



REGION I
PLANT STATUS REPORT

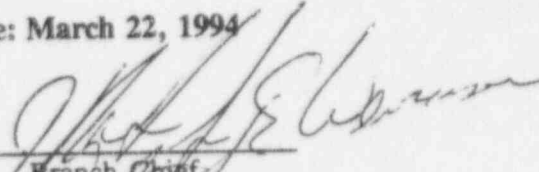
FACILITY: Salem Nuclear Generating Station
Units 1 and 2

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Last Update: March 22, 1994

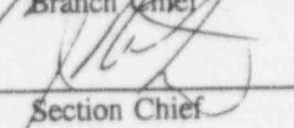
Update

Approval:


Branch Chief

Update

Approval:


Section Chief

CHANGES SINCE THE LAST UPDATE ARE DEMARCATED IN THE BORDER

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I. BACKGROUND

1. LICENSEE PARAMETERS

Utility:	Public Service Electric & Gas Company (PSE&G)	
Company Location:	Hancocks Bridge, NJ (18 miles Southeast of Wilmington, DE)	
County:	Salem	
	UNIT 1	UNIT 2
Docket No:	50-272	50-311
CP Issued:	September 25, 1968	September 25, 1968
Operating License		
Issued:	April 6, 1977	May 19, 1981
Initial Criticality:	December 11, 1976	August 2, 1980
Elec. Ener. 1st Gener:	December 19, 1976	May 29, 1981
Commercial Operation:	June 30, 1977	October 13, 1981
Reactor Type:	PWR 4-Loop	Same
Containment Type:	Large dry	Same
Power Level:	3411 MWt	Same
Architect/Engineer:	PSE&G/UE&C	Same
NSSS Vendor:	Westinghouse	Same
Constructor:	PSE&G/UE&C	Same
Turbine Supplier:	Westinghouse	Westinghouse (GE Generator)
Condenser Cooling Method:	Once-through	Same
Condenser Cooling Water:	Delaware River	Same

2. NRC ORGANIZATION

NRC Regional Administrator: Thomas T. Martin (Tel: 610-337-5000)
(Region I, King of Prussia, PA)

Division of Reactor Projects: Richard Cooper, Jr., Division Director
(Region I) (Tel: 8-610-337-5229)
Wayne Lanning, Deputy Director
(Tel: 8-610-337-5126)
Edward C. Wenzinger, Branch Chief
(Tel: 8-610-337-5225)
John R. White, Section Chief
(Tel: 8-610-337-5114)

NRC ORGANIZATION Continued:

Senior Resident Inspector:	Charles S. Marschall (Tel: 8-609-935-3850)
Resident Inspector:	Stephen T. Barr (Tel: 8-609-935-3850)
Resident Inspector:	Joseph G. Schoppy, Jr. (Tel: 8-609-935-3850)
Resident Inspector:	Todd H. Fish (Tel: 8-609-935-3850)
Project Engineer:	Robert J. Summers (Tel: 8-610-337-5189)
Project Manager:	James C. Stone, NRR (Tel: 8-301-504-1419)

3. LICENSEE ORGANIZATION

Management Personnel:

E. James Ferland	-Chairman and Chief Executive Officer
Lawrence R. Codey	-President and Chief Operating Officer
Robert J. Dougherty	-Senior Vice President, Electric
Steven E. Miltenberger	-Vice President and Chief Nuclear Officer
Stanley LaBruna	-Vice President, Nuclear Engineering
Joseph Hagan	-Vice President Operations and General Manager Salem Operations
Richard N. Swanson	-General Manager, Quality Assurance and Nuclear Safety Review
Lynn K. Miller	-General Manager, Nuclear Operations Support
Francis X. Thomson	-Licensing Manager
Lee Catalfomo	-Operations Manager
Michael P. Morroni	-Manager, Maintenance-Controls
Arthur Orticelle	-Manager, Maintenance-Mechanical
John W. Morrison	-Technical Manager
Terry L. Cellmer	-Radiation Protection/Chemistry Manager
Richard T. Griffith, Sr.	-Station QA Manager
G. Charles Munzenmaier	-Manager, Salem Station Planning
Peter Moeller	-Manager, Site Protection
Greg Mecchi	-Manager, Nuclear Training
Christopher Connor	-General Manager, Nuclear Support and Services

Workshifts

5 operations shifts, 2 working 12 hour shifts/day, 1 relief crew, 1 crew in training, 1 crew off.

<u>Shift Complement:</u>	<u>TS minimum</u>	<u>Actual</u>
	3 SRO	4 SRO
	4 RO	5 RO
	1 STA	1 STA (dual role SRO)
Non-licensed Operators	5	7 or 8

Maintenance Electrician/I&C	1	2
Chemistry/Rad. Prot.	1	2
Fire Brigade	5	6 (site fire brigade shared with Hope Creek)

4. OPERATOR LICENSING

a. Licensed Reactor Operators (Licenses Cover Both Units):

- Total number of active SROs: 29
- Total number of active ROs: 26
- Total number of certified instructors: 13
- In June 1993, NRC performed TI 117, "Licensed Operator Requalification Program Evaluation"; results were satisfactory.
- One simulator (modeled after Unit 2) located at the training facility in Salem, NJ, and used for Unit 1 and Unit 2 operator training and NRC administered licensing exams. PSE&G completed a major modeling upgrade package in the summer of 1993.

b. Other Licensed Operator Training / Performance / Staffing Concerns:

- Shift Supervisors began working 12 hour shifts during refuel outages conducted in the spring and summer of 1992, formally implementing that schedule in November 1992. The remainder of the shift complement maintained 8 hour shifts until April 1992, when, upon a union vote, they also adopted the 12 hour shifts for a 1 year trial basis. The reactor operators and equipment operators will be voting again in April 1993 as whether to permanently stay on 12 hour shifts.

II. PLANT PERFORMANCE DATA

1. CURRENT OPERATING STATUS (for period 10/1/93 to 3/1/94)

PSE&G shut down Unit 1 on October 1, 1993, to commence a 72 day refueling and maintenance outage. Prior to the shutdown, the unit had been on line since July 15, 1993, and operating at or near full power. Plant management extended the outage completion date (originally scheduled for December 17) because of emergency diesel generator (EDG) operability concerns. On December 2, 1993, a cracked cylinder liner in a Unit 2 EDG raised generic operability concerns for Unit 1 No. 1B EDG because of the similar liners installed in No. 1B. Operators restarted the unit on January 24; it automatically tripped from 100% power, on January 27 in response to a low water level condition in No. 14 steam generator. Operators restarted the unit on January 31, and operated the unit at power until it automatically tripped, from 100% power, in response to a loss of control power to the main turbine control system. PSE&G restarted the unit February 13, synchronized to the grid February 20, and has operated the unit at or near power through the end of the month.

10/93 U1
Refuel
outage

1/94 RT
Low SG low
controller
malfunction

2/94 RT
Loss Control
PWR TO EDG

4/94 RT
CRACKS
REPAIR

PSE&G operated Unit 2 at or near full power throughout the fall, until December 3, 1993, when operators shut down the unit due to failure of a cylinder liner in the 2C EDG. After completion of repairs to the EDG, operators restarted the unit on January 3, 1994, and operated at full power until January 19, when the reactor engineering staff discovered that PSE&G had apparently operated Unit 2 in excess of 3411 megawatts (thermal). Since then, and through February, operators have maintained Unit 2 at 95% power.

2. RECENT SIGNIFICANT OPERATING EVENTS AND IDENTIFIED SAFETY CONCERNS

a. Significant Events (of last 12 months)

- Unit 1 automatically tripped on February 10, 1994, from 99% power, in response to a loss of 15 VDC power to the main turbine control system. The plant stabilized at normal operating pressure and temperature. PSE&G determined that the 15 VDC power supplies had tripped when their protective relays sensed an over-voltage condition. (See IR 50-272/94-01)
- Unit 1 automatically tripped on January 27, 1994, from 10% power, in response to a low water level condition in No. 14 steam generator. The cause of the trip was a level error controller in the control circuit for No. 14 steam generator feedwater regulating valve, which caused generator water level control to malfunction in the auto position. This malfunction generated the low water level condition and subsequent reactor trip. (See IR 50-272/94-01)

- Operators shut down Unit 2 on December 3, 1993, from 100% power, due to failure of a cylinder liner in 2C emergency diesel generator (EDG). PSE&G conservatively determined they had a basis for concern about the particular liner's reliability and consequently declared Unit 1 EDG 1B inoperable as well, since the 1B diesel had similar liners installed. (See IR 50-311/93-27)
- On November 2, 1993, operators declared an Unusual Event (UE) in response to a fire in a 230 volt lighting transformer in the Unit 2 turbine building. The fire brigade responded to the scene and extinguished the fire. The station was in the UE for approximately one hour. A loose electrical connection caused the fire. No personnel were injured and no safety-related equipment was affected. (See IR 50-311/93-23)
- On October 13, 1993, operators declared an UE in response to a fire in the Unit 1 No. 12 service water piping penetration bay. The shift supervisor notified PSE&G Fire Department, which responded to the scene and extinguished the fire. The station was in the UE for about 50 minutes. The fire was caused by sparks from a grinding activity, which ignited insulation from service water piping. Three contractor employees were treated for smoke inhalation; no equipment sustained damage. (See IR 50-272/93-21)
- On August 24, 1993, operators initiated a Technical Specification-required shutdown of Unit 1 in response to a degraded voltage on a cell in the 1C 125 volt battery. The need to shut down was relieved when the NRC exercised enforcement discretion in response to the licensee's request and associated justification. (See IR 50-272/93-20)
- On July 11, 1993, while the repairs to a faulty Unit 1 feedwater isolation protection relay were being performed, the main feedwater regulating valve for the No. 14 steam generator inadvertently went closed at 8:38 p.m., resulting in the water level in that steam generator dropping to a level sufficient to cause an automatic reactor trip. The licensee determined that the technician who was repairing the SSPS relay lifted an improper lead and caused the isolation of the No. 14 steam generator. The licensee additionally determined the root cause of the technician's error was inadequate detail and direction in the SSPS troubleshooting plan. Subsequent to the cause determination of the trip, PSE&G repaired the SSPS and commenced a reactor startup on July 15, 1993. The unit was returned to service on July 16, 1993. (See IR 50-272/93-19)
- On July 10, 1993, toxic gas release (ammonia) in the Unit 1 turbine building caused by a loop seal failure on the ammonia hydroxide storage tank due to overpressure. This apparently resulted from excessive ambient temperature conditions. The licensee will change the concentration of the ammonia hydroxide in the tank to increase the boiling point of the solution to prevent recurrence. (See IR 50-272/93-19)

