STARTUP INTEGRATED TEST SIT-TP-250
ULTIMATE HEAT SINK TEST

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Startup Integrated Test SIT-TP-250 | Unit Waterford 3
Date 6-11-82
Ultimate Heat Sink Test | Revision Draft 2

1.0 OBJECTIVES

1.1 To assess the performance level of the ultimate heat sink under simulated loss of coolant accident (LOCA) conditions.

1.2 To assess the performance level of the ultimate heat sink under simulated normal shutdown conditions.

1.3 To assess the performance level of the ultimate heat sink under simulated shutdown 24 hours after reactor trip (tornado missile analysis) conditions.

1.4 To conduct a performance guarantee evaluation of the wet towers.

2. [illegible]

2.1 [illegible] Documents

2.1.1 FSAR

2.1.1.1 Chapter 9, Section 9.2.2, Amendment 22, Cooling System for Reactor Auxiliaries

2.1.1.2 Chapter 9, Section 9.2.5, Amendment 22, Ultimate Heat Sink

2.1.1.3 Chapter 9, Table 9.2-8, Amendment 22, Principal Cooling Tower Components

2.1.1.4 Chapter 14, Section 14.2.12.2.16, Amendment 22, Preoperational Testing

2.1.1.5 Chapter 16, Section 3/4.7.5, Amendment 16, Ultimate Heat Sink

2.1.2 Other Commitment Documents

2.1.2.1 ASME PTC-23, Power Test Code for Atmospheric Water Cooling Equipment, January 1958

2.1.2.2 ASME PTC-30, Power Test Code for Air-Cooled Heat Exchangers (undated draft copy for information only)

2.1.2.3 Regulatory Guide 1.68, Rev. 2, Initial Test Programs for Water-Cooled Nuclear Power Plants

2.1.2.4 Regulatory Guide 1.27, Rev. 2, Ultimate Heat Sink for Nuclear Power Plants

2.1.2.5 American Institute of Chemical Engineers (AIChE), Equipment Testing Procedure for Air-Cooled Heat Exchangers, August 26, 1978

2.1.2.6 API Standard 661, Air-Cooled Heat Exchangers for General Refinery Services, Second Edition, January 1978

2.1.2.7 Cooling Tower Institute Standard ATC-105, February 1975

2.1.2.8 ASME PTC-11, Fan Testing Procedure (draft copy for information only), December 1981

2.1.2.9 ASME PTC-18.1, Rev. (LATER), Pump Turbine Testing Procedure, dated 1978

2.1.2.10 Waterford SES Unit No. 3 Response to NRC Questions 371.15 and 371.09

2.1.2.11 Waterford SES Unit No. 3 Safety Evaluation Report, Section 2.4.5, NUREG 0787

2.1.2.12 Waterford SES Unit No. 3 Safety Evaluation Report, Section 9.2.5, NUREG 0787

2.2 Purchase Orders

2.2.1 NY-403528, Supplement 13, 09/26/78, Mechanical Draft Cooling Towers and Accessories

2.2.2 NY-403479, Supplement 0, Forced Draft Dry Cooling Towers

2.3 Design Documents

2.3.1 Flow Diagrams

2.3.1.1 LOU-1564-G-160, Sh. 1, Rev. 12, Component Closed Cooling Water System

2.3.1.2 LOU-1564-G-160, Sh. 2, Rev. 9, Component Closed Cooling Water System

2.3.2 Electrical One-Line Diagrams - NA

2.3.3 Control Wiring Diagrams, LOU-1564-B-424

2.3.3.1 Sh. 761S, Rev. 5, Wet Tower A Fan No. 1

2.3.3.2 Sh. 762S, Rev. 4, Wet Tower A Fan No. 2

2.3.3.3 Sh. 763S, Rev. 4, Wet Tower A Fan No. 3

2.3.3.4 Sh. 764S, Rev. 4, Wet Tower A Fan No. 4

2.3.3.5 Sh. 765S, Rev. 5, Wet Tower A Fan No. 5

2.3.3.6 Sh. 766S, Rev. 4, Wet Tower A Fan No. 6

2.3.3.7 Sh. 767S, Rev. 4, Wet Tower A Fan No. 7

2.3.3.8 Sh. 768S, Rev. 7, Wet Tower A Fan No. 8

2.3.3.9 Sh. 770S, Rev. 2, Cooling Tower A Motor Space Heaters

2.3.3.10 Sh. 777, Rev. 4, Wet Tower A Fans No. 1 to No. 5 Vibration Alarms

2.3.3.11 Sh. 778, Rev. 4, Wet Tower A Fans No. 6 to No. 8 and B Fans No. 1 and No. 2 Vibration Alarms

2.3.3.12 Sh. 779, Rev. 4, Wet Tower B Fans No. 3 to No. 8 Vibration Alarms

2.3.3.13 Sh. 811S, Rev. 4, Wet Tower B Fan No. 1

2.3.3.14 Sn. 812S, Rev. 4, Wet Tower B Fan No. 2

2.3.3.15 Sh. 813S, Rev. 4, Wet Tower B Fan No. 3

2.3.3.16 Sn. 814S, Rev. 4, Wet Tower B Fan No. 4

2.3.3.17 Sh. 815S, Rev. 4, Wet Tower B Fan No. 5

2.3.3.18 Sh. 816S, Rev. 4, Wet Tower B Fan No. 6

2.3.3.19 Sh. 817S, Rev. 4, Wet Tower B Fan No. 7

2.3.3.20 Sh. 818S, Rev. 5, Wet Tower B Fan No. 8

2.3.3.21 Sh. 820S, Rev. 2, Cooling Tower B Motor Space Heaters

2.3.3.22 Sh. 2941, Rev. 6, Transfer Switch Dev. Aux. Panel 1

2.3.3.23 Sh. 2391S, Rev. 3, Sequencer B, Sh. 1

2.3.3.24 Sh. 2942, Rev. 7, Transfer Switch Dev. Aux. Panel 2

2.3.3.25 Sh. 731S, Rev. 5, Dry Tower A Fan No. 1

2.3.3.26 Sh. 732S, Rev. 5, Dry Tower A Fan No. 2

2.3.3.27 Sh. 733S, Rev. 5, Dry Tower A Fan No. 3

2.3.3.28 Sh. 734S, Rev. 5, Dry Tower A Fan No. 4

2.3.3.29 Sh. 735S, Rev. 5, Dry Tower A Fan No. 5

2.3.3.30 Sh. 736S, Rev. 6, Dry Tower A Fan No. 6

2.3.3.31 Sh. 737S, Rev. 5, Dry Tower A Fan No. 7

2.3.3.32 Sn. 738S, Rev. 5, Dry Tower A Fan No. 8

2.3.3.33 Sh. 739S, Rev. 5, Dry Tower A Fan No. 9

2.3.3.34 Sh. 740S, Rev. 6, Dry Tower A Fan No. 10

2.3.3.35 Sh. 741S, Rev. 5, Dry Tower A Fan No. 11

2.3.3.36 Sh. 742S, Rev. 5, Dry Tower A Fan No. 12

2.3.3.37 Sh. 743S, Rev. 5, Dry Tower A Fan No. 13

2.3.3.38 Sh. 744S, Rev. 5, Dry Tower A Fan No. 14

2.3.3.39 Sh. 745S, Rev. 5, Dry Tower A Fan No. 15

2.3.3.40 Sh. 748, Rev. 3, Dry Tower A Computer Inputs

2.3.3.41 Sh. 781S, Rev. 4, Dry Tower B Fan No. 1

2.3.3.42 Sh. 782S, Rev. 5, Dry Tower B Fan No. 2

2.3.3.43 Sh. 783S, Rev. 4, Dry Tower B Fan No. 3

2.3.3.44 Sh. 784S, Rev. 5, Dry Tower B Fan No. 4

2.3.3.45 Sh. 785S, Rev. 4, Dry Tower B Fan No. 5

2.3.3.46 Sh. 786S, Rev. 4, Dry Tower B Fan No. 6

2.3.3.47 Sh. 787S, Rev. 4, Dry Tower B Fan No. 7

2.3.3.48 Sh. 788S, Rev. 4, Dry Tower B Fan No. 8

2.3.3.49 Sh. 789S, Rev. 4, Dry Tower B Fan No. 9

2.3.3.50 Sh. 790S, Rev. 4, Dry Tower B Fan No. 10

2.3.3.51 Sh. 791S, Rev. 4, Dry Tower B Fan No. 11

2.3.3.52 Sh. 792S, Rev. 5, Dry Tower B Fan No. 12

2.3.3.53 Sh. 793S, Rev. 4, Dry Tower B Fan No. 13

2.3.3.54 Sh. 794S, Rev. 4, Dry Tower B Fan No. 14

2.3.3.55 Sh. 795S, Rev. 7, Dry Tower B Fan No. 15

2.3.3.56 Sh. 798, Rev. 2, Dry Tower B Computer Inputs

2.3.3.57 Sh. 771, Rev. 7, Dry Tower A Fans 1 to 5 Vibration Alarms

2.3.3.58 Sh. 772, Rev. 5, Dry Tower A Fans 6 to 10 Vibration Alarms

2.3.3.59 Sh. 773, Rev. 4, Dry Tower A Fans 11 to 15 Vibration Alarms

2.3.3.60 Sh. 774, Rev. 4, Dry Tower B Fans 1 to 5 Vibration Alarms

2.3.3.61 Sh. 775, Rev. 4, Dry Tower B Fans 6 to 10 Vibration Alarms

2.3.3.62 Sh. 776, Rev. 4, Dry Tower B Fans 11 to 15 Vibration Alarms

2.3.3.63 Sh. 715S, Rev. 5, Component Cooling Water System Instrumentation, Sheet 4

2.3.3.64 Sh. 716S, Rev. 6, Component Cooling Water System Instrumentation, Sheet 5

2.3.3.65 Sh. 2341S, Rev. 3, Sequencer A, Sheet 1

2.3.3.66 Sh. 701S, Rev. 6, CCW Pump A Header Isol. Valves

2.3.4 Instrument Schematics and Logic Diagrams

2.3.4.1 LOU-1564-B-434, Rev. 17, Instrument List

2.3.4.1.1 LOU-1564-B-434, Sh. (LATER), General Arrangement Cooling Towers Plan

2.3.4.1.2 LOU-1564-B-434, Sh. (LATER), General Arrangement Cooling Towers Section

2.3.5 Other Design Documents - NA

2.4 Vendor Data

2.4.1 Vendor Engineering Documents

2.4.1.1 LOU-1564-3067, Rev. 0, Wet Cooling Towers Proposed Layout

2.4.1.2 LOU-1564-7933, Rev. 3, Wet Cooling Tower Fan Installation

2.4.1.3 LOU-1564-7934, Rev. 1, Wet Cooling Tower General Arrangement Equipment Location

2.4.1.4 LOU-1564-1419, Rev. 3, Dry Cooling Tower General Arrangement, Section AA

2.4.1.5 LOU-1565-1418, Rev. 3, Dry Cooling Tower General Arrangement, Section BB.

2.4.1.6 LOU-1564-1417, Rev. 3, Dry Cooling Tower General Arrangement, Plan

2.4.1.7 LOU-1564-1416, Rev. 7, Dry Cooling Tower General Arrangement, Sections CC and DD

2.4.1.8 LOU-1564-7935, Rev. 1, Wet Cooling Tower Plant Layout - Plan View

2.4.1.9 LOU-1564-7936, Rev. 2, Wet Cooling Tower Plant Layout - Section AA Elevation View

2.4.1.10 LOU-1564-8632, Rev. 1, Package Cooling Tower Frame Plan - Fan Deck with Connection Details

2.4.2 Vendor Manuals

2.4.2.1 LOU-5817-3957, Rev. 0, Instruction Manual for Zurn Cooling Towers

2.4.2.2 LOU-5817-4340, Rev. 0, Hudson Cooling Equipment Instruction Manual

2.5 Other References

2.5.1 STP-20, Rev. 2, Operation of Fans and Blowers

2.5.2 SAP-09, Rev. 1, Tagging

2.5.3 SFG-36-004, Rev. 0, Wet and Dry Cooling Tower Fans Performance Evaluation Prerequisite-Preservice Test

2.5.4 SFG-36-002, Rev. 0, Dry Cooling Tower Fans Initial Run-In

2.5.5 SFG-36-003, Rev. 0, Initial Run of Wet Cooling Tower Fans

2.5.6 SFL-36-001, Rev. 0, Component Closed Cooling Water System

2.5.7 SFL-36-002, Rev. 0, Auxiliary Component Cooling Water System

2.5.8 SFL-36-003, Rev. 0, Dry Cooling Towers

	Reference Paragraph	Initials & Date

3.0 ACCEPTANCE CRITERIA

3.1 Under simulated LOCA conditions, the wet and dry tower combination (both east and west trains) meets the following conditions while dissipating 176 x 10^6 BTU/hr (as determined by Attachment 8.3.1):

(1) Discharge temperatures of the wet tower, as read by resistance temperature detector (RTD) CC-7077-78AS, is ≤95 degrees F; and as read by RTD CC-7077-785S is ≤92 degrees F.

(a)	Side A	7.2.1.14	----------
(b)	Side B	7.2.2.14	----------

} align all pignoffs

(2) Auxiliary component cooling water (ACCW) flow is 5000 gpm ±10%.

7.2.1.17	----------	
7.2.2.17	----------	

(3) Component cooling water (CCW) flow is 6500 gpm ±10%.

	Reference Paragraph	Initials & Date
	7.2.1.12	_____
	7.2.2.12	_____
(4) Discharge temperature of the Component Cooling Water System (CCWS) heat exchanger, as read by the temporary RTD, located on the inlet to temporary feed heater, is ≤115 degrees F.		
	7.2.1.14	_____
	7.2.2.14	_____
NOTE: (5) Water makeup is not necessary during testing.		X
		_____ X

3.2 Under simulated normal shutdown conditions, the wet and dry tower combination (both east and west trains) meets the following conditions while dissipating 127 x 10^6 BTU/hr (as determined by Attachment 8.3.2): X

(1) Discharge temperature of the wet tower, as read by RTD CC-7077-78AS, is

		Reference Paragraph	Initials & Date
	≤95 degrees F; and as read by RTD CC-7077-78BS is ≤95 degrees F:		
	(a) Side A	7.2.3.14	_____
	(b) Side B	7.2.4.14	_____
(2)	ACCW flow is 6500 gpm ±10%.		
		7.2.3.17	_____
		7.2.4.17	_____
(3)	CCW flow is 6500 gpm ±10%.		
		7.2.3.12	_____
		7.2.4.12	_____
(4)	Discharge temperature of the CCWS heat exchanger, as read by the temporary RTD, located on the inlet to the temporary feed heater, is ≤115 degrees F.		
	(a) Side A	7.2.3.14	_____
	(b) Side B	7.2.4.14	_____

3.3 Under simulated shutdown 24 hours after reactor trip (tornado missile analysis), the wet and dry tower combination (both east and

	Reference	Initials & Date
west trains) meets the following conditions while dissipating 91.5 x 10^6 BTU/hr (as determined in Attachment 8.2.3):		
(1) Discharge temperature of the wet tower, as read by RTD CC-7077-7885, is ≤95 degrees F; and as read by RTD-CC-7077-7885 is ≤95 degrees F.	7.2.5.14 7.2.6.14	_____ _____
(2) ACCW flow is 5000 gpm ±10%.	7.2.5.17 7.2.6.17	_____ _____
(3) CCW flow is 6500 gpm ±10%.	7.2.5.12 7.2.6.12	_____ _____
(4) Discharge temperature of the CCWS heat exchanger, as read by the temporary RTD located on the inlet to the temporary feed		

		Reference Paragraph	Initials & Date
	heater is ≤120 degrees F.		
		7.2.5.14	_____
		7.2.6.14	_____
(5)	The 2-hour temperature, as read by RTD TE-CC-7077-AS, is ≤105 degrees F.		
			_____
~~(6)~~ NOTE:	Water makeup during testing is not necessary.		X
			_____ X

3.4 The Wet Cooling Tower is guaranteed to perform to the design conditions specified below:

		Accident	Reference Paragraph	Initials & Date
(1)	Total water quantity cooled, gpm (±10%)	5000	(LATER)	_____
(2)	Total cooling duty, 10 BTU/hr	67.5	(LATER)	_____
(3)	Cooling range, deg F	≤27	(LATER)	_____
(4)	Tower inlet design			

		Accident	Reference Paragraph	Initials & Date
	wet-bulb temperature, deg F	84	(LATER)	_____
(5)	Approach to above, deg F	≤8	(LATER)	_____
(6)	Temperature of water entering tower, deg F	≤119	(LATER)	_____
(7)	Temperature of water leaving tower, deg F	≤92	(LATER)	_____

4.0 TEST EQUIPMENT

4.1 Test Instrumentation

4.1.1 Indicating Equipment

	M&TE or Serial No.	Calibration Verification Initials & Date
4.1.1.1 Gill Model 27101 propeller anemometer (4), or equivalent		
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4.1.1.2 R.M. Young Model 12301/12101 microvane and cup anemometer (3), or equivalent		
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	---	---
	---	---
4.1.1.3 Climatronic electronic weather station (1), optional		
	---	---
4.1.1.4 Inclined manometer (2), airflow (optional)		

		M&TE or Serial No.	Calibration Verification Initials & Date
		---	---
		---	---
4.1.1.5	U-tube manometer (1), 20-inch, water flow	---	---
4.1.1.6	Platinum RTD, ESC-PTS-80-A (60), or equivalent	---	---
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Unit Waterford 3

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M&TE or Serial No.	Calibration Verification Initials & Date

	M&TE or Serial No.	Calibration Verification Initials & Date
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4.1.1.7 S&J psychrometer (22), or equivalent

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		M&TE or Serial No.	Calibration Verification Initials & Date
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4.1.1.8	Fluke Model 8022B ammeter/voltmeter (1), or equivalent	----------	----------
4.1.1.9	Environmental Systems Corporation (ESC) PTS-80A Temperature Acquisition System (2)	----------	----------
		----------	----------

X

	M&TE or Serial No.	Calibration Verification Initials & Date
4.1.1.10 Infrared thermometer (1), Model LATER or equivalent	----------	----------

4.2 Special Equipment

4.2.1 Simplex Flat rod pitot tube (1)

4.2.2 150,000 lb/hr package boiler (1), 300 psig operating pressure

4.3 Additional Test Equipment

4.3.1 List any additional equipment used below and in the Chronological Log, Attachment 8.4.1, as it is used. Enter "NA" if serial numbers or calibrations are not applicable for a particular piece of equipment.

Description	M&TE or Serial No.	Calibration Verification Initials & Date
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5.0 PRECAUTIONS AND NOTES

5.1 Precautions

5.1.1 All personnel must be outside the wet tower before a fan assembly is put into service.

5.1.2 Check the fan blades to ensure that they are installed at or below the proper angle, in accordance with the manufacturer's recommendations. All blades on a single fan assembly must be set at the same blade angle.

5.1.3 If excessive vibration is observed, the wet tower fan assembly shall be turned off immediately and the cause of the vibration shall be determined and corrected.

5.1.4 To prevent overheating, the vibration switch reset coil should not be energized for more than 3 minutes. If this condition exists, the coil must be deenergized for 10 minutes before reenergization.

5.1.5 Do not exceed the full-load amperage rating of the wet and dry towers motors during fan operation.

(1) Wet Tower Fans: 39.5 amps
(2) Dry Tower Fans: 48.0 amps fast speed
18.0 amps slow spee

5.1.6 As the dry tower gear reducer unit is brought up to speed, it should be monitored constantly for unusual sounds, excessive vibration, excessive heat, or oil leakage. If any of these conditions develops, the unit should be shut down immediately, and the cause determined and corrected. Operating temperature

of the unit at the hottest point should not exceed 180 degrees F as read by the infrared thermometer.

5.1.7 All personnel must be outside the tower before a fan assembly is put into operation, with the exception of the personnel necessary to monitor fan/gearbox operation and take velocity profiles. Monitoring personnel shall be equipped with safety harnesses (belts) to prevent the possibility of coming in contact with the blades.

5.1.8 Operation of the two-speed fans associated with the dry towers requires a minimum of a 30-second delay when switching from full speed to half speed.

5.1.9 All personnel involved in electrical measurements, lead lifting, or jumper placement shall be familiar with all necessary safety precautions.

5.1.10 Personnel involved in testing in high-noise areas shall be supplied with adequate ear protection.

5.1.11 No fewer than two individuals (one of whom will be in constant communication with the Control Room) shall be allowed entry inside the wet towers during water loading.

5.1.12 When using CCW Pump A/B instead of CCW Pump A or CCW Pump B, the following applies:

(1) Instead of CCW Pump A, rack out CCW Pump A breaker; and manually align the 3AB3S bus to the 3A3S bus to ensure channel separation.

(2) Instead of CCW Pump B, rack out CCW Pump B breaker; and manually align the 3AB3S bus to the 3B3S bus to ensure channel separation.

