

Duke Power Company
Catawba Training Center
4850 Concord Road
York, SC 29745

(803)831-3000



DUKE POWER

July 14, 1992

TO: Neal K. Huremuller
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

FROM: Jon D. Wylie
Manager, Catawba Training

SUBJECT: Simulator Four ~~Four~~ Report

This report is submitted as the four year report for the Catawba Nuclear Station Unit One Simulator in accordance with 10CFR50.45 b.5.ii and b.5.vi. The required information is included in the form of attachments to this letter as follows:

ATTACHMENT 1.0 FAILED TEST PROCEDURES
ATTACHMENT 2.0 DESCRIPTION OF TESTS COMPLETED (1988-1991)
ATTACHMENT 3.0 NEXT FOUR YEAR TEST SCHEDULE (1992-1995)

If there are any questions concerning this report, please feel free to call or write:

Glenn Spurlin
Director, Tech Services Trng
Catawba Nuclear Station
4850 Concord Road
York, S.C. 29745
Phone 803-831-3117

Thank you for your attention in this matter.



J.D. Wylie

cc: R.C. Futrell
M.S. Tuckman
W.R. McCollum

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ATTACHMENT 1

FAILED TEST PROCEDURES

There are no test failures pending. All failed tests have been corrected and retested satisfactorily. Nine tests have had work requests written to correct problems. All work requests are complete and satisfactory. A list of these tests and completed work requests follows.

1988	Malfunction EPL2 Loss of Vital Bus	WR # AFW007	Problem existed with Aux Feedwater valve indications.
1989	Steady State Test	WR # CFW015	Feed header and feed pump parameters were inconsistent with plant data.
		WR # RCP003	Reactor Coolant Pump bry temps were inconsistent with plant data.
1989	Loss of Feedwater With an AIWS	WR # CNM005	Obtained data for sump temperature and other containment parameters.
1989	Small Break LOCA With ICC.	WR # CNM005	Same as above.
		WR # CNM006	Obtained data for Containment Temp.
1990	Malfunction IRX13 Improper Overlap	WR # PCS012	Insufficient options on bank overlap failure selections.
1990	Malfunction VIX1 Loss of VI	WR # CFW024	Feed pump suction pressure meters had wrong power supply.
1990	Malfunction EPX8 Loss of 4160 Bus	WR # DSG001	D/G would not trip as per the malfunction description.
1991	Malfunction EPL4 Loss of Protective system Bus.	WR # EPS007	Various wrong power supplies.
1991	Malfunction MTX3 Loss of Condenser Vacuum.	WR # CFW030	Loss of condenser vacuum did not occur as expected.

Description of Tests Completed - 1988
Attachment 2

<u>Transients</u>	<u>Completion Date</u>
Transient #1 - S/G Tube Leak	11/28/88
Transient #2 - Large Break LOCA	12/12/88
Transient #3 - Small Break LOCA	12/06/88
Transient #4 - Loss of Offsite Power	12/13/88
Transient #5 - Single NC Pump Trip	11/14/88
Transient #6 - Loss of Main Feedwater	11/22/88
Transient #7 - Loss of All Feedwater	11/29/88
Transient #8 - Dropped Rod (EOL and BOL)	11/22/88
Transient #9 - Load Rejection	11/28/88
Transient #10 - Spray Valve Failure	10/14/88
Transient #11 - Reactor Trip	12/28/88
Transient #12 - Steam Line Break	10/18/88
Transient #13 - Feedwater Line Break	11/28/88
Transient #14 - Loss of CF ATWS	11/28/88
Transient #15 - Small Break LOCA ICC	11/28/88
Transient #16 - S/G Tube Rupture w/SM PORV Fail	10/07/88

<u>Malfunctions</u>	<u>Completion Date</u>
NDX4 - ND Pump Discharge Rupture	12/08/88
EPL2 - Loss of Vital Channel	12/06/88
KCX2 - KC Relief Valve Failure	12/27/88
IRX10 - Stuck Rod	11/01/88
CHX1 - Variable NC Activity	11/28/88
EGB2 - Main Generator Breaker Trip	11/28/88
ILE1 - PZR Level Master Failure	11/29/88
NCX2 - PZR PORV Failure	11/17/88
CFX7 - Main Feedline Break	11/29/88

