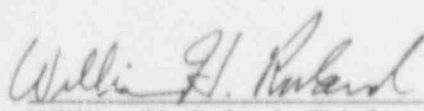


ENCLOSURE (1)

U. S. NUCLEAR REGULATORY COMMISSION
REGION 1

Meeting No.: 91-123
Docket No.: 50-219
Licensee: GPU Nuclear Corporation
Oyster Creek Nuclear Generating Station
P.O. Box 388
Forked River, New Jersey 08731
Facility: Oyster Creek
Meeting at: NRC Region I Office, King of Prussia, Pennsylvania
Date: October 21, 1991

Approved by:



William H. Ruland, Chief
Reactor Projects Section 4B

12/17/91
Date

Meeting Summary:

A meeting was held on October 21, 1991 at the NRC Region I office to discuss the recently completed 13R refueling outage at Oyster Creek. Items discussed included goals set prior to commencing the outage, success or failure in meeting these goals, major activities performed during the outage and lessons learned that will be applied to the 14R refueling outage.

The meeting was attended by NRC and licensee management and lasted for approximately two hours. The slides used by GPUN are attached.

DETAILS

1.0 PARTICIPANTS

1.1 GPU Nuclear Corporation

J. Barton, Vice President and Director
L. Lammeris, Maintenance Director
G. Busch, Licensing Manager
J. Hilóebrand, 14R Outage Director
K. Bromery, Media Relations Manager
D. Croneberger, Director, Special Projects

1.2 U.S. Nuclear Regulatory Commission (NRC)

W. Hodges, Director, Division of Reactor Safety (DRS)
E. Wenzinger, Chief, Projects Branch No. 4, Division of Reactor Projects (DRP)
W. Ruland, Chief, Reactor Projects Section 4B, DRP
D. Vito, Senior Resident Inspector, Oyster Creek
T. Frye, Reactor Engineer, DRP

2.0 PURPOSE

This meeting was held at the request of GPU Nuclear to discuss activities performed during the 13R refueling outage.

3.0 LICENSEE PRESENTATION

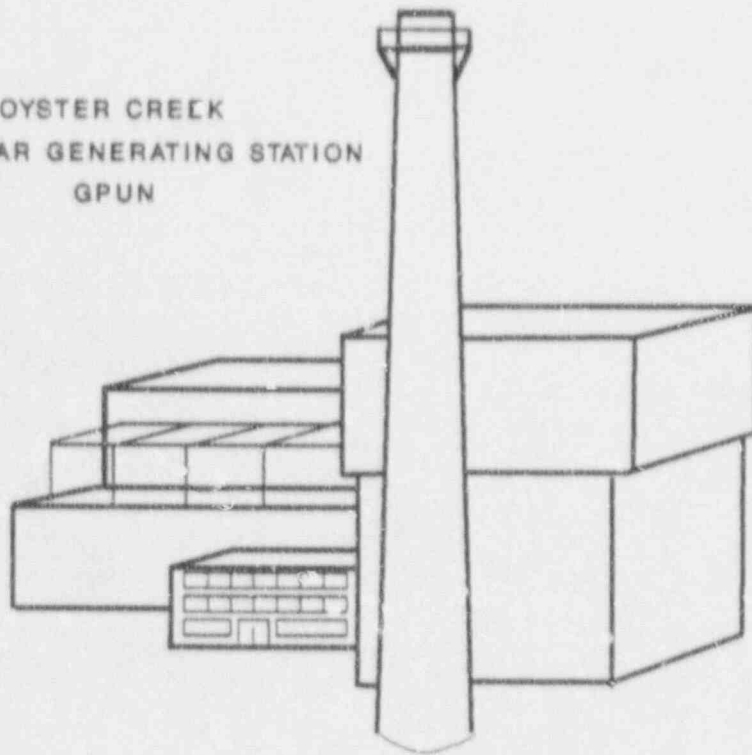
The licensee's presentation consisted of discussion of the attached handouts. Major activities performed during the outage were discussed by the licensee including isolation condenser piping replacement, feedwater system improvements, replacement of one of the main step-up transformers and ALARA program improvements, such as use of wet lift refuel equipment and chemical decon of the recirculation and reactor water cleanup systems.

Also discussed were goals established prior to the outage in the following general areas: work performance, radiological controls, industry safety, plant restoration/material condition and outage management. The discussion included which of these goals were met and the reasons why other goals were not met.

4.0 CONCLUDING STATEMENTS

NRC Region I management stated that the information provided would be considered and thanked GPU Nuclear for their presentation.

OYSTER CREEK
NUCLEAR GENERATING STATION
GPUN



GPU NUCLEAR CORPORATION
13R REFUELING OUTAGE
OCTOBER 21, 1991

AGENDA

1. INTRODUCTION G. BUSCH
2. OUTAGE OVERVIEW/
LESSONS LEARNED D. CRONEBERGER
3. MAINTENANCE DURING
THE OUTAGE L. LAMMERS
4. DET OBSERVATIONS/STATUS G. BUSCH
5. CLOSING REMARKS J. BARTON

OYSTER CREEK
13R REFUELING OUTAGE

- SIGNIFICANT STATISTICS

- MAJOR ACTIVITIES/SCOPE ADDITIONS

- 13R LEVEL 0 SCHEDULE

- KEY LESSONS LEARNED

SIGNIFICANT STATISTICS

<u>DESCRIPTION</u>	<u>PLAN</u>	<u>ACTUAL</u>
OUTAGE START	2/16/91	2/16/91
OUTAGE COMPLETE	5/31/91	6/28/91
OUTAGE DURATION (DAYS)	105	131.9
TOTAL PERSON REM	1200	1004
(EXCLUDES CONTINGENCY)		
CRAFT MANHOURS	536,000	687,000