5.2 Notes

5.2.1 Communications shall be established between all parties involved with the test to ensure coordination and consistency in testing.

5.2.2 The wet cooling towers shall be cleaned before the fans are started to prevent having foreign objects entrained in the airstream.

5.2.3 The dry cooling towers shall be cleaned prior to operating the fans to prevent having any foreign objects entrained in the airstream.

5.2.4 The order of testing, as outlined in section 7.0, may be changed at the discretion of the Startup Engineer.

5.2.5 The test personnel responsible for signing their initials to certify data shall complete Attachment 8.4.2, Test Personnel ID Sheet, by printing their names and signing their initials.

5.2.6 All analyses should incorporate pre- and post-test calibration data.

5.2.7 A Chronological Log, Attachment 8.4.1, shall be kept of all significant events that occur during the performance of this test.

6.0 PREREQUISITES

6.1 Data from Reference 2.5.4, SFG-36-002, Dry Cooling Tower Fans Initial Run-In, has been reviewed.

R-LPL/SFG36002*NONE*0010/05/81

6.2 Data from Reference 2.5.5, SFG-36-003, Initial Run of Wet Cooling Tower Fans, has been reviewed.

R-LPL/SFG36003*NONE*0003/04/80

6.3 Data from Reference 2.5.3, SFG-36-004, Wet and Dry Cooling Tower Fans Performance Evaluation, has been reviewed.

R-LPL/SFG36004*NONE*0000/00/00

6.4 Data from Reference 2.5.6, SFL-36-001, Component Closed Cooling water System, has been reviewed.

R-LPL/SFL36001*NONE*0012/03/81

6.5 Data from Reference 2.5.7, SFL-36-002, Auxiliary Component Cooling Water System, has been reviewed.

Initials & Date

R-LPL/SFL36002*NONE*0006/10/81

6.6 Data from Reference 2.5.8, SFL-36-003, Dry Cooling Towers, has been reviewed.

R-LPL/SFL36003*NONE*0010/26/82

6.7 All wet tower nozzles have been replaced and properly oriented.

6.8 All doorways, hatches, and penetrations between wet and dry tower sections and the dry tower Fuel Handling Building are closed or in "normal" operating positions.

6.9 Check tube bundle cleanliness on dry towers before testing begins to evaluate the need for mechanical or chemical cleaning. Verify that tube bundles are clean for this test.

6.10 Ensure that the dry towers are vented to remove any entrapped air pockets. (See Reference 2.5.6, SFL-36-001, Component Closed Cooling Water System.)

Initials & Date

R-LPD/SP[illegible] [illegible]

6.11 All [illegible] for the temporary boiler ~~listed in [illegible] Instrument Summary [illegible]~~ have been calibrated. ______________

6.12 Hudson and Zurn have been notified 7 days prior to testing so that their representatives can witness the testing of their equipment. ______________

6.13 All activities required to be handled by union personnel should be identified and coordinated prior to testing. ______________

6.14 All Field Change Requests (FCRs) and Design Change Notices (DCNs) pertaining to wet and dry towers have been reviewed prior to test commencement. ______________

6.15 A pretest briefing with personnel involved with this test has been performed. ______________

6.16 Pretest Walkdown

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Initials & Date

Pretest walkdowns of the following systems have been conducted to verify that the corresponding portions of this procedure covering testing of these systems are ready to be performed:

assign ↓	(1)	Wet Tower A	---------- X
	(2)	Wet Tower B	---------- ↓
	(3)	Dry Tower A	----------
	(4)	Dry Tower B	----------
	(5)	ACCW (Wet Tower A)	----------
	(6)	ACCW (Wet Tower B)	----------
	(7)	CCW System	----------

6.17 Release to Perform Testing

I hereby authorize the test to proceed, subject to the limitations as noted.

Remarks _____

_____

_____

Authorized By: _____ Date _____

LSE

7.0 PROCEDURE

7.1 Initial Conditions

7.1.1 Temporary Modifications (For All Tests)

7.1.1.1 Perform the following temporary modifications to remove automatic actuation of CCW header isolation valves:

(1) Lift cable at TBB-16 and TBB-17 in Aux. Panel 1. _____

(2) Lift cable at TBB-17 and TBB-6 in Aux. Panel 1. _____

(3) Install a jumper between TBB-17 and TBB-6 in Aux. Panel 1. _____

(4) Lift cable at TBB-36 and TBB-33 in Aux. Panel 2. _____

(5) Lift cable at TBB-33 and TBB-27 in Aux. Panel 2. _____

(6) Install a jumper between TBB-33 and TBB-27 in Aux. Panel 2. _____

(7) Lift cable at TBB-106 and TBB-107 in Aux. Panel 2.

Initials & Date

(8) Lift cable at TBB-107 and TBB-97 in Aux. Panel 2.

(9) Install a jumper between TBB-107 and TBB-97 in Aux. Panel 2.

(10) Lift cable at TBB-29 and TBB-30 in Aux. Panel 1.

(11) Lift cable at TBB-30 and TBB-23 in Aux. Panel 1.

(12) Install a jumper between TBB-30 and TBB-23 in Aux. Panel 1.

7.1.1.2 Verify that the installation of temporary instrumentation required for data in Attachment 8.2.1 and 8.2.~~1~~8 is complete. X

7.1.2 Initial Boiler Startup

7.1.2.1 The boiler must be warmed up and at pressure to begin the testing described in section 7.2.

7.1.3 Wet Tower - Train A (For Side A Testing)

Initials & Date

7.1.3.1 Verify that the following are available:

(1) 480V MCC-3A315-S ----------

7.1.3.2 At CP-33, verify that Wet Tower A fan control switches CS-1/761 (for fans 1 through 4) and CS-1/765 (for fans 5 through 8) are in the OFF position.

(1) Fan 1 ----------
(2) Fan 2 ----------
(3) Fan 3 ----------
(4) Fan 4 ----------
(5) Fan 5 ----------
(6) Fan 6 ----------
(7) Fan 7 ----------
(8) Fan 8 ----------

7.1.3.3 At Aux. Panel 1, verify that transfer switch 43-19 is in the CONTROL ROOM position.

7.1.3.4 At 480V MCC-3A315-S, compts. 10H, 12H, 10M, 11H, 11M, 12M, 13H, and 13M, verify that the 24 (3 for each compartment) thermal overload devices are installed. ×

---

(1) Compt. 10H ----------
(2) Compt. 12H ----------

Initials & Date

(3) Compt. 10M _____
(4) Compt. 11H _____
(5) Compt. 11M _____
(6) Compt. 12M _____
(7) Compt. 13H _____
(8) Compt. 13M _____

7.1.3.5 At 460V MCC-3A315-S, compts. 10H, 12H, 10M, 11H, 11M, 12M, 13H, and 13M, close the breakers for fans A1 through A8 and verify the following:

(1) Green indicating lights on CP-33 are ON for Wet Tower A fans 1 through 4 and 5 through 8.
   (a) Fan 1 _____
   (b) Fan 2 _____
   (c) Fan 3 _____
   (d) Fan 4 _____
   (e) Fan 5 _____
   (f) Fan 6 _____
   (g) Fan 7 _____
   (h) Fan 8 _____

(2) Red indicating lights on CP-33 are OFF for Wet Tower A fans 1 through 4 and 5 through 8.
   (a) Fan 1 _____
   (b) Fan 2 _____
   (c) Fan 3 _____

(d) Fan 4 _____
(e) Fan 5 _____
(f) Fan 6 _____
(g) Fan 7 _____
(h) Fan 8 _____

7.1.4 Wet Tower - Train B (For Side A Testing)

7.1.4.1 Verify that the following are available:

(1) 480V MCC-3B315-S _____

7.1.4.2 At CP-33, verify that Wet Tower B fan control switches CS-1/811 (for fans 1 through 4) and CS-1/815 (for fans 5 through 8) are in the OFF position.

(1) Fan 1 _____
(2) Fan 2 _____
(3) Fan 3 _____
(4) Fan 4 _____
(5) Fan 5 _____
(6) Fan 6 _____
(7) Fan 7 _____
(8) Fan 8 _____

7.1.4.3 At Aux. Panel 2, verify that transfer switch 43-19 is in the CONTROL ROOM position.

_____

Initials & Date

7.1.4.4 At 480V MCC-3B315-S, compts. 10H, 12H, 10M, 11H, 11M, 12M, 13H, and 13M, verify that the 24 (3 for each compartment) thermal overload devices are installed. X X

(1) Compt. 10H _____
(2) Compt. 12H _____
(3) Compt. 10M _____
(4) Compt. 11H _____
(5) Compt. 11M _____
(6) Compt. 12M _____
(7) Compt. 13H _____
(8) Compt. 13M _____

7.1.4.5 At 480V MCC-3B315-S, compts. 10H, 12H, 10M, 11H, 11M, 12M, 13H, and 13M, close the breakers for fans B1 through B8 and verify the following:

(1) Green indicating lights on CP-33 are ON for Wet Tower B fans 1 through 4 and 5 through 8.
   (a) Fan 1 _____
   (b) Fan 2 _____
   (c) Fan 3 _____
   (d) Fan 4 _____
   (e) Fan 5 _____
   (f) Fan 6 _____
   (g) Fan 7 _____

Initials & Date

(h) Fan 8 _____

(2) Red indicating lights on CP-33 are OFF for Wet Tower B fans 1 through 4 and 5 through 8.

(a) Fan 1 _____
(b) Fan 2 _____
(c) Fan 3 _____
(d) Fan 4 _____
(e) Fan 5 _____
(f) Fan 6 _____
(g) Fan 7 _____
(h) Fan 8 _____

7.1.5 Dry Tower - Train A (For Side A Testing)

7.1.5.1 Verify that the following are available:

(1) 480V MCC-3A315-S _____

7.1.5.2 At CP-33, verify that the following Dry Tower A fan control switches for fans A1 through A15 are in the OFF position:

	Fan No.	Switch No.	Initials & Date
(1)	A1	CS-1/731	_____
(2)	A2	CS-1/732	_____
(3)	A3	CS-1/733	_____
(4)	A4	CS-1/734	_____
(5)	A5	CS-1/735	_____
(6)	A6	CS-1/736	_____

	Fan No.	Switch No.	Initials & Date
(7)	A7	CS-1/737	----------
(8)	A8	CS-1/738	----------
(9)	A9	CS-1/739	----------
(10)	A10	CS-1/740	----------
(11)	A11	CS-1/741	----------
(12)	A12	CS-1/742	----------
(13)	A13	CS-1/743	----------
(14)	A14	CS-1/744	----------
(15)	A15	CS-1/745	----------

Initials & Date

7.1.5.3 At Aux. Panel 1, verify that transfer switches 43-14, 43-15, 43-16, 43-17, and 43-18 are in the CONTROL ROOM position.

(1)	Switch 43-14	----------
(2)	Switch 43-15	----------
(3)	Switch 43-16	----------
(4)	Switch 43-17	----------
(5)	Switch 43-18	----------

7.1.5.4 At 480V MCC-3A315-S, close the following breakers for Dry Tower A fans A1 through A15:

	Fan No.	Compt. No.	Initials & Date
(1)	A1	1F	----------
(2)	A2	1M	----------
(3)	A3	2F	----------

	Fan No.	Compt. No.	Initials & Date
(4)	A4	2M	----------
(5)	A5	3F	----------
(6)	A6	3M	----------
(7)	A7	4F	----------
(8)	A8	4M	----------
(9)	A9	5F	----------
(10)	A10	5M	----------
(11)	A11	7F	----------
(12)	A12	7M	----------
(13)	A13	8F	----------
(14)	A14	8M	----------
(15)	A15	9F	----------

Initials & Date

7.1.5.5 At CP-33, verify the following:

(1) Green indicating lights for fans A1 through A15 are ON.

(a)	Fan A1	---------- X
(b)	Fan A2	---------- ↓
(c)	Fan A3	----------
(d)	Fan A4	----------
(e)	Fan A5	----------
(f)	Fan A6	----------
(g)	Fan A7	----------
(h)	Fan A8	----------
(i)	Fan A9	----------
(j)	Fan A10	----------

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Initials & Date

(1) Fan A11 _____
(2) Fan A12 _____
(3) Fan A13 _____
(4) Fan A14 _____
(5) Fan A15 _____

(2) Red indicating lights for Fans A1 through A15 are OFF.

(a) Fan A1 _____ X
(b) Fan A2 _____ ↓
(c) Fan A3 _____
(d) Fan A4 _____
(e) Fan A5 _____
(f) Fan A6 _____
(g) Fan A7 _____
(h) Fan A8 _____
(i) Fan A9 _____
(j) Fan A10 _____
(k) Fan A11 _____
(l) Fan A12 _____
(m) Fan A13 _____
(n) Fan A14 _____
(o) Fan A15 _____

7.1.6 Dry Tower - Train B (For Side B Testing)

7.1.6.1 Verify that the following are available:

(1) 480V MCC-3B315-S _____

Initials & Date

7.1.6.2 At CP-33, verify that the following Dry Tower B fan control switches for fans B1 through B15 are in the OFF position:

	Fan No.	Switch No.	Initials & Date
(1)	B1	CS-1/781	----------
(2)	B2	CS-1/782	----------
(3)	B3	CS-1/783	----------
(4)	B4	CS-1/784	----------
(5)	B5	CS-1/785	----------
(6)	B6	CS-1/786	----------
(7)	B7	CS-1/787	----------
(8)	B8	CS-1/788	----------
(9)	B9	CS-1/789	----------
(10)	B10	CS-1/790	----------
(11)	B11	CS-1/791	----------
(12)	B12	CS-1/792	----------
(13)	B13	CS-1/793	----------
(14)	B14	CS-1/794	----------
(15)	B15	CS-1/795	----------

Initials & Date

7.1.6.3 At Aux. Panel 2, verify that transfer switches 43-13, 43-14, 43-15, 43-16, and 43-17 are in the CONTROL ROOM position.

(1) Switch 43-13 ----------

(2) Switch 43-14 ----------

Initials & Date

(3) Switch 43-15 ----------
(4) Switch 43-16 ----------
(5) Switch 43-17 ----------

7.1.6.4 At 480V MCC-3B315-S, close the following breakers for Dry Tower B fans B1 through 315:

	Fan No.	Compt. No.	Initials & Date
(1)	B1	1F	----------
(2)	B2	1M	----------
(3)	B3	2F	----------
(4)	B4	2M	----------
(5)	B5	3F	----------
(6)	B6	3M	----------
(7)	B7	4F	----------
(8)	B8	4M	----------
(9)	B9	5F	----------
(10)	B10	5M	----------
(11)	B11	7F	----------
(12)	B12	7M	----------
(13)	B13	8F	----------
(14)	B14	8M	----------
(15)	B15	9F	----------

Initials & Date

7.1.6.5 At CP-33, verify the following:

(1) Green indicating lights for fans B1 through B15 are ON.

Initials & Date

(a) Fan B1 _____
(b) Fan B2 _____
(c) Fan B3 _____
(d) Fan B4 _____
(e) Fan B5 _____
(f) Fan B6 _____
(g) Fan B7 _____
(h) Fan B8 _____
(i) Fan B9 _____
(j) Fan B10 _____
(k) Fan B11 _____
(l) Fan B12 _____
(m) Fan B13 _____
(n) Fan B14 _____
(o) Fan B15 _____

(2) Red indicating lights for fans B1 through B15 are OFF.

(a) Fan B1 _____
(b) Fan B2 _____
(c) Fan B3 _____
(d) Fan B4 _____
(e) Fan B5 _____
(f) Fan B6 _____
(g) Fan B7 _____
(h) Fan B8 _____
(i) Fan B9 _____
(j) Fan B10 _____
(k) Fan B11 _____

Initials & Date

(l) Fan B12 _____

(m) Fan B13 _____

(n) Fan B14 _____

(o) Fan B15 _____

NOTE: If CCW Pump A/B is lined up as Pump A, manually open valve 3CC-F123B. If CCW Pump A/B is lined up as Pump B, manually open valve 3CC-F122A with valve 3C-F123B closed.

7.2 Tests

7.2.1 Simulated LOCA Test (Side A)

7.2.1.1 Verify the initial conditions set forth in steps 7.1.1, 7.1.2, 7.1.3, and 7.1.5; and verify manometers or equivalent, used for measuring orifice flows, are ready for service. X X

_____

7.2.1.2 Verify the valve lineup of Attachment 8.4.3, Valve Lineup Table, Tower A.

_____

NOTE: The oil level indicators provided with the CCW and ACCW Pumps indicate OPERATING oil level. The oil level should read HIGH when the pump is shut down and MEDIUM when the pump is operating.

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Revision Draft 2

Initials & Date

CAUTION 1: IMMEDIATELY STOP THE ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGEES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED ACCW PUMP RUNOUT CAPACITY OF 6650 GPM.

CAUTION 3: DO NOT RUN ACCW PUMPS AGAINST DEAD HEAD EXCEPT BRIEFLY TO VERIFY SHUTOFF HEAD (1.5 MINUTES MAXIMUM).

7.2.1.3 Check ACCW Pump A for proper oil level. _____

7.2.1.4 Start ACCW Pump A by placing handswitch CS-1/752 on CP-8 to START. _____

7.2.1.5 Check CCW Pump A/B for proper oil level. _____

CAUTION 1: IMMEDIATELY STOP THE CCW/ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ~~IS~~ ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUN RUNNING AGAINST A DEAD HEAD.

7.2.1.6 Start CCW Pump A/B by positioning handswitch CS-1/707 on CP-8 to START.

7.2.1.7 Slowly open CCW Pump A/B discharge valve (3CC-8119AB).

CAUTION 1: IMMEDIATELY STOP THE CCW PUMP IF ANY OF THE FOLLOWING CONDITIONS IS OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.1.8 At CP-33, place the following control switches for fans A1 through A15 in the FAST position:

	Fan No.	Switch No.	Initials & Date
(1)	A1	CS-1/731	_____
(2)	A2	CS-1/732	_____

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	Fan No.	Switch No.	Initials & Date
(3)	A3	CS-1/733	----------
(4)	A4	CS-1/734	----------
(5)	A5	CS-1/735	----------
(6)	A6	CS-1/736	----------
(7)	A7	CS-1/737	----------
(8)	A8	CS-1/738	----------
(9)	A9	CS-1/739	----------
(10)	A10	CS-1/740	----------
(11)	A11	CS-1/741	----------
(12)	A12	CS-1/742	----------
(13)	A13	CS-1/743	----------
(14)	A14	CS-1/744	----------
(15)	A15	CS-1/745	----------

Initials & Date

CAUTION: WHEN A FAN IS IN FAST SPEED, THERE MUST BE A 30-SECOND WAIT PERIOD BEFORE THE FAN CAN BE SHIFTED TO SLOW SPEED. IF THIS MODIFICATION HAS NOT BEEN ACCOMPLISHED BY THE TIME THIS PROCEDURE IS PERFORMED, ALWAYS OPEN THE SPECIFIC BREAKER LISTED IN STEP 7.1.5.4 WHENEVER THE FAN IS IN FAST SPEED. AFTER A 30-SECOND WAIT PERIOD, TURN THE FAN SWITCH TO THE ~~IS~~ OFF POSITION AND RECLOSE THE BREAKER; THEN SHIFT THE FAN SWITCH TO SLOW SPEED.

X X X X

Initials & Date

7.2.1.9 At CP-33, place Wet Tower A fan control switches CS-1/761 and CS-1/765 in the ON position.

7.2.1.10 Ensure that the boiler has been started and is warmed up and at operating pressure and temperature.

7.2.1.11 Cut in steam to temporary heat exchanger by slowly opening the 12-inch stop-check valve located atop the temporary boiler.

7.2.1.12 Let the CCW and ACCW Systems reach thermal equilibrium. [This can be determined by monitoring TE-CC-7077AS. As this temperature reaches an asymptotic value (when two consecutive numbers record the same reading ±5 degrees F), then thermal equilibrium can be assumed.] Record these readings every 5 minutes on Attachment 8.1.4.

CAUTION: DO NOT EXCEED A CCW TEMPERATURE OF 160 DEGREES F AS READ BY THE RTD ON THE TEMPORARY PIPING TO THE SUCTION OF CCW PUMP A/B.

7.2.1.13 Using a Simplex pitot tube, make a 10-point traverse of the component cooling (CCW) water pipe on two mutually perpendicular diameters. (Pitot traverse taps are located approximately 12 diameters downstream of orifice LATER.) Record this data on Attachment 8.2.3, Pitot Tube Traverse Data Table. X

7.2.1.14 Monitor and record flowrate, as read from orifice plate (LATER), on Attachment 8.2.3, Flow Orifice Readings. Monitor this flowrate throughout the test (recording every 5 minutes) to ensure that the water flowrate does not change. X

7.2.1.15 Continuously monitor the temperatures stated in Attachment 8.2.1, RTD Data Table, on the PTS-80A Temperature Data System.

