calorimetric calculation
TI-8	Shutdown margin hand calculation

Note : All supporting SIs, SOIs, TIs, and GOIs required for the performance of these procedures will be performed and recorded.

Table 7.4 - 1997 Emergency Operating Instructions

<u>Procedure ID</u>	<u>Description</u>
E-0	Reactor trip or safety injection
E-1	Loss of reactor or secondary coolant
E-2	Faulted steam generation isolation
E-3	Steam generator tube rupture
ECA-0.0	Loss of shutdown power
ECA-0.1	Recovery from loss of shutdown power without SI required
ECA-0.2	Recovery from loss of shutdown power with SI required
ECA-1.1	Loss of RHR sump recirculation
ECA-1.2	LOCA outside containment
ECA-2.1	Uncontrolled depressurization of all steam generators
ECA-3.1	SGTR and LOCA subcooled recovery
ECA-3.2	SGTR and LOCA saturated recovery
ECA-3.3	SGTR without pressure control
ES-0.1	Reactor trip response
ES-0.2	Natural circulation cooldown
ES-0.3	Natural circulation cooldown with steam void and RVLIS
ES-0.4	Natural circulation cooldown with steam void without RVLIS
ES-1.1	SI termination
ES-1.2	Post LOCA cooldown and depressurization
ES-1.3	Transfer to RHR containment sump
ES-1.4	Transfer to hot leg recirculation
ES-3.1	Post-SGTR cooldown using blowdown
ES-3.2	Post-SGTR cooldown using backfill
ES-3.3	Post-SGTR cooldown using steam dump
FR-C.1	Inadequate core cooling
FR-C.2	Degraded core cooling
FR-C.3	Saturated core cooling
FR-H.1	Loss of secondary heat sink
FR-H.2	Steam generator overpressurization
FR-H.3	Steam generator high level
FR-H.4	Loss of normal steam release capabilities
FR-H.5	Steam generator low level
FR-1.1	High pressurizer level
FR-1.2	Low pressurizer level
FR-P.1	Pressurized thermal shock
FR-S.1	Nuclear power generation/ATWS
FR-S.2	Loss of core shutdown
FR-Z.1	High containment pressure
FR-Z.3	High containment radiation

Table 7.5 - 1998 Abnormal Operating Instructions

<u>Procedure ID</u>	<u>Description</u>
AOI-2	Malfunction of reactor coolant system
AOI-3	Malfunction of reactor makeup control
AOI-4	Nuclear instrumentation malfunction
AOI-5	Unscheduled removal of one RCP below P-8
AOI-6	Small reactor coolant system leak
AOI-10	Loss of control air
AOI-11	Loss of condensor vacuum
AOI-12	loss of containment integrity
AOI-13	Loss of essential raw cooling water
AOI-14	Loss of RHR shutdown cooling
AOI-15	Loss of CCS
AOI-16	Loss of normal feedwater
AOI-17	Turbine trip
AOI-18	Malfunction of pressurizer pressure control system
AOI-20	Malfunction of pressurizer level control channel
AOI-21.01	Loss of 125VDC vital battery board I
AOI-21.02	Loss of 125VDC vital battery board II
AOI-21.03	Loss of 125VDC vital battery board III
AOI-21.04	Loss of 125VDC vital battery board IV
AOI-24	RCP seal abnormalities during pump operation
AOI-25.01	Loss of 120VAC vital instrument board 1-I
AOI-25.02	Loss of 120VAC vital instrument board 1-II
AOI-25.03	Loss of 120VAC vital instrument board 1-III
AOI-25.04	Loss of 120VAC vital instrument board 1-IV
AOI-26	Loss of control room alarms
AOI-27	Main control room inaccessibility
AOI-28	High activity in reactor coolant
AOI-33	Steam generator tube leak
AOI-34	Immediate boration
AOI-35	Loss of offsite power
AOI-37	Turbine runback response
AOI-38	Main steam or feedwater line leak

Table 7.6
Malfunction Test Schedule (1995-1998)

