



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

MAR 29 1994

Dockets: 50-313
50-368
Licenses: DPR-51
NPF-6

Entergy Operations, Inc.
ATTN: J. W. Yelverton, Vice President
Operations, Arkansas Nuclear One
Route 3, Box 137G
Russellville, Arkansas 72801

SUBJECT: PUBLIC MEETING OF MARCH 1, 1994

This refers to the public meeting conducted at Arkansas Nuclear One on March 1, 1994. The purpose of this meeting was to discuss plant activities associated with Refueling Outage 10, which is scheduled to begin on March 11, 1994. This meeting was attended by those personnel listed in Attachment 1.

We found that your presentation provided a comprehensive review of the preparations, scope, and outage risk assessments for Refueling Outage 10. We note that you have planned a 44-day outage. The specific topics you discussed at this meeting are listed in Attachment 2.

Your outage planning to ensure important material improvements are accomplished with the minimum dose appeared to be comprehensive. We note your plans to perform an early boration and hydrogen peroxide flush to reduce the source term and to increase the use of remote dose monitoring and video cameras to reduce dose. You also seem to have evaluated previous dose history and targeted high dose jobs for permanent hardware improvements. We note plans for extensive steam generator inspection, replacement of four high pressure safety injection valves, four containment electrical penetrations, and modifications to your secondary system to reduce causes of condenser tube failures.

Your use of a layered system to effectively control outage risk has worked well for you in the past and appears to have continued to improve. We note that you have scheduled three offsite power supplies and two onsite emergency diesel generators to be available during reduced inventory. As previously committed, we also note that you will notify us if power supply redundancy is degraded below the two emergency diesel generators and one offsite power supply condition that is planned during periods of reduced inventory.

Your plans to provide evolution specific simulator training to operators prior to the startup and shutdown, as well as providing extensive simulator training

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P PDR

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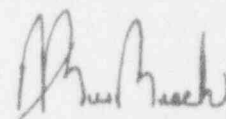
IFD/11

in shutdown cooling operation and failure mitigation, demonstrates appropriate emphasis on safety.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

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

Sincerely,



A. Bill Beach, Director
Division of Reactor Projects

Attachments:

1. Attendance List
2. Licensee Presentation

cc w/attachments:

Entergy Operations, Inc.
ATTN: Harry W. Keiser, Executive
Vice President & Chief Operating Officer
P.O. Box 31995
Jackson, Mississippi 39286-1995

Entergy Operations, Inc.
ATTN: John R. McGaha, Vice President
Operations Support
P.O. Box 31995
Jackson, Mississippi 39286

Wise, Carter, Child & Caraway
ATTN: Robert B. McGehee, Esq.
P.O. Box 651
Jackson, Mississippi 39205

Honorable C. Doug Lunningham
County Judge of Pope County
Pope County Courthouse
Russellville, Arkansas 72801

Winston & Strawn
ATTN: Nicholas S. Reynolds, Esq.
1400 L Street, N.W.
Washington, D.C. 20005-3502

Arkansas Department of Health
ATTN: Ms. Greta Dicus, Director
Division of Radiation Control and
Emergency Management
4815 West Markham Street
Little Rock, Arkansas 72201-3867

B&W Nuclear Technologies
ATTN: Robert B. Borsum
Licensing Representative
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Admiral Kinnaird R. McKee, USN (Ret)
214 South Morris Street
Oxford, Maryland 21654

ABB Combustion Engineering
Nuclear Power
ATTN: Charles B. Brinkman
Manager, Washington
Nuclear Operations
12300 Twinbrook Parkway, Suite 330
Rockville, Maryland 20352

MAR 29 1994

bcc to DMB (IE01)

bcc distrib. by RIV:
L. J. Callan
Branch Chief (DRP/D)
MIS System
RIV File
Project Engineer (DRP/D)

Resident Inspector
Lisa Shea, RM/ALF, MS: MNBB 4503
DRSS-FIPB
Branch Chief (DRP\TSS)

C:DRP/D <i>AS</i>	D:DRP			
TFStetka;df	ABBeach			
3/22/94	3/19/94			

MAR 29 1994

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L. J. Callan

Branch Chief (DRP/D)

MIS System

RIV File



Project Engineer (DRP/D)

Resident Inspector

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DRSS-FIPB

Branch Chief (DRP\TSS)

C:DRP/D 	D:DRP 			
TFStetka;df	ABBeach			
3/22/94	3/19/94			

ATTACHMENT 1

Licensee Personnel

C. Anderson, Unit 2 Operations Manager
S. Bennett, Licensing Supervisor
D. Binkley, Reactor Building Lead Coordinator
M. Bourgeois, Unit 2 Outage Manager
S. Cecil, Unit 2 Shift Operations Superintendent,
Shift Outage Coordinator
R. Edington, Unit 2 Plant Manager
R. Espolt, Unit 2 Technical Assistant to Plant Manager
D. Gregory, Unit 2 Planning/Scheduling Coordinator
M. Harris, Unit 2 Maintenance Manager
D. Harrison, Steam Generator Engineer
B. James, Outage Support Coordinator
D. Mims, Licensing Director
T. Mitchell, Unit 2 System Engineering
S. Robinson, Station ALARA Supervisor
J. Sutterfield, Unit 2 Operations
P. Williams, Shutdown Safety Advisor/Nuclear Safety Analysis
A. Wrape, III, Shift Outage Manager

NRC Personnel

T. Alexion, NRC Project Manager
L. Smith, NRC Senior Resident Inspector
T. Stetka, Chief, Project Branch D

**2R10 PREVIEW TO THE NRC
MARCH 01, 1994
GSB-107, 1300**

AGENDA

- | | | |
|------|--|-------------------------------|
| I. | INTRODUCTION AND
OPENING COMMENTS | Dwight Mims
Randy Edington |
| II. | PAST OUTAGE PERFORMANCE | Mike Bourgeois |
| III. | OPERATIONS &
SHUTDOWN SAFETY | Craig Anderson/
Sam Cecil |
| IV. | 2R10 SCOPE AND SCHEDULE | Mike Bourgeois |
| V. | OUTAGE RISK ASSESSMENT &
MANAGEMENT | Patrick Williams |
| VI. | CONCLUDING REMARKS | Randy Edington |



ENTERGY

Arkansas Nuclear One

Russellville, Arkansas

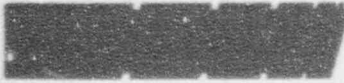


2R10

ARKANSAS NUCLEAR ONE - UNIT 2

PRESENTATION TO NRC - 03/01/94

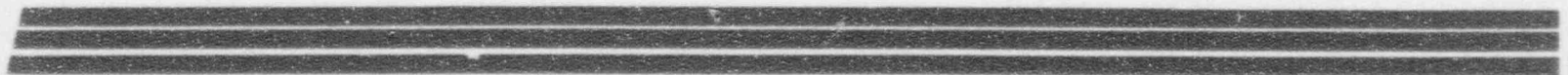
**MEETING
THE
CHALLENGE**



Introduction & Opening Comments

- Dwight Mims
- Licensing Manager

- Randy Edington
- Plant Manager - Unit 2





Past Outage Emphasis

Presented By:

Mike Bourgeois

Outage Manager - Unit 2

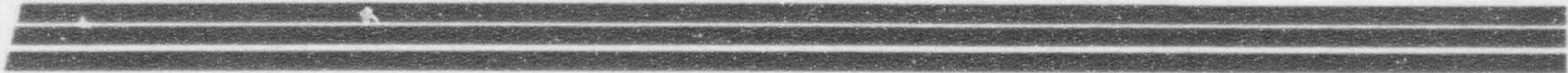
*"We are what we repeatedly do.
Excellence, then, is not a act, but a habit."*

Aristotle





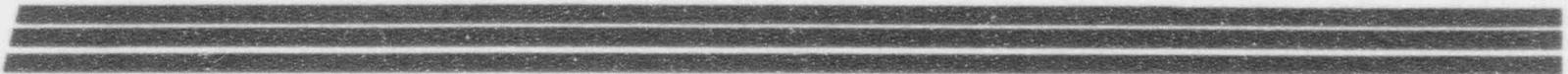
Underlying Outage Philosophy

- Outage Planning is a Continuous Process
 - Outages are Repeatable
 - 80% Repeatable
 - 10% Predictable
 - 10% New
 - Maximize Equipment Availability
 - Outage Planning Supports the Safety Function Concept
- 