7.2.1.16 A platinum RTD will be located on the hand railing at the inlet to the top dry cooling tower fans on the two end and middle columns. These RTDs will be monitored continuously and the readings

recorded on Attachment 8.2.1, ~~[illegible]~~ RTD Readings, every 5 minutes.

7.2.1.17 Using a hand-held wattmeter, measure the input power to each wet tower fan in the tower being used. Record this data in Attachment 8.2.5, Fan Input Power Data Table, once for each test on all eight fans being used. X

7.2.1.18 Using a Simplex pitot tube, make a 10-point traverse of the auxiliary component cooling water (ACCW) permanent piping on two mutually perpendicular diameters. The pitot taps are installed approximately six pipe diameters upstream of installed flow orifice FT-CC-7078AS. (The pipe traverse will be made once for each test, and the installed orifice plate will be monitored throughout the test to ensure that the water flowrate does not change.) Record data on Attachment 8.2.2. X

7.2.1.19 Ensure that the following test limitations are met before continuing:

Initials & Date

(1) Ambient wet-bulb temperature is between 74 degrees F and 94 degrees F, as recorded in Attachment 8.2.~~10~~ 8a. _____

(2) Ambient dry-bulb temperature is between 92 degrees F and 112 degrees F, as recorded in Attachment 8.2.~~10~~ 8a. _____

(3) Ambient wind speed is equal to or less than 10 mph, as recorded in Attachment 8.2.~~10~~ 8a. _____

(4) CCW flow is between 5850 and 7150 gpm. _____

(5) ACCW flow is between 4500 and 5500 gpm. _____

7.2.1.20 Equally space a two-by-two matrix of wet-bulb psychrometers over the vertical inlet to each wet tower cell and record on Attachment 8.2.~~8~~ 6, Wet ~~Bulb~~ Towers Temperature ~~Psychrometer~~ Data Table. X X _____

		Initials & Date
7.2.1.21	[illegible] psychrometer in each [illegible] to the wet towers and record on Attachment 8.2.6.	X
7.2.1.22	Place one dry-bulb psychrometer on the catwalk railing at a position between the two wet tower vertical inlet faces and record data on Attachment 8.2.6.	X
7.2.1.23	Place one Gill propeller anemometer in each window to the wet towers to monitor the air velocity through the windows during the test. Monitor these velocities continuously and record data every 5 minutes on Attachment 8.2.7, ~~Gill Propeller~~ Anemometer Readings Data Table.	X X
7.2.1.24	Measure the level of the wet tower cold water basin both before and after the test, to determine water losses, by (LATER).	
7.2.1.25	Using an R.M. Young microvane and cup anemometer, or equivalent, continuously monitor the ambient wind speed and direction and record on Attachment	X

Initials & Date

5.2.~~10~~ 8, Ambient Conditions Data Table, every 5 minutes. X

7.2.1.26 Use Attachment 8.1.3 to calculate temperature needed to satisfy the test.

7.2.1.27 Complete Attachment 8.3.1, LOCA Calculation Sheet.

7.2.1.28 Complete the valve lineup on Attachment 8.4.~~9~~ 6. X

7.2.2 Simulated LOCA Test (B Side) X

7.2.2.1 Verify the initial conditions set forth in steps 7.1.1, 7.1.2, 7.1.4, and 7.1.6; and verify that manometers or equivalent, used for measuring orifice flows, are ready for service. X X

7.2.2.2 Verify the valve lineup of Attachment 8.4.4, Valve Lineup Table, Tower B.

NOTE: The oil level indicators provided with the CCW and ACCW Pumps indicate OPERATING oil level. The oil level should read HIGH when

the pump is shut down and MEDIUM when the pump is operating.

CAUTION 1: IMMEDIATELY STOP THE ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ~~IS~~ ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGEES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED ACCW PUMP RUNOUT CAPACITY OF 6650 GPM.

CAUTION 3: DO NOT RUN ACCW PUMPS AGAINST DEAD HEAD EXCEPT BRIEFLY TO VERIFY SHUTOFF HEAD (1.5 MINUTES MAXIMUM).

7.2.2.3 Check ACCW Pump B for proper oil level. _____

7.2.2.4 Start ACCW Pump B by placing handswitch CS-1/752 on CP-8 to START. _____

7.2.2.5 Check CCW Pump A/B for proper oil level.

CAUTION 1: IMMEDIATELY STOP THE CCW/ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ~~IS~~ ARE OBSERVED: X

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.2.6 Start CCW Pump A/B by positioning handswitch CS-1/707 on CP-8 to START.

7.2.2.7 Slowly open CCW Pump A/B discharge valve (3CC-B119AB).

Initials & Date

CAUTION 1: IMMEDIATELY STOP THE CCW PUMP IF ANY OF THE FOLLOWING CONDITIONS IS ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.2.8 At CP-33, place the following control switches for fans B1 through B15 in the FAST position:

	Fan No.	Switch No.	Initials & Date
(1)	B1	CS-1/781	----------

	Fan No.	Switch No.	Initials & Date
(2)	B2	CS-1/782	_____
(3)	B3	CS-1/783	_____
(4)	B4	CS-1/784	_____
(5)	B5	CS-1/785	_____
(6)	B6	CS-1/786	_____
(7)	B7	CS-1/787	_____
(8)	B8	CS-1/788	_____
(9)	B9	CS-1/789	_____
(10)	B10	CS-1/790	_____
(11)	B11	CS-1/791	_____
(12)	B12	CS-1/792	_____
(13)	B13	CS-1/793	_____
(14)	B14	CS-1/794	_____
(15)	B15	CS-1/795	_____

Initials & Date

CAUTION: WHEN A FAN IS IN FAST SPEED, THERE MUST BE A 30-SECOND WAIT PERIOD BEFORE THE FAN CAN BE SHIFTED TO SLOW SPEED. IF THIS MODIFICATION HAS NOT BEEN ACCOMPLISHED BY THE TIME THIS PROCEDURE IS PERFORMED, ALWAYS OPEN THE SPECIFIC BREAKER LISTED IN STEP 7.1.6.4 WHENEVER THE FAN IS IN FAST SPEED. AFTER A 30-SECOND WAIT PERIOD, TURN THE FAN SWITCH TO THE OFF POSITION, AND RECLOSE BREAKER; THEN SHIFT THE FAN SWITCH TO SLOW SPEED.

7.2.2.9 At CP-33, place Wet Tower B fan control switches CS-1/811 and CS-1/815 in the ON position.

7.2.2.10 Ensure that the boiler has been started and is warmed up and at operating pressure and temperature.

7.2.2.11 Cut in steam to the temporary heat exchanger by slowly opening the 12-inch stop-check valve located atop the temporary boiler. Regulate temperature per Attachment 8.1.3.

7.2.2.12 Let the CCW and ACCW Systems reach thermal equilibrium. [This can be determined by monitoring TE-CC-7077BS. As this temperature reaches an asymptotic value (when two consecutive numbers record the same reading ±5 degrees F), then thermal equilibrium can be assumed.] Record these readings every 5 minutes on Attachment 8.1.4.

CAUTION: DO NOT EXCEED A CCW TEMPERATURE OF 160 DEGREES F AS READ BY THE RTD ON THE

TEMPORARY PIPING TO THE SUCTION OF CCW PUMP A/B.

7.2.2.13 Using a Simplex pitot tube, make a 10-point traverse of the component cooling water pipe on two mutually perpendicular diameters. (Pitot traverse taps are located approximately 12 diameters downstream of orifice LATER.) Record this data on Attachment 8.2.2. X

7.2.2.14 Monitor and record flowrate, as read from orifice plate (LATER), on Attachment 8.2.3. Monitor this flowrate throughout the test (recording every 5 minutes) to ensure that the water flowrate does not change.

7.2.2.15 Set up (if not already setup), and continuously monitor the temperatures stated in Attachment 8.2.1 on the PTS-80A Temperature Data System.

7.2.2.16 A platinum RTD will be located on the hand railing at the inlet to the top dry cooling tower fan on the two end and middle columns. These RTDs will be

monitored continuously and the readings recorded on Attachment 8.2.1 every 5 minutes.

7.2.2.17 Using a hand-held wattmeter, measure the input power to each wet tower fan in the tower being used. Record this data in Attachment 8.2.5 once for each test on all eight fans being used.

7.2.2.18 Using a Simplex pitot tube, make a 10-point traverse of the ACCW permanent piping on two mutually perpendicular diameters. The pitot taps are installed approximately six pipe diameters upstream of installed flow orifice FT-CC-7078BS. (The pipe traverse will be made once for each test, and the installed orifice plate will be monitored throughout the test to ensure that the water flowrate does not change.) Record data on Attachment 8.2.2.

7.2.2.19 Ensure that the following test limitations are met before continuing:

Initials & Date

(1) Ambient wet-bulb temperature is between 74 degrees F and 94 degrees F, as recorded on Attachment 8.2.8. ---

(2) Ambient dry-bulb temperature is between 92 degrees F and 112 degrees F, as recorded on Attachment 8.2.8. ---

(3) Ambient wind speed is equal to or less than 10 mph, as recorded on Attachment 8.2.8. ---

(4) CCW flow is between 5850 and 7150 gpm. ---

(5) ACCW flow is between 4500 and 5500 gpm. ---

7.2.2.20 Equally space a two-by-two matrix of wet-bulb psychrometers over the vertical inlet to each wet tower cell and record on Attachment 8.2.6. ---

7.2.2.21 Place one wet-bulb psychrometer in each window to the wet towers and record on Attachment 8.2.6.

7.2.2.22 Place one dry-bulb psychrometer on the catwalk railing at a position between the two wet tower vertical inlet faces and record data on Attachment 8.2.6.

7.2.2.23 Place one Gill propeller anemometer in each window to the wet towers to monitor the air velocity through the windows during the test. Monitor these velocities continuously and record data every 5 minutes on Attachment 8.2.7.

7.2.2.24 Measure the level of the wet tower cold water basin both before and after the test, to determine water losses, by (LATER).

7.2.2.25 Using an R.M. Young microvane and cup anemometer, or equivalent, continuously monitor the ambient wind speed and direction and record on Attachment 8.2.8 every 5 minutes.

7.2.2.26 Use Attachment 8.1.7 to determine the temperature needed to satisfy the test. ~~LOCA Calculation Sheet~~ X

7.2.2.27 Complete Attachment 8.3.1, LOCA Calculation Sheet.

7.2.2.28 Complete the valve lineup on Attachment 8.4.7.

7.2.3 Simulated Normal Shutdown Test (Step A)

7.2.3.1 Verify the initial conditions set forth in steps 7.1.1, 7.1.2, 7.1.3 and 7.1.5; and verify that manometers or the equivalent, used for measuring orifice flows, are ready for service.

7.2.3.2 Verify the valve lineup of Attachment 8.4.3.

NOTE: The oil level indicators provided with the CCW and ACCW Pumps indicate OPERATING oil level. The oil level should read HIGH when the pump is shut down and MEDIUM when the pump is operating.

CAUTION 1: IMMEDIATELY STOP THE ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGEES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED ACCW PUMP RUNOUT CAPACITY OF 6650 GPM.

CAUTION 3: DO NOT RUN ACCW PUMPS AGAINST DEAD HEAD EXCEPT BRIEFLY TO VERIFY SHUTOFF HEAD (1.5 MINUTES MAXIMUM).

7.2.2.3 Check ACCW Pump A for proper oil level. _____

7.2.3.4 Start ACCW Pump A by placing handswitch CS-1/7S2 on CP-8 to START. _____

7.2.3.5 Check CCW Pump A/B for proper oil level. _____

CAUTION 1: IMMEDIATELY STOP THE CCW/ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ~~is~~ ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.3.6 Start CCW Pump A/B by positioning handswitch CS-1/707 on CP-8 to START.

7.2.3.7 Slowly open CCW Pump A/B discharge valve (3CC-B119AB).

Initials & Date

CAUTION 1: IMMEDIATELY STOP THE CCW PUMP IF ANY OF THE FOLLOWING CONDITIONS IS OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.3.8 At CP-33, place the following control switches for fans A1 through A15 in the FAST position:

	Fan No.	Switch No.	Initials & Date
(1)	A1	CS-1/731	_____
(2)	A2	CS-1/732	_____

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	Fan No.	Switch No.	Initials & Date
(3)	A3	CS-1/733	----------
(4)	A4	CS-1/734	----------
(5)	A5	CS-1/735	----------
(6)	A6	CS-1/736	----------
(7)	A7	CS-1/737	----------
(8)	A8	CS-1/738	----------
(9)	A9	CS-1/739	----------
(10)	A10	CS-1/740	----------
(11)	A11	CS-1/741	----------
(12)	A12	CS-1/742	----------
(13)	A13	CS-1/743	----------
(14)	A14	CS-1/744	----------
(15)	A15	CS-1/745	----------

Initials & Date

CAUTION: WHEN A FAN IS IN FAST SPEED, THERE MUST BE A 30-SECOND WAIT PERIOD BEFORE THE FAN CAN BE SHIFTED TO SLOW SPEED. IF THIS MODIFICATION HAS NOT BEEN ACCOMPLISHED BY THE TIME THIS PROCEDURE IS PERFORMED, ALWAYS OPEN THE SPECIFIC BREAKER LISTED IN STEP 7.1.5.4 WHENEVER THE FAN IS IN FAST SPEED. AFTER A 30-SECOND WAIT PERIOD, TURN THE FAN SWITCH TO THE OFF POSITION, AND RECLOSE BREAKER; THEN SHIFT THE FAN SWITCH TO SLOW SPEED.

7.2.3.9 At CP-33, place Wet Tower A fan control switches CS-1/761 and CS-1/765 in the ON position.

7.2.3.10 Ensure that the boiler has been started and is warmed up and at operating pressure and temperature.

7.2.3.11 Cut in steam to the temporary heat exchanger by slowly opening the 12-inch stop-check valve located atop the temporary boiler. X

7.2.3.12 Let the CCW and ACCW Systems reach thermal equilibrium. [This can be determine by monitoring TE-CC-7077AS. As this temperature reaches an asymptotic value (when two consecutibe numbers record the same reading ±5 degrees F), then thermal equilibrium can be assumed.] Record these readings every 5 minutes on Attachment 8.1.4. X X

CAUTION: DO NOT EXCEED A CCW TEMPERATURE OF 160 DEGREES F AS READ BY THE RTD ON THE TEMPORARY PIPING TO THE SUCTION OF CCW PUMP A/B.

7.2.3.13 Using a Simplex pitot tube, make a 10-point traverse of the component cooling water pipe on two mutually perpendicular diameters. (Pitot traverse taps are located approximately 12-diameters downstream of orifice LATER.) Record this data on Attachment 8.2.2. X

7.2.3.14 Monitor and record flowrate, as read from orifice plate (LATER), on Attachment 8.2.3. Monitor this flowrate throughout the test (recording every 5 minutes) to ensure that the water flowrate does not change.

7.2.3.15 Set up and continuously monitor the temperatures stated in Attachment 8.2.1 on the PTS-80A Temperature Data System. X

7.2.3.16 A platinum RTD will be located on the hand railing at the inlet to the top dry cooling tower fan on the two end and middle columns. These RTDs will be monitored continuously and the readings recorded on Attachment 8.2.1 every 5 minutes.

7.2.3.17 Using a hand-held wattmeter, measure the input power to each wet tower fan in the tower being used. Record this data in Attachment 8.2.5 once for each test on all eight fans being used.

7.2.3.18 Using a Simplex pitot tube, make a 10-point traverse of the ACCW ~~water~~ permanent piping on two mutually perpendicular diameters. The pitot taps are installed approximately six pipe diameters upstream of installed flow orifice FT-CC-7078AS. (The pipe traverse will be made once for each test, and the installed orifice plate will be monitored throughout the test to ensure that the water flowrate does not change.) Record data on Attachment 8.2.2.

7.2.3.19 Ensure that the following test limitations are met before continuing:

(1) Ambient wet-bulb temperature is between 74 degrees F and 94 degrees F, as recorded on Attachment 8.2.8.

Initials & Date

(2) Ambient dry-bulb temperature is between 92 degrees F and 112 degrees F, as recorded on Attachment 8.2.8. ---

(3) Ambient wind speed is equal to or less than 10 mph, as recorded on Attachment 8.2.8. ---

(4) CCW flow is between 5850 and 7150 gpm, as recorded on Attachment 8.2.8. ---

(5) ACCW flow is between 5850 and 7150 gpm. ---

7.2.3.20 Equally space a two-by-two matrix of wet-bulb psychrometers over the vertical inlet to each wet tower cell and record on Attachment 8.2.6. ---

7.2.3.21 Place one wet-bulb psychrometer in each window to the wet towers and record on Attachment 8.2.6. ---

7.2.3.22 Place one dry-bulb psychrometer on the catwalk railing at a position between the two wet tower vertical inlet faces and record data on Attachment 8.2.6.

7.2.3.23 Place one Gill propeller anemometer in each window to the wet towers to monitor the air velocity through the windows during the test. Monitor these velocities continuously and record data every 5 minutes on Attachment 8.2.7.

7.2.3.24 Measure the level of the wet tower cold water basin both before and after the test, to determine water losses, by (LATER).

7.2.3.25 Using an R.M. Young microvane and cup anemometer, or equivalent, continuously monitor the ambient wind speed and direction and record on Attachment 8.2.8 every 5 minutes.

7.2.3.26 Use Attachment 8.1.3 to calculate temperature needed to satisfy the test.

Initials & Date

7.2.3.27 Complete Attachment 8.3.2, Normal Shutdown Calculation Sheet.

7.2.3.28 Complete valve lineup on Attachment 8.4.7.

7.2.4 Simulated Normal Shutdown Test (Side B)

7.2.4.1 Verify the initial conditions set forth in steps 7.1.1, 7.1.2, 7.1.4, and 7.1.6; and verify that manometers or the equivalent, used for measuring orifice flows, are ready for service.

7.2.4.2 Verify the valve lineup of Attachment 8.4.4.

NOTE: The oil level indicators provided with the CCW and ACCW Pumps indicate OPERATING oil level. The oil level should read HIGH when the pump is shut down and MEDIUM when the pump is operating.

CAUTION 1: IMMEDIATELY STOP THE ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ~~IS~~ ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION.

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGEES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED ACCW PUMP RUNOUT CAPACITY OF 6650 GPM.

CAUTION 3: DO NOT RUN ACCW PUMPS AGAINST DEAD HEAD EXCEPT BRIEFLY TO VERIFY SHUTOFF HEAD (1.5 MINUTES MAXIMUM).

7.2.4.3 Check ACCW Pump B for proper oil level.

7.2.4.4 Start ACCW Pump B by placing handswitch CS-1/752 on CP-8 to START.

7.2.4.5 Check CCW Pump A/B for proper oil level.

CAUTION 1: IMMEDIATELY STOP THE CCW/ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ~~IS~~ ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.4.6 Start CCW Pump A/B by positioning handswitch CS-1/707 on CP-8 to START.

7.2.4.7 Slowly open CCW Pump A/B discharge valve (3CC-B119AB).

CAUTION 1: IMMEDIATELY STOP THE CCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ~~IS~~ ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

Initials & Date

[illegible] EXCEEDS 180 DEGREES F, AS READ ON INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.4.8 At CP-33, place the following control switches for fans B1 through B15 in the FAST position:

	Fan No.	Switch No.	Initials & Date
(1)	B1	CS-1/781	----------
(2)	B2	CS-1/782	----------
(3)	B3	CS-1/783	----------
(4)	B4	CS-1/784	----------
(5)	B5	CS-1/785	----------
(6)	B6	CS-1/786	----------
(7)	B7	CS-1/787	----------

	Fan No.	Switch No.	Initials & Date
(8)	B8	CS-1/788	----------
(9)	B9	CS-1/789	----------
(10)	B10	CS-1/790	----------
(11)	B11	CS-1/791	----------
(12)	B12	CS-1/792	----------
(13)	B13	CS-1/793	----------
(14)	B14	CS-1/794	----------
(15)	B15	CS-1/795	----------

Initials & Date

CAUTION: WHEN A FAN IS IN FAST SPEED, THERE MUST BE A 30-SECOND WAIT PERIOD BEFORE THE FAN CAN BE SHIFTED TO SLOW SPEED. IF THIS MODIFICATION HAS NOT BEEN ACCOMPLISHED BY THE TIME THIS PROCEDURE IS PERFORMED, ALWAYS OPEN THE SPECIFIC BREAKER LISTED IN STEP 7.1.6.4 WHENEVER THE FAN IS IN FAST SPEED. AFTER A 30-SECOND WAIT PERIOD, TURN THE FAN SWITCH TO THE OFF POSITION, AND RECLOSE THE BREAKER; THEN SHIFT THE FAN SWITCH TO SLOW SPEED. X X

7.2.4.9 At CP-33, place Wet Tower B fan control switches CS-1/811 and CS-1/815 in the ON position. ----------

7.2.4.10 Ensure that the boiler has been started and is warmed up and at operating pressure and temperature.

7.2.4.11 Cut in steam to the temporary heat exchanger by slowly opening the 12-inch stop-check valve located atop the temporary boiler. X

7.2.4.12 Let the CCW and ACCW Systems reach thermal equilibrium. [This can be determined by monitoring TE-CC-7077BS. As this temperature reaches an asymptotic value (when two consecutive numbers record the same reading ±5 degrees F), then thermal equilibrium can be assumed.] Record these readings every 5 minutes on Attachment 8.1.4.

