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 50-270 Oconee Nuclear Station, Unit 2, Duke Power Co. 05000270
 50-287 Oconee Nuclear Station, Unit 3, Duke Power Co. 05000287
 AUTH. NAME AUTHOR AFFILIATION
 GRACE, J. N. Region 2, Office of Director
 RECIP. NAME RECIPIENT AFFILIATION
 TUCKER, H. B. Duke Power Co.

SUBJECT: Forwards brief meeting summary including list of attendees
 & outline of info presented by util re specific issues
 discussed.

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 TITLE: Summary of Significant Meeting with Licensee

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JUN 02 1987

Docket Nos. 50-269, 50-270, 50-287
License Nos. DPR-38, DPR-47, DPR-55

Duke Power Company
ATTN: Mr. H. B. Tucker, Vice President
Nuclear Production Department
422 South Church Street
Charlotte, NC 28242

Gentlemen:

SUBJECT: MEETING SUMMARY - DUKE POWER COMPANY - OCONEE NUCLEAR STATION -DOCKET
NOS. 50-269, 50-270, AND 50-287

This letter refers to the meeting conducted at your request in the NRC
Region II Office on May 13, 1987. This was a technical meeting held to discuss
the history of heat exchanger fouling at the Oconee facility.

Enclosed is a brief meeting summary including a list of attendees, and an
outline of the information presented by Duke Power Company regarding the
specific issues discussed.

In accordance with Section 2.790 of the NRC's "Rules of Practice", Part 2,
Title 10, Code of Federal Regulations, a copy of this letter and its enclosures
will be placed in the NRC's Public Document Room.

Should you have any questions concerning this matter, we will be pleased to
discuss them.

Sincerely,

ORIGINAL SIGNED BY
M. L. ERNST

/for

J. Nelson Grace
Regional Administrator

Enclosure:
Meeting Summary
w/Attachments

cc w/encl:
M. S. Tuckman, Station Manager

(bcc w/encl: See page 2)

8706110287 870602
PDR ADOCK 05000269
P PDR

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Duke Power Company

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JUN 02 1987

bcc w/encl:
NRC Resident Inspector
H. Pastis, NRR
State of South Carolina
Document Control Desk

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BBonsersht
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WBrownlee
6/2/87

RII *[Signature]*
LReyes
6/2/87

RII *[Signature]*
JAVERT
6/2/87

ENCLOSURE

MEETING SUMMARY

On May 13, 1987, representatives of Duke Power Company (DPC) met with the NRC at DPC's request in the NRC Region II Office in Atlanta, Georgia. The subject of discussion was fouling of Low Pressure Injection (LPI) system and Reactor Building Cooling Unit (RBCU) system heat exchangers serviced by Low Pressure Service Water (LPSW) at Oconee. A list of meeting attendees is in Attachment 1.

DPC gave a presentation which consisted of a brief description of the Low Pressure Injection System and the Reactor Building Cooling System, design criteria of the coolers, a chronology of events surrounding testing of the coolers, and future activities planned to assess and enhance the performance of the coolers.

The outline of DPC's presentation is attached as Attachments 2 and 3.

Attachments: (2 + 3 see B. Bower)

1. List of Attendees
2. Oconee Nuclear Station - Reactor Building Cooling Units/Low Pressure Injection Coolers - NRC Meeting of May 13, 1987
3. Oconee Nuclear Station LPI and Reactor Building Coolers Chronology of Events

ATTACHMENT 1

MEETING ATTENDEES
MAY 13, 1987 HEAT EXCHANGER
FOULING MEETING

<u>Name</u>	<u>Organization</u>	<u>Title</u>
Fred Owens	DUKE	Regulatory Compliance
Richard Sweigart	DUKE	Superintendent of OPS, ONS
Mike Tuckman	DUKE	Station Manager, ONS
Maurice McIntosh	DUKE	General Manager, G.O.
Paul Guill	DUKE	Licensing Engineer, G.O.
Paul White	DUKE	Design Engineer, G.O.
Norman Staurbaugh	DUKE	Nuclear Production Engineer, G.O.
Gregg B. Swindlehurst	DUKE	Design Engineer, G.O.
E. M. Weaver	DUKE	Design Engineer Dpt. - M&N, Divsn.
Ned Edwards	DUKE	Operations Engineer, ONS
T. A Peebles	NRC-RII	Acting Branch Chief
J. C. Bryant	NRC-RII	Sr. Resident Inspector
B. R. Bonser	NRC-RII	Project Engineer
P. K. VanDoorn	NRC-RII	Sr. Resident Inspector, Catawba
Johnny L. Mathis	NRC-RII	Reactor Inspector
Arthur J. Szczepaniec	NRC-RII	Reactor Inspector
McKenzie Thomas	NRC-RII	Reactor Inspector