- On June 8, 1993, Unit 1 automatically tripped following massive intrusion of sea-grass into the circulating water system suction. Four of five operating circulating water pumps tripped, causing a loss of main condenser vacuum, turbine trip, and subsequent reactor trip. (See IR 50-272/93-19)
- On May 28, 1993, Unit 2 was manually tripped by the operators per abnormal operating procedures when control bank "C", group 1 control rods (four rods total) fell into the core during reactor start up operations. At the time the operators were diluting the RCS to criticality for post-refueling startup. A card failure was attributed to a degraded solder trace in the rod control system, which led to the event. (See IR 50-311/93-81)
- On March 16, 1993, Unit 2 automatically tripped from 100% power due to a low-low level condition on the No. 24 steam generator. A failed pressure control switch in the condensate polishing system led to a low suction pressure condition for the No. 22 steam generator feed pump and subsequent feed pump trip, which caused the steam generator low level reactor trip. (See IR 50-311/93-08)

b. Performance Indicator Data

Units 1 and Unit 2:

- Performance indicators generally show good performance. Capacity factor numbers were low for 1993 due to back-to-back outages of Unit 1 and Unit 2 and shutdowns for potentially generic safety issues such as rod control and diesel generator cylinder liners. No other significant trends are evident in the statistical analysis.

c. Recently Identified Technical Safety and Managerial Challenges
(of last 12 months)

- The NRC Resident Office continues to monitor and evaluate the licensee's efforts to improve plant material condition, repair and replace service water piping, upgrade the RMS system, complete actions relative to Appendix R requirements, issues associated with fire watches and security guards, personnel error reduction efforts, and procedure quality and compliance improvement efforts.
- Reviews were conducted and are planned for erosion/corrosion program.
- Service Water (SW) Leaks: Numerous SW through wall leaks continue to occur due to erosion and microbiologic induced corrosion attack of carbon steel piping. The licensee has a seven year pipe replacement project that will replace 95% (about 19,000 linear feet are safety related) of the safety related SW piping with 6% moly stainless steel. This project will continue through 1995 (two more refueling outages per unit). Currently, approximately 90% of

the safety related portion of the project has been completed, including the majority of the SW piping in containment. Based on NRC inspection, SW pipe replacement project is progressing satisfactorily as scheduled.

- Radiation Monitoring System (RMS) Problems: RMS problems have resulted in numerous ESF actuations and reportable events. Short term corrective actions were completed on both Unit 2 and Unit 1 during the 1992 refueling outages. These changes include electronic upgrades and a new uninterruptible power supply. Longer term actions (1993-4) include a complete system upgrade. Based on NRC inspection, the upgraded RMS operation to date has been satisfactory.
- Failure of Overhead Annunciators: On December 13, 1992, a Unit 2 operator discovered that the overhead annunciators had not been updating alarms for about 1 1/2 hours. This was the result of a member of the operating shift entering a keystroke combination into a remote control workstation that, when input through the wrong system port, prevented the system from updating alarms. An AIT was dispatched to the site and concluded: (1) the root cause was a failure to follow procedure for proper operation of the overhead annunciator system; (2) the design of the OHA system permitted the operator to inadvertently emulate the password-protected software without warning.
- Rod Control System: On May 27, 1993 Unit 2 operators experienced several problems with the rod control system. The most significant event was that during an attempt to insert Shutdown Bank "A", one control rod actually withdrew 15 steps of travel. An AIT was dispatched to the site and concluded: (1) the root cause was an introduction of static charges into the solid state electronic components which caused system damage; (2) damage was also caused by voltage spikes originating from "back EMF" in the system's electro-mechanical step counters (the suppression diode installed to mitigate this previously-known phenomenon was disabled due to a failed pin connector on the affected circuit card).

At 5:12 p.m. on July 18, 1993, Salem Unit 2 Control Bank D (8 control rods) began stepping inward at a rate of 72 steps per minute, but only moved a few steps before being detected by operators. At the time, Unit 2 was at 100% power with the control rods in automatic. The operator, finding no apparent cause for the rod insertion, positioned the rods in manual control, which stopped the rod movement. The operators performed all actions per their abnormal rod movement procedure (AB-ROD-0003) and were still unable to positively identify the cause. The licensee installed monitoring instrumentation on the inputs to the automatic rod control signal summator and at 11:40 p.m. on July 18, returned rod control to automatic.

At 11:24 a.m. on July 21, 1993, the licensee again experienced the same phenomenon on Unit 2. As in the previous occurrence, the operator quickly evaluated the situation and appropriately placed the rods in manual control. In both cases the rods only moved inward a few steps (2 and 4 steps

respectively). Current traces on the signal summator input revealed no change from the nuclear instrument (NI) or turbine impulse pressure, but some spiking from the average temperature (Tave) and reference temperature (T ref) input. Together these four signals are the input signals to the automatic rod control system. On July 21, the licensee placed additional monitoring instrumentation on the output of the signal summator, output of the "rod in output" signal comparator, and individually on all four Tave channels.

On July 22, 1993, during I&C troubleshooting, the licensee was able to identify a fault in the signal summator, which erroneously produced a high rod inward demand output for a relatively small temperature error input.

- Switchyard Modifications: During the recent outage on Unit 1, PSE&G implemented an extensive design change package involving modifications to the Salem switchyard. These modifications increased voltage recovery on vital and group buses during bus transfers, provided load growth capacity, removed the Salem circulating water system pump motor feeds from the Hope Creek switchyard, improved voltages in both Salem plants, provided margin for short circuit capability, and improved plant reliability. Major components added included two 500/13.8 kv transformers, four 13.8/4.16 kv transformers, four 13.8 kv breakers, and 4.16 kv switchgear for the circulating water system bus.
- Unit 2 Sustained Operation of Greater Than 100% Power: Suspected root cause is erosion of the feedwater flow nozzles resulting in incorrect online calorimetric data. Upon discovery, licensee immediately reduced power for both units, and began adjusting instrument setpoints to insure conservative operation. Licensee is pursuing determination of the exact power level and the effects on the UFSAR Chapter XV analyses. They expect resolution by mid-April 1994.
- Emergency Diesel Generator Cylinder Liner: This caused Salem 2 to shut down as a result of a cracked liner, and delayed Salem 1 to delay startup from the refueling outage. The licensee could not find a clear root cause. The suspected root cause was dimensional tolerance problems with liners distributed by Canadian Allied Diesels. PSE&G determined that only two liners have ever failed, including the Salem liner, in a population of tens of thousands of liners in use world wide (including locomotives and ships).

3. ESCALATED ENFORCEMENT ACTIVITIES

- The NRC issued a Level III Violation on March 8, 1994, documented in NRC Inspection Report 50-272 and 311/93-23; 50-354/93-25. The violation was based on multiple examples of PSE&G's failure to follow procedures and their failure to properly control safety-related activities.

4. IPE INSIGHTS

- The Salem IPE was submitted to the NRC in July 1993, and is still under NRC review.

III. ANALYSIS/ASSESSMENT

1. PREVIOUS SALP RATINGS AND OVERVIEW

a. Previous SALP Ratings

<u>Functional Area</u>	<u>December 28, 1991</u>	<u>June 19, 1993</u>
Operations	2	2
Maintenance/ Surveillance	2	2
Radcon	2, Imp	1
Emergency Preparedness	1	1, Declining
Security	1	1
SA/QV	2	2
Engineering & TS	2	2

Current assessment period: June 20, 1993 to December 10, 1994.

b. SALP Overview (derived from the summary paragraph of each SALP section):

OPERATIONS

On July 29, 1993, the SALP board met to discuss PSE&G's performance at Salem during the period from December 29, 1991 to June 19, 1993. The board concluded that the licensee had operated the Salem units safely and that operator response to operational events was excellent. The overall performance in the Operations area was good. However, weaknesses were noted in the decisions to restart Unit 2 following the rod control system problems, in the failure to follow procedures resulting in the loss of Unit 2 annunciators, and in the inadequate oversight of the fire protection program.

MAINTENANCE/SURVEILLANCE

The board concluded that the Salem maintenance and surveillance programs contributed to the safe operation of the two units during the assessment period. In general, a declining number of personnel errors in both maintenance and surveillance indicated improving performance. However, the number of transients induced by component failures and the significant problems with the rod control system raise questions regarding the overall effectiveness of the maintenance and engineering support functions.

RADIOLOGICAL CONTROLS

PSE&G continued to implement effective radiological controls and ALARA programs during this period. The SALP board noted improvements in this functional area including strong management support and oversight. Quality Assurance audits in this area were of very good quality.

EMERGENCY PREPAREDNESS

The SALP board determined that PSE&G maintained a generally strong and effective emergency preparedness (EP) program. However, the board was concerned with an apparent decline in the ability of the licensee to make correct initial Protective Action Recommendations during training, drills and annual exercises. This concern resulted in the board's assessment of a declining trend for this area. The board also concluded that PSE&G continued to maintain an effective and performance-oriented security program during this period. Overall, licensee performance in both EP and security remained excellent.

ENGINEERING AND TECHNICAL SUPPORT

Engineering and technical support organizations provided good support for refueling and maintenance outages, and strong performance in addressing day-to-day problems. The SALP board noted that training programs for engineering personnel were excellent but that weaknesses were observed in the licensee's non-conformance, erosion/corrosion, and fire protection programs. Although the root cause training program was viewed as a strength, the board noted that the threshold for initiating actual root cause investigation was not clear or consistent.

PSE&G management continued to provide generally effective management support. Significant Event Response Team (SERT) reviews of major events have been effective. However, the board noted that in several instances, PSE&G failed to initiate adequate root cause evaluation or assessment of abnormal conditions. NRC interaction with PSE&G management was needed in a number of cases in order for full evaluation and corrective action to be taken in a timely manner. Once initiated, comprehensive assessment, root cause analysis and effective corrective actions were implemented. Outage planning and training programs in all areas were considered strengths.

2. LICENSEE RESPONSE TO PREVIOUS SALP FUNCTIONAL AREA WEAKNESSES / RECENT LICENSEE PERFORMANCE TRENDS (in the last year)

● OPERATIONS

PSE&G continues to safely operate the units. Operator plant knowledge and response to events remains strong, however, operator response has been less than thorough regarding indications of stuck-open RHR check valves, indications of a possible leaking RHR pressure isolation valve, and a case of indeterminate hotwell level.

Recent management changes included the naming of a new Operations Manager in September 1993, and two new Operations Engineers in January 1994. The licensee intends to pursue full unitization of the Salem operating crew shifts.