7.2.4.13 Using a Simplex pitot tube, make a 10-point traverse of the component cooling water pipe on two mutually perpendicular diameters. (Pitot traverse taps are located approximately 12 diameters downstream of orifice LATER.)

Initials & Date

Record this data on Attachment 8.2.2. ________ X

____

7.2.4.14 Monitor and record flowrate, as read from orifice plate (LATER), on Attachment 8.2.3. Monitor this flowrate throughout the test (recording every 5 minutes) to ensure that the water flowrate does not change. ________

7.2.4.15 Set up and continuously monitor the temperatures stated in Attachment 8.2.1 on the PTS-80A Temperature Data System. ________

7.2.4.16 A platinum RTD will be mounted on the hand railing at the inlet to the top fan on the two end and middle columns. These RTDs will be monitored continuously and the readings recorded on Attachment 8.2.1 every 5 minutes. ________

7.2.4.17 Using a hand-held wattmeter, measure the input power to each wet tower fan in the tower being used. Record this data in Attachment 8.2.5 once for each test on all eight fans being used.

7.2.4.18 Using a Simplex pitot tube, make a 10-point traverse of the ACCW ~~water~~ permanent piping on two mutually perpendicular diameters. The pitot taps are installed approximately six pipe diameters upstream of installed flow orifice FT-CC-7078BS. (The pipe traverse will be made once for each test, and the installed orifice plate will be monitored throughout the test to ensure that the water flowrate does not change.) Record data on Attachment 8.2.~~7~~2. X X

7.2.4.19 Ensure that the following test limitations are met before continuing:

(1) Ambient wet-bulb temperature is between 74 degrees F and 94 degrees F, as recorded on Attachment 8.2.8.

(2) Ambient dry-bulb temperature is between 92 degrees F and 112 degrees F, as recorded on Attachment 8.2.8.

Initials & Date

(3) Ambient wind speed is equal to or less than 10 mph, as recorded on Attachment 8.2.8. ---

(4) CCW flow is between 5850 and 7150 gpm, as recorded on Attachment 8.2.8. ---

(5) ACCW flow is between 5850 and 7150 gpm. ---

7.2.4.20 Equally space a two-by-two matrix of wet-bulb psychrometers over the vertical inlet to each wet tower cell and record on Attachment 8.2.6. ---

7.2.4.21 Place one wet-bulb psychrometer in each window to the wet towers and record on Attachment 8.2.6. ---

7.2.4.22 Place one dry-bulb psychrometer on the catwalk railing at a position between the two wet tower vertical inlet faces and record data on Attachment 8.2.6. ---

		Initials & Date
7.2.4.23	Place one Gill propeller anemometer in each window to the wet towers to monitor the air velocity through the windows during the test. Monitor these velocities continuously and record data every 5 minutes on Attachment 8.2.~~8~~ 7.	X
7.2.4.24	Measure the level of the wet tower cold water basin both before and after the test, to determine water losses, by (LATER).	
7.2.4.25	Using ~~a~~ an R.M. Young microvane and cup anemometer, or equivalent, continuously monitor the ambient wind speed and direction and record on Attachment 8.2.~~10~~ 8 every 5 minutes.	X
7.2.4.26	Use Attachment 8.1.3 to calculate temperature needed to satisfy the test.	
7.2.4.27	Complete Attachment 8.3.2, Normal Shutdown Calculation Sheet.	
7.2.4.28	Complete valve lineup on Attachment 8.4.8.	

7.2.5 Simulated Shutdown 24 Hours After Reactor Trip Test (Side A)

7.2.5.1 Verify the initial conditions set forth in steps 7.1.1, 7.1.2, 7.1.3, and 7.1.5; and verify that manometers or the equivalent, used for measuring orifice flows, are ready for service. ----------

7.2.5.2 Verify the valve lineup of Attachment 8.4.7. ----------

7.2.5.3 Check CCW Pump A/B for proper oil level. ----------

CAUTION 1: IMMEDIATELY STOP THE CCW/ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS IS OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.5.4 Start CCW Pump A/B by positioning handswitch CS-1/707 on CP-8 to START. _____

7.2.5.5 Slowly open CCW Pump A/B discharge valve (3CC-8119AB). _____

CAUTION 1: IMMEDIATELY STOP THE CCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.5.6 At CP-33, place the following control switches for fans A1 through A15 in the FAST position:

	Fan No.	Switch No.	Initials & Date
(1)	A1	CS-1/731	----------
(2)	A2	CS-1/732	----------
(3)	A3	CS-1/733	----------
(4)	A4	CS-1/734	----------
(5)	A5	CS-1/735	----------
(6)	A6	CS-1/736	----------
(7)	A7	CS-1/737	----------
(8)	A8	CS-1/738	----------
(9)	A9	CS-1/739	----------
(10)	A10	CS-1/740	----------
(11)	A11	CS-1/741	----------
(12)	A12	CS-1/742	----------
(13)	A13	CS-1/743	----------
(14)	A14	CS-1/744	----------
(15)	A15	CS-1/745	----------

CAUTION: WHEN A FAN IS IN FAST SPEED, THERE MUST BE A 30-SECOND WAIT PERIOD BEFORE THE FAN CAN BE SHIFTED TO SLOW SPEED. IF THIS MODIFICATION HAS NOT BEEN ACCOMPLISHED BY THE TIME THIS PROCEDURE IS PERFORMED, ALWAYS OPEN THE SPECIFIC BREAKER LISTED IN STEP 7.1.5.4 WHENEVER THE FAN IS IN FAST SPEED, AND SLOW SPEED OR OFF IS DESIRED.

7.2.5.7 At CP-33, ensure that Wet Tower A fan control switches CS-1/761 and CS-1/765 are in the OFF position. ----------

7.2.5.8 Ensure that the boiler is warmed up and at operating pressure and temperature. ----------

7.2.5.9 Cut in steam to temporary heat exchanger by slowly opening stop-check valve (LATER). ----------

7.2.5.10 Using RTDs TX-CC-7910AS and TX-CC-7920AS, vary heat load until a heat loading of 91.7×10^6 Btu/hr is obtained on the dry tower A. ---------- X

7.2.5.11 Using a Simplex pitot tube, make a 10-point traverse of the component

cooling water pipe on two mutually perpendicular diameters. Record this data on Attachment 8.2.2.

7.2.5.12 Monitor and record flowrate, as read from orifice plate (LATER), on Attachment 8.2.3. Monitor this flowrate throughout the test (recording every 5 minutes) to ensure that the water flowrate does not change.

7.2.5.13 Set up and continuously monitor the temperatures stated in Attachment 8.2.1 on the PTS-80A Temperature Data System.

7.2.5.14 A platinum RTD will be mounted on the hand railing at the inlet to the top fan on the two end and middle columns. These RTDs will be monitored continuously and the readings recorded on Attachment 8.2.1 every 5 minutes.

7.2.5.15 Ensure that the following test limitations are met before continuing:

(1) Ambient wet-bulb temperature is between 74 degrees F and 84

degrees F, as recorded on Attachment 8.2.8.

---

(2) Ambient wind speed is equal to or less than 10 mph, as recorded on Attachment 8.2.8.

---

(3) CCW flow is between 5850 and 7150 gpm, as recorded on Attachment 8.2.8.

7.2.5.16 Measure the level of the wet tower cold water basin both before and after the test, to determine water losses. See Attachment 8.3.5, Water Loss Calculation Sheet.

7.2.5.17 Using an R.M. Young microvane and cup anemometer, or equivalent, continuously monitor the ambient wind speed and direction and record on Attachment 8.2.8 every 5 minutes.

NOTE: The oil level indicators provided with the CCW and ACCW Pumps indicate OPERATING oil level. The oil level should read HIGH when

the pump is shut down and MEDIUM when the pump is operating.

CAUTION 1: IMMEDIATELY STOP THE ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED ACCW PUMP RUNOUT CAPACITY OF 6650 GPM.

CAUTION 3: DO NOT RUN ACCW PUMPS AGAINST DEAD HEAD EXCEPT BRIEFLY TO VERIFY SHUTOFF HEAD (1.5 MINUTES MAXIMUM).

7.2.5.18 Start ACCW Pump A by placing handswitch CS-1/752 on CP-8 to START.

7.2.5.19 Using a Simplex pitot tube, make a 10-point traverse of the ACCW ~~water~~ pipe on two mutually perpendicular

diameters. The pitot taps are installed approximately six pipe diameters upstream of installed flow orifice FT-CC-7078AS. (The pipe traverse will be made once for each test, and the installed orifice plate will be monitored throughout the test to ensure that the water flowrate does not change.) Record data on Attachment 8.2.2.

7.2.5.20 Initiate the tornado test by performing the following:

7.2.5.20.1 Open 3CC-B104A, inlet to component cooling heat exchanger.

7.2.5.20.2 Close 3CC-B238A bypass to CCW heat exchanger.

7.2.5.20.3 Mark all tapes and charts to signify the start of the tornado test.

7.2.5.20.4 Ensure that the level in the wet cooling tower basin is at the low end of the operating band (approximately 175,000 gal).

Initials & Date

7.2.5.21 Open 3CC-B201A (inlet to dry cooling towers).

7.2.5.22 Open 3CC-B212A (outlet to dry cooling towers).

7.2.5.23 Close bypass to dry cooling towers 3CC-B265A.

NOTE: Maintain the same temperature differential across tne temporary feed heater as initial ΔT.

7.2.5.24 At CP-33, place the following control switches for fans A1 through A15 in the OFF position.

	Fan No.	Switch No.	Initials & Date
(1)	A1	CS-1/731	---
(2)	A2	CS-1/732	---
(3)	A3	CS-1/733	---
(4)	A4	CS-1/734	---
(5)	A5	CS-1/735	---
(6)	A6	CS-1/736	---
(7)	A7	CS-1/737	---

	Fan No.	Switch No.	Initials & Date
(8)	A8	CS-1/738	----------
(9)	A9	CS-1/739	----------
(10)	A10	CS-1/740	----------
(11)	A11	CS-1/741	----------
(12)	A12	CS-1/742	----------
(13)	A13	CS-1/743	----------
(14)	A14	CS-1/744	----------
(15)	A15	CS-1/745	----------

Initials & Date

7.2.5.25 Perform the following steps after 2 hours. ----------

7.2.5.25.1 After 2 hours, record the TE-CC-7077AS reading on Attachment LATER. ----------

7.2.5.25.2 Measure level in wet tower according to Attachment 8.3.5. ----------

7.2.5.25.3 Close the following valves:

(1) 3CC-B81A, Dry Tower A Inlet Header Isolation Valve ----------

(2) 3CC-B82A, Dry Tower A Inlet Header Isolation Valve ----------

(3) 3CC-853A, Dry Tower A Inlet Header Isolation Valve

---

(4) 3CC-884A, Dry Tower A Inlet Header Isolation Valve

7.2.5.25.4 At CP-33, place the following control switches for fans A7 through A15 in fast speed.

	Fan No.	Switch No.	Initials & Date
(1)	A7	CS-1/737	---
(2)	A8	CS-1/738	---
(3)	A9	CS-1/739	---
(4)	A10	CS-1/740	---
(5)	A11	CS-1/741	---
(6)	A12	CS-1/742	---
(7)	A13	CS-1/743	---
(8)	A14	CS-1/744	---
(9)	A15	CS-1/745	---

Initials & Date

7.2.5.26 Continue monitoring all RTDs listed in Attachment 8.2.1 and orifice reading listed in Attachment 8.2.3 for the next 22 hours.

Initials & Date

7.2.5.27 At the 10-hour mark, record water level. ---

7.2.5.28 Record all water added to the wet tower basin during testing. ---

7.2.5.29 Perform tornado calculation, and record on Attachment 8.3.3. ---

7.2.5.30 Complete valve lineup on Attachment 8.4.6, and continue on to the next test. ---

7.2.6 Simulated Shutdown 24 Hours After Reactor Trip Test (Side B)

7.2.6.1 Verify the initial conditions set forth in steps 7.1.1, 7.1.2, 7.1.3, and 7.1.6; and verify that manometers or the equivalent, used for measuring orifice flows, are ready for service. ---

7.2.6.2 Verify the valve lineup of Attachment 8.4.8. ---

7.2. [illegible] for proper oil level.

CAUTION 1: IMMEDIATELY STOP THE CCW/ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.6.4 Start CCW Pump A/B by positioning handswitch CS-1/707 on CP-8 to START.

7.2.6.5 Slowly open CCW Pump A/B discharge valve (3CC-B119AB).

Initials & Date

CAUTION 1: IMMEDIATELY STOP THE CCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED CCW PUMP RUNOUT CAPACITY OF 7500 GPM.

CAUTION 3: THE CCW PUMPS DO NOT HAVE AN INSTALLED RECIRCULATION LINE AND ARE LIMITED TO 3 MINUTES MAXIMUM RUNNING AGAINST A DEAD HEAD.

7.2.6.6 At CP-33, place the following control switches for fans A1 through A15 in the FAST position:

	Fan No.	Switch No.	Initials & Date
(1)	B1	CS-1/781	----------

	Fan No.	Switch No.	Initials & Date
(2)	B2	CS-1/782	----------
(3)	B3	CS-1/783	----------
(4)	B4	CS-1/784	----------
(5)	B5	CS-1/785	----------
(6)	B6	CS-1/786	----------
(7)	B7	CS-1/787	----------
(8)	B8	CS-1/788	----------
(9)	B9	CS-1/789	----------
(10)	B10	CS-1/790	----------
(11)	B11	CS-1/791	----------
(12)	B12	CS-1/792	----------
(13)	B13	CS-1/793	----------
(14)	B14	CS-1/794	----------
(15)	B15	CS-1/795	----------

Initials & Date

CAUTION: WHEN A FAN IS IN FAST SPEED, THERE MUST BE A 30-SECOND WAIT PERIOD BEFORE THE FAN CAN BE SHIFTED TO SLOW SPEED. IF THIS MODIFICATION HAS NOT BEEN ACCOMPLISHED BY THE TIME THIS PROCEDURE IS PERFORMED, ALWAYS OPEN THE SPECIFIC BREAKER LISTED IN STEP 7.1.6.4 WHENEVER THE FAN IS IN FAST SPEED, AND SLOW SPEED OR OFF IS DESIRED.

7.2.6.7 At CP-33, ensure that Wet Tower A fan control switches CS-1/811 and CS-1/815 are in the OFF position.

Initials & Date

7.2.6.8 Ensure that the boiler is warmed up and at operating pressure and temperature.

7.2.6.9 Cut in steam to temporary heat exchanger by slowly opening stop-check valve (LATER).

7.2.6.10 Using RTDs TX-CC-7910BS and TX-CC-7920BS, vary heat load until a heat loading of 91.7×10^6 Btu/hr is obtained on the dry tower B.

7.2.6.11 Using a Simplex pitot tube, make a 10-point traverse of the component cooling water pipe on two mutually perpendicular diameters. Record this data on Attachment 8.2.2.

7.2.6.12 Monitor and record flowrate, as read from orifice plate (LATER), on Attachment 8.2.3. Monitor this flowrate throughout the test (recording every 5 minutes) to ensure that the water flowrate does not change.

Initials & Date

7.2.6.13 Set up and continuously monitor the temperatures stated in Attachment 8.2.1 on the PTS-80A Temperature Data System.

7.2.6.14 A platinum RTD will be mounted on the hand railing at the inlet to the top fan on the two end and middle columns. These RTDs will be monitored continuously and the readings recorded on Attachment 8.2.1 every 5 minutes.

7.2.6.15 Ensure that the following test limitations are met before continuing:

(1) Ambient wet-bulb temperature is between 74 degrees F and 84 degrees F, as recorded on Attachment 8.2.8.

---

(2) Ambient wind speed is equal to or less than 10 mph, as recorded on Attachment 8.2.8.

---

(3) CCW flow is between 5850 and 7150 gpm, as recorded on Attachment 8.2.8.

7.2.6.16 Measure the level of the wet tower cold water basin both before and after the test, to determine water losses. See Attachment 8.3.5, Water Loss Calculation Sheet.

7.2.6.17 Using an R.M. Young microvane and cup anemometer, or equivalent, continuously monitor the ambient wind speed and direction and record on Attachment 8.2.8 every 5 minutes. X

NOTE: The oil level indicators provided with the CCW and ACCW Pumps indicate OPERATING oil level. The oil level should read HIGH when the pump is shut down and MEDIUM when the pump is operating.

CAUTION 1: IMMEDIATELY STOP THE ACCW PUMP IF ANY OF THE FOLLOWING CONDITIONS ARE OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMPERATURE INDICATOR, EXCEEDS 180 DEGREES F

(3) PUMP MOTOR WINDING THERMOCOUPLE READING EXCEEDS 230 DEGREES F

(4) RATED CAPACITY OF 40.2 AMPS IS EXCEEDED

CAUTION 2: DO NOT EXCEED ACCW PUMP RUNOUT CAPACITY OF 6650 GPM.

CAUTION 3: DO NOT RUN ACCW PUMPS AGAINST DEAD HEAD EXCEPT BRIEFLY TO VERIFY SHUTOFF HEAD (1.5 MINUTES MAXIMUM).

7.2.6.18 Start ACCW Pump B by placing handswitch CS-1/752 on CP-8 to START.

7.2.6.19 Using a Simplex pitot tube, make a 10-point traverse of the ACCW ~~water~~ pipe on two mutually perpendicular diameters. The pitot taps are installed approximately six pipe diameters upstream of installed flow orifice FT-CC-7078BS. (The pipe traverse will be made once for each test, and the installed orifice plate will be monitored throughout the test to ensure that the water flowrate does not change.) Record data on Attachment 8.2.2.

7.2.6.20 Initiate the tornado test by performing the following:

Initials & Date

7.2.6.20.1 Open 3CC-B105B, inlet to component cooling heat exchanger. _____

7.2.6.20.2 Close 3CC-B239B bypass to CCW heat exchanger. _____

7.2.6.20.3 Mark all tapes and charts to signify the start of the tornado test. _____

7.2.6.20.4 Ensure that the level in the wet cooling tower basin is at the low end of the operating band (approximately 175,000 gal). _____

7.2.6.21 Open 3CC-B203B (inlet to dry cooling towers). _____

7.2.6.22 Open 3CC-B213B (outlet to dry cooling towers). _____

7.2.6.23 Close bypass to dry cooling towers 3CC-B262B. _____

Initials & Date

NOTE: Maintain the same temperature differential across the temporary feed heater as initial ΔT.

7.2.6.24 At CP-33, place the following control switches for fans B1 through B15 in the OFF position.

	Fan No.	Switch No.	Initials & Date
(1)	B1	CS-1/781	----------
(2)	B2	CS-1/782	----------
(3)	B3	CS-1/783	----------
(4)	B4	CS-1/784	----------
(5)	B5	CS-1/785	----------
(6)	B6	CS-1/786	----------
(7)	B7	CS-1/787	----------
(8)	B8	CS-1/788	----------
(9)	B9	CS-1/789	----------
(10)	B10	CS-1/790	----------
(11)	B11	CS-1/791	----------
(12)	B12	CS-1/792	----------
(13)	B13	CS-1/793	----------
(14)	B14	CS-1/794	----------
(15)	B15	CS-1/795	----------

Initials & Date

7.2.6.25 Perform the following steps after 2 hours.

7.2.6.25.1 After 2 hours, record the TE-CC-7077BS reading on Attachment LATER.

7.2.6.25.2 Measure level in wet tower according to Attachment 8.3.5.

7.2.6.25.3 Close the following valves:

(1) 3CC-B71B, Dry Tower B Inlet Header Isolation Valve

(2) 3CC-B72B, Dry Tower B Inlet Header Isolation Valve

(3) 3CC-B73B, Dry Tower B Inlet Header Isolation Valve

(4) 3CC-B74B, Dry Tower B Inlet Header Isolation Valve

7.2.6.25.4 At CP-33, place the following control switches for fans B7 through B15 in fast speed.

	Fan No.	Switch No.	Initials & Date
(1)	B7	CS-1/787	----------
(2)	B8	CS-1/788	----------
(3)	B9	CS-1/789	----------
(4)	B10	CS-1/790	---------- X
(5)	B11	CS-1/791	---------- ↓
(6)	B12	CS-1/792	----------
(7)	B13	CS-1/793	----------
(8)	B14	CS-1/794	----------
(9)	B15	CS-1/795	----------

Initials & Date

7.2.6.26 Continue monitoring all RTDs listed in Attachment 8.2.1 and orifice reading listed in Attachment 8.2.3 for the next 22 hours. ----------

7.2.6.27 At the 10-hour mark, record water level. ----------

7.2.6.28 Record all water added to the wet tower basin during testing. ----------

7.2.6.29 Perform tornado calculation, and record on Attachment 8.3.3. ----------

7.2.5.30 Complete valve lineup on Attachment 8.4.6, and continue on to the next test.

Initials & Date

7.3 Restoration

7.3.1 Wet Tower - Train A

7.3.1.1 At CP-33, place (or verify placed) wet tower fan control switches CS-1/761 (for fans 1 through 4) and CS-1/765 (for fans 5 through 8) in the OFF position. JG 7.1.1

7.3.1.2 At 480V MCC-3A315-S, Compts. 10H and 12H, open the breakers for fans A1 through A8. JG 7.1.1

7.3.2 Wet Tower - Train B

7.3.2.1 At CP-33, place (or verify placed) wet tower fan control switches CS-1/811 (for fans 1 through 4) and CS-1/815 (for fans 5 through 8) in the OFF position.