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ATTACHMENT 2

OCONEE NUCLEAR STATION

REACTOR BUILDING COOLING UNITS
LOW PRESSURE INJECTION COOLERS

NRC MEETING
MAY 13, 1987

AGENDA

- SYSTEM DESCRIPTIONS
 - LOW PRESSURE INJECTION SYSTEM
 - REACTOR BUILDING COOLING SYSTEM
- DESIGN CRITERIA FOR COOLERS
- CHRONOLOGY OF EVENTS
- FUTURE ACTIVITIES

SYSTEM DESCRIPTIONS

LOW PRESSURE INJECTION SYSTEMS - LPI

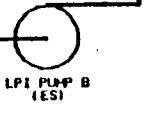
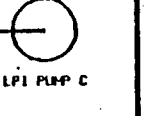
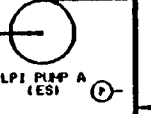
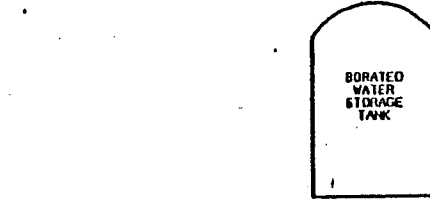
- SYSTEM PROVIDES BOTH NORMAL AND ACCIDENT FUNCTIONS
- TWO FULL CAPACITY ENGINEERED SAFEGUARDS ACTUATED TRAINS
 - 1 PUMP AND 1 COOLER PER TRAIN
 - INITIAL PHASES OF ACCIDENT USE WATER FROM BWST
 - LATER PHASES OF ACCIDENT RECIRC WATER FROM REACTOR BUILDING SUMP
 - SYSTEM REJECTS HEAT TO LOW PRESSURE SERVICE WATER SYSTEM LPSW
- A THIRD NON-ES PUMP IS PROVIDED
- NORMAL FLOW IS 3,000 GPM LPSW FOR EACH TRAIN IN ACCIDENT CONDITIONS
- TWO TRAINS REQUIRED OPERABLE WHEN REACTOR IS ABOVE 250 DEGREES OR 350 PSI
- COOLERS ARE SHELL AND TUBE TYPE WITH RAW WATER ON SHELL SIDE

REACTOR BUILDING COOLING
UNIT SYSTEM - RBCU

- SYSTEM PROVIDES BOTH NORMAL AND ACCIDENT FUNCTIONS
- THREE FULL CAPACITY ES INDEPENDENT TRAINS PROVIDED
- SYSTEM REJECTS REACTOR BUILDING HEAT TO LOW PRESSURE SERVICE WATER SYSTEM
- NORMAL FLOW IS 1400 GPM LPSW FOR EACH COOLER IN ACCIDENT CONDITIONS
- TWO COOLERS ARE REQUIRED WHEN REACTOR IS ABOVE 250 DEGREES OR 350 PSI
- THREE COOLERS ARE REQUIRED WHEN THE REACTOR IS CRITICAL