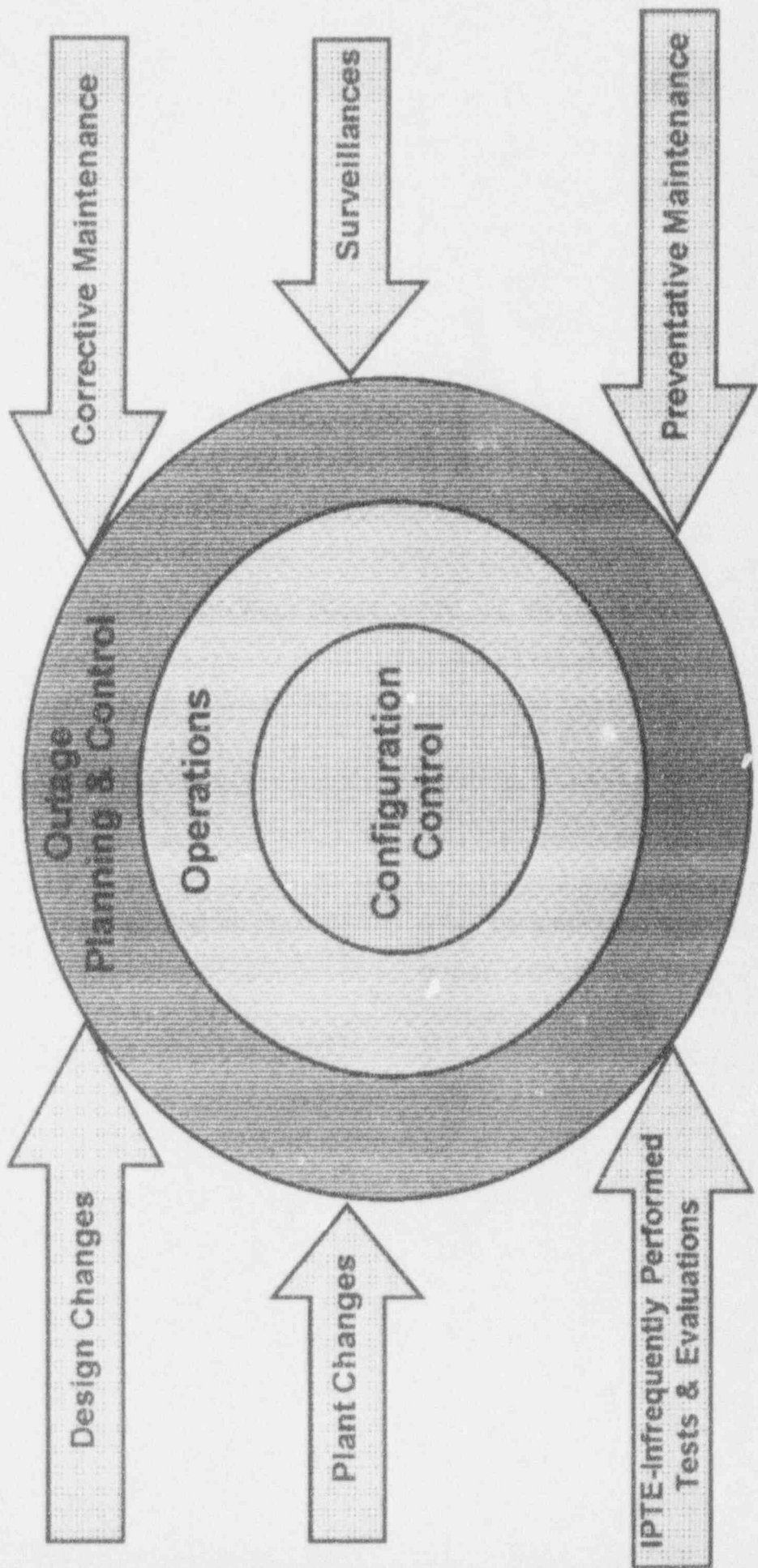


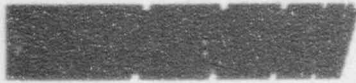
Total Quality Objectives

- Ensure Personnel Safety
- Assure Shutdown Safety
- Reduce Personnel Radiation Exposure
- Improve Plant Availability
- Reduce Outage Cost
- Optimize Outage Duration