13R OUTAGE
MAJOR ACTIVITIES

- IGSCC MITIGATION
 - REPLACE ISO CONDENSER PIPING INCLUDING PENETRATIONS
 - REPLACE RWCU PENETRATIONS

- ALARA
 - CHEMICAL DECON-RECIRC & RWCU
 - WET LIFT REFUEL TOOLS
 - DW EXPOSURE REDUCTION IMPROVEMENTS

- FEEDWATER SYSTEM IMPROVEMENTS
 - NEW FLOW ELEMENT
 - NEW BLOCK VALVES
 - "A" FW PUMP OVERHAUL AND MOTOR EXCHANGE

- DIESEL GENERATORS - OVERHAUL AND IMPROVEMENTS
- 4160V SWITCHGEAR - REFURBISH IE SWITCHGEAR
- RECIRC PUMPS - NEW DESIGN MECH SEALS FOR 3 PUMPS

- MAJOR INSPECTIONS
 - CRD RETURN NOZZLE ON REACTOR
 - REACTOR INTERNALS
 - IGSCC
 - DW SHELL

13R OUTAGE
MAJOR ACTIVITIES (CONTINUED)

- TURBINE
 - LOW PRESSURE "B" TURBINE INSPECTION
 - LAST STAGE BUCKET REPLACEMENT ON "B" TURBINE
 - VALVE INSPECTION/REPAIR

- REPLACE ONE OF TWO MAIN STEP-UP TRANSFORMERS

- VALVES
 - REPLACE ISOLATION CONDENSER ISOLATION VALVES
 - REACTOR SAFETY VALVE REDUCTION
 - REACTOR SAFETY & CORE SPRAY RELIEF VALVE REPLACEMENTS
 - LIMITORQUE REPLACEMENTS
 - MOV LIMIT SWITCH UPGRADES
 - HCU VALVES-PM'S/CM'S
 - RECIRC VALVE REPACKS
 - MSIV REPACKS/SPRING CLOSURE TESTING
 - GENERAL MAINTENANCE
 - MISCELLANEOUS VALVE REPLACEMENTS