<u>Others</u>	<u>Completion Date</u>
Steady State/Normal Ops Test (Four Power levels, including the one hour at 100% normal operations)	12/14/88
Simulator Real Time Test	01/06/89

Description of Tests Completed - 1989
Attachment 2

<u>Transients</u>	<u>Completion Date</u>
Transient #1 - S/G Tube Leak	10/25/89
Transient #2 - Large Break LOCA	03/06/89
Transient #3 - Small Break LOCA	05/24/89
Transient #4 - Loss of Offsite Power	11/02/89
Transient #5 - Single NC Pump Trip	03/06/89
Transient #6 - Loss of Main Feedwater	05/25/89
Transient #7 - Loss of All Feedwater	11/03/89
Transient #8 - Dropped Rod (EOL and BOL)	04/11/89
Transient #9 - Load Rejection	05/22/89
Transient #10 - Spray Valve Failure	05/15/89
Transient #11 - Reactor Trip	05/22/89
Transient #12 - Steam Line Break	05/25/89
Transient #13 - Feedwater Line Break	04/20/89
Transient #14 - Loss of CF ATWS	11/03/89
Transient #15 - Small Break LOCA ICC	11/03/89
Transient #16 - S/G Tube Rupture w/SM PORV Fail	03/14/89

<u>Malfunctions</u>	<u>Completion Date</u>
SGX1 - SGTR	01/30/89
NCX7 - NC Leak	04/25/89
EPX2 - Loss of Switchyard	03/06/89
DGX1 - D/G Failure to Start	05/22/89
RX3 - RN Pump Failure	05/23/89
CFX1 - Loss of FWPT Vacuum	05/25/89
IRX6 - Dropped Rod	11/02/89
IRX9 - Rods Fail to Move	05/25/89
IRX3 - Uncontrolled Rod Motion	05/25/89
SMX7 - Steam Line Break Inside Containment	11/06/89

<u>Others</u>	<u>Completion Date</u>
Steady State/Normal Ops Test (Four Power levels, including the one hour at 100% normal operations)	11/02/89
Simulator Real Time Test	11/02/89

Description of Test Completed - 1990
Attachment 2

<u>Transients</u>	<u>Completion Date</u>
Transient #1 - S/G Tube Leak	03/29/90
Transient #2 - Large Break LOCA	04/18/90
Transient #3 - Small Break LOCA	04/18/90
Transient #4 - Loss of Offsite Power	07/03/90
Transient #5 - Single NC Pump Trip	04/11/90
Transient #6 - Loss of Main Feedwater	04/18/90
Transient #7 - Loss of All Feedwater	03/29/90
Transient #8 - Dropped Rod (EOL and BOL)	04/24/90
Transient #9 - Load Rejection	04/24/90
Transient #10 - Spray Valve Failure	04/24/90
Transient #11 - Reactor Trip	03/27/90
Transient #12 - Steam Line Break	04/18/90
Transient #13 - Feedwater Line Break	03/29/90
Transient #14 - Loss of CF ATWS	03/30/90
Transient #15 - Small Break LOCA ICC	06/01/90
Transient #16 - S/G Tube Rupture w/SM PORV Fail	04/18/90

<u>Malfunctions</u>	<u>Completion Date</u>
NCX8 - LOCA	05/30/90
VIX1 - Loss of VI	05/15/90
EPX8 - Loss of 4160 VAC Bus	06/20/90
NCP1 - NCP Trip	04/26/90
IRX13 - Improper Overlap	05/07/90
EHC1 - Inadvertent Turbine Trip	05/30/90
ENB11 - Power Range Det. Failure	04/26/90
IPE1 - PZR Master Pressure Controller Failure	06/11/90
IPX1 - Auto Reactor Trip Failure	06/11/90