Maintaining Configuration Control





Planning

- **Product of Process Management**

- ✓ Plan

- ✓ Do

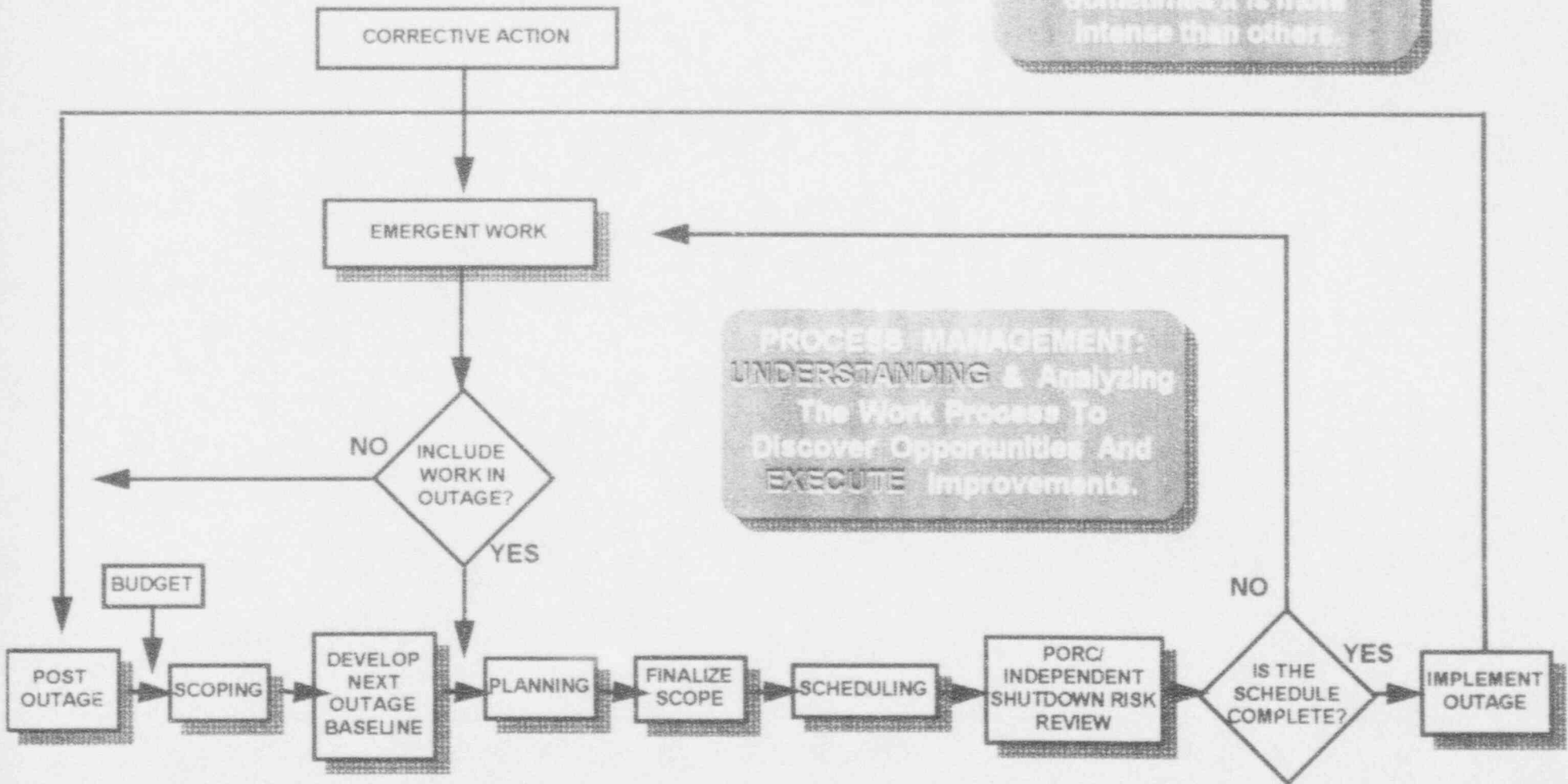
- ✓ Check

- ✓ Adjust



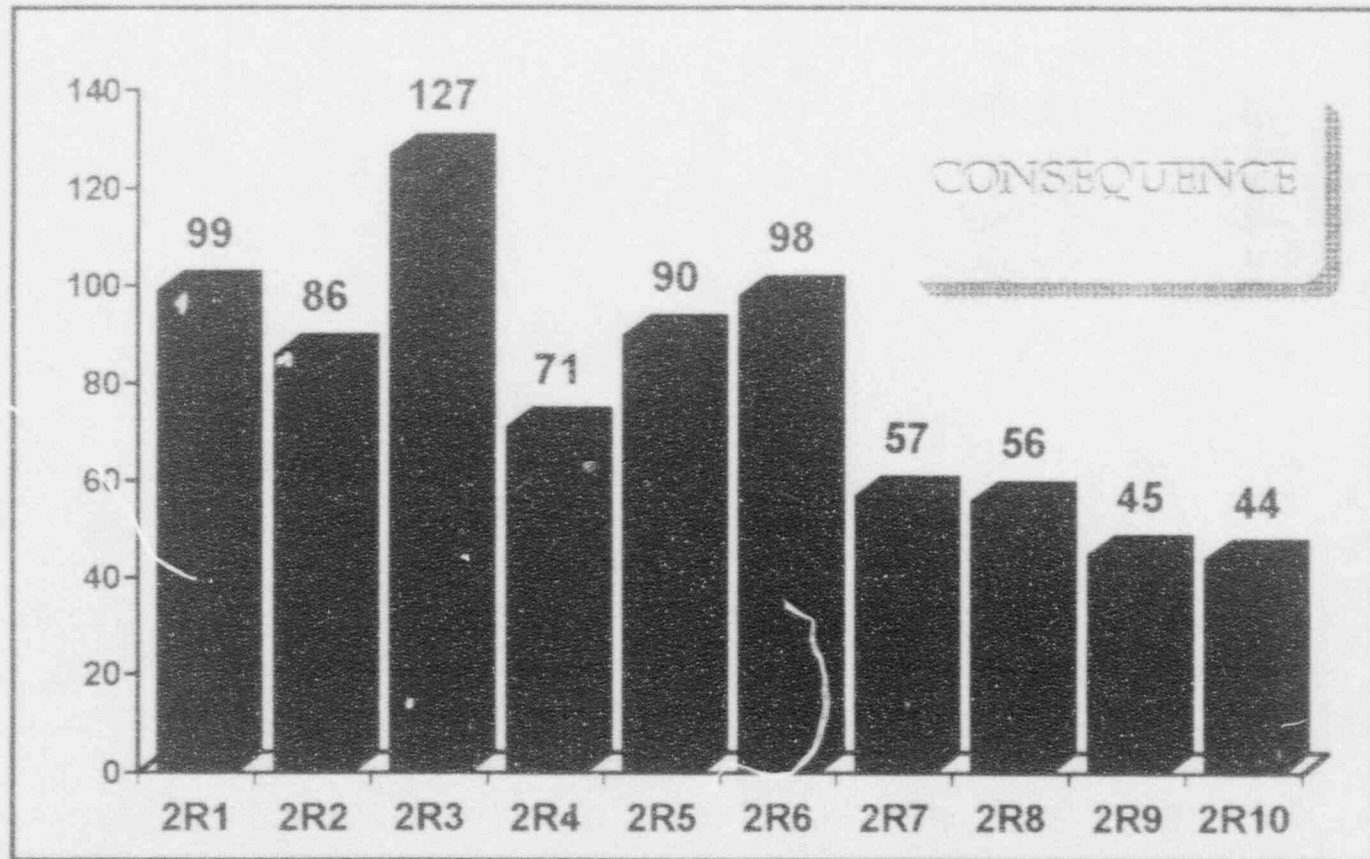
Outage Planning Process

We are ALWAYS in an outage.
Sometimes it is more
intense than others.



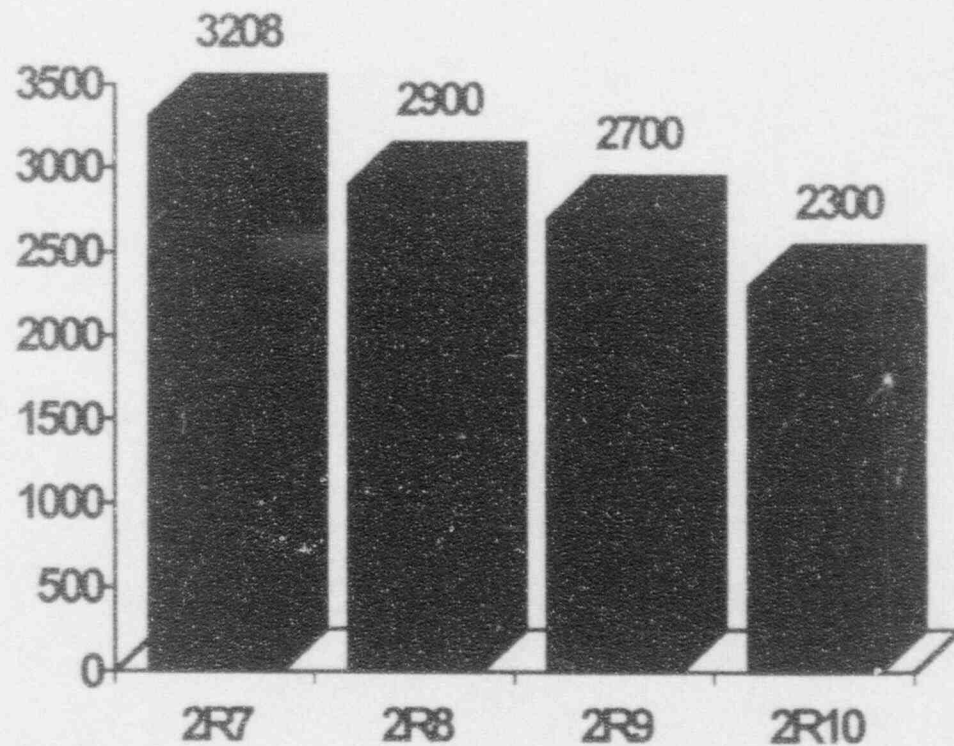
Outage Duration Comparison

(Output Measure of the Process)



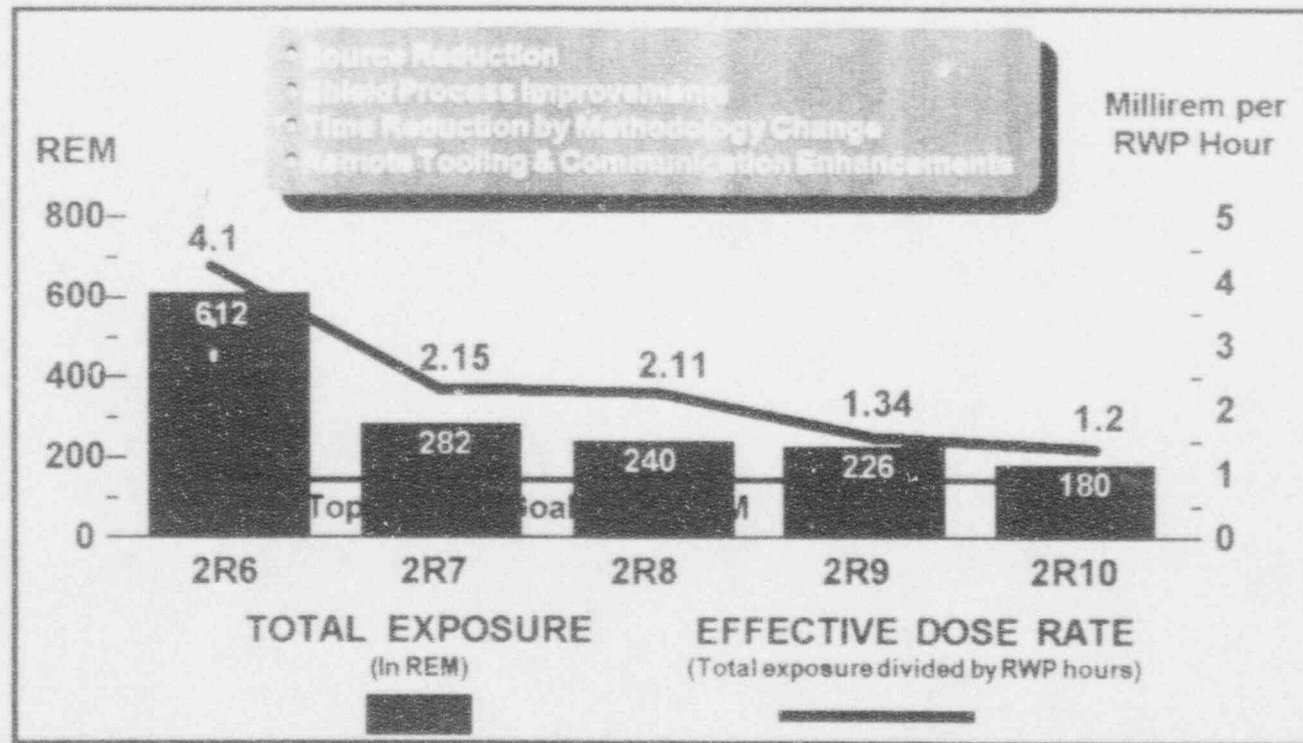
Outage Job Orders (Output Measure of the Process)

- Improved Material Condition
- Efficiency Gains
 - Work Processes
 - Work Packages
- Technology Improvements