Test		Malfunction Description	Malf Name	ANS 3.5
Period	Index			Section 3.1.2 Reference
1995	1	VCT Level Transmitter Fails Hi	CV09	3.1.2(18)
	2	Steam Generator Tube Leak	TH05	3.1.2(1a)
	3	Letdown Line Break Inside Auxiliary Building	CV04	3.1.2(1b)
	4	LOCA Small Leak	TH03	3.1.2(1c)
	5	Pressurizer Safety Failure	TH04	3.1.2(1d)
	6	Stuck Rod	RD13	3.1.2(12)
	7	Loss of non-essential control air	IA02	3.1.2(2)
	8	Total Loss of Offsite Power	ED01	3.1.2(3)
	9	Loss of 6.9kv Shutdown Board	ED06	3.1.2(3)
	10	Loss of 480v Shutdown	ED08	3.1.2(3)
1996	1	Loss of 250 VDC Batt Bd	ED15	3.1.2(3)
	2	RCP Locked Rotor	RC01	3.1.2(4)
	3	RCCA Misalignment	RD05	3.1.2(12)
	4	RCW Pump Trip	RW02	3.1.2(6)
	5	RCW Heat Exchange Fouling	RW04	3.1.2(6)
	6	RHR Loop Suction Line Blockage	RH04	3.1.2(7)
	7	Reactor Trip Signal Failure	RP01	3.1.2(24)
	8	Component Cooling Pipe Break Inside Containment	CC04	3.1.2(8)
	9	Condensate Booster Pump Trip	FW02	3.1.2(9)
	10	Main Steam Line Break Inside Containment	MS01	3.1.2(20)
	11	Loss of <u>All</u> Feedwater		
		◦ Trip of Standby MFWP	FW06	3.1.2(10)
		◦ Trip of Turbine MFWP	FW05	3.1.2(10)
		◦ Trip of AFWP	FW07	3.1.2(10)
1997	1	LOCA Hot Leg	TH01	3.1.2(1c)
	2	Main Turbine Hi Vibes	TU02	3.1.2(15)
	3	Main Generator Trip	EG01	3.1.2(16)
	4	Loss of 120 VAC Inverter	ED10	3.1.2(3,11)
	5	T-avg. Control Signal Fails	RX18	3.1.2(17)
	6	Pzr pressure Transmitter Fails Hi	RX07	3.1.2(18)
	7	RHR Pump Trip	RH01	3.1.2(7)
	8	False Auto Reactor Trip Signal	RP05	3.1.2(19)
	9	Main Steam Line Break Outside Containment	MS02	3.1.2(20)
	10	Main Feedwater Line Break Inside Containment	FW23	3.1.2(20)
	11	Dropped Rod	RD07	3.1.2(12)

Table 7.6 (cont.)
Malfunction Test Schedule (1995-1998)

Test Period	Index	Malfunction Description	Malf Name	ANS 3.5 Section 3.1.2
				Reference
1998	1	Loss of 125 VDC Vital Bus	ED12	3.1.2(3)
	2	PR Channel Output Signal Failure	N107	3.1.2(21)
	3	#1 Feedwater Heater Level Control Fails Lo	FW12	3.1.2(22)
	4	Loss of Vacuum	FW09	3.1.2(5)
	5	Charging Flow Control Problem, Pressurizer level swing	CV15	3.1.2(22)
	6	Auto SI Initiation Signal Failure	RP02	3.1.2(23)
	7	Loss of Essential Control Air	IA03	3.1.2(2)
	8	Rods Fail to Move on Demand	RD08	3.1.2(13)
	9	Fuel Cladding Failure	TH09	3.1.2(14)
	10	Main Feedwater Line Break Outside Containment	FW20	3.1.2(20)
	11	Failure of Pressurizer PORV	RC07	3.1.2(1d)
	12	Loss of Emergency Generators	EG02	3.1.2(3)
	13	Loss of Condenser Level Control	FW36 FW37	3.1.2(5) 3.1.2(5)