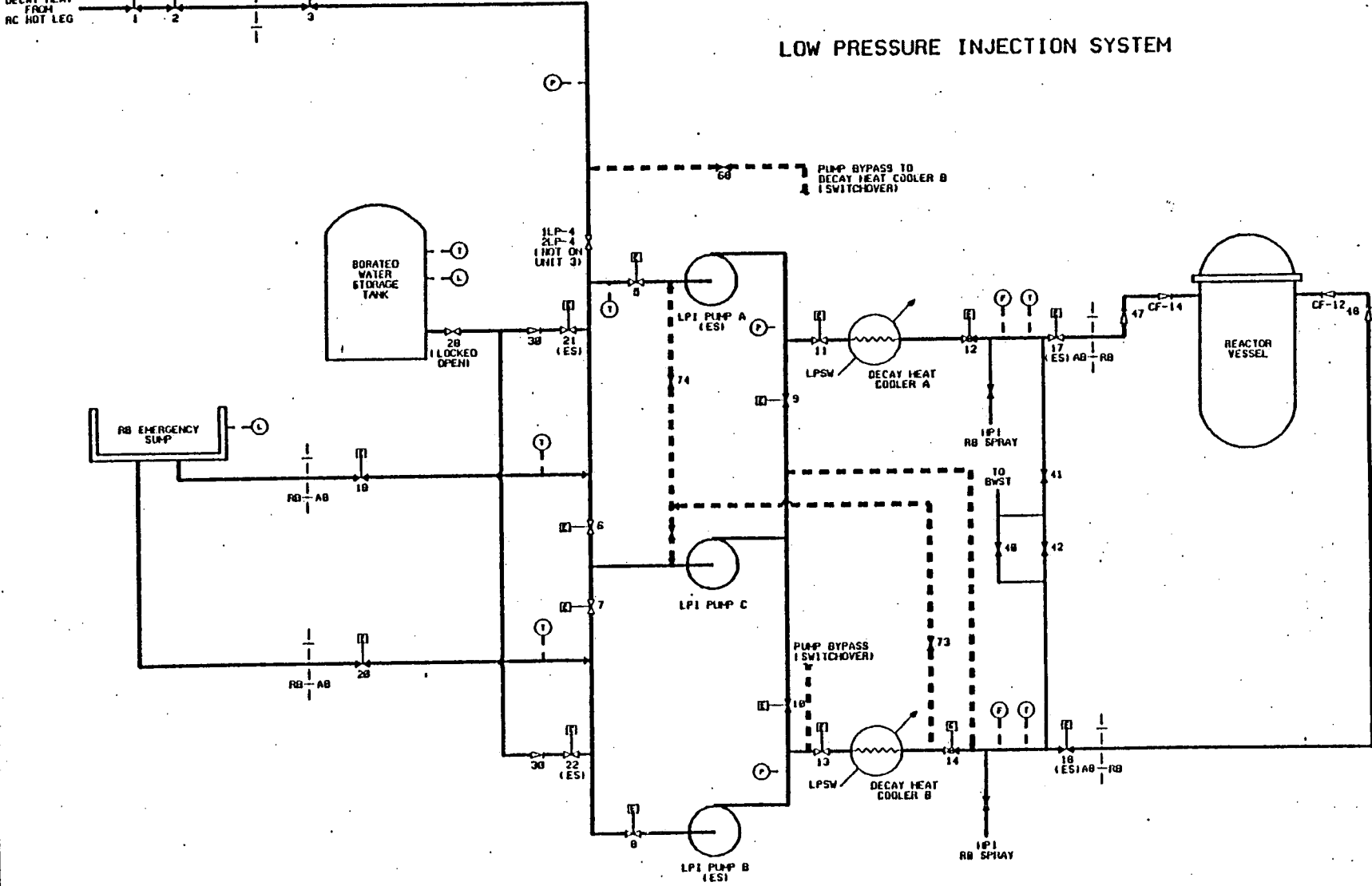
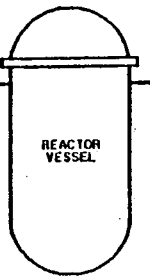
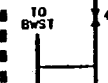
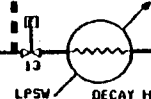
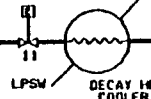
DECAY HEAT FROM RC HOT LEG
 1 2 3
 RB AB