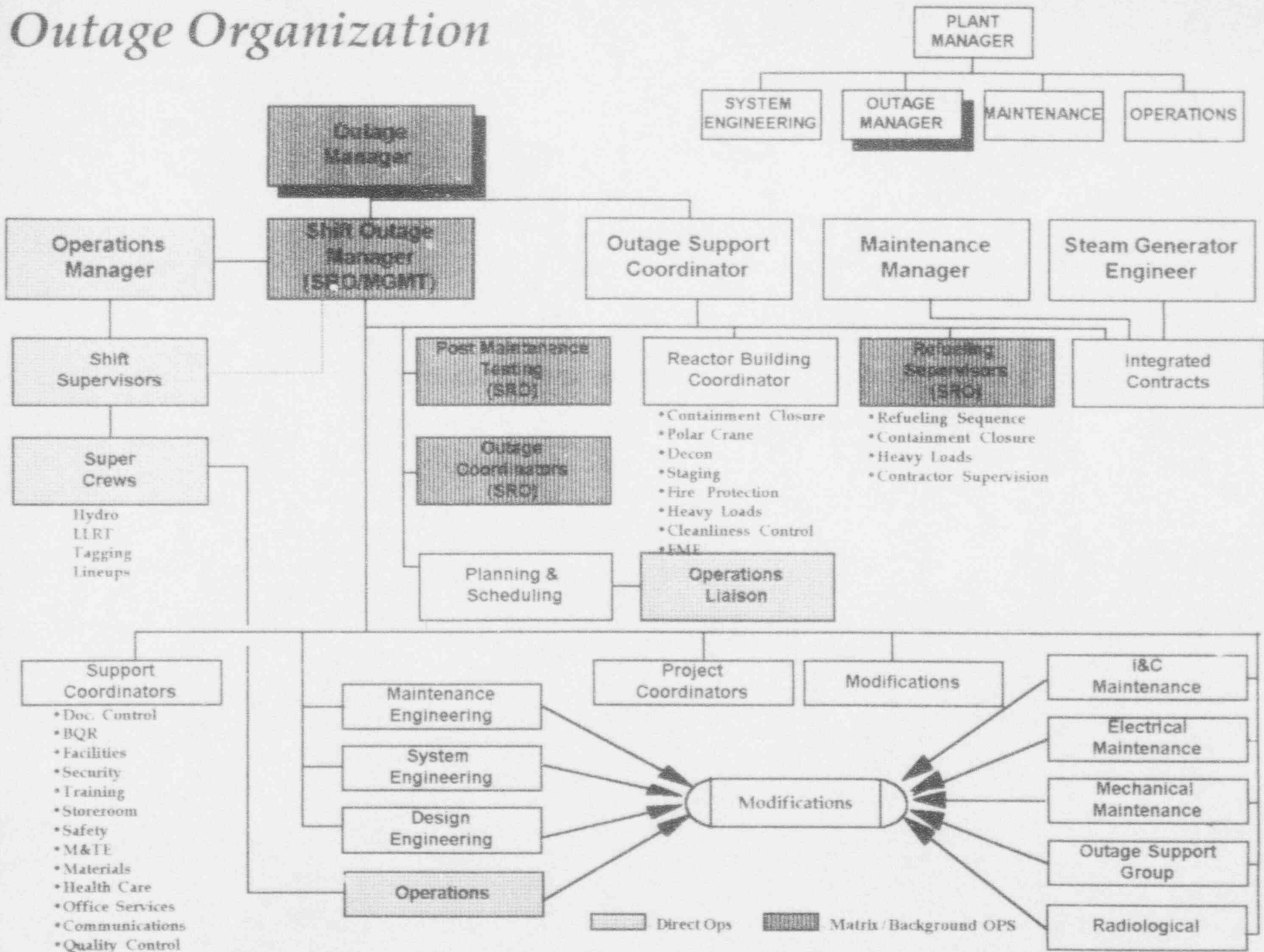


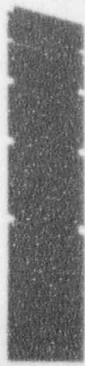
Refueling Outage Exposure

(Output Measure of the Process)



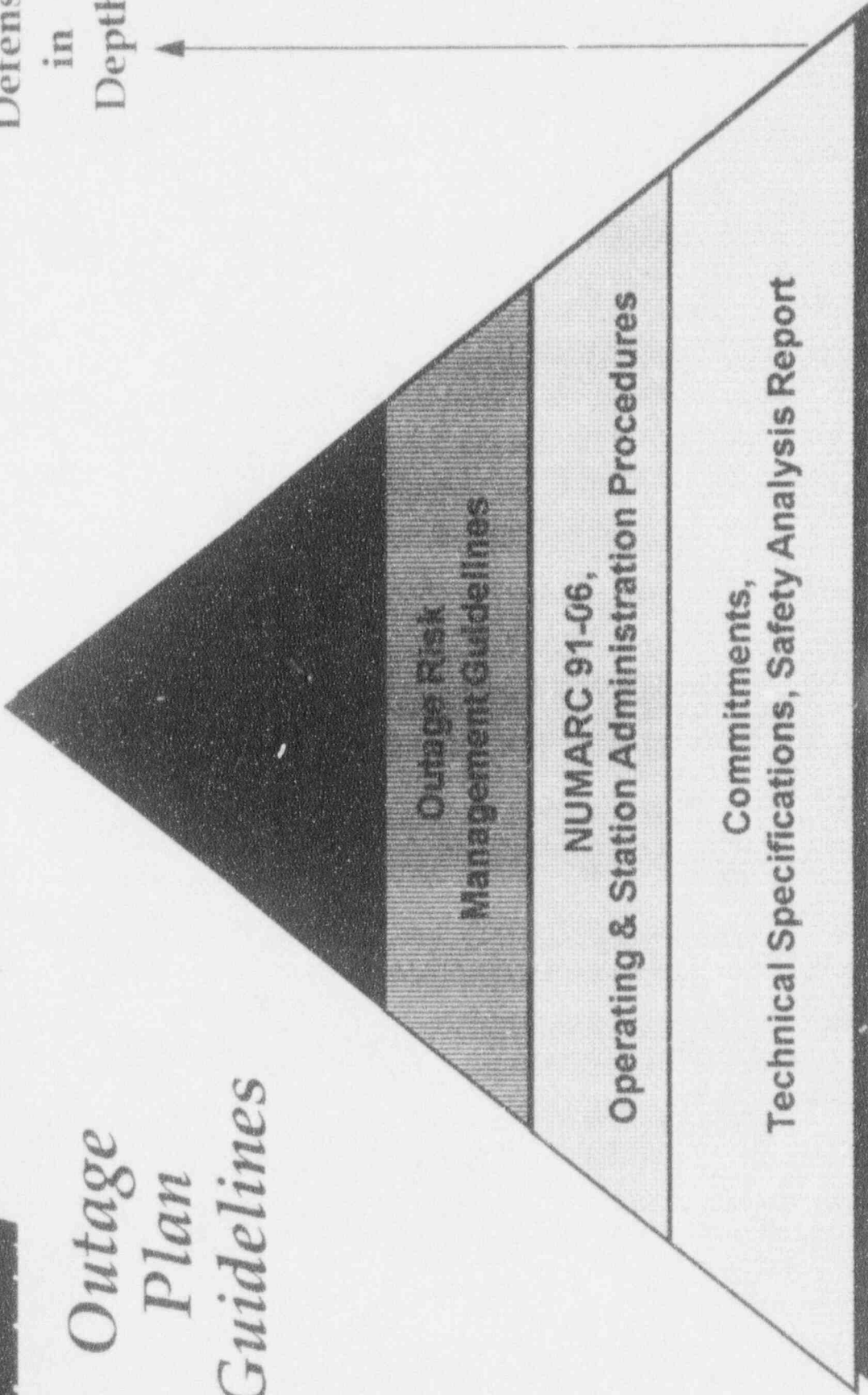
Outage Organization





Outage Plan Guidelines

Defense
in
Depth



Outage Risk
Management Guidelines

NUMARC 91-06,
Operating & Station Administration Procedures

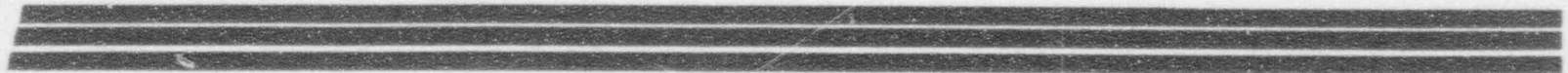
Commitments,
Technical Specifications, Safety Analysis Report





Operations Shutdown Safety

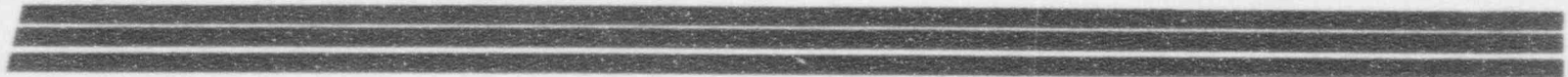
- Presented By:
- Craig Anderson
- Operations Manager - Unit 2