- INDUSTRIAL SAFETY
 - ASBESTOS ABATEMENT PROGRAM
 - ELIMINATE TRANSFORMER PCB'S

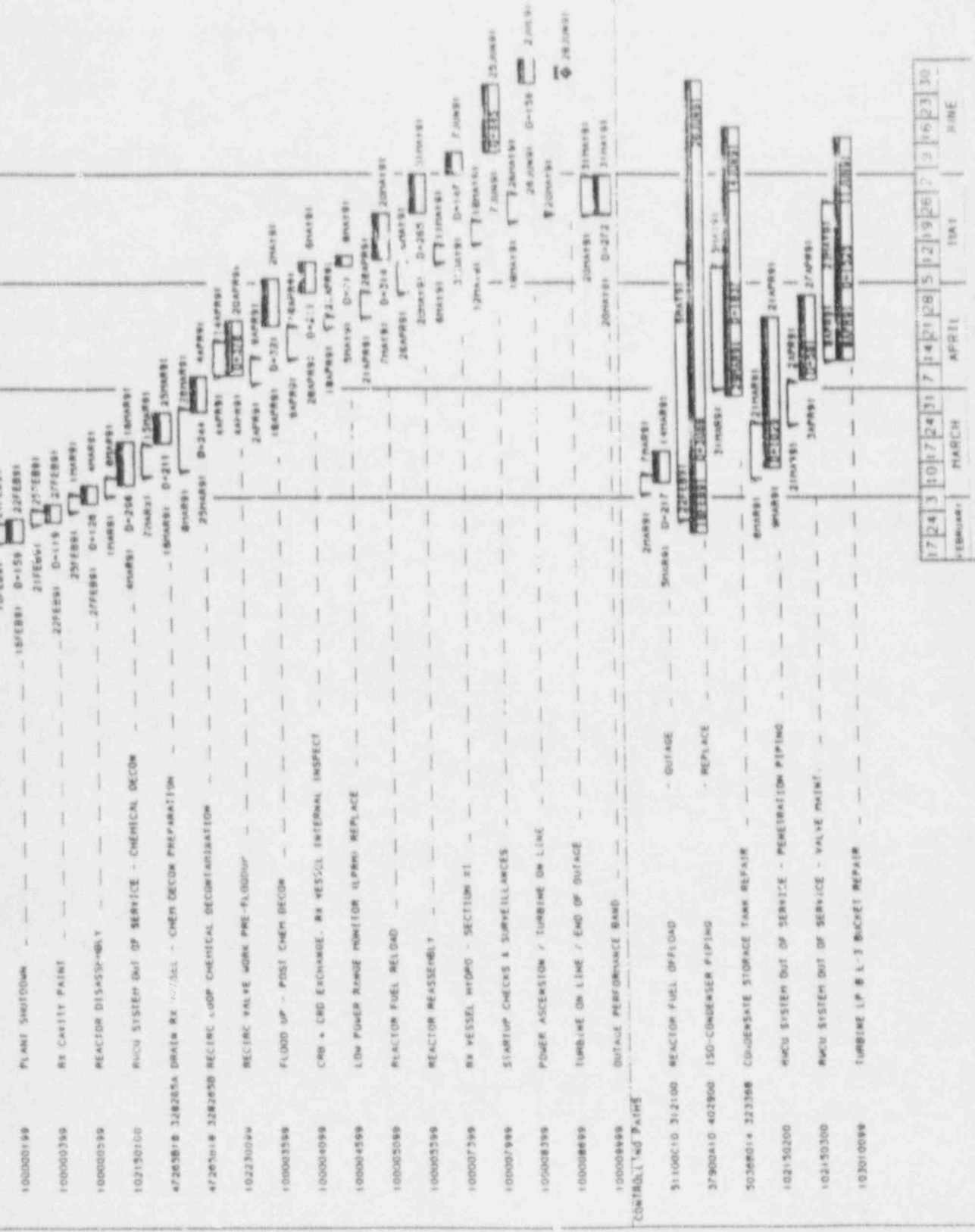
MAJOR SCOPE ADDITIONS

- ESW PIPING REPAIRS AT INTAKE
- POWER CABLE HI POT TESTING
- POWER FEEDER REPLACEMENTS
 - 1A2
 - RFP 1A
- CONDENSATE STORAGE TANK
 - REPLACE BOTTOM
 - TEMP MODS TO SUPPORT CONDENSATE TRANSFER
- V-37-31 STEM REPLACEMENT
- IGSCC REPAIRS & EXPANDED INSPECTION SCOPE
- MSIV'S - NS04A REBUILD AND NS04B SPRING REPLACEMENT
- LOW PRESSURE TURBINE - L-3 WHEEL - IGSCC REWORK & PRESSURE PLATE
- NUCLEAR FUEL - INCREASED SIPPING & RECHANNELING OF ASSEMBLES
- DRYWELL INSPECTIONS
- PREPARATIONS FOR DW SAND REMOVAL
- VALVE REPAIRS (LLRT FAILURES)
- TORUS CONTAINMENT SPRAY NOZZLE REFURBISHMENT

PROJECT: [REDACTED] SHEET: [REDACTED] OF [REDACTED]
 ISSUE: REV 0 - 07/08/91
 TARGET SCHEDULE: 13
 LINE BREAK ON: 31DEC91
 SORT BREAKS: FCODES G
 FCODES: [REDACTED]
 TARG DATA DATE: 16APR91
 INTERVAL: 1 WEEK (5)
 TARG FINISH: 31DEC91
 TARG DATA DATE: 16APR91

18R LEVEL 0 SCHEDULE (94 DAYS + 6 HOURS)
REV 0 - AS OF 7/07/91 23:00

REFUEL OUTAGE CRITICAL PATH



CONTRIBUTING PATHS

KEY LESSONS LEARNED

- OUTAGE MANAGEMENT ORGANIZATION
 - CONTINUE FUNCTION WITH DEDICATED TEAM
 - INTEGRATE BETTER WITH OPERATIONS AND MTCE
 - STRENGTHEN AREA MANAGEMENT FUNCTION

- REFUELING OUTAGE CONTRACTOR
 - CONTINUE FUNCTION
 - ASSIGN SCOPE IN STRONG AREAS
 - RECONSIDER INDEPENDENT QA PROGRAM AND/OR QC ORGANIZATION

- PLANNING AND ESTIMATING
 - WORK PACKAGES REQUIRED EARLIER
 - AT LEAST 3 MONTHS PRIOR TO WORK START
 - IMPROVE CREDIBILITY OF COST ESTIMATES
 - STRENGTHEN COST CONTROLS

- SCHEDULING
 - COMPREHENSIVE INTEGRATED SCHEDULE IS REQUIRED
 - UPGRADE TECHNICAL QUALIFICATIONS OF SCHEDULERS
 - RECONSIDER FREQUENCY OF UPDATING AND REISSUING SCHEDULE

*13R FUNCTIONAL MAINTENANCE
ESTIMATED vs. ACTUAL MANHOURS*

	ORIGINAL EST. (12/12/90)	ACTUALS
IN-HOUSE	93,000 *	122,000
CONTRACT LABOR	37,927	33,000
TOTAL	130,927	155,000

* 6 DAYS/WK 10HRS/DAY FOR 105
DAYS

13R GOALS

O.C. MAINTENANCE

GOAL

ACTUAL

0 13R C.M.'S

49

0 P.M.'S

2

NO INCREASE IN NON-OUTAGE
BACKLOG (START=408)

477

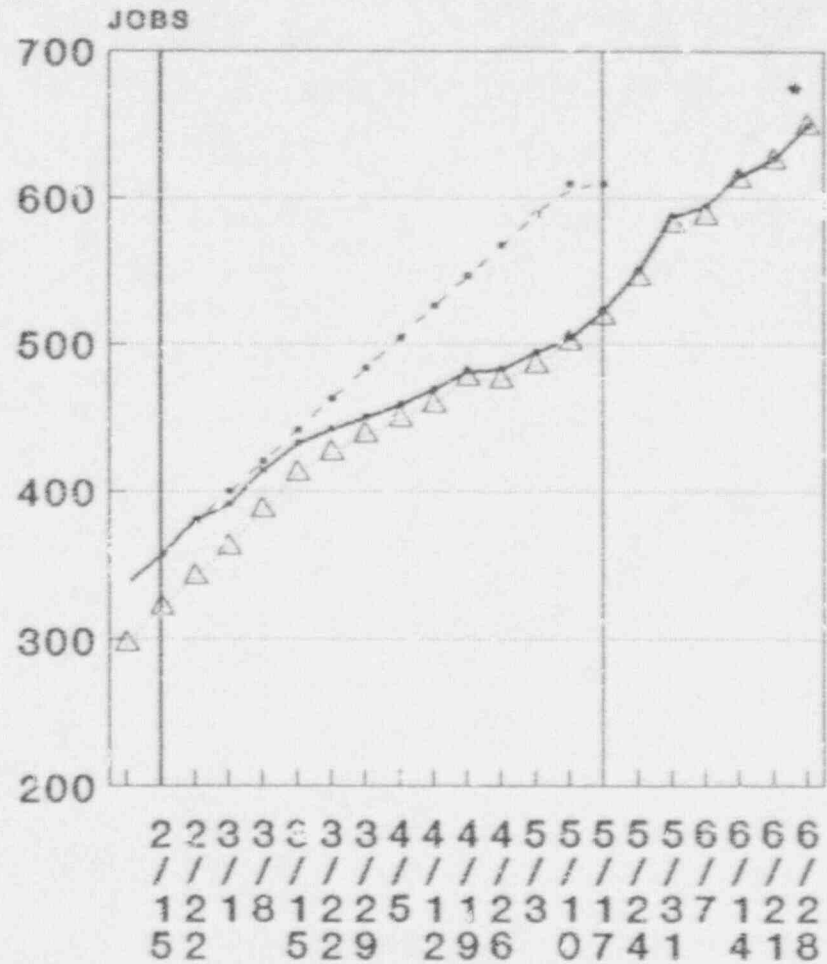
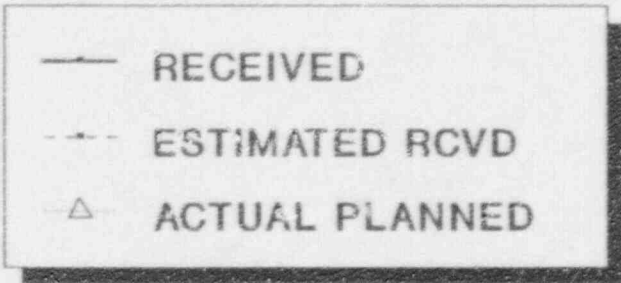
0 SURVEILLANCES