LOW PRESSURE INJECTION SYSTEM

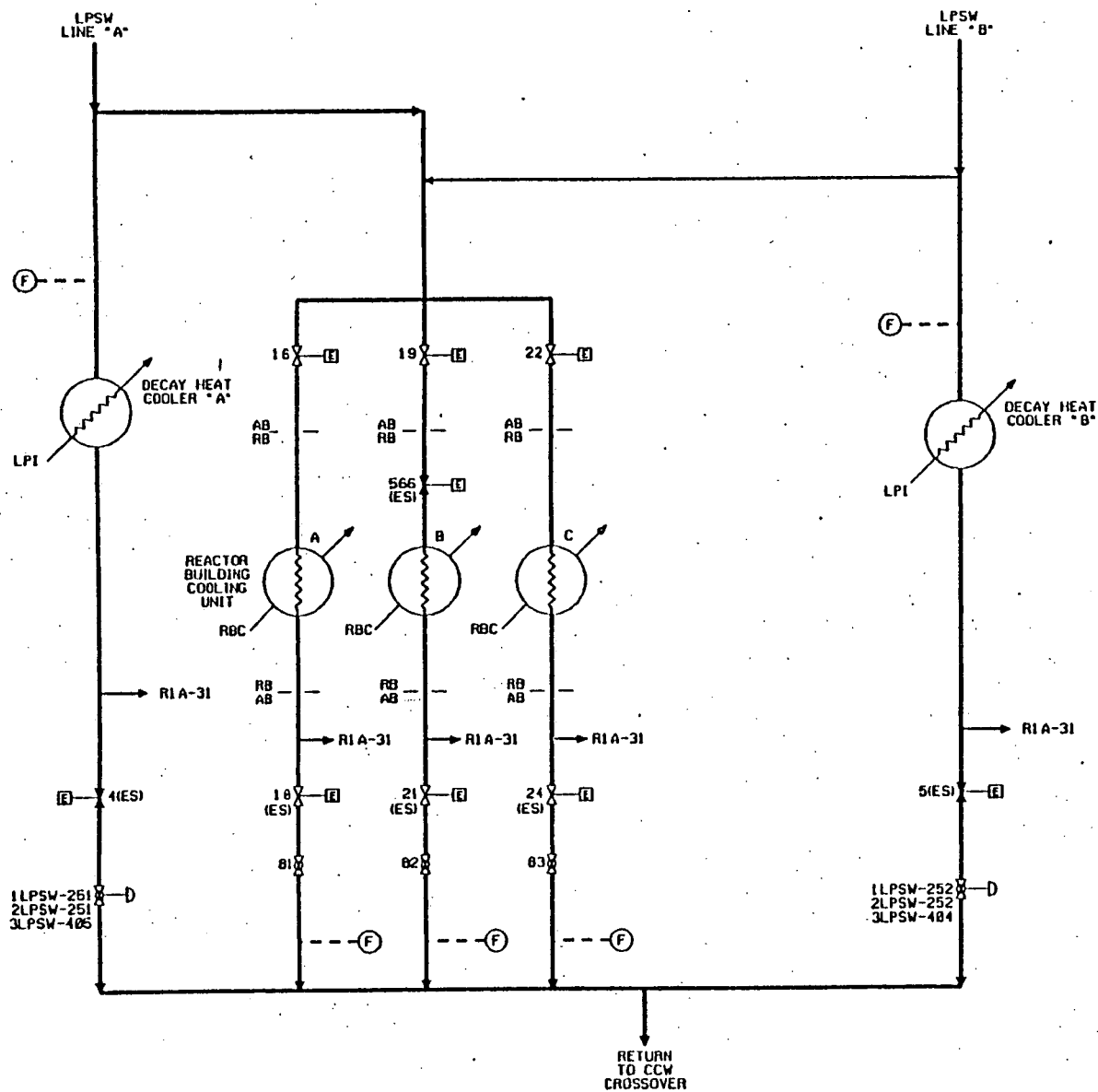


PUMP BYPASS TO DECAY HEAT COOLER B (SWITCHOVER)

PUMP BYPASS (SWITCHOVER)



LOW PRESSURE SERVICE WATER SYSTEM (REACTOR BUILDING & AUXILIARY BUILDING)



DESIGN CRITERIA

NORMAL PLANT OPERATIONS

- REACTOR BUILDING COOLING UNITS MAINTAIN CONTAINMENT ENVIRONMENT
- RBCU OPERATE UNDER DRY AIR CONDITIONS USING SENSIBLE HEAT TRANSFER
- COMBINED HEAT REMOVAL OF BOTH TRAINS OF LPI CAN COOL REACTOR FROM 250 DEGREES TO 140 DEGREES IN 14 HOURS

EMERGENCY PLANT OPERATIONS

- COMBINED HEAT REMOVAL CAPABILITY OF RBCU'S AND LPI CAN MEET ACCIDENT HEAT GENERATION IN CONTAINMENT
 - LOSS OF COOLANT ACCIDENT - HEAT REMOVAL AT 30 MINUTE TIME FRAME (AFTER INJECTION PHASE)
 - LOSS OF COOLANT ACCIDENT - HEAT REMOVAL LONG TERM TO ASSURE THAT CONTAINMENT TEMPERATURE PROFILE MATCHES ENVIRONMENTAL QUALIFICATION REQUIREMENTS
- REACTOR BUILDING COOLING UNITS OPERATE UNDER SATURATED AIR CONDITIONS USING LATENT AND CONDENSING HEAT TRANSFER
- ABOVE CRITERIA ASSUMES THE LOSS OF THE BEST LPI COOLER BEST REACTOR BUILDING COOLING UNIT AS WELL AS OTHER CREDIBLE SINGLE FAILURES