Safe Operating Environment

- Layered Protection
- Establishing Shutdown Safety Mindset
- Providing Operating Controls
 - Reduce Probability of Shutdown Events
 - Protect Equipment needed for Safe Shutdown Operation
 - Protect Equipment needed for Mitigation of Shutdown Events





Layered Protection






Training / Mindset

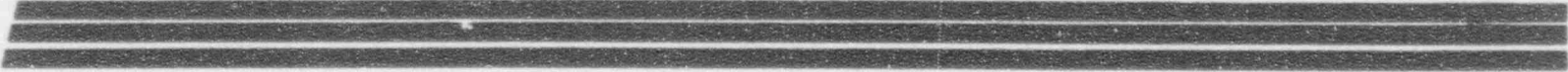
- Shift Superintendent Meetings
- Classroom Training
- Simulator Training
- Evolution Specific Training
- Outage Crew Meetings






Operating Controls

(Shutdown Cooling Control Procedure)

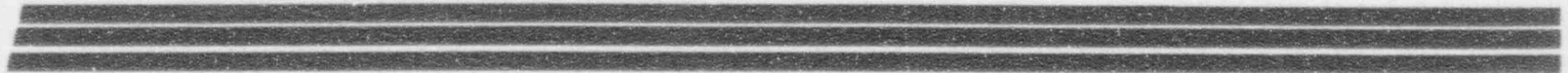
- Provides Physical Protection of Operating Shutdown Cooling Train & Associated Equipment
 - Provides Routine Review of SDC & RCS Makeup Source Line
 - Tracks Containment Closure Issues
 - Specifies Requirements for RCS Monitoring Instruments
- 

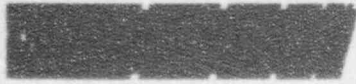


Operating Controls

(Shutdown Cooling Control Procedure)

- **Specifies Additional Controls for Operation During Draindown**
 - Pre-draindown Briefing
 - Dedicated Draindown Watch
 - Containment Breaches Approved by Ops Management
 - Additional Level Instrumentation





Shift Outage Manager & Score Cards

- Presented By:
- Sam Cecil
- Shift Operations Superintendent
- Shift Outage Manager for 2R10



Static

PSC Sub-committee
formed for
Independent Review of
SOPP

Dynamic

Verify to ORMG:
✓ NUMARC 91-06
✓ OPS PHII / Proc
✓ It makes sense!
✓ NUREG 1449

2R10

Outage Schedule &
SOPP Developed

Outage Schedule & SOPP
Reviewed & Verified by
PSC and ORAM-TIP

SOPP & Schedule
Approved
by Unit 2 Plant Manager

APPROVED OUTAGE PLAN

Static

Design Engineering/
NPS/EPR/ERN
form ORAM-TIP Team.

Dynamic

ORAM - TIP
Schedule
Review
Shutdown Safety
Advisor



Shift Outage Manager

Provides round the clock outage management for logistic, communications, coordination and interface support of the outage schedule.

- Major Communication Link with Control Room
- Management Oversight / Decision Making Authority
- Maintain Focus on Shutdown Safety
- Conduct Shift Outage Meetings
- Review Emergent Work



2R10

SCORE Card 2A

- Condition Definition
- Equipment Requirements
 - A - RCS Decay Heat Removal
 - B - RCS & SFP Inventory Control
 - C - Electrical Power Distribution
 - D - Reactivity Control
 - E - Containment Closure
 - F - Miscellaneous

6.2. CONDITION 2 REDUCED INVENTORY (RCS Level < 375' Elevation) DRAINED TO CENTERLINE OF HOT LEG

This condition begins with the draining of the RCS to reduced inventory. The opening of the S/G secondary side and the installation of the Nozzle Dams will occur during this condition but the longest activity requiring the reduced inventory window will be the replacement of "D" RCP seal.

This condition ends with closing the reduced inventory window.

A. RCS Decay Heat Removal Equipment Requirements:

- * As specified by 2R10 SCORE Cards 2A.
- * Two methods of heat removal

B. RCS & SFP Inventory Control Requirements:

- * As specified by 2R10 SCORE Cards 2A.
- * One source and two (2) flow paths

C. Electrical Power Distribution Requirements:

- * As specified by 2R10 SCORE Cards 2A.
- * Offsite and emergency power supplies:
 - 3 of 5 (both EDG and an offsite)
 - 4160 VAC load centers - both
 - 480 VAC load centers - both

D. Reactivity Control Requirements:

- * As specified by 2R10 SCORE Cards 2A.
- * Boric Acid Injection Paths - 1 of 3
- * Source Range Channels - one
- * Boron Dilution Tagout - in place
- * RTCB - open

E. Containment Closure Requirements:

- * Containment Closure - Not Required

F. Miscellaneous:

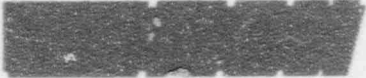
- * A minimum of two independent Core Exit Thermocouples (CETs).
- * Two independent loop "A" hot leg level instruments (except during calibration).
- * Tygon tube level indication available and manned when changing RCS level.

2R10
SYSTEMATIC CONTROL OF OUTAGE RISK EVOLUTIONS
SCORE CARD 2A - SAFETY FUNCTION SYSTEMS AVAILABILITY

Available Options Protected Options Out of Service

	A	B	C	D	E
A. MAINTENANCE OF HEAT REMOVAL: (FIG. 4.2.1.A)					
1. SPENT FUEL POOL COOLING (MIN 1 OF 3)	<input type="checkbox"/> SFPCA	<input type="checkbox"/> SFPCB	<input type="checkbox"/> *SW		
2. REACTOR COOLANT SYSTEM (MIN 2 OF 5)	<input type="checkbox"/> S/G A	<input type="checkbox"/> S/G B	<input type="checkbox"/> SDCA	<input type="checkbox"/> SDCB	<input type="checkbox"/> > 390'
B. MAINTENANCE OF INVENTORY: (FIG. 4.2.2.A)					
1. RCS MAKEUP SOURCE (MIN 1 OF 3)	<input type="checkbox"/> 2T6A	<input type="checkbox"/> 2T6B	<input type="checkbox"/> RWT		
2. RCS MAKEUP FLOW PATHS (MIN 2 OF 4)	<input type="checkbox"/> HPSIA	<input type="checkbox"/> SPRAY	<input type="checkbox"/> HPSIB	<input type="checkbox"/> CHG	
3. SFP MAKEUP FLOW PATH (MIN 1 OF 5)	<input type="checkbox"/> 2P39/ 2P109	<input type="checkbox"/> 2P48	<input type="checkbox"/> 2P86	<input type="checkbox"/> *SW1	<input type="checkbox"/> *SW2
C. MAINTENANCE OF VITAL AC: (FIG. 4.2.3.A)					
1. POWER SOURCES (MIN 3 OF 5)	<input type="checkbox"/> 2DG1	<input type="checkbox"/> 2DG2	<input type="checkbox"/> 2X02 (AUX)	<input type="checkbox"/> 2X03 (SU3)	<input type="checkbox"/> X04 (SU2)
2. 4160 VAC LOAD CENTERS (MIN 2 OF 2)	<input type="checkbox"/> 2A3	<input type="checkbox"/> 2A4			
3. 480 VAC LOAD CENTERS (MIN 2 OF 2)	<input type="checkbox"/> 2B5	<input type="checkbox"/> 2B6			
4. 480 VAC MCCs (MIN 4 OF 8)	<input type="checkbox"/> 2B51	<input type="checkbox"/> 2B52	<input type="checkbox"/> 2B53	<input type="checkbox"/> 2B54	
	<input type="checkbox"/> 2B61	<input type="checkbox"/> 2B62	<input type="checkbox"/> 2B63	<input type="checkbox"/> 2B64	
5. 120 VAC BUSES (MIN 3 OF 4)	<input type="checkbox"/> 2RS1	<input type="checkbox"/> 2RS2	<input type="checkbox"/> 2RS3	<input type="checkbox"/> 2RS4	
D. MAINTENANCE OF VITAL DC: (FIG. 4.2.3.B)					
1. VITAL (125V) DC BUS (MIN 2 OF 4)	<input type="checkbox"/> 2D31 & 2D01	<input type="checkbox"/> 2D34 & 2D01	<input type="checkbox"/> 2D34 & 2D02	<input type="checkbox"/> 2D32 & 2D02	
E. MAINTENANCE OF REACTIVITY: (FIG. 4.2.4.A)					
1. BORIC ACID SOURCE (MIN 1 OF 3)	<input type="checkbox"/> 2T6A	<input type="checkbox"/> 2T6B	<input type="checkbox"/> RWT		
2. BORIC ACID FLOW PATH (MIN 1 OF 3)	<input type="checkbox"/> HPSIA	<input type="checkbox"/> HPSIB	<input type="checkbox"/> CHG		
3. SOURCE RANGE CHANNELS (MIN 1 OF 2)	<input type="checkbox"/> A	<input type="checkbox"/> B			
4. BORON DILUTION TAGOUT	<input type="checkbox"/> IN PLACE		<input type="checkbox"/> NOT IN PLACE		
5. LOG CHANNELS (MIN 3 OF 4 OR RTCB OPEN)	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> OPEN
F. CONTAINMENT CLOSURE (NOT REQUIRED)					
	<input type="checkbox"/> SET		<input type="checkbox"/> OPEN		

*EMERGENCY USE ONLY



2R10

SCORE Card 2A

- Expected Duration
- Special Precautions
- Major Activities
- Requirements for Advancing to Next Schedule Period

2R10 SCORE Card 2A

Expected Period Duration: 72 hours

The duration for the 2R10 Schedule Period 2A is dependent on completing the RCP seal replacement work.