7.3.2.2 At 480V MCC-3B315-S, Compts. 10H and 12H, open the breakers for fans B1 through B8.

7.3.3. Dry Tower - Train A

7.3.3.1 At CP-33, place (or verify placed) the following Dry Tower A fan control

switches for fans A1 through A15 in the OFF position:

	Fan No.	Switch No.	Initials & Date
(1)	A1	CS-1/731	----------
(2)	A2	CS-1/732	----------
(3)	A3	CS-1/733	----------
(4)	A4	CS-1/734	----------
(5)	A5	CS-1/735	----------
(6)	A6	CS-1/736	----------
(7)	A7	CS-1/737	----------
(8)	A8	CS-1/738	----------
(9)	A9	CS-1/739	----------
(10)	A10	CS-1/740	----------
(11)	A11	CS-1/741	----------
(12)	A12	CS-1/742	----------
(13)	A13	CS-1/743	----------
(14)	A14	CS-1/744	----------
(15)	A15	CS-1/745	----------

7.3.3.2 At 480V MCC-3A315-S, open the following breakers for Dry Tower A fans A1 through A15:

	Fan No.	Compt. No.	Initials & Date
(1)	A1	1F	----------
(2)	A2	1M	----------
(3)	A3	2F	----------

	Fan No.	Compt. No.	Initials & Date
(4)	A4	2M	----------
(5)	A5	3F	----------
(6)	A6	3M	----------
(7)	A7	4F	----------
(8)	A8	4M	----------
(9)	A9	5F	----------
(10)	A10	5M	----------
(11)	A11	7F	----------
(12)	A12	7M	----------
(13)	A13	8F	----------
(14)	A14	8M	----------
(15)	A15	9F	----------

Initials & Date

7.3.4 Dry Tower - Train B

7.3.4.1 At CP-33, place (or verified placed) the following Dry Tower B fan control switches for fans B1 through B15 in the OFF position:

	Fan No.	Switch No.	Initials & Date
(1)	B1	CS-1/781	----------
(2)	B2	CS-1/782	----------
(3)	B3	CS-1/783	----------
(4)	B4	CS-1/784	----------
(5)	B5	CS-1/785	----------
(6)	B6	CS-1/786	----------

	Fan No.	Switch No.	Initials & Date
(7)	B7	CS-1/787	----------
(8)	B8	CS-1/788	----------
(9)	B9	CS-1/789	----------
(10)	B10	CS-1/790	----------
(11)	B11	CS-1/791	----------
(12)	B12	CS-1/792	----------
(13)	B13	CS-1/793	----------
(14)	B14	CS-1/794	----------
(15)	B15	CS-1/795	----------

7.3.4.2 At 480V MCC-3B315-S, open the following breakers for Dry Tower B fans B1 through B15:

	Fan No.	Compt. No.	Initials & Date
(1)	B1	1F	----------
(2)	B2	1M	----------
(3)	B3	2F	----------
(4)	B4	2M	----------
(5)	B5	3F	----------
(6)	B6	3M	----------
(7)	B7	4F	----------
(8)	B8	4M	----------
(9)	B9	5F	----------
(10)	B10	5M	----------
(11)	B11	7F	----------
(12)	B12	7M	----------
(13)	B13	8F	----------

	Fan No.	Compt. No.	Initials & Date
(14)	B14	8M	_____
(15)	B15	9F	_____

7.3.4.3 Ensure that valves are aligned per Attachment 8.4.6. _____

8.0 ATTACHMENTS

8.1 Instruction Tables/Graphs

8.1.1 Performance Curves for Wet Tower

8.1.2 Performance Curves for Dry Tower

8.1.3 Instructions for Calculating Heat Load on Wet and Dry Towers

8.1.4 Temperature Equalization Graph

8.2 Data Tables

8.2.1 RTD Data Table

8.2.2 Pitot Tube Traverse Data Table

8.2.3 Flow Orifice Readings

8.2.4 Dry-Bulb RTD Readings - LATER

8.2.5 Fan Input Power Data Table - LATER

8.2.6 Wet Towers Temperature Data Table

8.2.7 Anemometer Readings Data Table

8.2.8 Ambient Conditions Data Table

8.3 Calculation Sheets

8.3.1 LOCA Calculation Sheet

8.3.2 Normal Shutdown Calculation Sheet

8.3.3 Tornado Case Calculation Sheet

8.3.4 Wet Tower Performance Calculation Sheet

8.3.5 Water Loss Calculation Sheet

8.4 Miscellaneous Attachments

8.4.1 Chronological Log

8.4.2 Test Personnel ID Sheet

8.4.3 Valve Lineup Table, Tower A

8.4.4 Valve Lineup Table, Tower B

8.4.5 System Deficiency Record

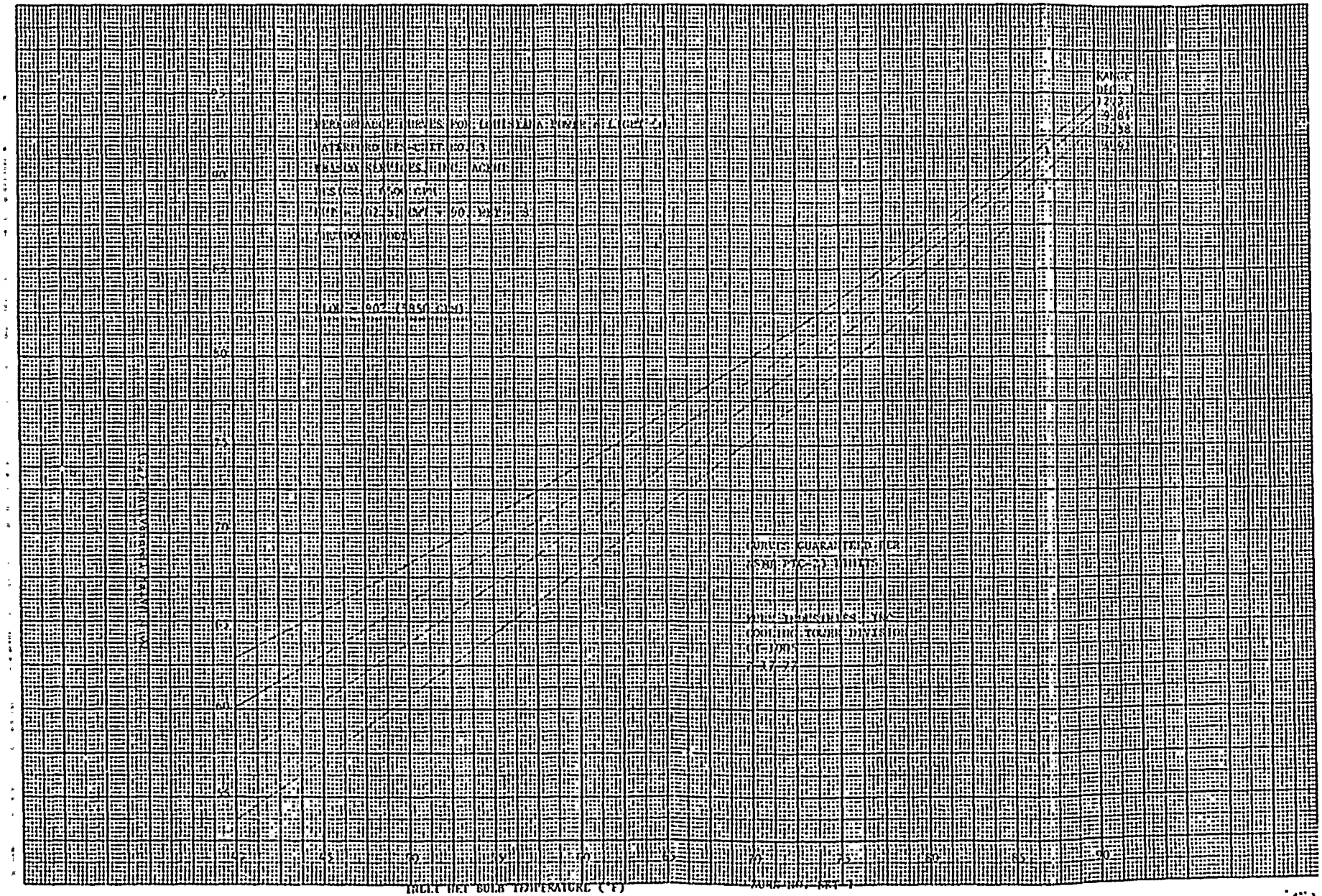
8.4.6 Restoration Valve Lineup, Towers A and B

8.4.7 Tornado Valve Lineup - Tower A

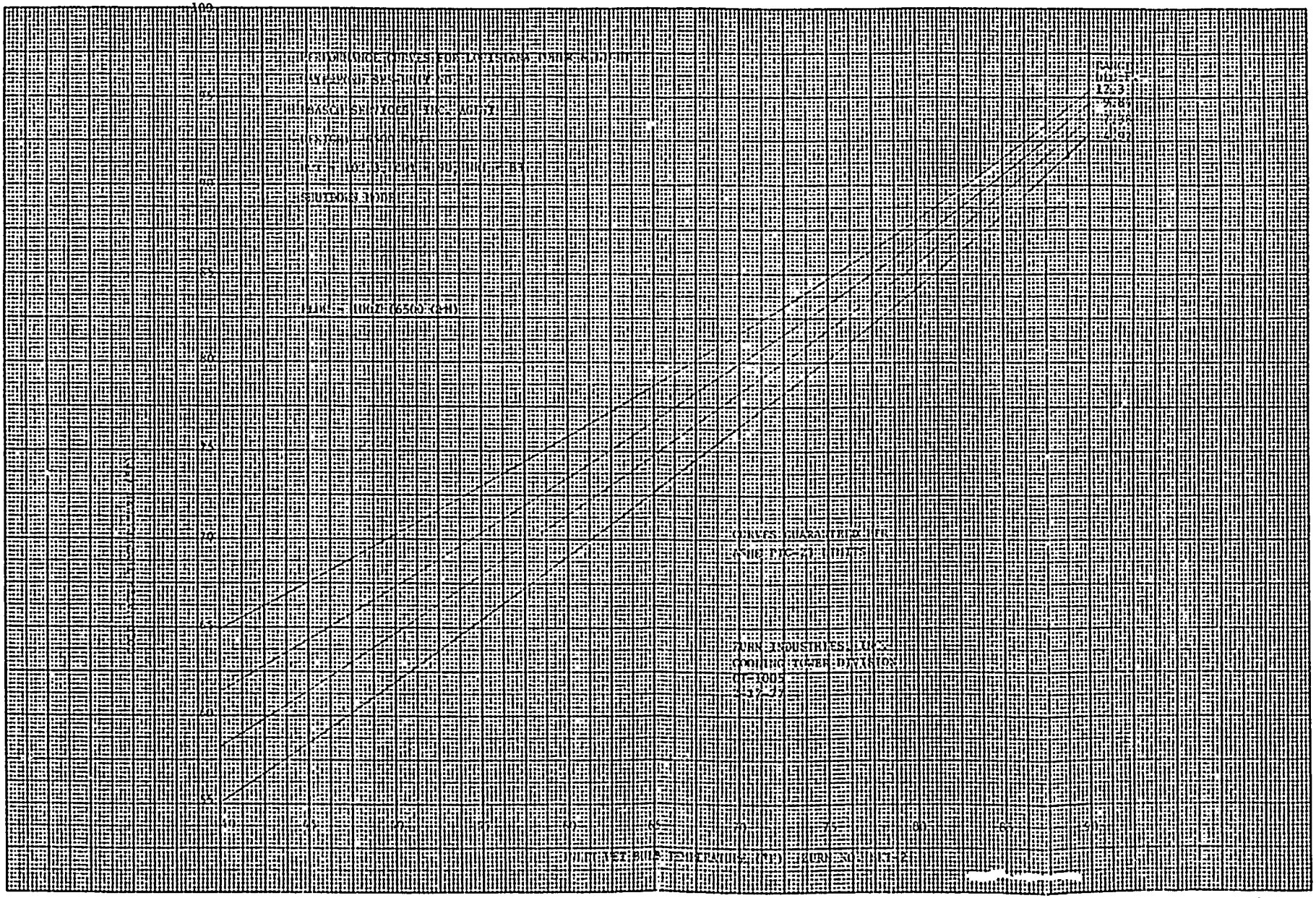
8.4.8 Tornado Valve Lineup - Tower B

8.4.9 Missing Information List

X



PERFORMANCE CURVES FOR WET TOWER



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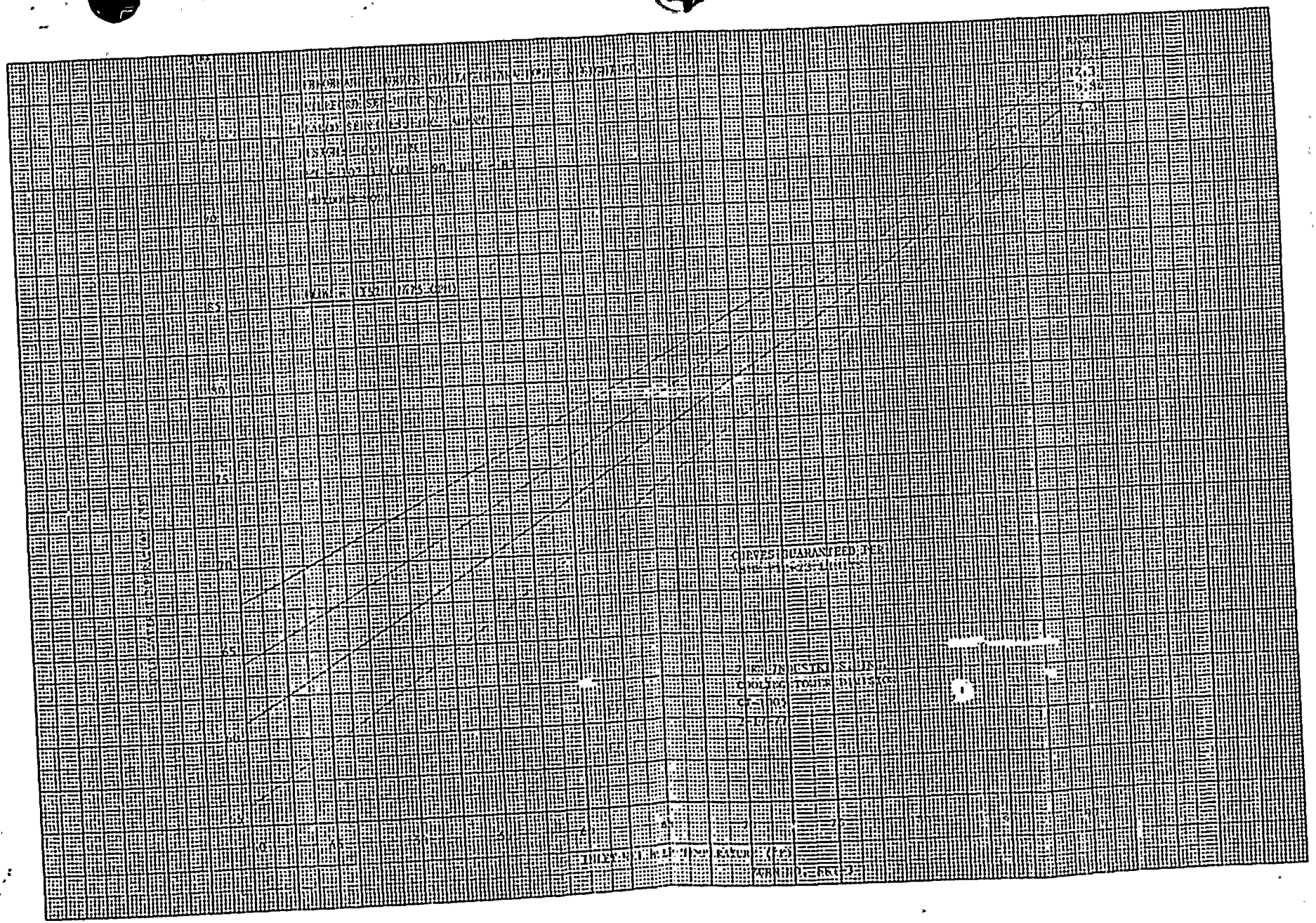

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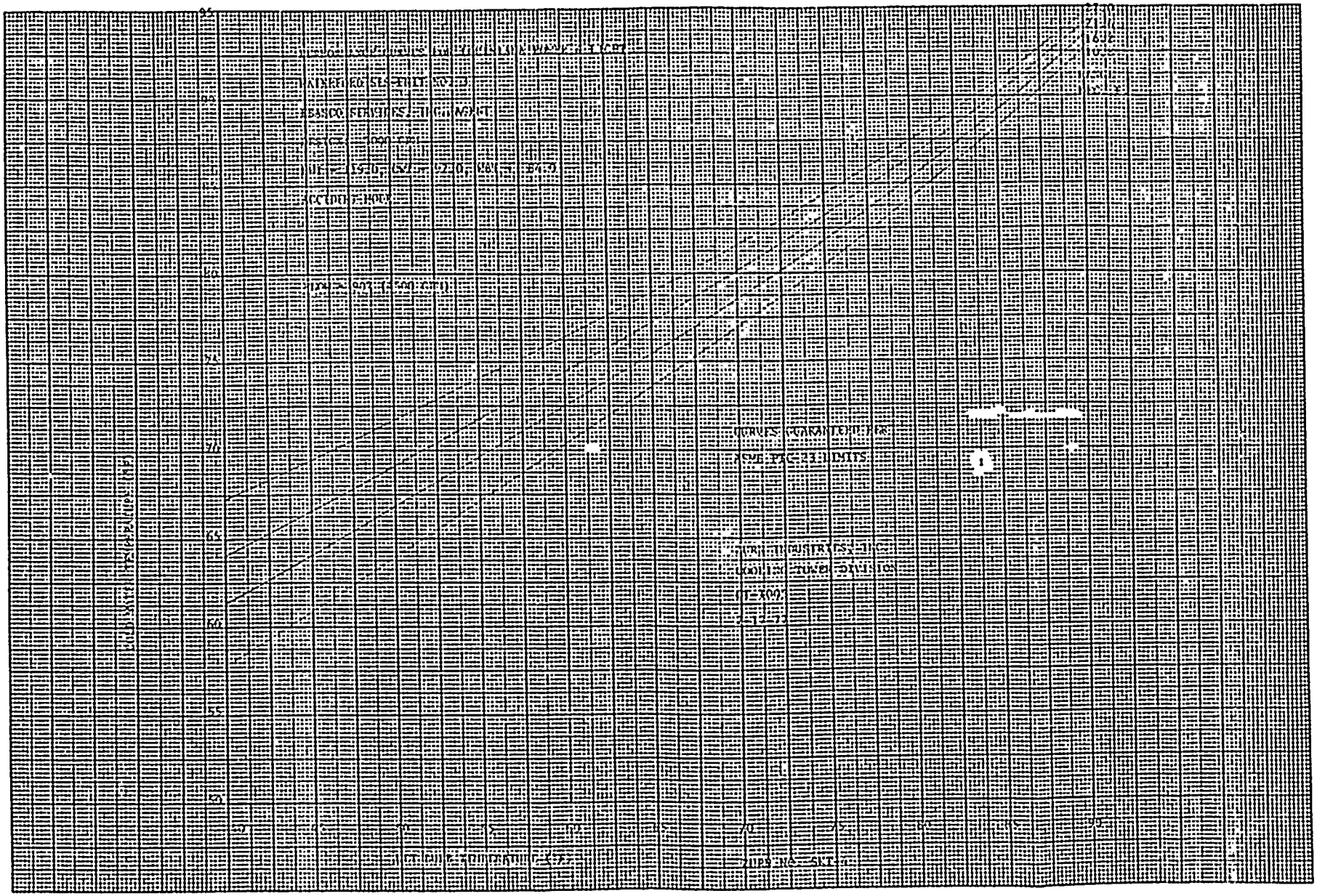