● MAINTENANCE AND SURVEILLANCE

Although maintenance and surveillance activities remain generally good, as exhibited by strong Maintenance Department performance in response to the December 1993 EDG cracked cylinder liner issue, the recent Unit 1 refueling outage was marked by multiple examples of poor work control practices and multiple examples of failure to follow procedures.

In order to improve overall performance and response to emergent issues, PSE&G has reorganized the Maintenance Department. Recent changes include replacing the single Maintenance Manager role with three new positions: 1) Mechanical Maintenance Manager, 2) Controls Maintenance Manager, and 3) Planning Manager. PSE&G is also pursuing unitization in these departments.

● ENGINEERING AND TECHNICAL SUPPORT

Both Salem system engineering and PSE&G nuclear engineering have continued to provide good engineering support for plant operations.

An NRC observation related to the Salem rod control issue was that the initial troubleshooting efforts lacked clear leadership and delegation of responsibilities. This resulted in the efforts narrowly focusing on the most recent system malfunction without adequate attention to the repetitive nature of the failures and the need to determine and correct the root cause. The failure of PSE&G to determine the root cause of the failures resulted in numerous aborted startup attempts. The team did observe significant improvements in the control of troubleshooting and root cause determination during the inspection.

- PLANT SUPPORT

The NRC noted that PSE&G continued to perform at a noteworthy level in the area of radiological protection through the end of 1993, especially during the recent Unit 1 refueling outage.

The licensee's annual partial-participation emergency preparedness exercise was conducted on June 23, 1993. On-site response to the simulated emergency was very good. An exercise strength was Emergency Response Manager command and control. No exercise weaknesses were identified. Significant areas for potential improvement were maintenance team tracking from the Operational Support Center and public address system operability in the Technical Support Center.

The PSE&G security program continues to be effectively directed towards public health and safety. A strike by the security force was narrowly averted when a new labor agreement was reached in November 1993.

- SAFETY ASSESSMENT/QUALITY VERIFICATION

In July 1993, the licensee formed a Comprehensive Performance Assessment team (CPAT) which conducted a special assessment of safety issues and recent plant events using an integrated MORT investigatory analysis. The CPAT developed comprehensive root causes for these events, and the licensee has formed task teams charged with developing corrective actions. PSE&G has held periodic meetings with the NRC to discuss CPAT findings, and the NRC continues to monitor licensee progress in this area.

In February 1994, PSE&G Vice President of Nuclear Operation (VP-NO) assumed the collateral role of General Manager of Salem Operations. The licensee also initiated other management changes under the VP-NO and intends to pursue unitization of the Salem units. PSE&G has implemented these changes in order to achieve sustained improvement in the area of Salem performance.

3. LICENSEE PERFORMANCE STRENGTHS AND WEAKNESSES *

Salem performance continues to be inconsistent.

- Capacity factor has been low due to refueling outages at both units and forced outages due to rod control problems, and diesel liner concerns.

Strengths:

- The licensee continues to increase resources for a material condition improvement program. The NRC has observed noticeable improvement in the material condition of the plant, indicating that the licensee has been earnest in the implementation of improvements.

- The Procedure Upgrade Project (PUP) was closed out in September 1993. A large majority of procedures were reviewed and upgraded, and procedure maintenance has been made the responsibility of the Technical Department.
- Material condition
- Procedure quality
- Radiation protection program implementation
- When problems or conditions are self-identified and self-detected, event response and root cause determination are thorough and comprehensive, particularly when the matter is the subject of NRC attention. In other cases, the licensee's performance is considered weaker, as identified below.
- PSE&G has responded to identified performance and management weaknesses relative to approach to problem resolution by initiating the following actions:
- Replacing the Salem General Manager with the Vice President, Nuclear Operations until the licensee's program changes are in place;
- Verifying the effectiveness of numerous supervisors and managers and changing the incumbent when deemed appropriate
- Pursuing unitization of the maintenance, operations, and planning organizations,
- Implementing the existing performance assessment tools to improve accountability from the highest levels of management down to rank and file workers,
- Forming dedicated teams to implement the corrective actions developed in response to the CPAT findings.

Weaknesses:

Salem performance has been weak in:

- Control of maintenance
- Recognition of the need to do root cause determination,
- Corrective action effectiveness due to inadequate root cause assessment
- Inadequate approach to problem resolution (i.e., general tendency to fix problems or conditions without assessment or understanding of causal factors. Examples include, but are not limited to the licensee's initial response to cracked diesel liner issues, failure to identify elevated reactor power in 1992, and failure to recognize generic implication of rod control problems

4. NRC TEAM INSPECTIONS WITHIN THE LAST YEAR

<u>Area/Date</u>	<u>Findings</u>
EDSFI Assessment August 16 - September 3, 1993	Licensee-contracted EDSFI has been completed. The NRC assessment of the licensee EDSFI identified a number of minor concerns; but, concluded overall that the licensee's assessment was good.
Augmented Inspection Team (AIT) June 5 - July 2, 1993	An AIT was formed to review and evaluate the circumstances surrounding a problem with the Unit 2 rod control system. The components within the control circuitry that led to rod withdrawal when operators were demanding rod insertion.
Appendix R Inspection May 17-21, 1993	Identified concerns with Kaowool and 3-M fire wrap material. Also weaknesses in safe shutdown outside the control room and lighting. Re-evaluation to occur during July 1993.

5. PLANNED TEAM INSPECTIONS

SWSOPI Date and scope to be determined.

DET/OSTI/IPAT?? (Does this team exist yet?)

IV. INSPECTION PROGRAM STATUS

1. STATUS OF INSPECTIONS

The inspection program status is reflected in attached MIPS report #2. The data is current as of the date of the MIP. The MIP indicates that inspection program is on-track with the planned resource allotment; no significant shift in inspection activities is warranted.

2. PROPOSED CHANGES TO MIP

- Unit 1
 - A. DRSS -
 - B. DRS -
 - C. DRP
- Unit 2
 - A. DRSS -
 - B. DRS -
 - C. DRP -

3. SIGNIFICANT ALLEGATIONS AND INVESTIGATIONS

- There are eight open significant allegations at Salem. (two are common with Hope Creek)

Three allegations are related to harassment and intimidation of licensee personnel, up to and including allegations of promotion denial due to "whistleblowing." One of the allegations asserts that the Offsite Safety Review Group is not performing its function in accordance with technical specifications. OI is actively reviewing these cases.

A fourth allegation asserted that the main security access center at the Salem/Hope Creek site was not manned as required by the NRC approved security plan. DRSS is scheduled to conduct a routine security inspection in March 1994 and will review this matter.

The fifth allegation concerns an operator wrongdoing issue. During and subsequent to the Overhead Annunciator (OHA) AIT in early 1993, neither of the two operators in the control room at the time of the incident admitted to any manipulation of the OHA system, even though clearly operator involvement was a contributor to the event. DRP is reviewing the licensee's investigation and followup into this matter and will determine this issue's resolution on the basis of that review.

The sixth allegation involves a technical question that suggests that HVAC ductwork integrity may not be assured under dynamic loading of new fast-acting curtain fire dampers. DRP is reviewing test procedures and results while DRS is scheduled to review the matter during the next routine fire protection inspection.

The seventh allegation regards evidence that the Rod Control problems experienced by the plant (and followed up by the AIT) occurred during startup testing at the Zion nuclear station, even though Westinghouse representatives denied that the problem had ever occurred before. OI has opened an investigation into this case and is currently reviewing the matter.

The final allegation concerns 6 technical issues raised regarding the environmental qualification of equipment. Upon agreement of the allegor, this matter will be referred to the licensee for resolution. Otherwise, DRS will followup it up.

4. OPEN ITEM STATUS

BACKLOG/No. GREATER THAN 2 YRS

(Unit 1 and 2 - Common) 57/6

NOTE: The large number of open items is due to the issuance of an Appendix R/Fire Protection Team Inspection Report in October 1993 and an EDSFI Team Inspection Report in November 1993.

5. OUTSTANDING LICENSING ISSUES

- GL 89-10 (MOV) - technical differences between NRC/PSE&G. (Hope Creek also)
- EDG amendment - meeting held May 11, 1992 to resolve issues.
- TS amendment to resolve AFW/containment spray issue (see Section II.2.a).
- Increase in surveillance test intervals and AOT for reactor trip and ESFAS.
- Install new digital feedwater control system.
- Evaluation of Control Room Design Deficiencies that were not corrected.

- Bulletin 88-08 (Thermal Stress in Piping Systems Connected to the RCS) - licensee is revising their response.

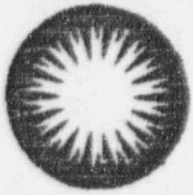
6. LOCAL/STATE/EXTERNAL ISSUES

a. NJ DEPE/BNE

- Now providing input/comments on all PSE&G licensing change requests.
- Letter regarding Salem RMS (see Section II.2.a).
- Provided comments on recent SALP report.
- High interest in resident inspection accompaniment.
- Continuing interest in Salem cooling tower issue: When Salem's renewable variance for the use of the Delaware River as a heat sink came up for renewal in 1984, New Jersey environmentalists appealed to the state to not renew the variance. In 1990, NJ DEPE issued a "draft order" requiring PSE&G to build two cooling towers to support the Salem units' operation. PSE&G responded to the state's order with a 56-volume comment, and the issue is currently under review by NJ DEPE. Recent NJ DEPE decision not to require cooling towers.
- State inspector accompanied AITs that reviewed Salem 2 loss of OHA system and RCS.
- Recent letter (6/29/93) concerning digital feedwater modifications to be performed the next two refueling outages.

b. Other (Media Interest)

- Minimal interest in SALP Management Meeting.
- Large interest in AIT (Unit 2 TG failure) exit meeting.
- Smaller interest in two AITs (Unit 2 Loss of Alarms and rod control problems) exit meeting.