0

13R CM STATUS OF PLANNING

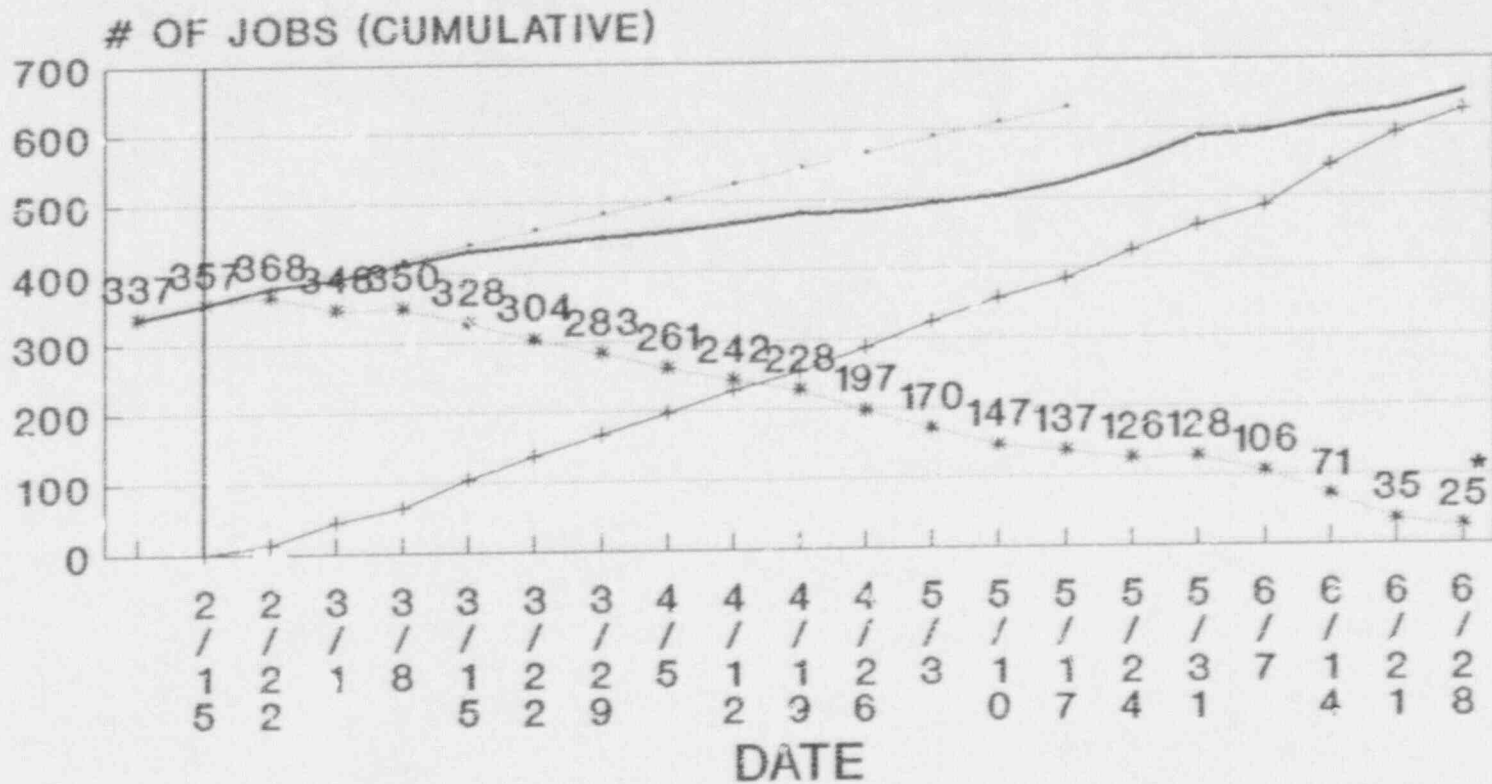
PLANNING BACKLOG

2/16	35		
2/22	38	5/31	5
3/1	29	6/7	7
3/8	27	6/14	3
3/15	20	6/21	1
3/22	16	6/28	0
3/29	12		
4/5	9		
4/12	11		
4/19	4		
4/26	8		
5/3	9		
5/10	3		
5/17	4		
5/24	5		