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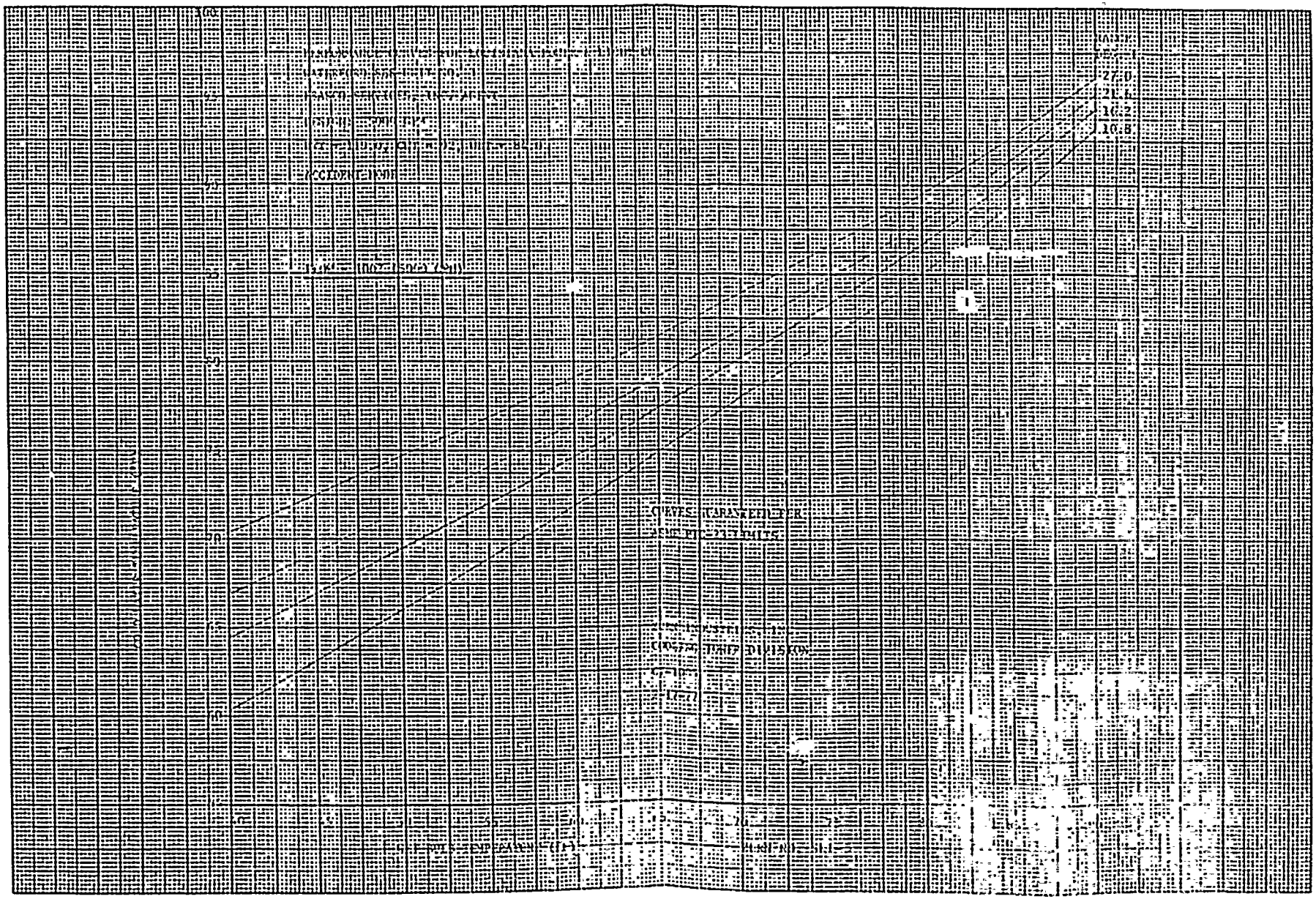
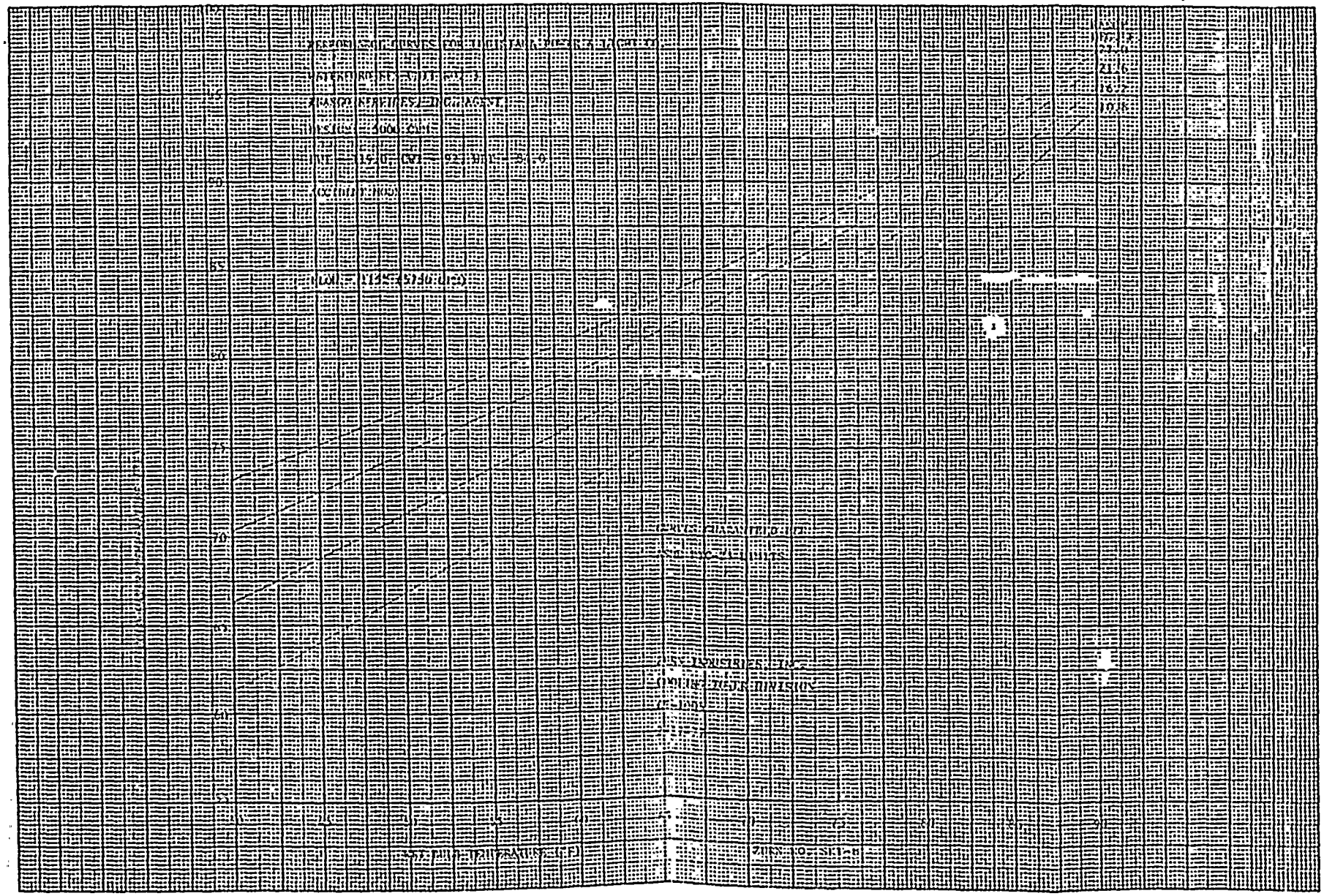
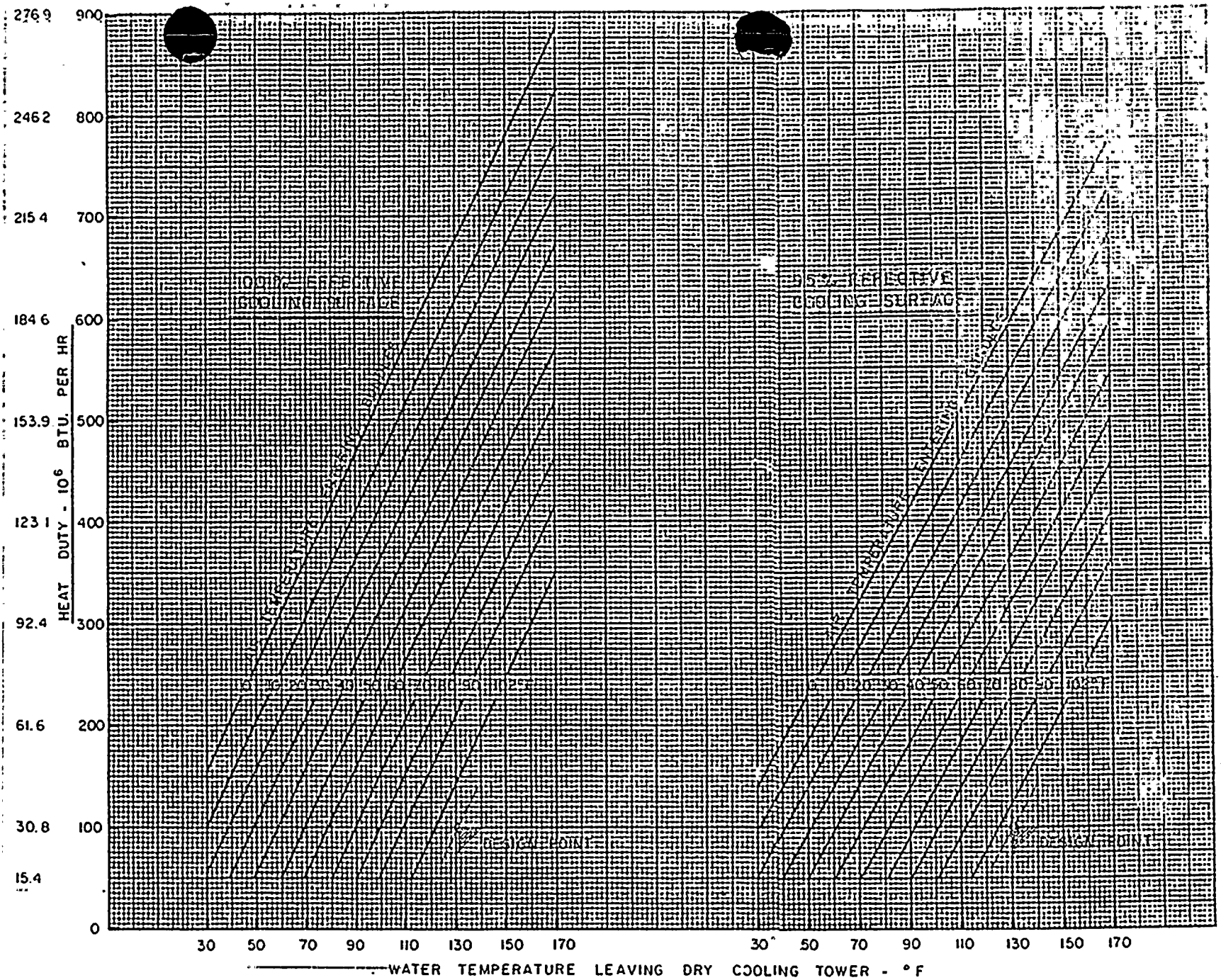


PERFORMANCE CURVES FOR WET TOWER



PERFORMANCE CURVES FOR WET TOWER



Basis

Cooling water flow rate - 6500 gpm

PERFORMANCE CURVES FOR DRY TOWER

SIT-TP-250

Attachment 8.1.2

INSTRUCTIONS FOR CALCULATING HEAT LOAD ON WET AND DRY TOWERS

8.1.3.1 Adjust temperature control valve 7CC-TV-001 to reflect the following:

(1) 161.4 degrees F for the LOCA Tests (sections 7.2.1 and 7.2.2)
(2) 146.2 degrees F for the Normal Shutdown Test (sections 7.2.3 and 7.2.4)
(3) 146.2 degrees F for the Tornado Tests (sections 7.2.5 and 7.2.6)

8.1.3.2 Adjust temperature control valve 7CC-TV-001 to give the above readings as recorded by TX-CC-7910AS for dry tower A inlet and TX-CC-7910BS for dry tower B inlet.

8.1.3.3 Use the following formula to calculate mass flow rate:

$$\dot{m} = \rho\left(\frac{lbm}{ft}\right) \dot{Vol}\ \left(\frac{gal}{min}\right)\ 60\ \left(\frac{min}{hr}\right) \cdot 1137\ \left(\frac{ft}{gal}\right)$$

8.1.3.4 Use the calculated value of $\dot{m}$ from 8.1.3.3 in the following equation.

$$\dot{Q} = \dot{m}\ (he - hi)$$

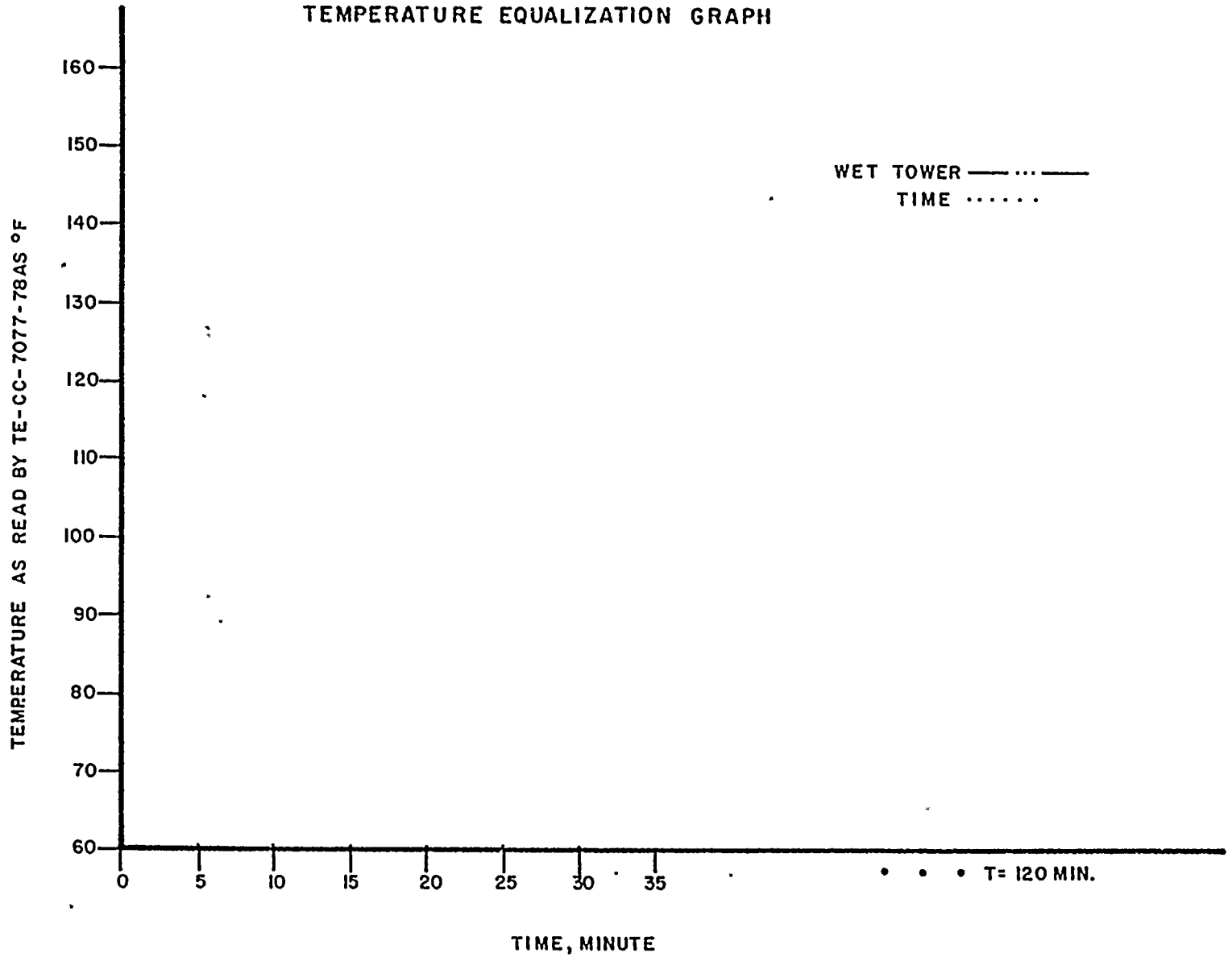
where

$\dot{Q}$ = 176 x 10^6 Btu/hr for LOCA ~~cases~~ Tests (section 7.2.1 and 7.2.2) X
$\dot{Q}$ = 127 x 10^6 Btu/hr for Normal Shutdown Tests (sections 7.2.3 and 7.2.4)
$\dot{Q}$ = 91.5 x 10^6 Btu/hr for the Tornado Cases (sections 7.2.5 and 7.2.6)

8.1.3.5 Calculate ~~a~~ Δh from step 8.1.3.4. Since he is known because the temperature (and hence enthalpy) was set in step 8.1.3.1, the temperature (the temperature of water entering the temporary heat exchanger) needed to satisfy the equation given in 8.1.3.4, can be calculated. X

8.1.3.6 If the temperature of entering feed water to the temporary heat exchanger is less than or equal to this temperature, then proceed to the next step in the procedure. If the temperature is greater than that calculated in step 8.1.3.5, attempt to adjust the temperature out of the temporary heat exchanger until the equation expressed in 8.1.3.4 is satisfied.

8.1.3.7 If the equation given in step 8.1.3.4 cannot be balanced, record the available Tin and Tout of the temporary heat exchanger on Attachment 8.3.1 for the LOCA test; on Attachment 8.3.2 for the Normal Shutdown Test; and on Attachment 8.3.3, for the Tornado Case. Proceed to the next step in the procedure.


TEMPERATURE EQUALIZATION GRAPH
TEMPERATURE AS READ BY TE-CC-7077-78AS °F
160
150
140
130
120
110
100
90
80
70
60
0
5
10
15
20
25
30
35
TIME, MINUTE
WET TOWER
TIME
T= 120 MIN.

Time: _____

(Fill out one sheet per hour.)

RTD READINGS DATA SHEET

TESTING A TOWERS													
RTD ID	T = 0	5 MIN.	10 MIN.	15 MIN.	20 MIN.	25 MIN.	30 MIN.	35 MIN.	40 MIN.	45 MIN.	50 MIN.	55 MIN.	60 MIN.
TX-CC-7910AS													
TX-CC-7920AS													
TE-CC-7079AS													
TE-CC-7077AS													
TE-(LATER)													
TE-(LATER)													
Dry Tower North End													
Dry Tower Middle													
Dry Tower South End													

TESTING B TOWERS													
RTD ID	T = 0	5 MIN.	10 MIN.	15 MIN.	20 MIN.	25 MIN.	30 MIN.	35 MIN.	40 MIN.	45 MIN.	50 MIN.	55 MIN.	60 MIN.
TX-CC-7910BS													
TX-CC-7920BS													
TE-CC-7079BS													
TE-CC-7077BS													
TE-(LATER)													
TE-(LATER)													
Dry Tower North End													
Dry Tower Middle													
Dry Tower South End													

Data Taken By _____ Date _____

Data Reviewed By _____ Date _____

PITOT TUBE TRAVERSE DATA TABLE

LOCA_____
NORMAL SHUTDOWN____
TORNADO CASE_____

CCW FLOW
SIDE A/B
(Circle One)

TEST DATE _____ LOCATION OF TRAVERSE _____ TEST ENGINEER _____

MEASURED PIPE DIAMETER (INCHES)

	STA.	RAD. X		STA.	RAD. X	DISTANCE IN.	DISTANCE MM.	D IN.	D	D IN.	D	D IN.	D	D IN.	D
	1	.025													
24 IN. DIA. AND OVER	2	.078	UNDER 24 IN. DIA.												
	3	.134													
	4	.194													
	5	.258													
	6	.330		1	.051										
	7	.408		2	.163										
	8	.500		3	.293										
	9	.613		4	.452										
	10	.776		5	.684										
CENTERLINE NOT IN AVERAGE															
	10	1.224		5	1.316										
	9	1.387		4	1.548										
	8	1.500		3	1.707										
	7	1.592		2	1.837										
	6	1.670		1	1.949										
	5	1.742													
	4	1.806													
	3	1.886													
	2	1.922													
	1	1.975													
								TOTAL ____ AVG. ____		TOTAL ____ AVG. ____		TOTAL ____ AVG. ____		TOTAL ____ AVG. ____	

PITOT TUBE USED _____

TUBE COEFFICIENT, C=_____

TUBE BLOCKAGE DIA., TBD=_____ IN.