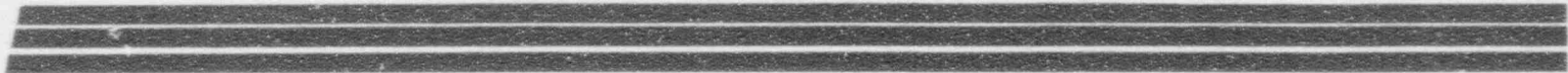
Special Precautions:

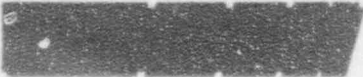
- * Both SDC loops are available.
- * Time to boil may be less than 30 minutes and time to uncover is just over 2 hours (assuming no SDC or makeup available).
- * Do not perform any maintenance or testing on any of the protected systems and avoid system alignment changes that could cause SDC flow or RCS level perturbations.

Major activities also in progress during this Schedule Period include:

- * The HPSI system is being prepared for the replacement of four (4) valves.
- * "B" RCP motor replacement efforts are in progress.
- * "D" RCP seal replacement efforts are in progress.

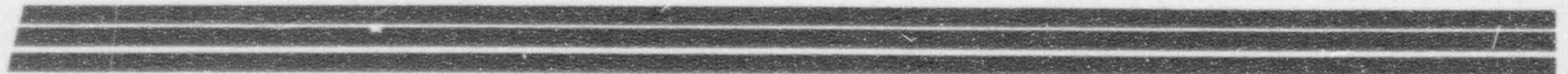
Required changes to safety function availability to progress into SCORE Card 3A:

- * The RCS is filled to the head removal level.
- 



2R10 Scope & Schedule

- Presented By:
- Mike Bourgeois
- Outage Manager

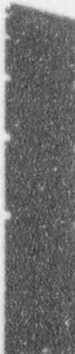




Previous Outage Good Practices

- Shutdown Protection Plan
- Shift Outage Managers
- Early Boration & Hydrogen Peroxide Flush
- Core Teams





2R10 Initiatives

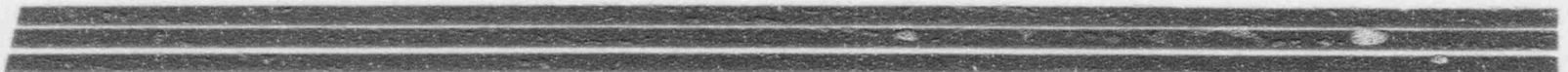
- Early Integrated Leak Rate Testing
- Safety Injection Hydro Plug
- Shutdown Safety Enhancements
- Expansion of Core Teams
- Long Range Plan

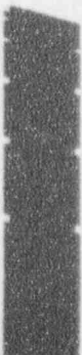




2R10 Initiatives

- Levelize Weekend Manpower
- New Outage Control Center & Expansion of Communications Network
- Work Package Enhancements
- Contingency Task Development





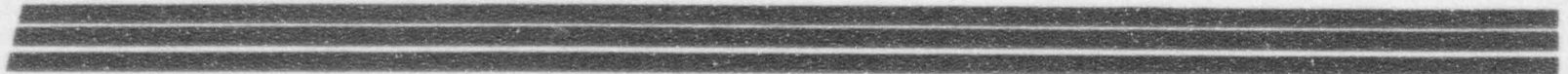
2R10 Scheduled Duration

- **Start:** March 12, 1994
- **End:** April 24, 1994



██████████ *2R10 Major Projects*

- Integrated Leak Rate Testing
- 'B' RCP Motor Replacement
- Replace Impeller; on 'A' & 'B' Circ Water Pumps
- 'B' Circ Water Pump Motor Overhaul
- Major Inspection of LP 'A' Turbine Rotor
- Modification to MSR 'A'





2R10 Major Projects

- Replace Service Water Piping Train 'A'
- Replace 4 High Pressure Safety Injection Valves
- Replace 4 Containment Electrical Penetrations
- Steam Generator Inspection

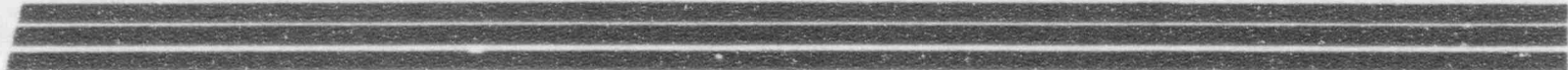


Steam Generator Work Scope

- 100% Bobbin Full Length
 - 100% Hot Leg RPC at Top of Tubesheet
 - 20% Cold Leg RPC at Top of Tubesheet
 - 20% of Dented Tube Support Plates on Hot Leg Side with RPC
 - Selected RPC of Bobbin Indications at Support Plates/Sludge Pile
 - 100% Inspection of Existing Sleeves
 - Secondary Side Inspection of "B" SG
 - Sludge Lancing of both SG's
-
-
-

██████████ 2R10 Work Load

● Repetitive Tasks (PM's):	1148
● Corrective/Enhancement:	1108
● Plant Changes:	41
● DCP's:	28

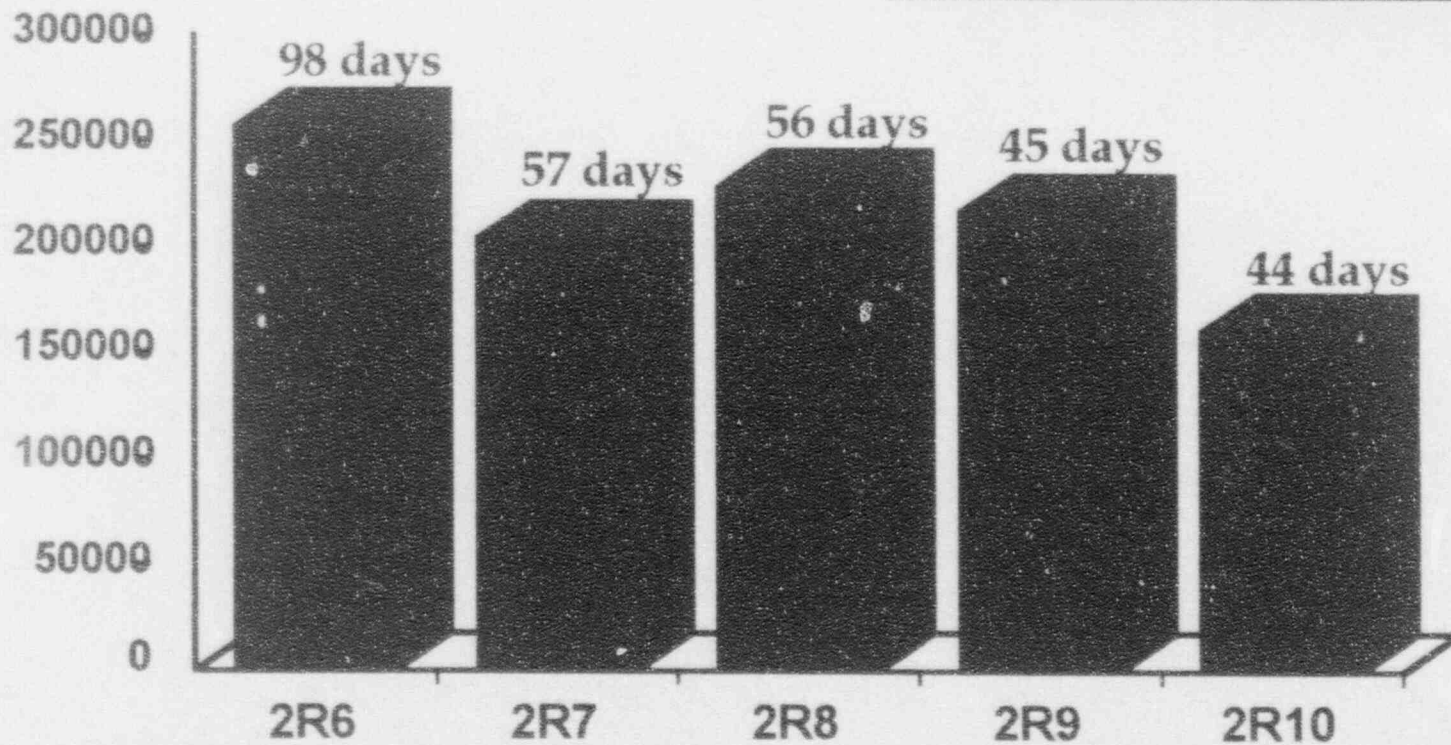


Outage Manhours

(Output Measure of the Process)