• INCLUDES JOBS DEFERRED

13R CM STATUS



—+— RECEIVED

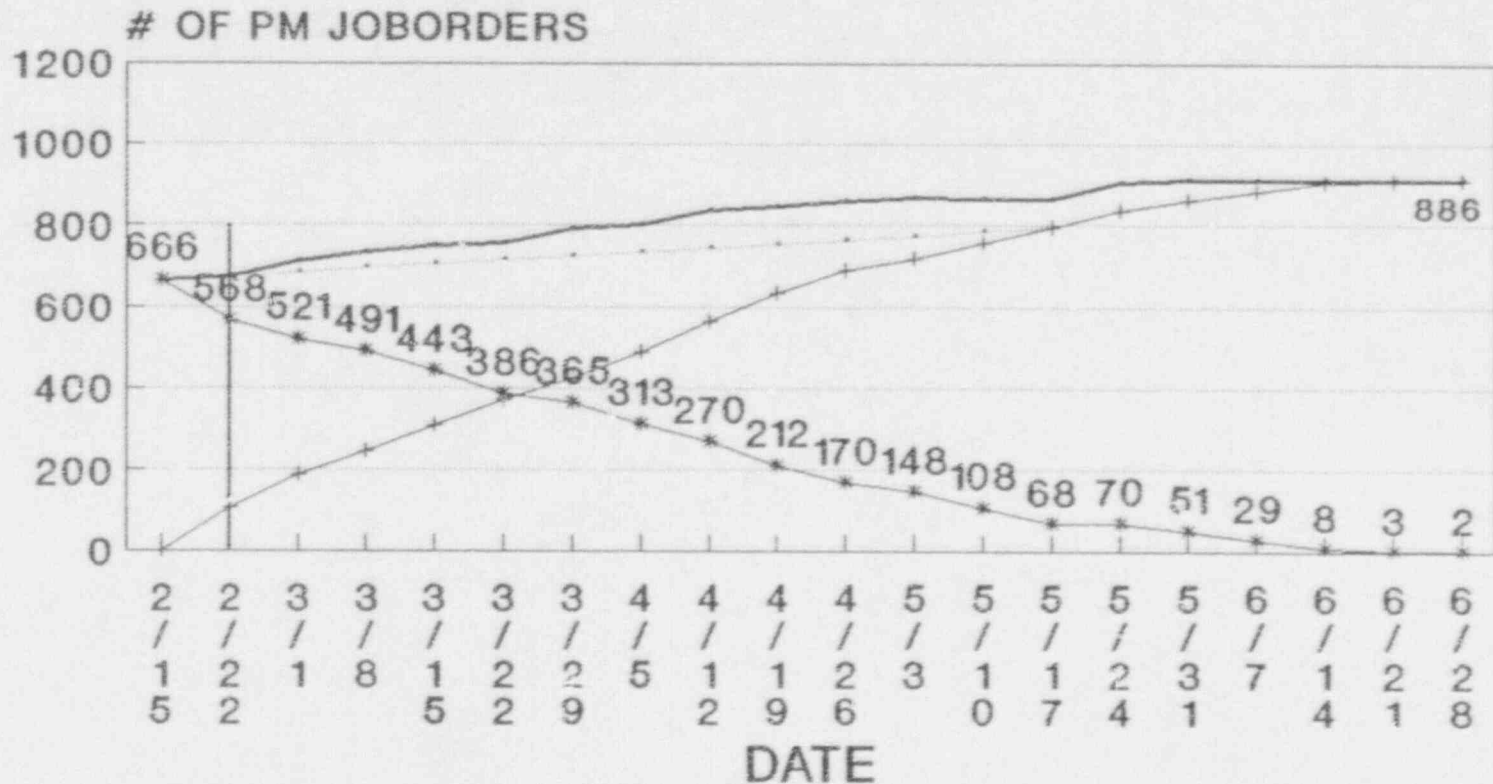
—+— COMPLETE

* BALANCE

... ESTIMATED JO'S RCVD

• COMPLETED DURING POWER ASCENSION : 49 JOBS DEFERRED

13R P.M. STATUS



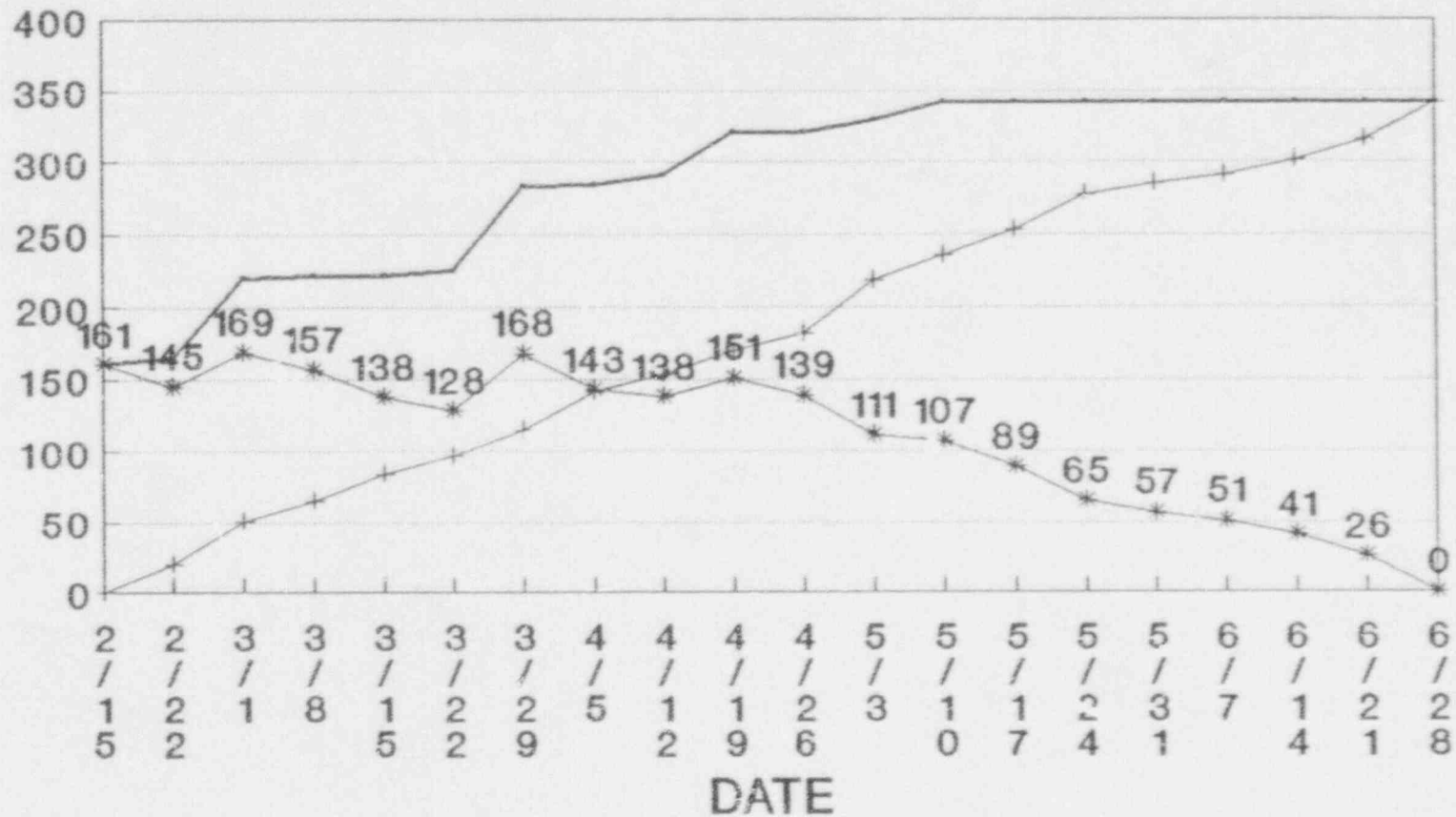
— ACTUAL RECEIVED

+ COMPLETE

* BALANCE

- - ESTIMATED RECEPTION

13R S.T. STATUS



— ACTUAL RECEIVED + COMPLETE * BALANCE

13R REWORK MAINTENANCE

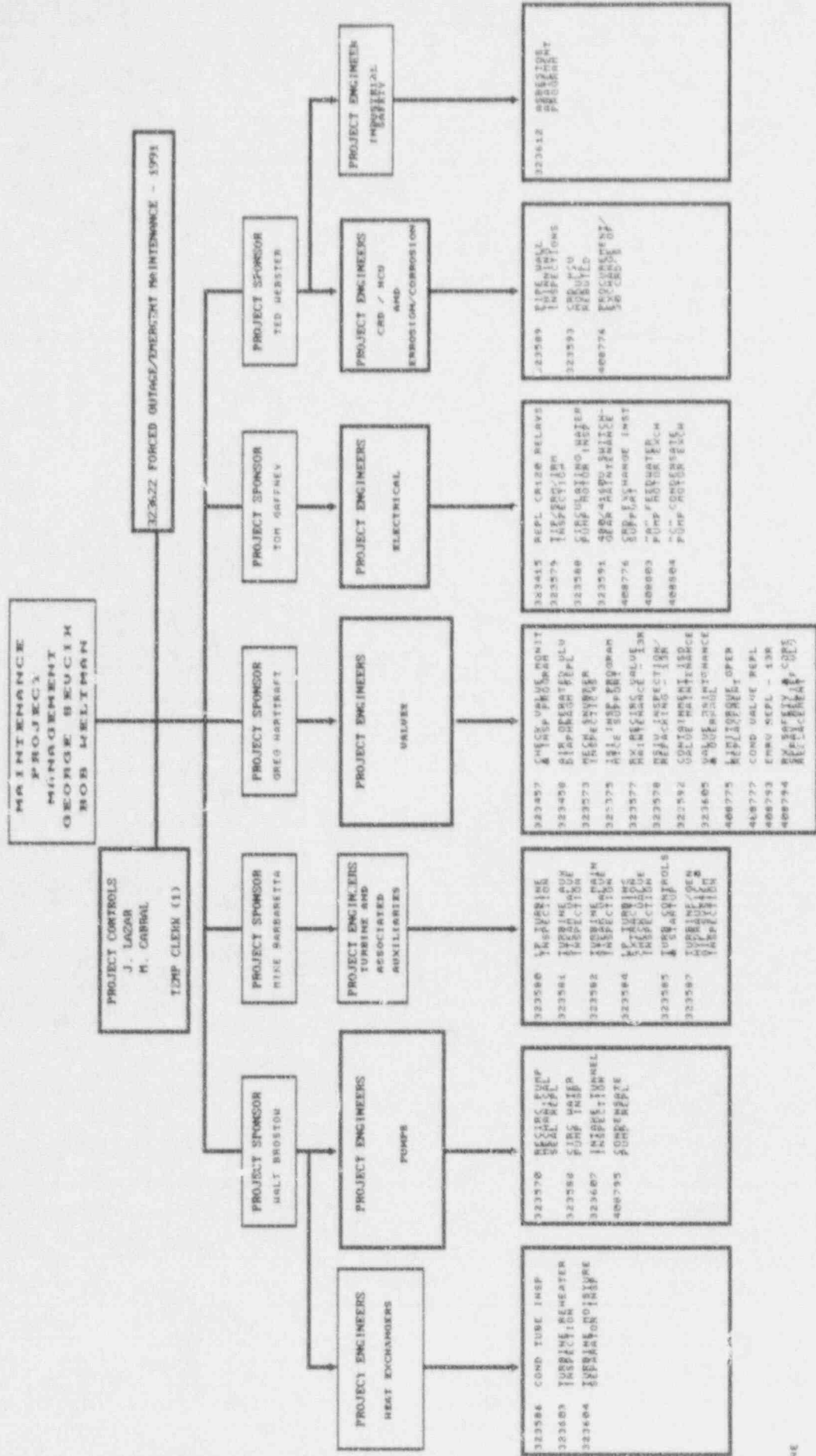
- 'A' FEEDPUMP MAINTENANCE/OVERHAUL
 - MECHANICAL SEALS INSTALLED 180 DEGREES OUT OF PROPER ORIENTATION
 - PUMP BEARING FAILURE
 - OUTBOARD SEAL LEAK

- 'B' CLEANUP PUMP OUTBOARD PACKING LEAK

- 'B' CORE SPRAY PUMP - SEAL LEAK

- CONTAINMENT SPRAY PUMPS (4) INCORRECT GREASE APPLICATION

- 'A' STATOR COOLING PUMP REVERSE ROTATION



DIANE

* MEMBERS OF PERSONNEL MAY CHANGE BASED ON INTEGRATED SCHEDULE NORMALIZATION

NOTE: MAINTENANCE ASSESSMENT ENGINEERS; GILLES, MEADOW, GONZALES, PIND AND INSCER WILL BE CROSS-TRAINED IN PROJECT ENGINEER ACCOUNTABILITIES AND ASSISTANT AS FUNCTIONAL WORK LOAD PERMITS...