MANOMETER FLUID_____ SPECIFIC GRAVITY OF MANOMETER FLUID, SGF=_____

WATER TEMPERATURE _____ DEG. F

AMBIENT TEMPERATURE _____ DEG. F

FLOW GPM= $7.221 \left[\pi/4 \text{ (MEAS. DIA.)}^2 - 1/2 \text{ (MEAS. DIA.) X TBD}\right] \text{ X } \sqrt{(\text{SGF} - 1)} \text{ x (AVG. } \sqrt{\text{D}} \text{)}$

PITOT TUBE TRAVERSE DATA TABLE

LOCA_____
NORMAL SHUTDOWN_____
TORNADO CASE_____

ACCW FLOW

SIDE A/B
(Circle One)

TEST DATE _____ LOCATION OF TRAVERSE _____ TEST ENGINEER _____

MEASURED PIPE DIAMETER (INCHES)																
	STA.	RAD. X		STA.	RAD. X	DISTANCE IN.	DISTANCE MM.	D IN.	D	D IN.	D	D IN.	D	D IN.	D	
24 IN. DIA. AND OVR	1	.025	UNDER 24 IN. DIA.													
	2	.078														
	3	.134														
	4	.194														
	5	.258														
	6	.330		1	.051											
	7	.408		2	.163											
	8	.500		3	.293											
	9	.613		4	.452											
	10	.776		5	.684											
CENTERLINE NOT IN AVERAGE																
	10	1.224		5	1.316											
	9	1.387		4	1.548											
	8	1.500		3	1.707											
	7	1.592		2	1.837											
	6	1.670		1	1.949											
	5	1.742														
	4	1.806														
	3	1.886														
	2	1.922														
	1	1.975														
								TOTAL ____ AVG. ____		TOTAL ____ AVG. ____		TOTAL ____ AVG. ____		TOTAL ____ AVG. ____		

PITOT TUBE USED _____

TUBE COEFFICIENT, C=_____

TUBE BLOCKAGE DIA., TBD=_____ IN.

MANOMETER FLUID_____ SPECIFIC GRAVITY OF MANOMETER FLUID, SGF=_____

WATER TEMPERATURE _____ DEG. F

AMBIENT TEMPERATURE _____ DEG. F

FLOW GPM= $7.221 \left[\pi/4 \text{ (MEAS. DIA.)}^2 - 1/2 \text{ (MEAS. DIA.) X TBD}\right] \text{ X } \sqrt{(\text{SGF} - 1)} \text{ x (AVG. } \sqrt{\text{D}} \text{)}$

PITOT TUBE TRAVERSE DATA TABLE

TEST EQUIPMENT									
DESCRIPTION	M&TE	RANGE	ACC.	RECAL	DESCRIPTION	M&TE	RANGE	ACC.	RECAL

COMMENTS: _____

PERFORMED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

QC	QA
DATE	DATE
PAGE OF	

FLOW ORIFICE READINGS

LOCA ——
NORMAL SHUTDOWN ——
TORNADO CASE ——

ORIFICE ID	TIME START	5 MIN.	10 MIN.	15 MIN.	20 MIN.	25 MIN.	30 MIN.	35 MIN.	40 MIN.	45 MIN.	50 MIN.	55 MIN.	60 MIN.
FT-CC-7078AS during ACCW piping traverse for Wet Tower A	____	____	____	____	____	____	____	____	____	____	____	____	____
FT-CC-7078BS during ACCW piping traverse for Wet Tower B	____	____	____	____	____	____	____	____	____	____	____	____	____
Temporary CCW orifice during CCW piping traverse for Dry Tower A flow	____	____	____	____	____	____	____	____	____	____	____	____	____
Temporary CCW orifice during CCW piping traverse for Dry Tower B flow	____	____	____	____	____	____	____	____	____	____	____	____	____

FLOW ORIFICE READINGS

TEST EQUIPMENT									
DESCRIPTION	MATE	RANGE	ACC.	RECALL	DESCRIPTION	MATE	RANGE	ACC.	RECALL

COMMENTS: _____

PERFORMED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

QC	QA
DATE	DATE

PAGE OF

LOCA _____
NORMAL SHUTDOWN _____
TORNADO CASE _____

FAN INPUT POWER DATA TABLE

Wattmeter Readings

Fan 1	_____	Fan 5	_____
Fan 2	_____	Fan 6	_____
Fan 3	_____	Fan 7	_____
Fan 4	_____	Fan 8	_____

Horsepower Calculation

	Avg. Volts	Avg. Amps	Ambient Temp. (deg. F)	Horsepower (HP)
Fan 1	_____	____	_____	_____
Fan 2	_____	____	_____	_____
Fan 3	_____	____	_____	_____
Fan 4	_____	____	_____	_____
Fan 5	_____	____	_____	_____
Fan 6	_____	____	_____	_____
Fan 7	_____	____	_____	_____
Fan 8	_____	____	_____	_____

$$HP = \frac{(volts) \times (amps) \times (\sqrt{3}) \times EF}{746}$$

where EF = 0.71

FAN INPUT POWER DATA TABLE

TEST EQUIPMENT									
DESCRIPTION	MAKE	RANGE	ACC.	CAL DUE	DESCRIPTION	MAKE	RANGE	ACC.	RESPONSE

COMMENTS: _____

PERFORMED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

QC	QA
DATE	DATE

PAGE OF

LOCA _____
NORMAL SHUTDOWN _____
TORNADO CASE _____

WET TOWER TEMPERATURES DATA TABLE

	South Cell							North Cell						
	Inlet Face RTDs (Wet Bulbs)				East Window RTD (Wet Bulb)	West Window RTD (Wet Bulb)	Dry Bulb	Inlet Face RTDs				East Window RTD	West Window RTD	Dry Bulb
Time	1	2	3	4				1	2	3	4			

Performed By: _____ Date: _____

Reviewed By: _____ Date: _____

LOCA _____
NORMAL SHUTDOWN _____
TORNADO CASE _____

ANEMOMETER READINGS - WET TOWER ___

	North Cell		South Cell	
Time:	East Window	West Window	East Window	West Window
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______
______	_______	_______	_______	_______

Reviewed By: ________________________________ Date: ____________________
Performed By: ________________________________ Date: ____________________

LOCA _____
NORMAL SHUTDOWN _____
TORNADO CASE _____

AMBIENT CONDITIONS DATA TABLE

Time	Wind Speed	Wind Direction	Dry Bulb	Wet Bulb

Performed By: _____ Date: _____
Reviewed By: _____ Date: _____

LOCA CALCULATION SHEET

8.3.1.1 Using the equations given below, calculate the available heat duty for the LOCA test.

(1) $\dot{Q} = \dot{m}\,(he - hi)$

$\dot{Q}$ = heat flux in Btu/hr = 176×10^6 Btu/hr

$\dot{m}$ = mass flow rate of water in lbm/hr as calculated in equation (2)

hi = enthalpy of liquid water as found in the ASME Steam Tables at the water temperature read by the RTD at the inlet of the boiler heat exchanger

he = enthalpy of liquid water as found in the ASME Steam Tables at the water temperature read by the RTD at the exit of the boiler heat exchanger

(2) $\dot{m} = \rho\,(\dot{Vol.}) = \rho\ (lbm/ft^3)\ \dot{Vol.}\ (gal/min)\ 60\ (min/hr)\ 0.1337\ (ft^3/gal)$

ρ = density of water at the water temperature read by the RTD at the inlet to the boiler heat exchanger

$\dot{Vol.}$ = volumetric flow rate determined in Attachment LATER

8.3.1.2 If equation (1) gives a heat flux less than 176×10^6 Btu/hr, record the data on the table and inform the Test Director.

LOCA CALCULATION SHEET

Time	$\dot{V}ol$ (gal/min)	Ti (°F)	ρi (lbm/ft^3)	Te (°F)	hi (Btu/lbm)	he (Btu/lbm)	$\dot{m}$ (lbm/hr)	$\dot{Q}$ Btu/hr)

Performed By: _____ Date: _____

Reviewed By: _____ Date: _____

NORMAL SHUTDOWN CALCULATION SHEET

8.3.2.1 Using the equations given below, calculate the available heat duty for the ~~LOCA~~ Normal Shutdown test.

(1) $\dot{Q} = \dot{m}\,(he - hi)$

align $\dot{Q}$ = heat flux in Btu/hr = 127×10^6 Btu/hr

$\dot{m}$ = mass flow rate of water in lbm/hr as calculated in equation (2)

hi = enthalpy of liquid water as found in the ASME Steam Tables at the water temperature read by the RTD at the inlet of the boiler heat exchanger

he = enthalpy of liquid water as found in the ASME Steam Tables at the water temperature read by the RTD at the exit of the boiler heat exchanger

(2) $\dot{m} = \rho\,(\dot{V}ol.) = \rho\ (lbm/ft^3)\ \dot{V}ol.\ (gal/min)\ 60\ (min/hr) \cdot 0.1337\ (ft^3/gal)$

ρ = density of water at the water temperature read by the RTD at the inlet to the boiler heat exchanger

Vol. = volumetric flow rate determined in Attachment LATER

8.3.2.2 If equation (1) gives a heat flux less than 127×10^6 Btu/hr, record the data on the table and inform the Test Director.

NORMAL SHUTDOWN CALCULATION SHEET

Time	Vol (gal/min)	Ti (°F)	ρi (lbm/ft³)	Te (°F)	hi (Btu/lbm)	he (Btu/lbm)	ṁ (lbm/hr)	Q̇ Btu/hr)

Performed By: _____ Date: _____

Reviewed By: _____ Date: _____

TORNADO CASE CALCULATION SHEET

8.3.3.1 Using the equations given below, calculate the available heat duty for the ~~LOCA~~ Tornado test. X

(1) $\dot{Q} = \dot{m}\,(he - hi)$

align $\dot{Q}$ = heat flux in Btu/hr = 91.5×10^6 Btu/hr

$\dot{m}$ = mass flow rate of water in lbm/hr as calculated in equation (2)

hi = enthalpy of liquid water as found in the ASME Steam Tables at the water temperature read by the RTD at the inlet of the boiler heat exchanger

he = enthalpy of liquid water as found in the ASME Steam Tables at the water temperature read by the RTD at the exit of the boiler heat exchanger

(2) $\dot{m} = \rho\,(\dot{Vol.}) = \rho\ (lbm/ft^3)\ \dot{Vol.}\ (gal/min)\ 60(min/hr)\ 0.1337\ (ft^3/gal)$

ρ = density of water at the water temperature read by the RTD at the inlet to the boiler heat exchanger

$\dot{Vol.}$ = volumetric flow rate determined in Attachment LATER

8.3.3.2 If equation (1) gives a heat flux less than 91.5×10^6 Btu/hr, record the data on the table and inform the Test Director. X

TORNADO CASE CALCULATION SHEET

Time	$\dot{V}ol$ (gal/min)	Ti (°F)	ρi (lbm/ft^3)	Te (°F)	hi (Btu/lbm)	he (Btu/lbm)	$\dot{m}$ (lbm/hr)	$\dot{Q}$ Btu/hr)

Performed By: _____ Date: _____

Reviewed By: _____ Date: _____

WET TOWER PERFORMANCE
CALCULATION SHEET

The manufacturer has submitted figures ___, ___, and ___. At the test wet bulb, generate a new set of curves with the ordinate being cooling range and the abscissa being cold water temperature. The family of curves will be the water flow rate. For the test cooling range, generate a new curve with the ordinate being cold water temperature and the abscissa being the predicted water flow rate. At the test cold water temperature, read the predicted flow rate. The capability of the tower is

$$\text{Capability} = \frac{\text{ADJUSTED TEST GPM}}{\text{PREDICTED GPM}} \times 100$$

where

$$\text{ADJUSTED TEST GPM} = \text{TEST GPM} \left(\frac{\text{DESIGN FAN HP}}{\text{TEST FAN HP}}\right)$$

For any capability less than 100%, the wet tower is assumed to fail the guarantee.

WATER LOSS CALCULATION SHEET

The water loss from the ACCW System will be determined by measuring the change in volume of the wet tower water basin for the duration of the test. Makeup to the ACCW System will be secured during the test.

The water level in the basin will be measured, both before and after the test, using a tape measure attached to the basin wall and a vernier caliper.

Time	Water Height
-----	----------
-----	----------
-----	----------
-----	----------
-----	----------
-----	----------
-----	----------
-----	----------
-----	----------
-----	----------
-----	----------

CHRONOLOGICAL LOG

Sheet _____ of _____

System No. NA

Title Ultimate Heat Sink Test Procedure No. SIT-TP-250

DATE/TIME COMMENTS

TEST PERSONNEL ID SHEET

Name (Print)	Initials

VALVE LINEUP TABLE
TOWER A

NOTE: This is the valve lineup for operation of Wet Tower A with CCW Pump A/B lined up as Pump A and CCW Pump B lined up to carry all CCW heat loads.

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-F109A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-F113A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-F110A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-F114A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-B108A/B	CCW PUMP A/B SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-111A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-115A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-112A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-116A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-B117A	CCW PUMP A DISCHARGE VALVE	CLOSED	_____	_____
3CC-B106A	CCW PUMP A SUCTION VALVE	CLOSED	_____	_____
3CC-B201A	DRY TOWER A INLET ISOLATION VALVE	OPEN	_____	_____
3CC-B265A	DRY TOWER A BYPASS ISOLATION VALVE	CLOSED	_____	_____

VALVE LINEUP TABLE

TOWER A

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B81A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B82A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B83A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B84A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B85A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B86A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B87A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B88A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B89A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B90A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B91A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B92A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B93A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B94A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____

VALVE LINEUP TABLE
TOWER A

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B95A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B96A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B97A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B98A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B99A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B100A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B104A	CCW HEAT EXCHANGER A INLET VALVE	OPEN	_____	_____
3CC-B238A	CCW HEAT EXCHANGER A BYPASS VALVE	TAGGED CLOSED	_____	_____
3CC-B140A	CCW HEAT EXCHANGER A DISCHARGE VALVE	TAGGED CLOSED	_____	_____
7CC-V003	CCW HEADER A ISOLATION TO TEMPORARY HEAT EXCHANGER	TAGGED OPEN	_____	_____
7CC-V006	CCW PUMP A/B SUCTION FROM TEMPORARY HEAT EXCHANGER	OPEN	_____	_____
7CC-V004	CCW HEADER B ISOLATION TO TEMPORARY HEAT EXCHANGER	CLOSED	_____	_____
7CC-V005	TEMPORARY HEAT EXCHANGER DISCHARGE ISOLATION VALVE	OPEN	_____	_____
[redacted]354A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____

VALVE LINEUP TABLE
TOWER A

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B57A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B58A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B53A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B260A	ACCW PUMP A SUCTION ISOLATION VALVE	OPEN	_____	_____
3CC-B288A	ACCW PUMP A DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-TM290A	ACCW PUMP A FLOW CONTROL VALVE	CLOSED	_____	_____
3CC-B292A	ACCW PUMP A FLOW CONTROL VALVE DISCHARGE ISOLATION VALVE	OPEN	_____	_____
7CC-V008	TEMPORARY HEATER DRAIN VALVE	OPEN	_____	_____
7CC-PV002	TEMPORARY BOILER STEAM CONTROL VALVE	AUTO	_____	_____
7CC-TV001	TEMPORARY HEATER TEMPERATURE CONTROL VALVE	AUTO	_____	_____
7CC-V007	MAKEUP TO SURGE TANK	(LATER)	_____	_____
3CC-F285B	WET TOWER EQUALIZING VALVES	CLOSED	_____	_____ X
3CC-F284A	WET TOWER EQUALIZING VALVES	CLOSED	_____	_____ X

VALVE LINEUP TABLE

TOWER B

NOTE: This is the valve lineup for the operation of Wet Tower B with CCW Pump A/B lined up as Pump B and CCW Pump A lined up to carry all CCW heat loads.

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-F109A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-F113A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-F110A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-F114A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-B108A/B	CCW PUMP A/B SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-111A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-115A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-112A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-116A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-B118B	CCW PUMP A DISCHARGE VALVE	CLOSED	_____	_____
3CC-B107B	CCW PUMP A SUCTION VALVE	CLOSED	_____	_____
3CC-B203B	DRY TOWER B INLET ISOLATION VALVE	OPEN	_____	_____
3CC-B262B	DRY TOWER B BYPASS ISOLATION VALVE	CLOSED	_____	_____

VALVE LINEUP TABLE
TOWER B

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B71B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B72B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B73B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B74B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B75B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B76B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B77B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B78B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B79B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B80B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B61B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B62B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B63B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B64B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------

VALVE LINEUP TABLE
TOWER B

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B65B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B66B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B67B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B68B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B69B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B70B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B105B	CCW HEAT EXCHANGER B INLET VALVE	OPEN	_____	_____
3CC-B239B	CCW HEAT EXCHANGER B BYPASS VALVE	TAGGED CLOSED	_____	_____
3CC-B141B	CCW HEAT EXCHANGER B DISCHARGE VALVE	TAGGED CLOSED	_____	_____
7CC-V004	CCW HEADER B ISOLATION TO TEMPORARY HEAT EXCHANGER	TAGGED OPEN	_____	_____
7CC-V006	CCW PUMP A/B SUCTION FROM TEMPORARY HEAT EXCHANGER	OPEN	_____	_____
7CC-V003	CCW HEADER A ISOLATION TO TEMPORARY HEAT EXCHANGER	CLOSED	_____	_____
7CC-V005	TEMPORARY HEAT EXCHANGER DISCHARGE ISOLATION VALVE	OPEN	_____	_____
[redacted]355B	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____

VALVE LINEUP TABLE

TOWER B

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B56B	ACCW RISER HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B59B	ACCW RISER HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B60B	ACCW RISER HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B261B	ACCW PUMP B SUCTION ISOLATION VALVE	OPEN	----------	----------
3CC-B289B	ACCW PUMP B DISCHARGE ISOLATION VALVE	OPEN	----------	----------
3CC-TM291B	ACCW PUMP B FLOW CONTROL VALVE	CLOSED	----------	----------
3CC-B293B	ACCW PUMP B FLOW CONTROL VALVE DISCHARGE ISOLATION VALVE	OPEN	----------	----------

PROCEDURE NO. SIT-TP-250

REV. ______

SYSTEM DEFICIENCY RECORD

Page ____ of ____

Def. No.	C.I.R. No. (if app.)	Affected Paragraph	DESCRIPTION	CLEARED	
				Date	Initials

RESTORATION VALVE LINEUP TABLE
TOWERS A AND B

NOTE: This is the valve lineup for normal operation of Wet Tower A with CCW Pump A/B lined up as Pump A and CCW Pump B lined up to carry all CCW heat loads.

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-F109A/B	CCW PUMP DISCHARGE ISOLATION VALVE	OPEN	----------	----------
3CC-F113A/B	CCW PUMP SUCTION ISOLATION VALVE	OPEN	----------	----------
3CC-F110A/B	CCW PUMP DISCHARGE ISOLATION VALVE	OPEN	----------	----------
3CC-F114A/B	CCW PUMP SUCTION ISOLATION VALVE	OPEN	----------	----------
3CC-B108A/B	CCW PUMP A/B SUCTION ISOLATION VALVE	OPEN	----------	----------
3CC-111A/B	CCW PUMP DISCHARGE ISOLATION VALVE	OPEN	----------	----------
3CC-115A/B	CCW PUMP SUCTION ISOLATION VALVE	OPEN	----------	----------
3CC-112A/B	CCW PUMP DISCHARGE ISOLATION VALVE	OPEN	----------	----------
3CC-116A/B	CCW PUMP SUCTION ISOLATION VALVE	OPEN	----------	----------
3CC-B117A	CCW PUMP A DISCHARGE VALVE	OPEN	----------	----------
3CC-B106A	CCW PUMP A SUCTION VALVE	OPEN	----------	----------
3CC-B201A	DRY TOWER A INLET ISOLATION VALVE	OPEN	----------	----------
3CC-B265A	DRY TOWER A BYPASS ISOLATION VALVE	CLOSED	----------	----------

[illegible] LINEUP TABLE
[illegible] A AND B

VALVE [illegible]	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B81A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B82A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B83A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B84A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B85A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B86A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B87A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B88A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B89A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B90A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B91A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B92A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B93A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
[illegible]94A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____

RESTORATION VALVE LINEUP TABLE
TOWERS A AND B

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B95A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B96A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B97A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B98A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
[redacted]B99A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B100A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B104A	CCW HEAT EXCHANGER A INLET VALVE	OPEN	_____	_____
3CC-B238A	CCW HEAT EXCHANGER A BYPASS VALVE	CLOSED	_____	_____
3CC-B140A	CCW HEAT EXCHANGER A DISCHARGE VALVE	OPEN	_____	_____
7CC-V003	CCW HEADER A ISOLATION TO TEMPORARY HEAT EXCHANGER	CLOSED	_____	_____
7CC-V006	CCW PUMP A/B SUCTION FROM TEMPORARY HEAT EXCHANGER	CLOSED	_____	_____
7CC-V004	CCW HEADER B ISOLATION TO TEMPORARY HEAT EXCHANGER	CLOSED	_____	_____
7CC-V005	TEMPORARY HEAT EXCHANGER DISCHARGE ISOLATION VALVE	OPEN	_____	_____
[redacted]B54A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____

RESTORATION VALVE LINEUP TABLE
TOWERS A AND B

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B57A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B58A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B53A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B260A	ACCW PUMP A SUCTION ISOLATION VALVE	OPEN	_____	_____
3CC-B288A	ACCW PUMP A DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-TM290A	ACCW PUMP A FLOW CONTROL VALVE	AS IS	_____	_____
3CC-B292A	ACCW PUMP A FLOW CONTROL VALVE DISCHARGE ISOLATION VALVE	OPEN	_____	_____
7CC-V008	TEMPORARY HEATER DRAIN VALVE	OPEN	_____	_____
7CC-PV002	TEMPORARY BOILER STEAM CONTROL VALVE	AUTO	_____	_____
7CC-TV001	TEMPORARY HEATER TEMPERATURE CONTROL VALVE	AUTO	_____	_____
7CC-V007	MAKEUP TO SURGE TANK	(LATER)	_____	_____

TORNADO VALVE LINEUP TABLE

TOWER A

NOTE: This is the valve lineup for operation of Wet Tower A with CCW Pump A/B lined up as Pump A and CCW Pump B lined up to carry all CCW heat loads.