PSEG

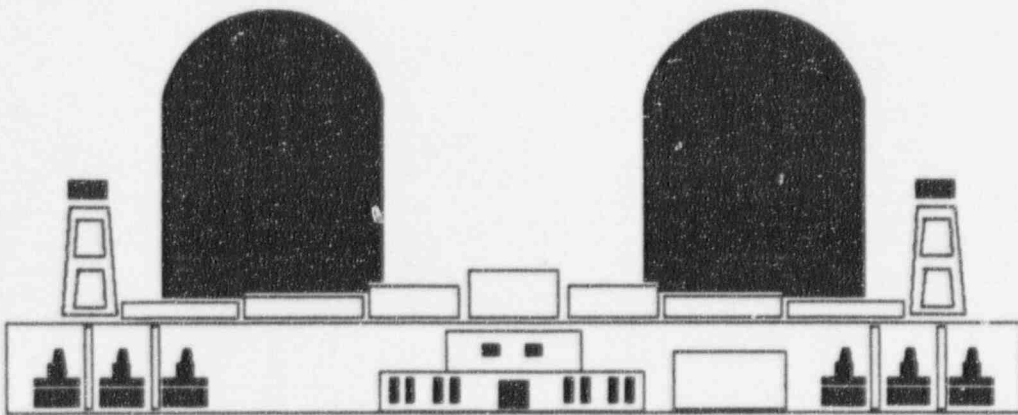
*Public Service
Electric and Gas
Company*

NRC VISIT

MAY 25, 1994

SALEM

GENERATING STATION



28/14
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**SALEM GENERATING STATION
NRC VISIT
AGENDA**

Introduction

Strategy for Improvement

Comprehensive Performance Assessment

Communications

Unitization

Improved Oversight

Measures of Success

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

**COMPREHENSIVE PERFORMANCE
ASSESSMENT TEAM (CPAT)**

Charter Highlights

- Full-time multi-disciplinary, dedicated team
- Report directly to Vice President and Chief Nuclear Officer
- Assess a defined set of 27 occurrences
- Look for previously undiscovered, underestimated, or overlooked root causes, failed barriers, and contributing/causal factors
- Look for "threads" common to multiple occurrences
- Identify responsibility for correcting the root causes, restoring the failed barriers, or eliminating the causal factors
- Act as change agents

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

**COMPREHENSIVE PERFORMANCE
ASSESSMENT TEAM**

Members

Dana Cooley, Manager - Quality Performance

Tom DiGuisseppi, Emergency Preparedness Manager

E.J. Galbraith, Chemistry Engineer - Salem

John Wilson, Nuclear Engineering Consultant - E&PB

Charles Manero, System Engineer - Salem Technical

Greg Mecchi, Principal Nuclear Trainer - Operations

**Roberta Kankus, Senior Strategic Planning Specialist
(PECO Energy Co.)**

**Craig Assimos, Nuclear Technical - Controls Special -
Salem**

**Ron Sutton, Career Pathing Administrator - Human
Resources**

**Steven Spiese, Certified NRRPT Radiation Protection
Technologist - Hope Creek**

**Bruce Little, Former NRC Senior Resident
Inspector/DOE Certified Accident Investigator**

Judy Almond, Senior Secretary - Site Services

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

**COMPREHENSIVE PERFORMANCE
ASSESSMENT TEAM**

- **Senior Project Oversight Group**
 - Monthly report from Assessment Team
 - Purpose
 - ▲ Satisfy group that review was thorough and appropriate
 - ▲ Ensure both short and long term buy-in from Senior Management
 - ▲ Provide impetus for timely action
 - ▲ Share experience with nuclear plant change management
 - ▲ Counsel Senior Managers and Assessment Team
 - ▲ Foster external credibility

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

**COMPREHENSIVE PERFORMANCE
ASSESSMENT TEAM**

Senior Project Oversight Group Membership

**S.E. Miltenberger, Vice President and Chief Nuclear
Officer**

J.J. Hagan, Vice President - Nuclear Operations

S. LaBruna, Vice President - Nuclear Engineering

**M.V. Butz, General Manager - Nuclear Human
Resources & Administration**

**R.N. Swanson - General Manager - QA/Nuclear
Safety Review**

S.P. Cohen, Director - Nuclear Finance

**R.A. Burricelli, General Manager - Information
Systems and External Affairs**

G. Rainey, Vice President - PECO Energy Company

**J. Cross, Senior Vice President - Portland General
Electric Company**

**J.S. Carroll, Professor-Sloan School of Management -
MIT**

M. Peifer, Institute of Nuclear Power Operations

COMPREHENSIVE PERFORMANCE ASSESSMENT TEAM (CPAT)

ACTIVITY/PERFORMANCE STATUS

AS OF APRIL 30, 1994

COMPREHENSIVE PERFORMANCE ASSESSMENT TEAM PROBLEM STATEMENT CATEGORIES

MANAGEMENT PHILOSOPHY, SKILLS AND PRACTICES

- M-1 Supervisory practices that properly support professionals who make decisions and perform work.
- M-2 Management risk assessment and prioritization.
- M-3 Management actions and establishment of accountability.
- M-4 Content and delivery of management training to effectively support individuals and groups.
- M-5 Self-assessment processes

PEOPLE PERFORMING THE WORK

- W-1 Access to timely and accurate technical information versus reliance on interpersonal contacts.
- W-2 Effective use of work planning and schedules.
- W-3 Process work-arounds versus ownership and continuing improvement.
- W-4 Timely and accurate part information and availability with appropriate levels of end-user intervention.
- W-5 Content and delivery of technical training to effectively support individuals and groups.
- W-6 Standards and methods of contractor performance.

PROBLEM SOLVING AND FOLLOW UP

- S-1 Root cause determination.
- S-2 Corrective action follow through.
- S-3 Performance trending for systems and equipment important to reliability and operational control. Action upon results.
- S-4 Operating Experience Feedback (OEF) delivery and tracking that meets the job needs of recipients for information.

Nuclear Department Tactical Plan - CPAT M-1/M-3

Key Focus Items Supported: Management Actions and Establishment of Accountability (CPAT M-3)
 Supervisory Practices that Support Professionals Who Make Decisions and Perform Work (CPAT M-1)

Sponsor: Vice President - Nuclear Operations

Activity	Sponsor	Support	Start	Stop
<p>Implement Salem Personnel Performance Improvement Plan</p> <ul style="list-style-type: none"> Develop and implement a supervisory monitoring program STATUS: Program was developed during 1st quarter 1993, and documented in SL-40. Improving implementation is an ongoing process. SL-40 Program is currently being reviewed to increase effectiveness. Significantly improve two-way communications STATUS: 1. Letter issued by VP-NO in January stating expectations that supervisors spend 16 hours/week in the field. 2. Observation training given by VP-NO & GM-SO to all Salem employees at department engineer level and above during 1994. Being rolled down through organization. Provide 360 degree feedback to Salem supervision STATUS: Ongoing. As of 5/12, 107 1st line supervisors and above have begun the process with 72 having received feedback. 	GM-SO GM-NHR&AS	Sta. Mgrs Mgr-Nuc Comm.	1/93	12/95

Nuclear Department Tactical Plan - CPAT M-1/M-3(cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> • Resolve long-standing equipment deficiencies and reduce number of significant events, to eliminate chronic drain on resources and morale. Expected results are a reduction in the number of events and the elimination of significant events. <p>STATUS: Resolving long standing equipment deficiencies is ongoing. The Salem OEF meeting has determined that two Salem events were "notable" during the 1st quarter of 1994. This compares to ten "notable" events during the 1st quarter of 1993. <i>54 done</i></p> <ul style="list-style-type: none"> • Establish effective vehicles for responding to station workers' issues, concerns and productivity recommendations. <p>STATUS: This item is being met on an ongoing basis by NOIT teams. NOIT's have been in place since 9/93.</p> <ul style="list-style-type: none"> • Improve personnel accountability and ownership relative to: <ul style="list-style-type: none"> • procedure compliance • compliance to work standards • self verification • schedule adherence <p>STATUS: 1) Salem transitioned to the Star Self-Checking acronym during 1/94. 2) Updated work standards handbook issued during 3/94. 3) Above being continually reinforced through supervisory monitoring program.</p>				

Nuclear Department Tactical Plan - CPAT M-1/M-3 (cont'd)

Activity	Sponsor	Support	Start	Stop
<p><u>Develop Descriptive Supervisor Behavior Model (CPAT M1)</u></p> <ul style="list-style-type: none"> Describe/reinforce model at spring supervisors dialogue. <p>STATUS: complete</p> <ul style="list-style-type: none"> Follow-up at fall supervisors dialogue All managers/supervisors to spend at least 16 hours/week of their time in the field. <p>STATUS: Reported data indicates that slightly greater than 16 hours/week is being achieved.</p>	VP-NO	GM-NS&S	2/94	3/94
		All Mgrs/Supvr	9/94 1/94	9/94 12/95
<p><u>Improve the Performance Appraisal Process (CPAT M3)</u></p> <ul style="list-style-type: none"> Managers to review existing performance appraisals for all employees three levels down in their organizations to insure the appraisals accurately reflect individual performance <p>STATUS: Process underway throughout the Nuclear Department.</p> <ul style="list-style-type: none"> Managers prepare and deliver new performance appraisals to employees, as required, to ensure a current performance appraisal (within 12 months) exists for all employees that meets standards (accurate reflection of individual performance). <p>STATUS: Process underway throughout the Nuclear Department.</p>	VP-NO	All Mgrs All Mgrs All Mgrs	1/94 1/94 1/94	12/94 4/94 4/94

Nuclear Department Tactical Plan - CPAT M-1/M-3 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> Continue to reinforce performance appraisal expectations at manager dialogues <p>STATUS: Ongoing</p>			1/94	12/94
<ul style="list-style-type: none"> Review/revise guidance, policies, and rating definitions for performance appraisals <p>STATUS: One to three months behind schedule, revised schedule to January 1995 for implementation. Based on inability to present information during January & February at Managers Dialogue - due to weather conditions.</p>	Compensation		1/94	4/94

M-1 Supervisory practices that properly support professionals who make decisions and perform work

MEASURES:

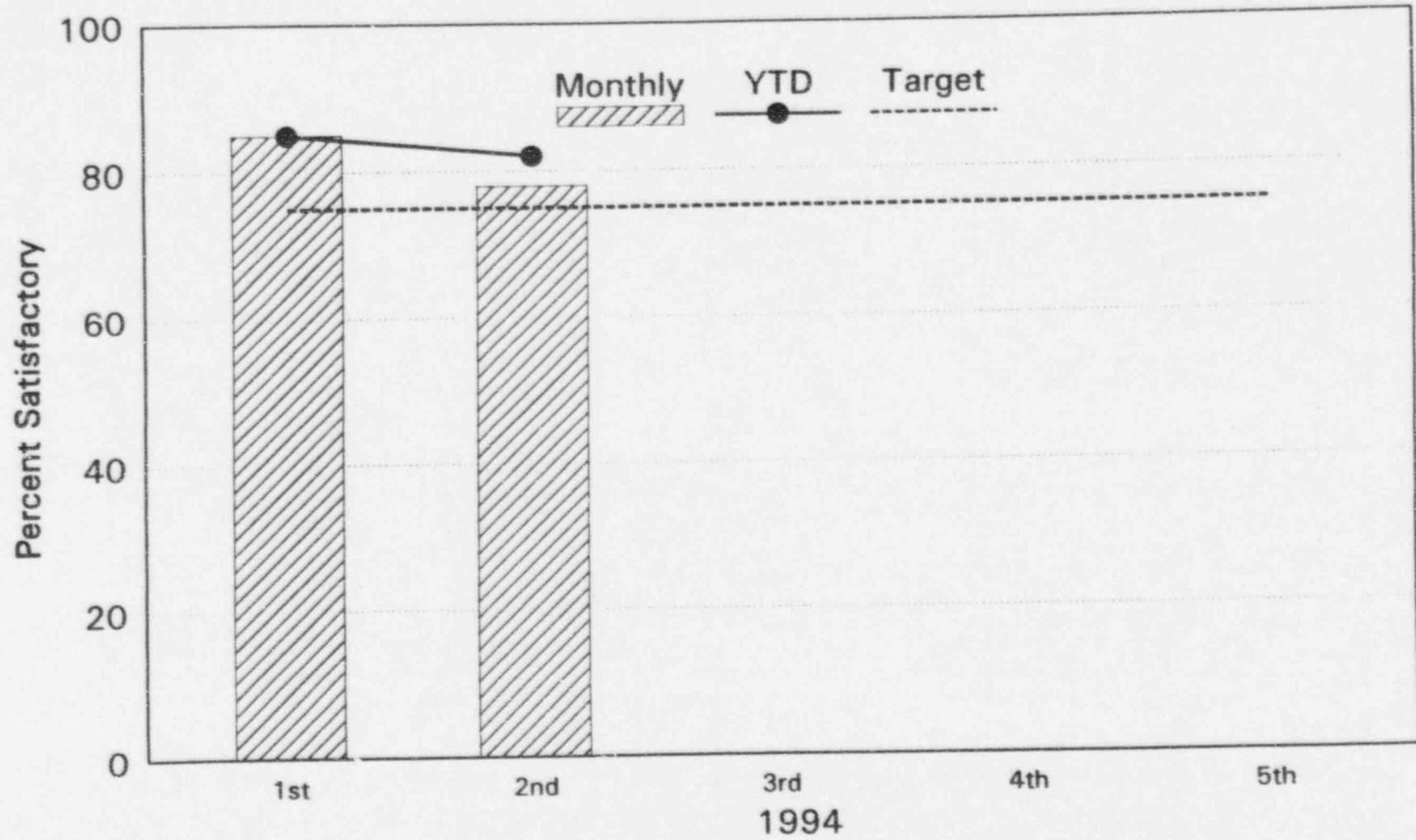
- Business Leadership Development Content Applicability
- Work Practices and Standards Monitoring by Line Management
- Work Practices and Standards Monitoring by QA
- Supervisory Face-to-Face Time
- Total Human Performance Events

M-3 Management actions and establishment of accountability

MEASURES:

- Business Leadership Development Content Applicability
- Work Practices and Standards Monitoring by Line Management
- Work Practices and Standards Monitoring by QA
- Supervisory Face-to-Face Time
- Total Human Performance Events
- Licensee Event Reports (Personnel Error) (M-3 only)

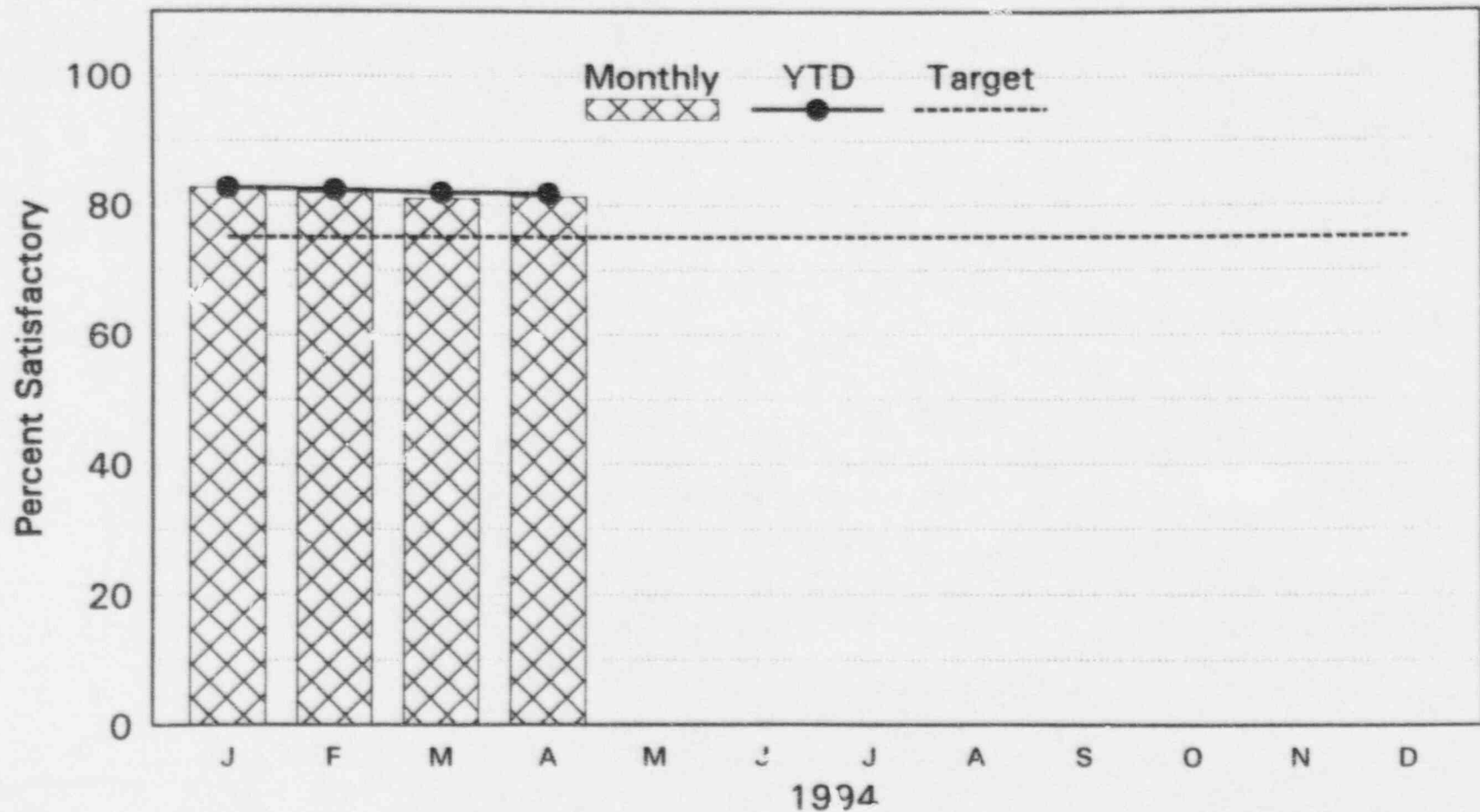
BLD Content Applicability Nuclear Dept



CPM1

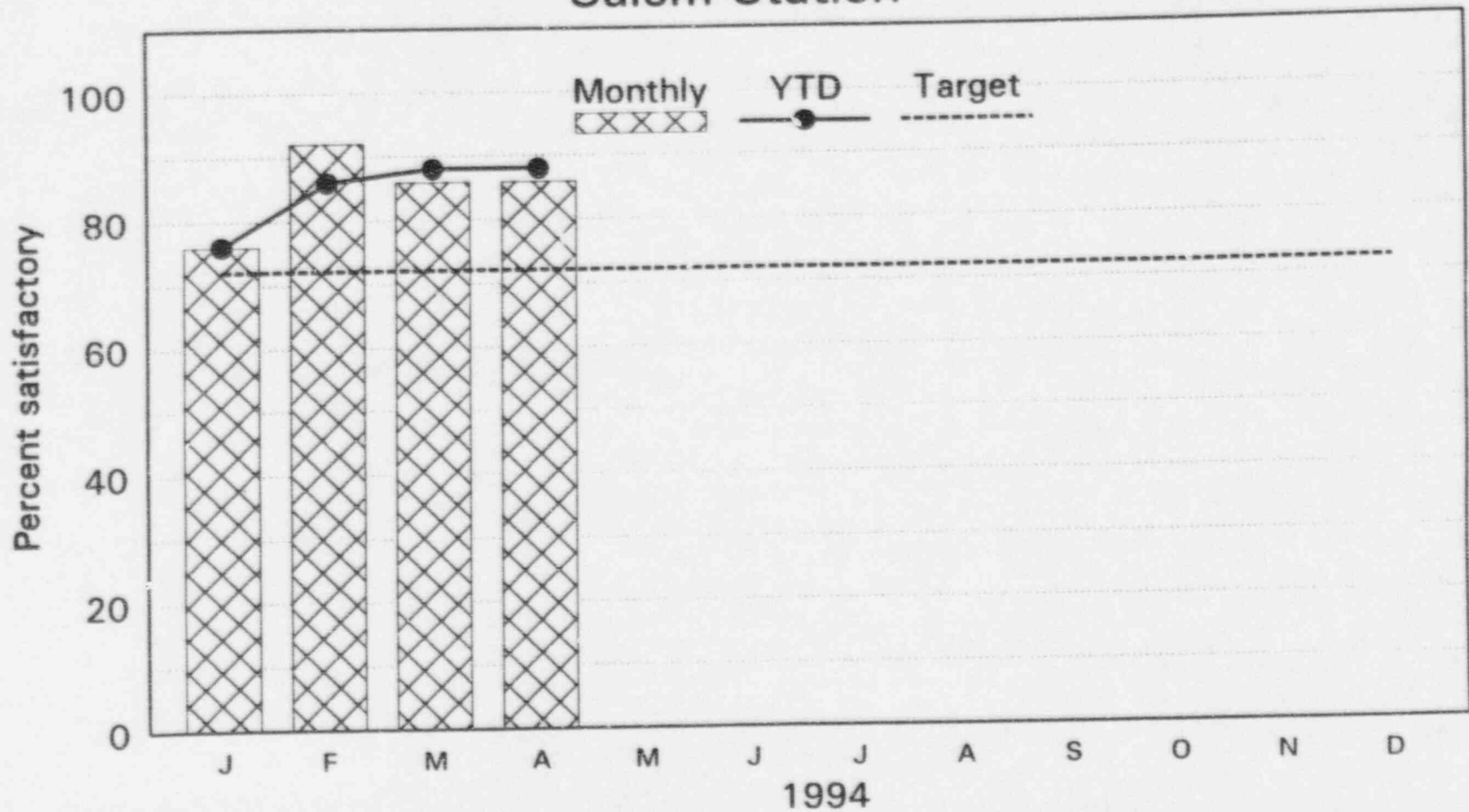
Work Practices & Standards Performance Line Management Monitoring