CHRONOLOGY

- 2/6/86
- MEETING HELD WITH OCONEE AND CATAWBA TO SHARE INFO ON MCGUIRES RAW WATER FOULING
 - RECOMMENDATIONS MADE ON TESTING AND PM
- 2/15/86
- UNIT 1 LPI COOLERS TESTED DURING SHUTDOWN FOR REFUELING
 - COOLERS DEEMED ACCEPTABLE
 - COOLER 1A CLEANED TO INCREASE MARGIN
 - VISUAL INSPECTION PERFORMED ON BOTH 1A AND 1B
 - OTHER UNITS NOT DEEMED AFFECTED - BY OBSERVATION
 - UNIT 1 ACCEPTABLE
 - UNIT 1 THE OLDEST
 - NO OBSERVED PROBLEMS ON OTHER UNITS
- 8/12/86
- UNIT 2 RBCU TESTING CAPABILITY DEVELOPED AND PERFORMED IMMEDIATELY PRIOR TO OUTAGE
 - PRELIMINARY CALCULATIONS SHOWED DEGRADATION
 - VISUAL INSPECTIONS CONDUCTED AND SHOWED CLEAN
 - CALCULATIONAL ERROR FOUND WHICH AGREED WITH VISUAL
 - LPI VISUAL INSPECTIONS PERFORMED AND SHOWED RESULTS SIMILAR TO UNIT 1 LPI COOLERS

CHRONOLOGY (Continued)

- 9/3-8/86 - RBCU VENDOR NOT ABLE TO ASSIST IN ANALYZING TEST DATA
- ASSUMPTION MADE THAT IMPACT OF FOULING, NORMAL WAS EQUAL TO EMERGENCY
 - CALCULATIONS WERE SUSPECT DUE TO APPEARANCE OF UNIT 2 COOLERS
- 9/22/86 - DUKE ENGAGES A CONSULTANT TO DEVELOP ANALYSIS CAPABILITY
- 10/10/86 - RBCU AIR SIDE FOULING FOUND ON UNIT 3
- UNIT 3 HAD THE WORST TEST DATA
 - AIR SIDE CLEANING WAS ACCOMPLISHED IN PLACE
- 12/17/86 - TESTING CONDUCTED ON UNIT 3 LPI DURING SHUTDOWN FOR REFUELING
- 1/23/87 - DECISION MADE TO NOT CLEAN UNIT 3 LPI COOLERS
- ANALYSIS SHOWED THEM TO BE ACCEPTABLE
 - A BETTER TECHNIQUE WAS TO BE USED STARTING WITH UNIT 1'S NEXT OUTAGE
 - VISUAL INSPECTIONS HAD BEEN PERFORMED WITH RESULTS SIMILAR TO UNIT 1 AND 2

CHRONOLOGY (Continued)

- 2/25/87 - UNIT 1 RBCU AIRSIDE CLEANED
- NOT REQUIRED BY TEST RESULTS
 - FORCED OUTAGE WHICH PROVIDED OPPORTUNITY
 - LITTLE MATERIAL FOUND
- 3/30/87 - DUKE'S CONSULTANT ISSUED CODE WHICH SHOWED SIGNIFICANT DEGRADATION OF RBCU'S FOR EMERGENCY
- DECISION MADE NOT TO PROCEED WITH UNIT 3 STARTUP UNTIL COOLERS CLEANED AND DATA RE-ANALYZED
- 4/1/87 - OPERABILITY DETERMINATIONS MADE ON ALL UNITS
- UNIT 1 WAS AT REDUCED POWER AND WAS DEEMED ACCEPTABLE AT THAT POWER
 - UNIT 2 WAS REDUCED IN POWER TO LEVEL JUSTIFIED BY ANALYSIS
 - DECISION MADE TO CLEAN UNIT 3 RBCU'S AND LPI COOLERS

CHRONOLOGY (Continued)

4/6-12/87

- THE FOLLOWING COOLERS WERE
CLEANED AND TESTED

- UNIT 1A LPI COOLER
CLEANED BUT UNIT CON-
DITIONS DID NOT ALLOW
TESTING
- UNIT 2A LPI COOLER
CLEANED, UNIT SHUTDOWN
FOR TESTING
- UNIT 3 A AND B LPI
COOLERS CLEANED AND
TESTED, A, B AND C
REACTOR BUILDING COOLERS
CLEANED AND TESTED

FUTURE ACTIVITIES

- HEAT LOAD REMOVAL TESTING WILL BE CONDUCTED ON LOW PRESSURE INJECTION COOLERS AND REACTOR BUILDING COOLING UNITS ON A REFUELING CYCLE
- CRITERIA FOR CLEANING WILL BE ESTABLISHED BASED UPON TEST RESULTS
- DATA TRENDING WILL DICTATE ADJUSTMENT OF THE CRITERIA FOR CLEANING IN THE FUTURE TO ASSURE OPERABILITY
- CALCULATIONS WILL BE PERFORMED TO ASSESS THE PERFORMANCE OF THE COOLERS WITH LAKE TEMPERATURES ABOVE THE DESIGN VALUE