<u>Others</u>	<u>Completion Date</u>
Steady State/Normal Ops Test (Four Power levels, including the one hour at 100% normal operations)	01/02/91
Simulator Real Time Test	12/28/90

Description of Tests Completed - 1991
Attachment 2

<u>Transients</u>	<u>Completion Date</u>
Transient #1 - S/G Tube Leak	09/10/91
Transient #2 - Large Break LOCA	09/10/91
Transient #3 - Small Break LOCA	09/10/91
Transient #4 - Loss of Offsite Power	12/30/91
Transient #5 - Single NC Pump Trip	11/06/91
Transient #6 - Loss of Main Feedwater	11/18/91
Transient #7 - Loss of All Feedwater	12/09/91
Transient #8 - Dropped Rod (EOL and BOL)	11/04/91
Transient #9 - Load Rejection	12/16/91
Transient #10 - Spray Valve Failure	11/06/91
Transient #11 - Reactor Trip	11/15/91
Transient #12 - Steam Line Break	11/06/91
Transient #13 - Feedwater Line Break	11/11/91
Transient #14 - Loss of CF ATWS	11/11/91
Transient #15 - Small Break LOCA ICC	12/11/91
Transient #16 - S/G Tube Rupture w/SM PORV Fail	11/18/91

<u>Malfunctions</u>	<u>Completion Date</u>
NCX3 - PZR Safety Failure	09/10/91
EPX5 - Loss of 6900 Switchgear	09/10/91
MTX3 - Loss of Cond. Vacuum	09/10/91
NDX1 - ND Pump Failure	11/25/91
MLT2 - Loss of All Feedwater	09/10/91
EPL4 - Loss of Protective System Channel	12/30/91
IRE1 - Process Instrument and Control Failure	11/18/91
NIX4 - ECCS Header Vlvs Fail to Open on ECCS	11/25/91
IRX2 - Uncontrolled Rod Withdrawal	11/18/91

<u>Others</u>	<u>Completion Date</u>
Steady State/Normal Ops Test (Four Power levels, including the one hour at 100% normal operations)	12/16/91
Simulator Real Time Test	11/11/91

Attachment 3 - Four Year Test Schedule

Annual Simulator Testing Schedule for 1992

Transients:

- Transient #1 - S/G Tube Leak
- Transient #2 - Large Break LOCA
- Transient #3 - Small Break LOCA
- Transient #4 - Loss of Offsite Power
- Transient #5 - Single NC Pump Trip
- Transient #6 - Loss of Main Feedwater
- Transient #7 - Loss of All Feedwater
- Transient #8 - Dropped Rod (EOL and BOL)
- Transient #9 - Load Rejection
- Transient #10 - Spray Valve Failure
- Transient #11 - Reactor Trip
- Transient #12 - Steam Line Break
- Transient #13 - Feedwater Line Break
- Transient #14 - Loss of CF ATWS
- Transient #15 - Small Break LOCA ICC
- Transient #16 - S/G Tube Rupture with SM PORV Failure

Malfunctions:

- NDX4 - ND Pump Discharge Rupture
- EPL2 - Loss of Vital Channel
- KCX2 - KC Relief Valve Failure
- IRX10 - Stuck Rod
- CFX1 - Variable NC Activity
- EGB2 - Main Generator Breaker Trip
- ILE1 - PZR Level Master Failure
- NCX2 - PZR PORV Failure
- CFX7 - Main Feedline Break

Others:

- Steady State/Normal Ops Test - (Four Power levels,
including the one hour at
100% normal operations)
- Simulator Real Time Test

Attachment 3 - Four Year Test Schedule

Annual Simulator Testing Schedule for 1993

Transients:

- Transient #1 - S/G Tube Leak
- Transient #2 - Large Break LOCA
- Transient #3 - Small Break LOCA
- Transient #4 - Loss of Offsite Power
- Transient #5 - Single NC Pump Trip
- Transient #6 - Loss of Main Feedwater
- Transient #7 - Loss of All Feedwater
- Transient #8 - Dropped Rod (EOL and BOL)
- Transient #9 - Load Rejection
- Transient #10 - Spray Valve Failure
- Transient #11 - Reactor Trip
- Transient #12 - Steam Line Break
- Transient #13 - Feedwater Line Break
- Transient #14 - Loss of CF ATWS
- Transient #15 - Small Break LOCA ICC
- Transient #16 - S/G Tube Rupture with SM PORV Failure

Malfunctions:

- SGX1 - SGTR
- NCX7 - NC Leak
- EPX2 - Loss of Switchyard
- DGX1 - D/G Failure to Start
- RNX3 - RN Pump Failure
- CFX1 - Loss of FWPT Vacuum
- IRX6 - Dropped Rod
- IRX9 - Rods Fail to Move
- IRX3 - Uncontrolled Rod Motion
- SMX7 - Steam Line Break Inside Containment

Others:

- Steady State/Normal Ops Test - (Four Power levels,
including the one hour at
100% normal operations)
- Simulator Real Time Test

Attachment 3 - Four Year Test Schedule

Annual Simulator Testing Schedule for 1994

Transients:

- Transient #1 - S/G Tube Leak
- Transient #2 - Large Break LCCA
- Transient #3 - Small Break LOCA
- Transient #4 - Loss of Offsite Power
- Transient #5 - Single NC Pump Trip
- Transient #6 - Loss of Main Feedwater
- Transient #7 - Loss of All Feedwater
- Transient #8 - Dropped Rod (EOL and BOL)
- Transient #9 - Load Rejection
- Transient #10 - Spray Valve Failure
- Transient #11 - Reactor Trip
- Transient #12 - Steam Line Break
- Transient #13 - Feedwater Line Break
- Transient #14 - Loss of CF ATWS
- Transient #15 - Small Break LOCA ICC
- Transient #16 - S/G Tube Rupture with SM PORV Failure

Malfunctions:

- NCK8 - LOCA
- VIX1 - Loss of VI
- EPX8 - Loss of 4160 VAC Bus
- NCP1 - NCP Trip
- IRX13 - Improper Overlap
- EHC1 - Inadvertent Turbine Trip
- ENB11 - Power Range Det. Failure
- IPE1 - PZR Master Pressure Controller Failure
- IPX1 - Auto Reactor Trip Failure

Others:

Steady State/Normal Ops Test - (Four Power levels,
including the one hour at
100% normal operations)

Simulator Real Time Test

Attachment 3 - Four Year Test Schedule

Annual Simulator Testing Schedule for 1995

Transients:

- Transient #1 - S/G Tube Leak
- Transient #2 - Large Break LOCA
- Transient #3 - Small Break LOCA
- Transient #4 - Loss of Offsite Power
- Transient #5 - Single NC Pump Trip
- Transient #6 - Loss of M in Feedwater
- Transient #7 - Loss of All Feedwater
- Transient #8 - Dropped Rod (EOL and BOL)
- Transient #9 - Load Rejection
- Transient #10 - Spray Valve Failure
- Transient #11 - Reactor Trip
- Transient #12 - Steam Line Break
- Transient #13 - Feedwater Line Break
- Transient #14 - Loss of CF ATWS
- Transient #15 - Small Break LOCA LOC
- Transient #16 - S/G Tube Rupture with SM PORV Failure

Malfunctions:

- NCX3 - PZR Safety Failure
- EPX5 - Loss of 6900 Switchgear
- MTX3 - Loss of Cond. Vacuum
- NDX1 - ND Pump Failure
- MLT2 - Loss of All Feedwater
- EPL4 - Loss of Protective System Channel
- IRE1 - Process Instrument and Control Failure
- NIX4 - ECCS Header Valves Fail to Open on ECCS Activation
- IRX2 - Uncontrolled Rod Withdrawal

Others:

- Steady State/Normal Ops Test - (Four Power levels,
including the one hour at
100% normal operations)
- Simulator Real Time Test