Salem Station



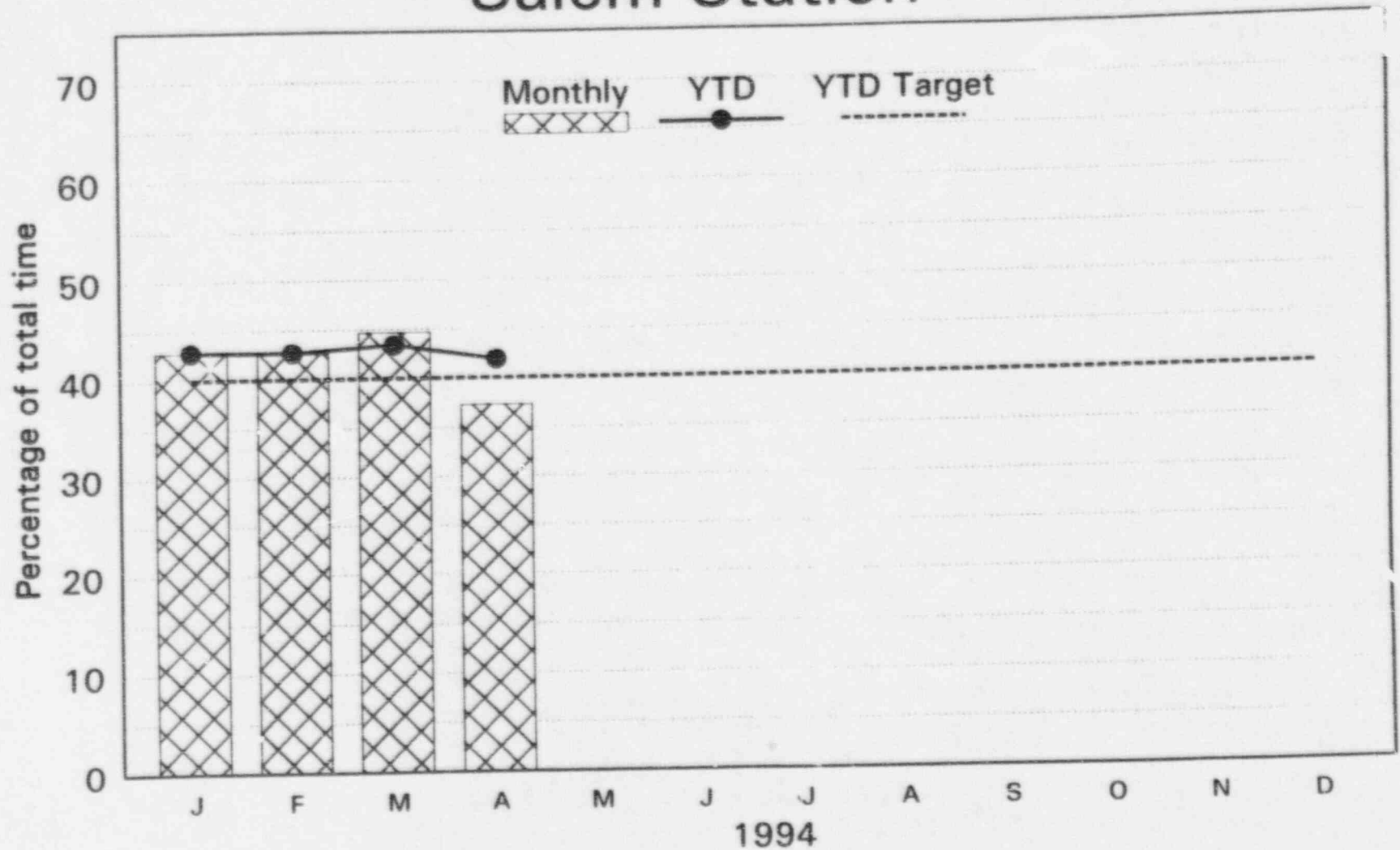
55s

Work Practices & Standards Performance QA Monitoring Salem Station



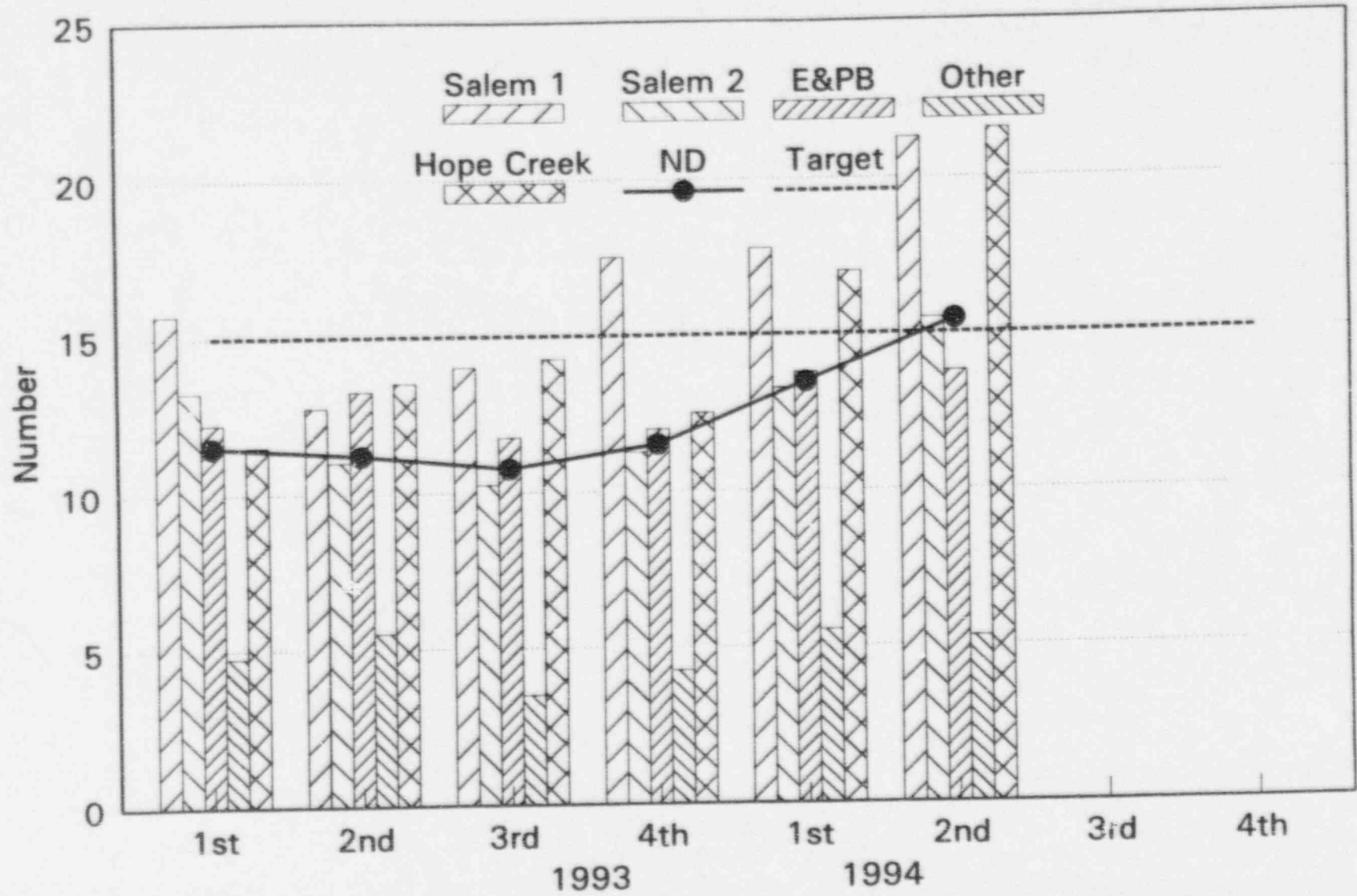
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Supervisory Face-to-Face Time Salem Station