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-F109A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-F113A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-F110A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-F114A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-B108A/B	CCW PUMP A/B SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-111A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-115A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-112A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-116A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-B117A	CCW PUMP A DISCHARGE VALVE	CLOSED	_____	_____
3CC-B106A	CCW PUMP A SUCTION VALVE	CLOSED	_____	_____
3CC-B201A	DRY TOWER A INLET ISOLATION VALVE	OPEN	_____	_____
3CC-B265A	DRY TOWER A BYPASS ISOLATION VALVE	CLOSED	_____	_____

TORNADO VALVE LINEUP TABLE

TOWER A

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B81A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B82A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B83A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B84A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B85A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B86A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B87A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B88A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B89A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B90A	DRY TOWER A INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B91A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B92A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B93A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B94A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____

TORNADO VALVE LINEUP TABLE

TOWER A

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B95A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B96A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B97A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B98A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B99A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B100A	DRY TOWER A INLET DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-B104A	CCW HEAT EXCHANGER A INLET VALVE	CLOSED	_____	_____
3CC-B238A	CCW HEAT EXCHANGER A BYPASS VALVE	OPEN	_____	_____
3CC-B140A	CCW HEAT EXCHANGER A DISCHARGE VALVE	TAGGED CLOSED	_____	_____
7CC-V003	CCW HEADER A ISOLATION TO TEMPORARY HEAT EXCHANGER	TAGGED OPEN	_____	_____
7CC-V006	CCW PUMP A/B SUCTION FROM TEMPORARY HEAT EXCHANGER	OPEN	_____	_____
7CC-V004	CCW HEADER B ISOLATION TO TEMPORARY HEAT EXCHANGER	CLOSED	_____	_____
7CC-V005	TEMPORARY HEAT EXCHANGER DISCHARGE ISOLATION VALVE	OPEN	_____	_____
[illegible]54A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____

TORNADO VALVE LINEUP TABLE

TOWER A

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B57A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B58A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B53A	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B260A	ACCW PUMP A SUCTION ISOLATION VALVE	OPEN	_____	_____
3CC-B288A	ACCW PUMP A DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-TM290A	ACCW PUMP A FLOW CONTROL VALVE	AS IS	_____	_____
3CC-B292A	ACCW PUMP A FLOW CONTROL VALVE DISCHARGE ISOLATION VALVE	OPEN	_____	_____
7CC-V008	TEMPORARY HEATER DRAIN VALVE	OPEN	_____	_____
7CC-PV002	TEMPORARY BOILER STEAM CONTROL VALVE	AUTO	_____	_____
7CC-TV001	TEMPORARY HEATER TEMPERATURE CONTROL VALVE	AUTO	_____	_____
7CC-V007	MAKEUP TO SURGE TANK	(LATER)	_____	_____
3CC-F285B	WET TOWER EQUALIZING VALVES	CLOSED	_____	_____
3CC-F284A	WET TOWER EQUALIZING VALVES	CLOSED	_____	_____

TORNADO VALVE LINEUP TABLE

TOWER B

NOTE: This is the valve lineup for the operation of Wet Tower B with CCW Pump A/B lined up as Pump B and CCW Pump A lined up to carry all CCW heat loads.

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-F109A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-F113A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-F110A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-F114A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-B108A/B	CCW PUMP A/B SUCTION ISOLATION VALVE	TAGGED CLOSED	_____	_____
3CC-111A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-115A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-112A/B	CCW PUMP DISCHARGE ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-116A/B	CCW PUMP SUCTION ISOLATION VALVE	TAGGED OPEN	_____	_____
3CC-B118B	CCW PUMP A DISCHARGE VALVE	CLOSED	_____	_____
3CC-B107B	CCW PUMP A SUCTION VALVE	CLOSED	_____	_____
3CC-B203B	DRY TOWER B INLET ISOLATION VALVE	OPEN	_____	_____
3CC-B262B	DRY TOWER B BYPASS ISOLATION VALVE	CLOSED	_____	_____

TORNADO VALVE LINEUP TABLE

TOWER B

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B71B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B72B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B73B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B74B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B75B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B76B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B77B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B78B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B79B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B80B	DRY TOWER B INLET HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B61B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B62B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B63B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B64B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	_____	_____

TORNADO VALVE LINEUP TABLE
TOWER B

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B65B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B66B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B67B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B68B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B69B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B70B	DRY TOWER B DISCHARGE HEADER ISOLATION VALVE	OPEN	----------	----------
3CC-B105B	CCW HEAT EXCHANGER B INLET VALVE	CLOSED	----------	----------
3CC-B239B	CCW HEAT EXCHANGER B BYPASS VALVE	OPEN	----------	----------
3CC-B141B	CCW HEAT EXCHANGER B DISCHARGE VALVE	TAGGED CLOSED	----------	----------
7CC-V004	CCW HEADER B ISOLATION TO TEMPORARY HEAT EXCHANGER	TAGGED OPEN	----------	----------
7CC-V006	CCW PUMP A/B SUCTION FROM TEMPORARY HEAT EXCHANGER	OPEN	----------	----------
7CC-V003	CCW HEADER A ISOLATION TO TEMPORARY HEAT EXCHANGER	CLOSED	----------	----------
7CC-V005	TEMPORARY HEAT EXCHANGER DISCHARGE ISOLATION VALVE	OPEN	----------	----------
3CC-B55B	ACCW RISER HEADER ISOLATION VALVE	OPEN	----------	----------

TORNADO VALVE LINEUP TABLE
TOWER B

VALVE NO.	DESCRIPTION	REQUIRED POSITION	PERFORMED (INITIALS)	VERIFIED (INITIALS)
3CC-B56B	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B59B	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B60B	ACCW RISER HEADER ISOLATION VALVE	OPEN	_____	_____
3CC-B261B	ACCW PUMP B SUCTION ISOLATION VALVE	OPEN	_____	_____
3CC-B289B	ACCW PUMP B DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-TM291B	ACCW PUMP B FLOW CONTROL VALVE	CLOSED	_____	_____
3CC-B293B	ACCW PUMP B FLOW CONTROL VALVE DISCHARGE ISOLATION VALVE	OPEN	_____	_____
3CC-F285B	WET TOWER EQUALIZING VALVE	CLOSED	_____	_____
3CC-F284A	WET TOWER EQUALIZING VALVE	CLOSED	_____	_____

MIDDLE SOUTH UTILITIES SYSTEM

LOUISIANA POWER & LIGHT CO.
WATERFORD 3

MISSING INFORMATION LIST

PROCEDURE NO. SIT-TP-250 PROCEDURE TITLE Ultimate Heat Sink Test

ITEM NO.	ITEM	AFFECTED PARAGRAPH	CLEARED DATE	CLEARED INITIAL
1	Rev. no.	2.1.2.9		
2	Sheet no.	2.3.4.1.1		
		2.3.4.1.2		
3	Wet Cooling Tower Specs. Reference Para.	3.4 (ALL)		
4	Infrared Thermometer Model No.	4.1.1.10		
5	Orifice Plate ID	7.2.1.14		
		7.2.2.14		
		7.2.3.14		
		7.2.4.14		
		7.2.5.12		
		7.2.6.12		
6	Orifice ID	7.2.1.13		
		7.2.2.13		
		7.2.3.13		
		7.2.4.13		
7	Dry-Bulb RTD Readings	att. 8.2.4		
8	Attachment reference (step 8.3.1.1 Vol)	att. 8.3.1.		
9	Attachment reference (step 8.3.2.1 Vol)	att. 8.3.2		
10	Attachment reference (step 8.3.3.1 Vol)	att. 8.33		
11	Manufacture figures	Att. 8.3.4		
12	Valve 7CC-V007 Position	Atts. 8.4.3,		
		8.4.6, 8.4.7		

ALL MISSING INFORMATION ON THIS LIST HAS BEEN CLEARED

STARTUP ENGINEER/ASSIGNED AUTHOR

LOUISIANA POWER & LIGHT CO.
WATERFORD 3

MIDDLE SOUTH UTILITIES SYSTEM

MISSING INFORMATION LIST

PROCEDURE NO. SIT-TP-250 PROCEDURE TITLE Ultimate Heat Sink Test

ITEM NO.	ITEM	AFFECTED PARAGRAPH	CLEARED	
			DATE	INITIAL
13	TE nos.	att. 8.2.1		

ALL MISSING INFORMATION ON THIS LIST HAS BEEN CLEARED

STARTUP ENGINEER/ASSIGNED AUTHOR

REVIEW CHECKLIST

Document Number SIT-TP-250 R0/D1

Document Title Ultimate Heat Sink Test

Reviewer's Name ~~T Earle~~ D. Evans Tel. No. 3275

Date Review Started 6-2-82 Date Completed 6-8-82

1.	Document scope (or test objectives section) is adequate:	(Yes)	No	n/a
2.	Reference section (Section 2.0) is complete. (If no, indicate deficiencies/omissions on Document Review Comments sheet.)	(Yes)	No	n/a
3.	Stated commitments meet regulatory requirements. (If no, indicate deficiencies/omissions on Document Review Comments sheet.)	(Yes)	No	n/a
4.	Commitment catalog lists all known commitments. (If no, indicate deficiencies/omissions on Document Review Comments sheet.)	(Yes)	No	n/a
5.	Document meets all requirements of regulatory source documents. (If no, indicate deficiencies/omissions on Document Review Comments sheet.)	(Yes)	No	n/a
6.	Document is consistent with other referenced documents. (If no, indicate discrepancies on Document Review Comments sheet.)	(Yes)	No	n/a
7.	Document content is consistent with stated scope or test objectives. (If no, indicate discrepancies on Document Review Comments sheet.)	(Yes)	No	n/a

8. If document being reviewed is a revision of an approved document, are the revised portions consistent with the rest of the document? (If no or n/a, explain on Document Review Comments sheet.) Yes No (n/a)

NOTE: Questions 9-11 are to be completed following the author's incorporation of comments.

9. List of RECOMMENDED comments is complete. (Yes) No n/a

10. List of REQUIRED comments is complete. (Yes) No n/a

11. Document is recommended for approval and distribution (with changes or corrections as noted). (Yes) No n/a

O M Lanes — Designated Reviewer

6/11/82 — Date

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SIT-TP-250 REV./DRAFT R0/D1

TITLE Ultimate Heat Sink Test

COMMENT NO.	COMMENT	RES. NO.	RESOLUTION
1.	Step 2.1.2.3 Delete Reference		done
2.	Step 2.1.2.10 change reference to: ASME PTC-18.1; Pumping Mode of Pump/Turbines, 1978.		done
3.	Step 2.1.2.12 - Delete Rev (Later) & Title (Later) and add - Nureg 0787.		done
4	Step 2.1.2.13 - Delete Rev (Later) & Title (Later) and add Nureg 0787.		done
5	Step 2.2.2 - add - NY-403479, Supplement 0, Forced Draft Dry Cooling Towers.		done
6	Step 2.5.3 - change Rev (Later) to Rev 0.		done
7	Step 2.5.8 - change Rev (Later) to Rev 0.		done

1. Reviewed By:

O M Evans 6/4/82

Reviewer Date

2. Comments Received By:

James E. Gibson 6-7-82

Author Date

3. Resolution of Comments Accepted By

O M Evans 6/11/82

Reviewer Date

F 1069 81 00 SU

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SIT-TP-250 REV./DRAFT R0/01

TITLE Ultimate Heat Sink Test

COMMENT NO.	COMMENT	RES. NO.	RESOLUTION
8	Step 3.3 (2) - add ± 10%		done
9	Step 3.3 (3) add ± 10%		done
10	Step 3.1 (1) change to 95°F vs 92°		done
11	Step 3.2 (1) - change to 95°F vs 90°F		done
12	Step 3.2 (11) - change to 115°F vs. 105°F		done
13	Step 3.4 - Delete shutdown Column.		done
14	Step 3.4 (1) - add ± 10%		done
15	Step 3.4 (2) - should be 67.5		done
16	Step 3.4 (3) - add ≤ 27		done
17	Step 3.4 (5) - add ≤ 8		done
18	Step 3.4 (6) - add ≤ 119		done
19	Step 3.4 (7) - add ≤ 92		done

1. Reviewed By:

J M Evans 6/4/82

Reviewer Date

2. Comments Resolved By:

James E Wilson 6-8-82

Author Date

3. Resolution of Comments Accepted By

J M Evans 6/11/82

Reviewer Date

F 1069 81 00 SU

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SET-TP-250 REV./DRAFT R0/D1

TITLE Ultimate Head Sink Test

COMMENT NO.	COMMENT	RES. NO.	RESOLUTION
20	Step 3.1 : add - as calculated in attachment 8.3.1		done
21	Step 3.1 (1) - add: "and RTD CC-7077-78 BS." also add 2nd signoff line.		done
22	Step 3.1 (2) - add ± 10%		done
23	Step 3.1 (3) - add ± 10%		done
24	Step 3.2 - add: as calculated in attachment 8.3.2		done
25	Step 3.2 (1) : add - "and RTD CC-7077-78BS" also add 2nd signoff line.		done
26	Step 3.2 (2) - add ± 10%		done
27	Step 3.2(3) - add ± 10%		done
28	Step 3.3 - add : as calculated in attachment 8.3.3		done
29	Step 3.3 (1) : add "and RTD - CC-7077-78 BS". also add 2nd signoff line		done

1. Reviewed By:

J M Evans 6/4/82

Reviewer Date

2. Comments Resolved By:

James E. Wilson 6-8-82

Author Date

3. Resolution of Comments Accepted By

J M Evans 6/11/82

Reviewer Date

F 1069 81 00 SU

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SIT-TP-250 REV./DRAFT R0/01

TITLE Ultimate Heat Sink Test

COMMENT NO.	COMMENT	RES. NO.	RESOLUTION
30	Step 4.1.1.4 - add optional		done
31	Step 4.1.1.6 add- or equivalent		done
32	Step 4.1.1.7 - change to (20) and add - equivalent.		done
33	Step 4.1.1.9 - Delete		done
34	Step 4.1.1.10 - Delete		done
35	Step 5.1.3 ~~add 25° fan fan blade angle~~. delete step.		done
36	Step 5.3 - Delete section		done
37	Step 5.6 Delete		done
??	add following precautions in section 5 (1) All personnel involved in electrical measurements and/or lead lifting/Jumper placement shall be familiar with all necessary safety precautions		done

1. Reviewed By:

O M Laws 6/4/82

Reviewer Date

2. Comments Resolved By:

James S. J. Dixon 6-8-82

Author Date

3. Resolution of Comments Accepted By

O M Laws 6/11/82

Reviewer Date

F 1069 81 00 SU

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SIT-TP-250 REV./DRAFT R0/D1

TITLE Ultimate Heat Sink Test

COMMENT NO.	COMMENT	RES. NO.	RESOLUTION
P 37 cont'd	(2) Personnel involved in testing in high-noise areas shall be supplied with adequate ear protection.		done
	(3) No fewer than 2 individuals (one of whom will be in constant communication with the Control Room) shall be allowed entry inside the WET towers during water loading.		done
	(4) When using CCW Pump A/B instead of ~~CCW~~ CCW Pump A or CCW pump B, the following applies:		done
	(1)- Instead of CCW pump A - rack out CCW Pump A breaker and manually align the 3AB3S bus to the 3A3S bus to ensure channel separation.		
	(2)- Instead of CCW pump B rack out CCW pump B breaker and manually align the 3AB3S bus to the 3B3S bus to ensure channel separation		

1. Reviewed By: [signature] 6/4/82
Reviewer Date

2. Comments Resolved By: James E. Wilson 6-8-82
Author Date

3. Resolution of Comments Accepted By
[signature] 6/10/82
Reviewer Date

F 1069 81 00 SU

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SET-TP-250 REV./DRAFT R0/D1

TITLE Ultimate Heat Sink Test

COMMENT NO.	COMMENT	RES. NO.	RESOLUTION
P 38	Step 6.17 change to the following: Pretest walkdowns of the following systems have been conducted to verify that the corresponding portions of this procedure testing these systems are ready to be performed. WET Tower A - - - - WET Tower B - - - - Dry Tower A - - - Dry Tower B - - - - ACCW for WET Tower A - - - - ACCW for WET Tower B - - - - CCW - - - -		done

1. Reviewed By:

DM Lam 6/4/82

Reviewer Date

2. Comments Resolved By:

James E. Wilson 6-8-82

Author Date

3. Resolution of Comments Accepted By

DM Lam 6/11/82

Reviewer Date

F 1069 81 00 SU

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SIT-TP-250 REV./DRAFT R0/D1

TITLE Ultimate Heat Sink Test

COMMENT NO.	COMMENT	RES. NO.	RESOLUTION
39	Step 7.1.3.1 (2)-Delete		done
40	Step 7.1.3.4 - add: Compartments 10M, 11H, 11M, 12M, 13H, & 13M, also change to 24 Thermal overloads.		done
41	Step 7.1.3.5 - add: Compartments 10M, 11H, 11M, 12M, 13H & 13M.		done
42	Step 7.1.4.1 (2)- Delete		done
43	Step 7.1.4.4-add: Compartments 10M, 11H, 11M, 12M, 13H & 13M, also change to 24 Thermal overloads		done
44	Step 7.1.4.5 - add: Compartments 10M, 11H, 11M, 12M, 13H & 13M.		done
45	Step 7.1.5.1(2). Delete		done
46	Step 7.1.6.1 (2) - Delete		done
47	Step 7.2.1.1 add-" and verify manometers or equivalent for measuring orifice flows are ready for service.		done

1. Reviewed By: O M Rao 6/4/82
Reviewer Date

2. Comments Resolved By: James E. Gibson 6-8-82
Author Date

3. Resolution of Comments Accepted By
O M Rao 6/11/82
Reviewer Date

F 1069 81 00 SU

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SET-TP-250 REV./DRAFT Rev 01

TITLE Ultimate Heat Sink Test

COMMENT	RES. NO.	RESOLUTION
48 Step 7.2.1.24 Delete step		done
49 Step 7.2.1.21 change reference to attachment 8.2.8		done
50 Step 7.2.1.15 Change reference to attachment 8.2.1		done
51 Step 7.2.2.15 - change reference to attachment 8.2.1		done
52 Step 7.2.2.21 - Change reference to attachment 8.2.8		done
[redacted] Step 7.2.2.24 - Delete step		done
54 Step 7.2.3.15 Change reference to Attachment 8.2.1		done
55 Step 7.2.3.21 change reference to Attachment 8.2.8		done
56 Step 7.2.3.24 Delete step		done
57 Step 7.2.4.15 change reference to Attachment 8.2.1		done
58 Step 7.2.4.21 change reference to Attachment 8.2.8		done
59 Step 7.2.4.24 - Delete step		done

1. Reviewed By:

J M Evans 6/4/82

Reviewer Date

[redacted]

2. Comments Resolved By:

James E. Bloom 6-8-82

Author Date

3. Resolution of Comments Accepted By

J M Evans 6/11/82

Reviewer Date

DOCUMENT REVIEW COMMENTS

DOCUMENT NO. SIT-TP-270 REV./DRAFT R0/D1

TITLE Ultimate Heat Sink Test

COMMENT NO.	COMMENT	RES. NO.	RESOLUTION
F 60	Step 7.2.5.15 change reference to Attachment 8.2.1		done
61	Step 7.2.5.~~19~~ 18 - Delete step		done
62	step 7.2.6.20 - Delete step		deleted step 7.2.6.19 instead

1. Reviewed By:

DM Evans 6/4/82

Reviewer Date

2. Comments Received By:

James E. Gibson 6-8-82

Author Date

3. Resolution of Comments Accepted By

DM Evans 6/11/82

Reviewer Date

F 1069 81 00 SU