13R MAINTENANCE PROJECTS

BUDGET INFORMATION

O.C. PLANT CAP/SPECIFIC O&M	\$ 23.45M
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ASSIGNED TO MAINTENANCE DEPT. (33 MAINTENANCE PROJECTS)	\$ 16.65M
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13R OUTAGE EQUIPMENT UPGRADES

- EXTENDED LIFE CRB'S PROGRAM
- DRYWELL CORROSION CONTROL
- **LIMITORQUE OPERATOR REPLACEMENT**
- **CRD REPLACEMENT/UPGRADE TO BWR 6'S**
- **CONDENSER VALVE REPLACEMENT**
- **CONDENSATE PUMP & MOTOR REFURBISHMENT**
- REPLACEMENT OF ROSEMONT 1153 TRANSMITTERS
- **FEEDWATER MOTOR REFURBISHMENT**
- CONDENSATE STORAGE TANK REFURBISHMENT
- INTAKE STRUCTURE CONDUIT REPLACEMENT
- **SERVICE WATER PUMP REPLACEMENT**
- SAFETY VALVE REDUCTION/MONITORING REDUNDANCY
- TORUS TO DRYWELL VACUUM BREAKER LOST MOTION MOD
- **100% MAIN CONDENSER TUBE CONDITION ASSESSMENT**
- **TURBINE DRAIN TANK INSTRUMENT VALVE REPLACEMENT**
- **1-2 SUMP PUMP & LEVEL CONTROL UPGRADE**

BOLD TYPE INDICATES PLANT MAINTENANCE PROJECTS

13R OUTAGE EQUIPMENT UPGRADES

- MAIN TRANSFORMER M1A REPLACEMENT
- **REPLACE CR 120 RELAYS**
- **CHECK VALVE MONITOR/INSPECTION PROGRAM**
- DIESEL MAINTENANCE IMPROVEMENTS
- **RECIRC PUMP MECH SEAL CONVERSION UPGRADE**
- **MSIV'S REFURBISHMENT/UPGRADE**
- **CIRC WATER PUMP & MOTOR REFURBISHMENT**
- **PIPE WALL THINNING INSPECTION/REPAIR**
- **CRD HCU MODULE REBUILD**
- **INTAKE TUNNEL EXPANSION JOINT REPLACEMENT**
- HFA RELAY REPLACEMENT
- CRD NOZZLE EXTERNAL UT INSPECTION
- TORUS INTERNAL COATING INSPECTION/RESTORATION
- **CRD PUMP REFURBISHMENT**
- **C M-G FLUID COUPLER REFURBISHMENT**
- CONCRETE STRUCTURE REPAIR TO DG BUILDING

BOLD TYPE INDICATES PLANT MAINTENANCE PROJECTS

13R OUTAGE EQUIPMENT UPGRADES

- 4160V FEEDER CABLE UPGRADE FOR CIRC WATER MOTORS
- EDG FUEL OIL TANK REPLACEMENT
- RX MANUAL CONTROL SYSTEM MOD
- **AIR OPERATED VALVE DIAPHRAM REPLACEMENT**
- **LIMIT SWITCH UPGRADE ON LIMITORQUE MOV**
- HYDRO ESW PIPING, PARTIAL PIPING REPLACEMENT
- RCS AUGMENTED IGSCO INSPECTIONS
- ISO CONDENSER PIPING REPLACEMENT
- ISO CONDENSER VALVE REPLACEMENTS
- ISO CONDENSER VENT VALVE REPLACEMENTS
- FEEDWATER SYSTEM BLOCK VALVE INSTALLATION
- RWOU PENETRATION PIPING REPLACEMENT
- **AUX CLEANUP PUMP AND MOTOR REPLACEMENT**
- **TURBINE SEAL OIL PUMP REFURBISHMENT/UPGRADE**
- **REFURBISH A AND C 4160V SWITCHGEAR**
- LOW PRESSURE TURBINE BLADE REPLACEMENT
- NEW COMBINED FEEDWATER FLOW ELEMENT
- REACTOR VESSEL INTERNAL INSPECTION
- DE-CONTAMINATED RWOU PIPING
- **REHEATER PROTECTION VENTILATION VALVE REFURBISHMENT**
- 4160V FEEDER CABLE REPLACEMENT FOR USS 1A2 & A
FEEDWATER MOTOR

BOLD TYPE INDICATES PLANT MAINTENANCE PROJECTS

CM PRODUCTIVITY
13R vs. 12R

	<u>13R</u>	<u>12R</u>
OUTAGE DURATION	4.75 MONTHS	7.5 MONTHS
AT START	357	170
<u>GROWTH</u>	<u>275</u>	<u>772</u>
TOTAL COMPLETED	632	942
PRODUCTIVITY JOBS/MONTH	133/MO	125/MO

PM PRODUCTIVITY
13R vs. 12R

	<u>13R</u>	<u>12R</u>
OUTAGE DURATION	4.75 MONTHS	7.5 MONTHS
TO BE PERFORMED	800	900
TOTAL COMPLETED	886	600
PRODUCTIVITY PM'S COMP/MONTH	183/MO	75/MO

DET REPORT OBSERVATIONS

- THREE MAJOR AREAS
 - ROOT CAUSE ANALYSIS
 - WORK PRACTICES
 - WEAK SUPERVISION AND INDEPENDANT VERIFICATION

- DETAILED REVIEW BY AREA
 - ENG/TECH SUPPORT 5 OBSERVATIONS
 - MAINTENACE 12 OBSERVATIONS
 - MANAGEMENT EFFECTIVENESS 7 OBSERVATIONS
 - OPERATIONS 9 OBSERVATIONS