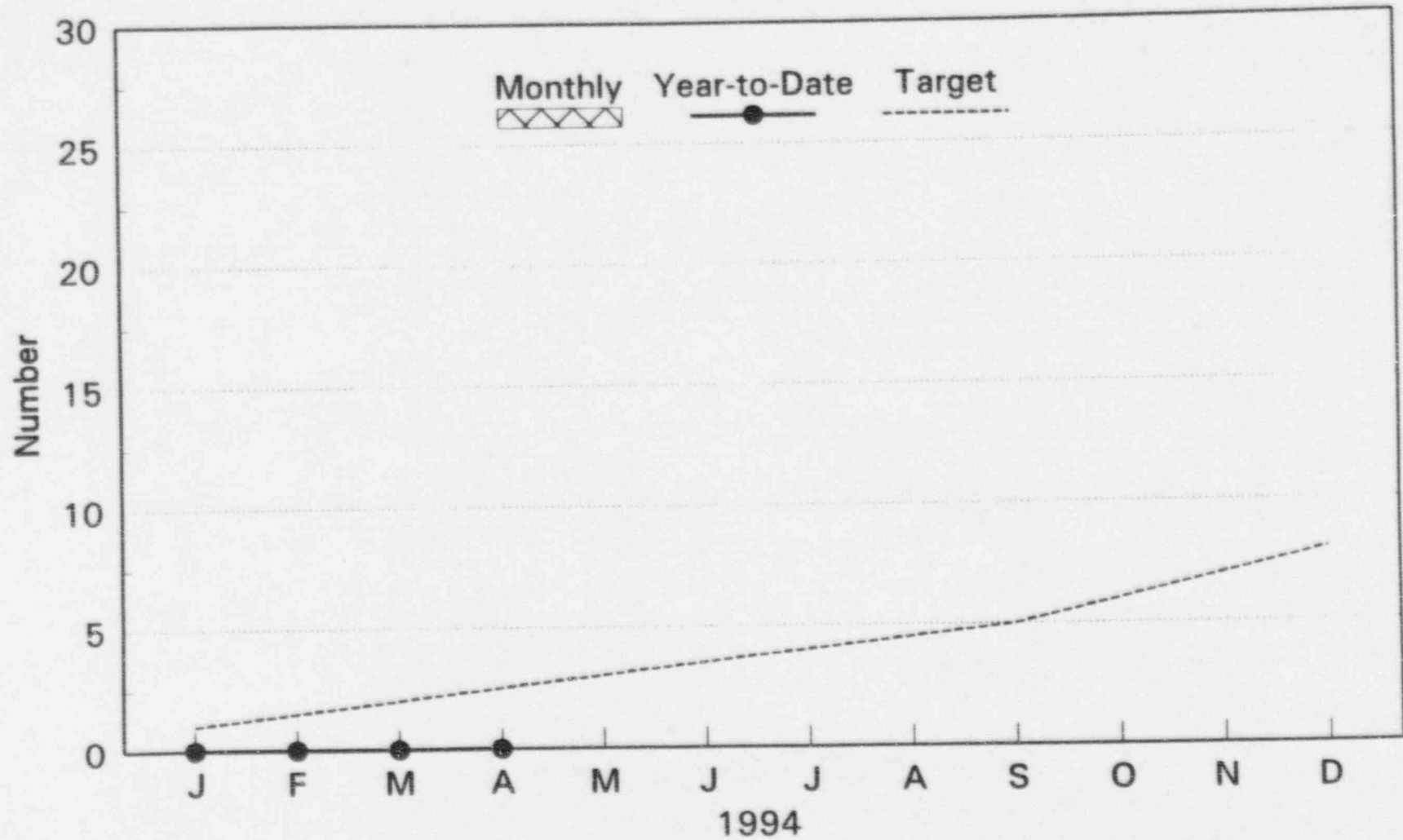
56s

Total Human Performance Events



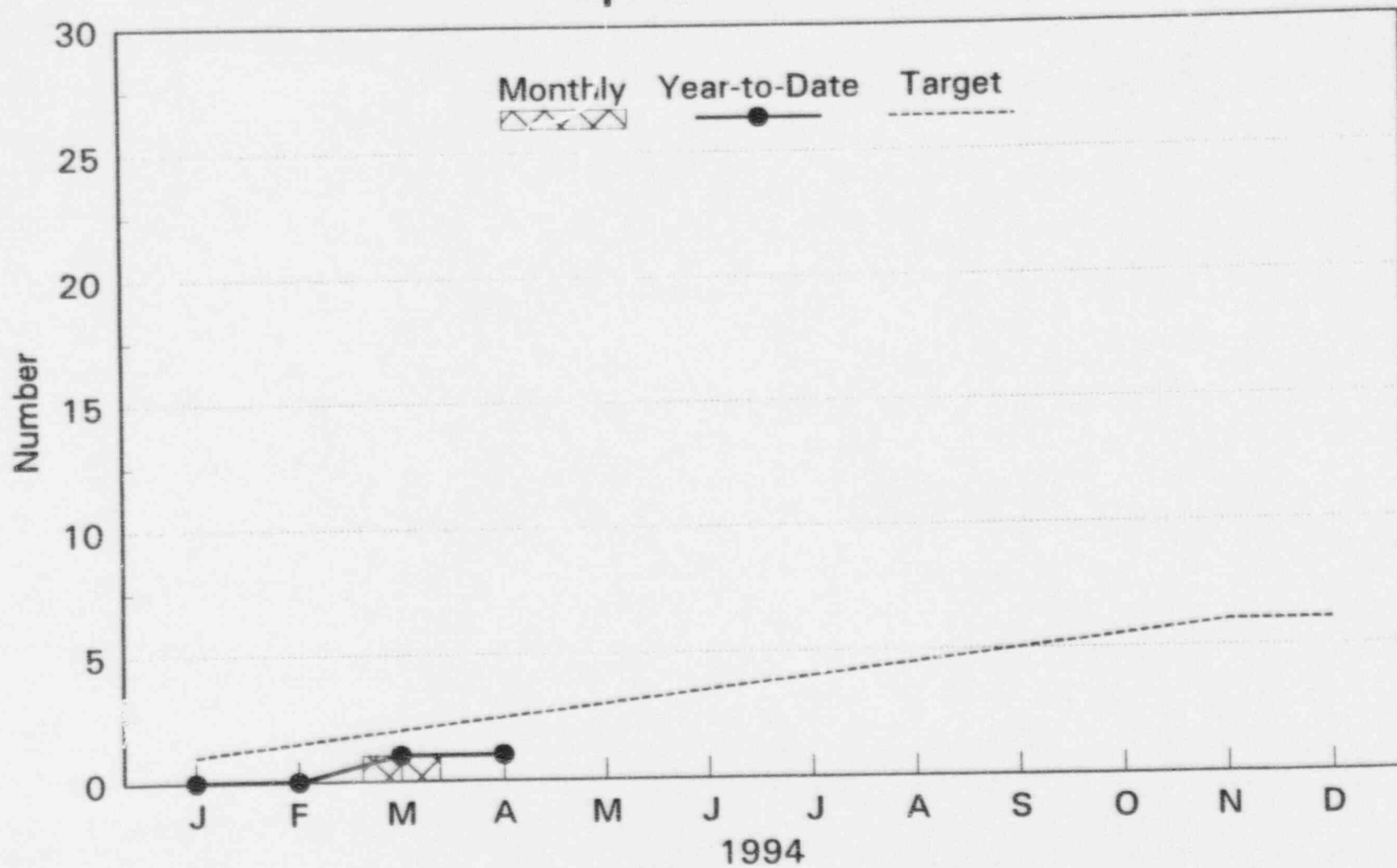
REAS3 12 month avg

LER Personnel Related Salem Station



28s

LER Personnel Related Hope Creek



Nuclear Department Tactical Plan - CPAT M-2

Key Focus Item Supported: Management Risk Assessment & Prioritization (CPAT M-2)

Sponsor: Vice President - Nuclear Engineering

Activity	Sponsor	Support	Start	Stop
<u>Risk Assessment</u>				
Select M2 team and meet with CPAT representatives to establish clarity of issues and brainstorm actions. <u>STATUS:</u> Complete.	VP-NE	M2 Team	1/94	
Establish draft framework and plan to address risk <u>STATUS:</u> Complete.	VP-NE PM-IP (MAP Team)	MAP Team/ PM-IP	11/93	
Obtain acceptance of framework and plan from VP-NE/VP-NO and E&PB peer group (approximately 6 separate sessions). <u>STATUS:</u> Complete.	PM-IP PMA	Peer Group	1/94	
Revise framework plan based on acceptance dialogue sessions <u>STATUS:</u> Complete.	PM-IP PMA		1/94	
Obtain acceptance of framework and plan from E&PB and station department managers (THEY Bashers population). <u>STATUS:</u> Complete.	VP-NE VP-NO	PM-IP PMA	3/1/94	
Investigate the development of risk assessment policy to embrace key components <u>STATUS:</u> Working.	VP-NE VP-NO	M2 Team	3/1/94	6/15/94

Nuclear Department Tactical Plan - CPAT M-2 (cont'd)

Activity	Sponsor	Support	Start	Stop
Design communication plan through 1994 <u>STATUS:</u> Working.	VP-NO	M2 Team/Nuc Comm Mgr	4/1/94	6/15/94
Implement Communication plan	VP-NE/VP-NO	RC Mgrs PMA/PM-IP	6/1/94	ongoing
Set up Socratic Dialogue. (method to demonstrate framework application by Nuclear Department Leadership) (Video session for roll down) <u>STATUS:</u> Working	PM-IP/PMA	VP-NE VP-NO	3/1/94	7/1/94
Design mini tool, thought process aid as handout <u>STATUS:</u> Working	VP-NE VP-NO	PMA/PM-IP	4/1/94	6/1/94
Roll out framework and Socratic Dialogue. Roll out per communication plan (use video as aid)	VP-NE VP-NO	PM-IP/PMA	7/1/94	9/1/94
Design measures through 1994 to assess what changes have occurred in prudent risk taking	VP-NE	M2 Team RC Mgrs	7/1/94	7/1/94
<u>Prioritization</u>				
Select M2 team and meet with CPAT representatives to establish clarity of issues and brainstorming actions <u>STATUS:</u> Complete.	VP-NE	M2 Team	1/94	
Survey RC managers for work in department that can be a) stopped, b) given lower priority, c) emphasized less by management <u>STATUS:</u> Complete.	VP-NE	RC Mgrs	2/8/94	

Nuclear Department Tactical Plan - CPAT M-2 (cont'd)