Manhours

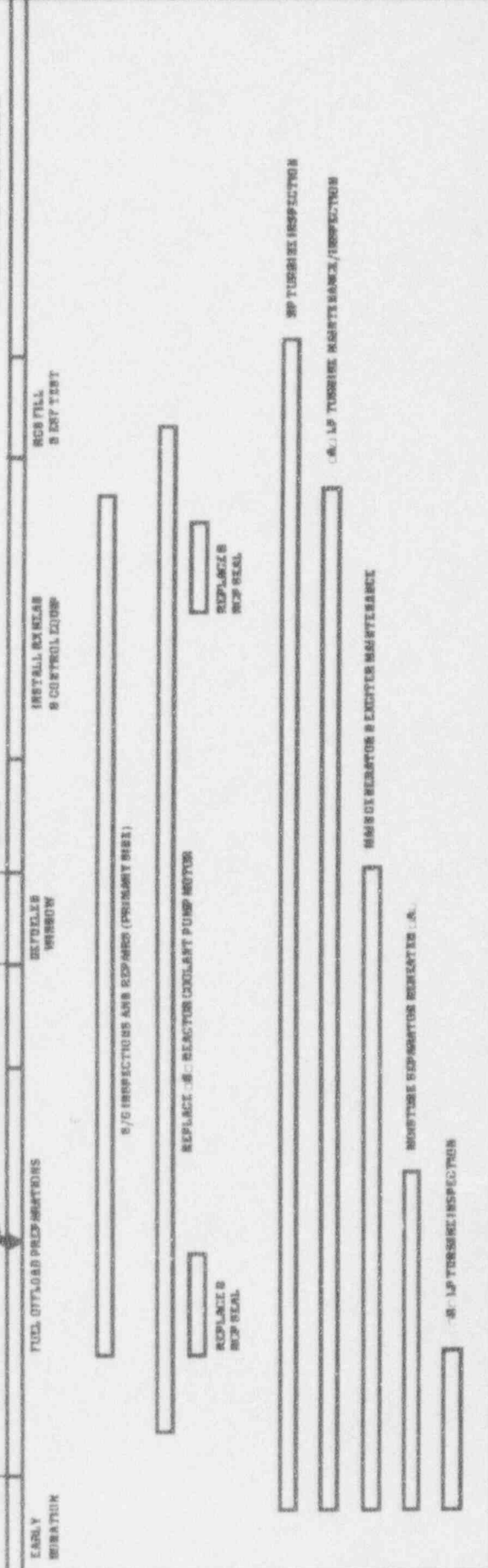
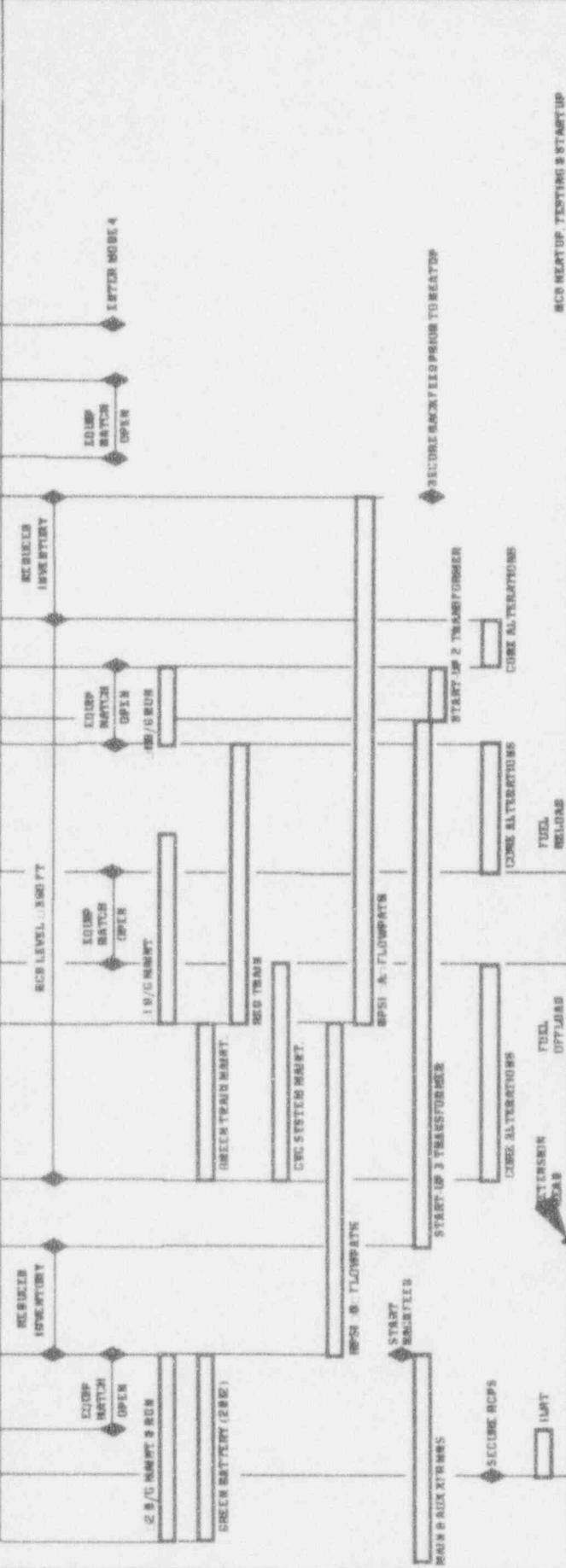
Scope \neq Duration



DAY OF REFUELING OUTAGE 2810

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
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REFUEL CONDITIONS



10. LP TURBINE INSPECTION

11. LP TURBINE MAINTENANCE/INSPECTION

12. LP TURBINE MAINTENANCE

13. MOISTURE SEPARATOR REPAIRS E.A.

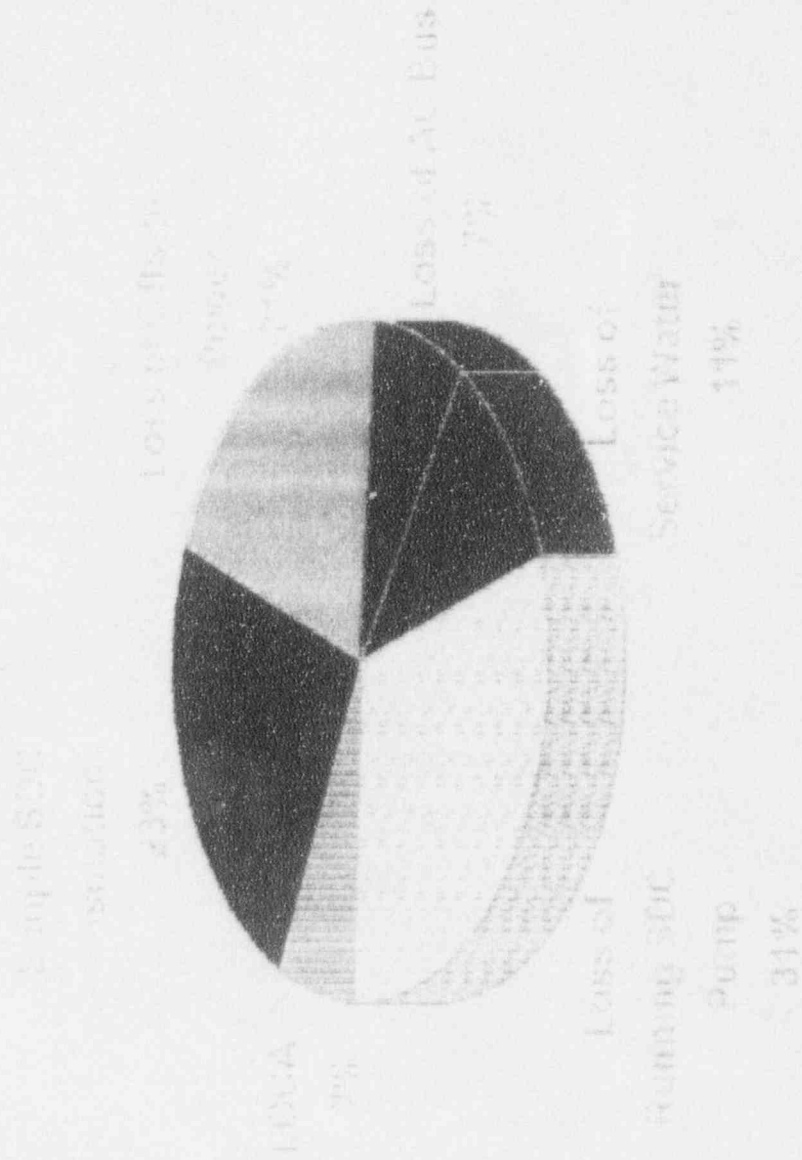
14. TURBINE INSPECTION

 **ORAM-TIP**

Presented by:



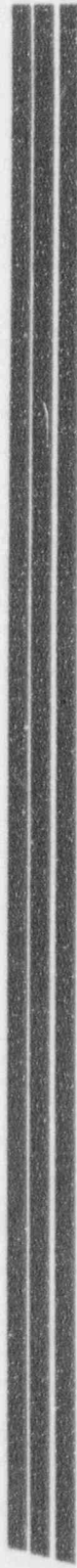
Risk Contribution Pie Chart



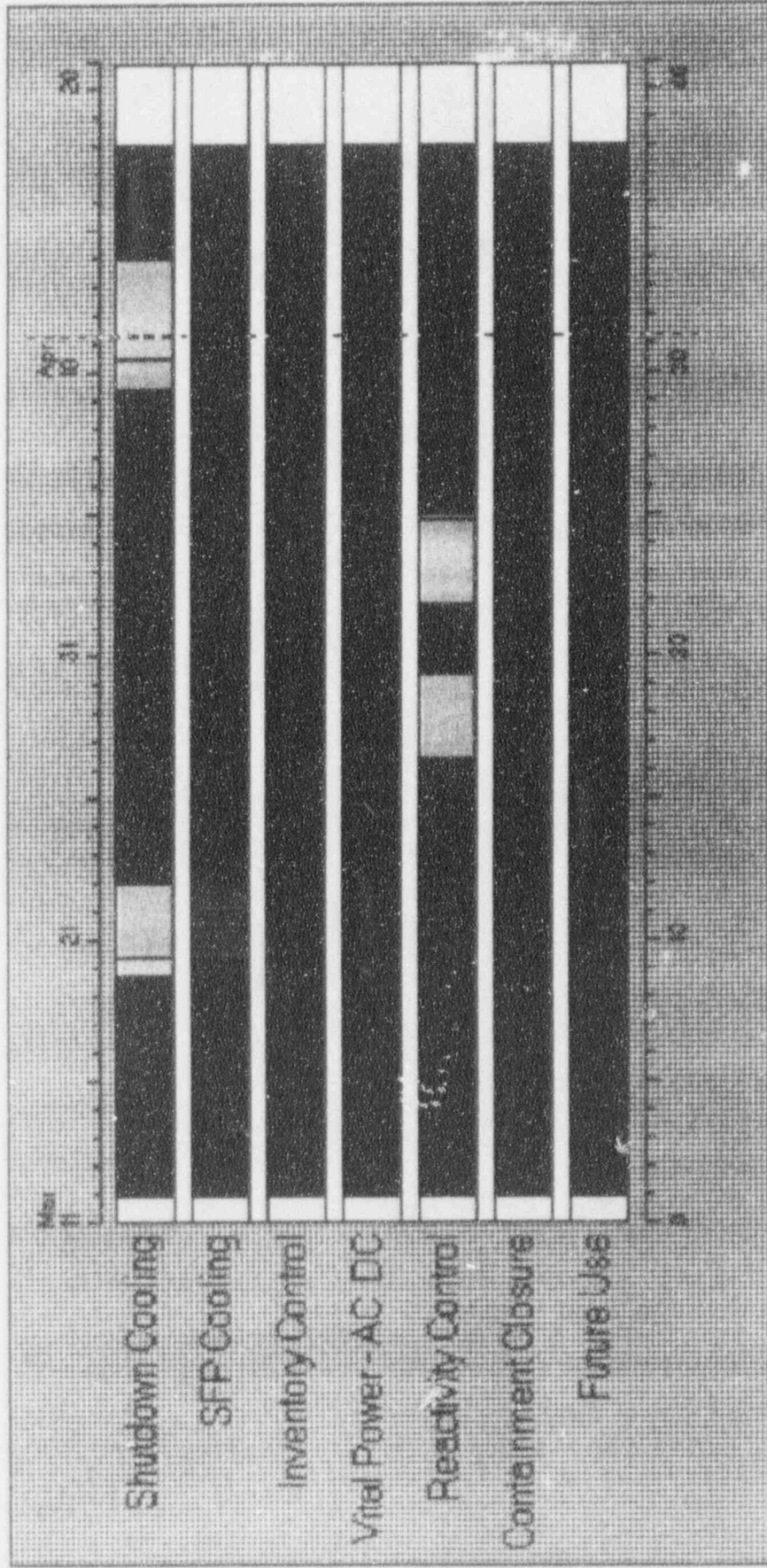


ORAM-TIP Key Points

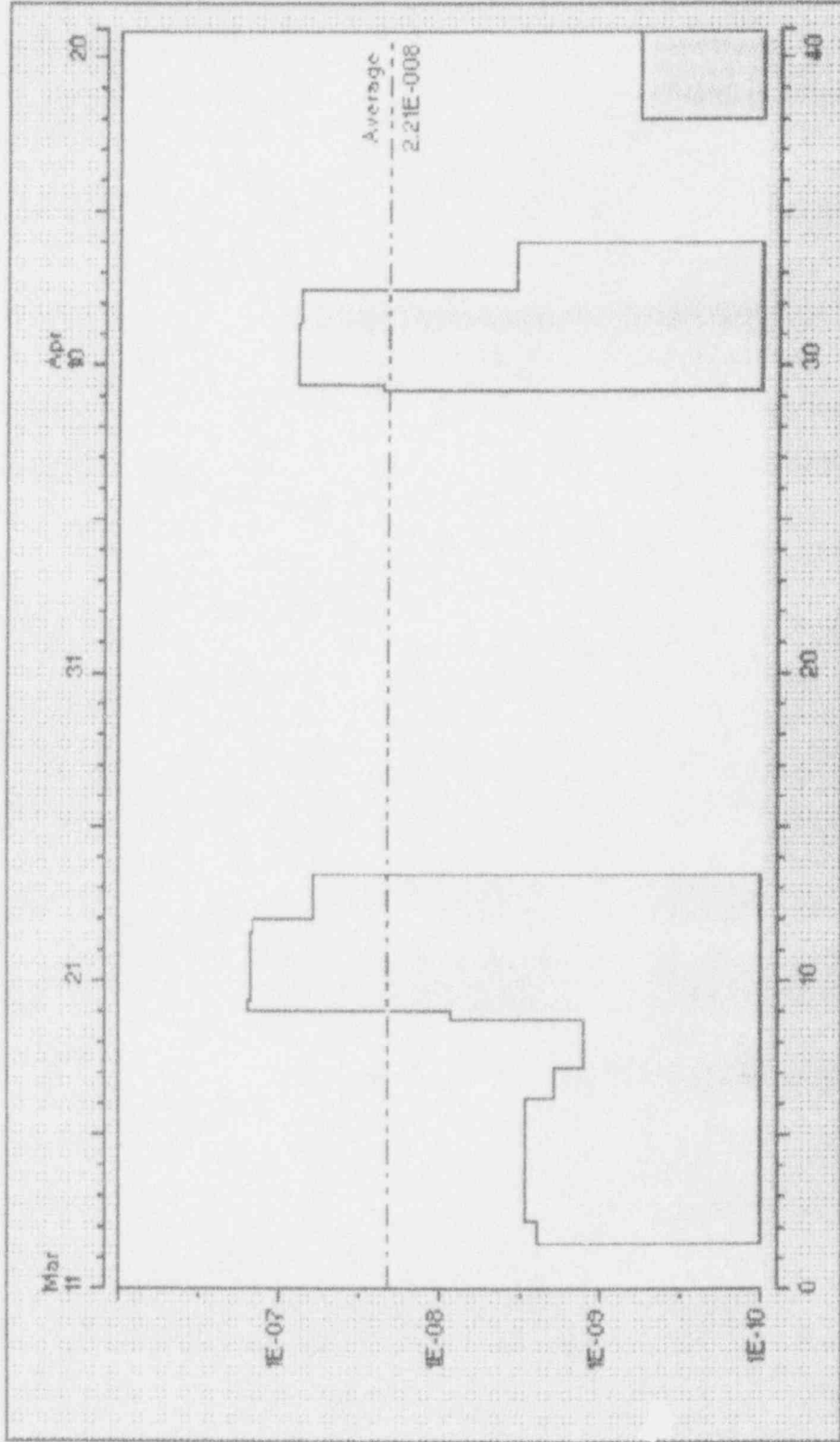
- ORAM-TIP is not a replace for solid program
- Model updatable during outage
- Check of Defense-in-Depth



Safety Function Status Display



ORAM-TIP Risk Profile





Concluding Remarks

Presented by:

Kandy Edington

Plant Manager - Unit 2