- STATUS
 - ELEVEN ACTION PLANS DEVELOPED
 - OBSERVATION TEAMS FORMED
 - FOCUS ON MANAGEMENT/WORKER PERFORMANCE

- ADMINISTRATION
 - STATUS OF ACTION PLANS REVIEWED WEEKLY
 - CHANGES REQUIRE DIRECTOR OC APPROVAL
 - MANAGEMENT TEAM UPDATED MONTHLY ON STATUS

ROOT CAUSE ANALYSIS

- ~~STANDARD~~ DEVELOPED AND APPROVED FOR USE
 - GRADED APPROACH BASED ON RISK AND UNCERTAINTY
 - FOUR LEVELS A THROUGH D
 - A = HIGH RISK, HIGH UNCERTAINTY
 - D = LOW RISK, LOW UNCERTAINTY
- STANDARD UTILIZES DEVIATION REPORT (DR) AS INITIATOR
 - CURRENTLY BEING USED FOR ALL DRs
 - GROUP REVIEW AFTER POD FOR CLASSIFICATION
 - ASSIGNED AS APPROPRIATE
 - FOLLOWUP VIA DR COMPLETION
- RESULTS HAVE BEEN POSITIVE
- PLANS IN PROGRESS TO IMPLEMENT FOR ALL DEPARTMENTS
 - REVISE PROCESSES WHICH REQUIRE ROOT CAUSE DETERMINATION TO GENERATE DR FOR CLASSIFICATION
 - DEVELOP LIST OF APPROVED TEAM LEADERS
 - COMPLETE ROOT CAUSE PROCEDURE (PROC # 140)
 - COMPLETE REVISION OF PROC #104

WORK PRACTICES

- STANDARDS AND EXPECTATIONS
 - STANDARDS COMMITTEE HAS ISSUED STDS MANUAL
 - 6 STANDARDS ISSUED 22 STANDARDS UNDER REVIEW

- MANAGEMENT/SUPERVISOR/WORKER MEETINGS
 - DETAIL EXPECTATIONS AND ACCOUNTABILITIES

- MANAGEMENT/SUPERVISOR TOURS
 - OPERATIONS/MAINTAINENCE/RAD CON
 - MANAGEMENT OBSERVATION TEAMS

- POSITIVE FEEDBACK BASED ON EXPERIENCES
 - CONVERT MISTAKES TO POSITIVE ACTION
(EXAMPLE: FILTER SLUDGE TANK ROOM, IMPROPER RAD
AREA ENTRY)

- GENERAL EMPLOYEE MEETINGS WITH DIRECTOR
 - REINFORCE EXPECTATIONS
 - SEEK INVOLVEMENT OF ALL PERSONNEL IN PROBLEM
RESOLUTION

OUTAGE EXPECTATIONS

° PRIOR TO OUTAGE ESTABLISHED GOALS IN FIVE GENERAL AREAS:

- WORK PERFORMANCE
- RADIOLOGICAL CONTROLS (ALARA)
- INDUSTRIAL SAFETY
- PLANT RESTORATION/MATERIEL CONDITION
- OUTAGE MANAGEMENT
(INCLUDES DURATION/RESOURCES)

WORK PERFORMANCE

GOAL

6 LER'S DUE TO PERSONNEL
PERSONNEL ERROR

REWORK <2% OF
WORK PERFORMED

RESULT

1 LER DUE TO
ERROR

PLANT MTCE	.064%
SSD	. 17%
G.E.	. 52%

RADIOLOGICAL CONTROLS

<u>GOAL</u>	<u>RESULT</u>
◦ TOTAL EXPOSURE <1200 REM	1004 REM
◦ NO INDIVIDUAL TO EXCEED 3 REM	ACHIEVED
◦ NO INPO LEVEL 2 POSITION WBC	1 PERSON RECEIVED A LEVEL 2 WBC
◦ SKIN CONTAMINATION EVENTS <1.5/10,00 RWP HRS	RATE WAS 0.5
◦ CLOTHING CONTAMINATION <15/10,000 RWP HRS	RATE WAS 7.8
◦ 30 DAYS AFTER OUTAGE AREA CONTAMINATION ± PRE-OUTAGE LEVEL	ACCOMPLISHED 64,800 SQ. FT.
◦ GENERATE <10,500 CU. FT. DRY WASTE	8,820 CU. FT. GENERATED

INDUSTRIAL SAFETY

GOAL

RESULT

◦ ≤1.8 LOST TIME ACCIDENTS
PER 200,000 WORK HOURS
(INCLUDES LIMITED DUTY)

RATE WAS 3.2

PLANT RESTORATION/MATERIEL CONDITION

GOAL

RESULT

◦ ON POWER ASCENT TO 100%,
NO UNPLANNED SCRAMS OR
POWER REDUCTION

ACCOMPLISHED

◦ OPERATE AT CAP. FACTOR OF
85 % OVER FIRST 90 DAYS
AFTER POWER ASCENSION

ACTUAL WAS
70.6%

◦ ALL SYSTEMS/MAJOR COMPONENTS
OPERATIONAL AT OUTAGE
COMPLETION

ACCOMPLISHED

◦ ≤25 CONTROL ROOM INSTRUMENTS
OOS AT END OF OUTAGE

ACTUAL WAS 3

◦ <25 TEMP VARIATIONS AT
OUTAGE END

ACTUAL WAS 61

◦ UNIDENTIFIED LEAK RATE <1 GPM

ACCOMPLISHED
(CURRENTLY .86)

OUTAGE MANAGEMENT

GOAL

RESULT

- DEVELOP/IMPLEMENT INTEGRATED SCHEDULE

ACCOMPLISHED

- MEET BUDGET

BUDGET WAS OVER RUN

- TAKE SYSTEMS OOS NO MORE THAN ONCE

SIGNIFICANT SUCCESS BUT SOME SYSTEMS WERE TAKEN OUT OF SERVICE MORE THAN ONCE

- PLANT OPERATIONS SUPPORT TAG OUT REQUESTS TO ASSURE SYSTEM OUT OF SERVICE SCHEDULES ARE MET

MAJOR IMPROVEMENT BUT NOT 100%