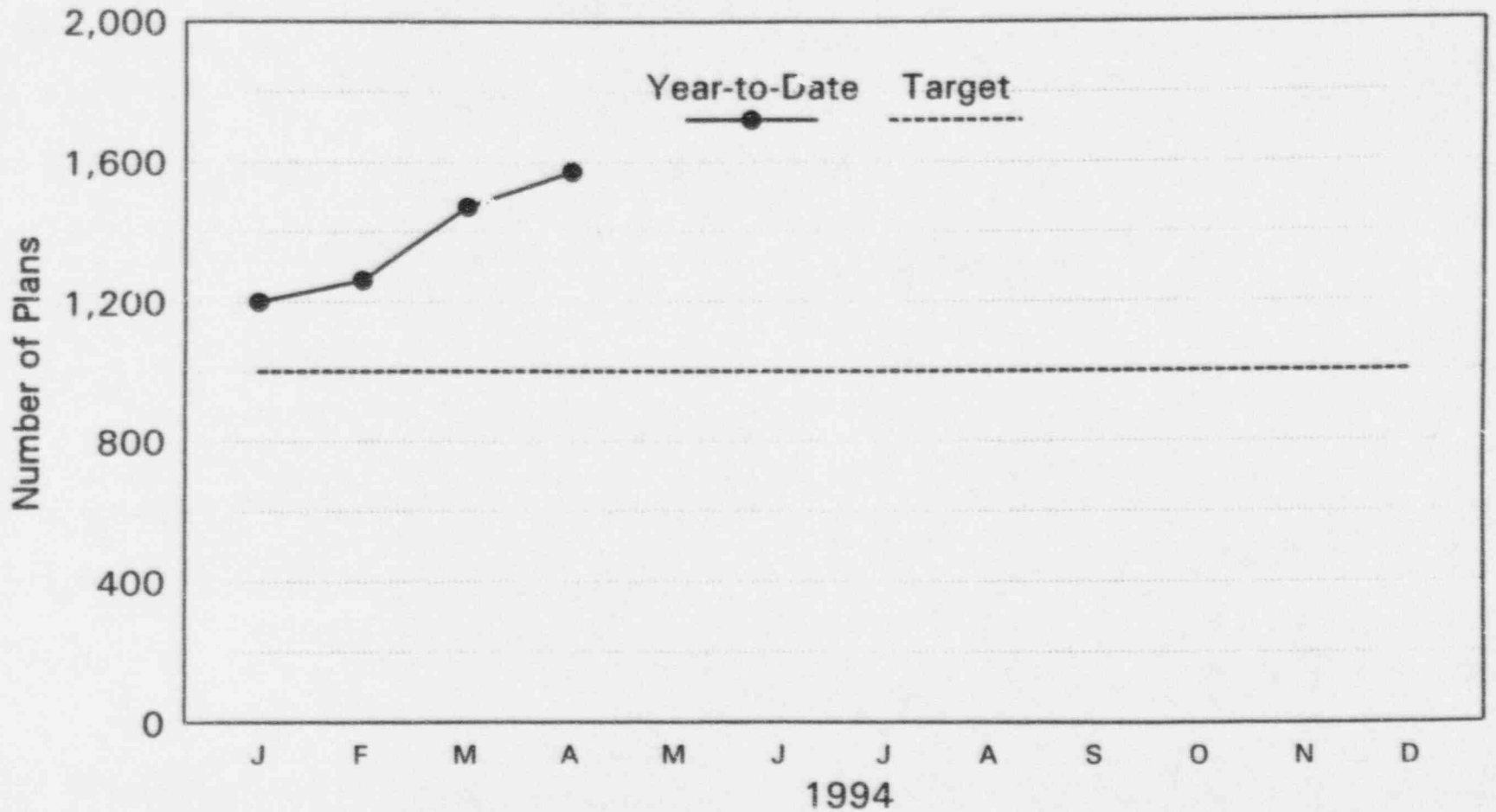
Activity	Sponsor	Support	Start	Stop
Review NDRAP projects to reduce workload on ND <u>STATUS:</u> Working.	Ops/E&PB Mgrs	NSM Team	10/93	6/15/94
Resolve NDRAP inconsistencies and insure use of system <u>STATUS:</u> Working	VP-NE E&PB MAP team (work control)	VP-NE	10/93	6/1/94
Executive decision to cut work, reprioritize, de-emphasize based on survey results	VP-NE VP-NO VP-CNO	NSM Team	6/1/94	7/1/94
Perform collegial assessment on NDRAP process	Mgr-NED	TBD	6/1/94	
Design Communication Plan Implement Communication Plan	VP-NE VP-NE VP-NO	RC Mgrs	6/1/94 7/1/94	7/1/94 ongoing
Design measures to assess what changes have occurred regarding prioritization effectiveness	VP-NE	M2 Team	7/1/94	7/1/94

M-2 Management Risk Assessment and Prioritization

MEASURES:

- Corrective Maintenance Backlog
- Preventive Maintenance Backlog
- Engineering Work Requesis
- NDRAP
- Repetitive Equipment Problems (**under development**)
- DCP SORC Status Approval
- Total Human Performance Events
- Licensee Event Reports (Personnel Error)
- Work Practices and Standards Monitoring by QA

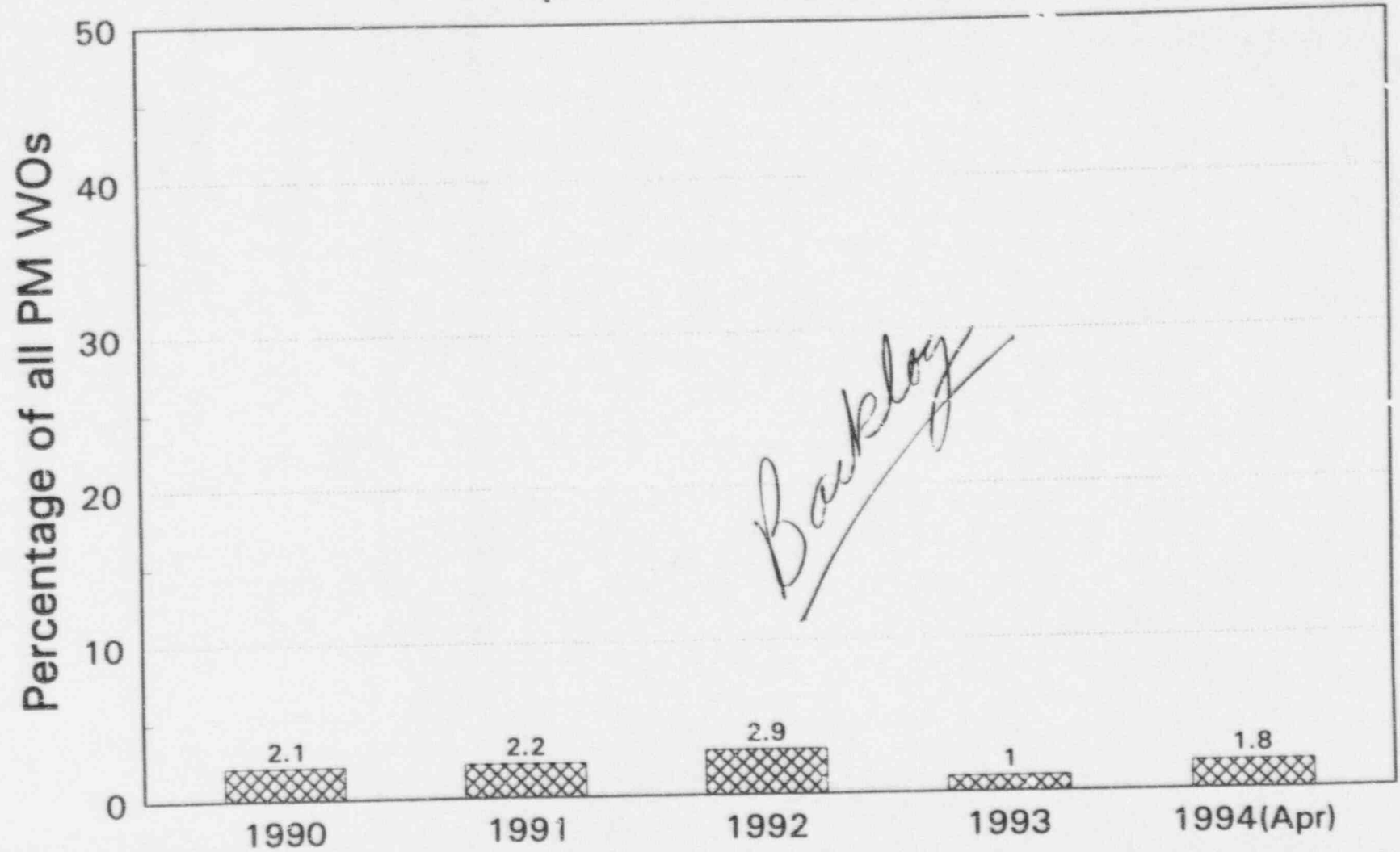
Corrective Maintenance Backlog All Priorities Salem Station



18AS

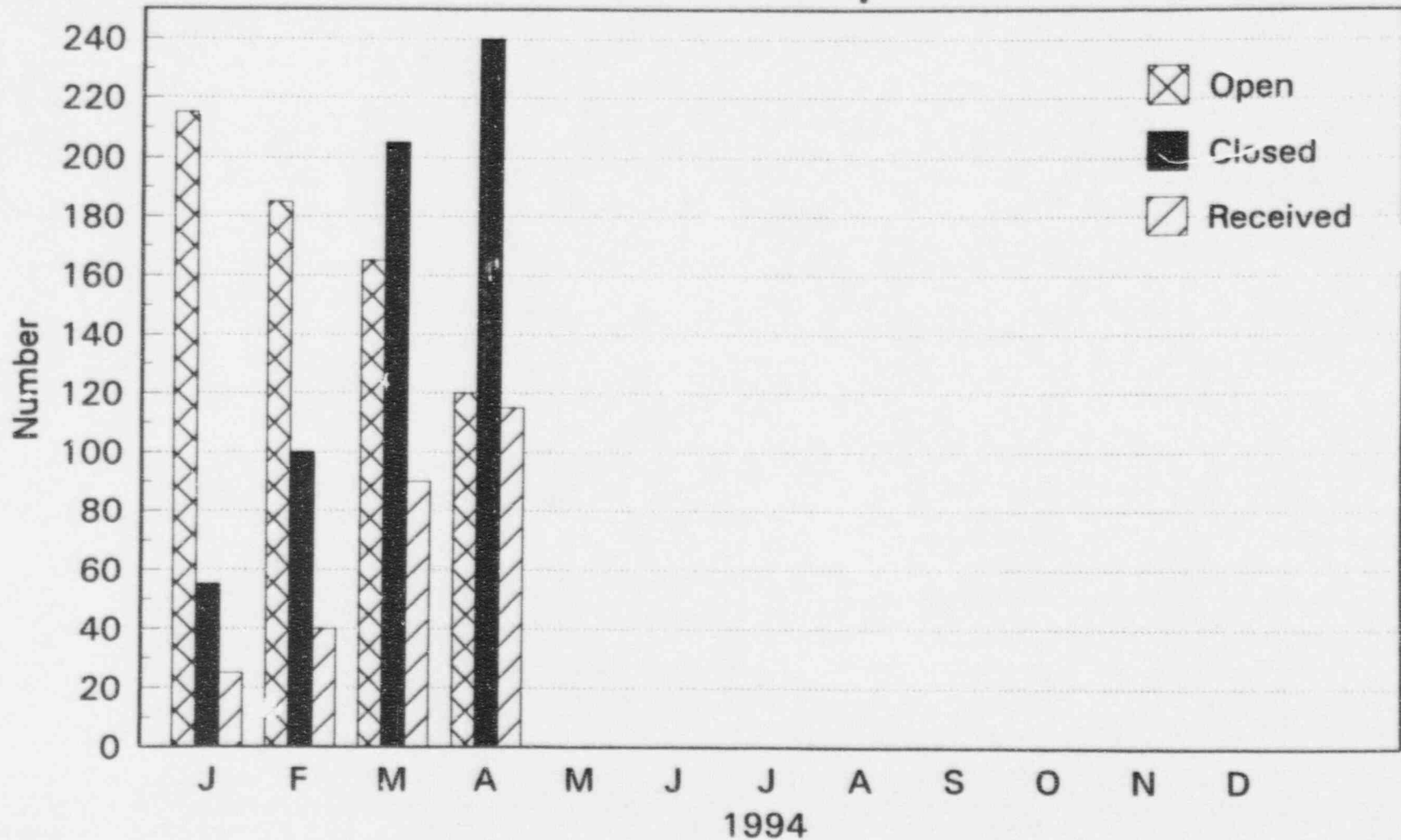
Preventive Maintenance Overdue

Hope Creek Station



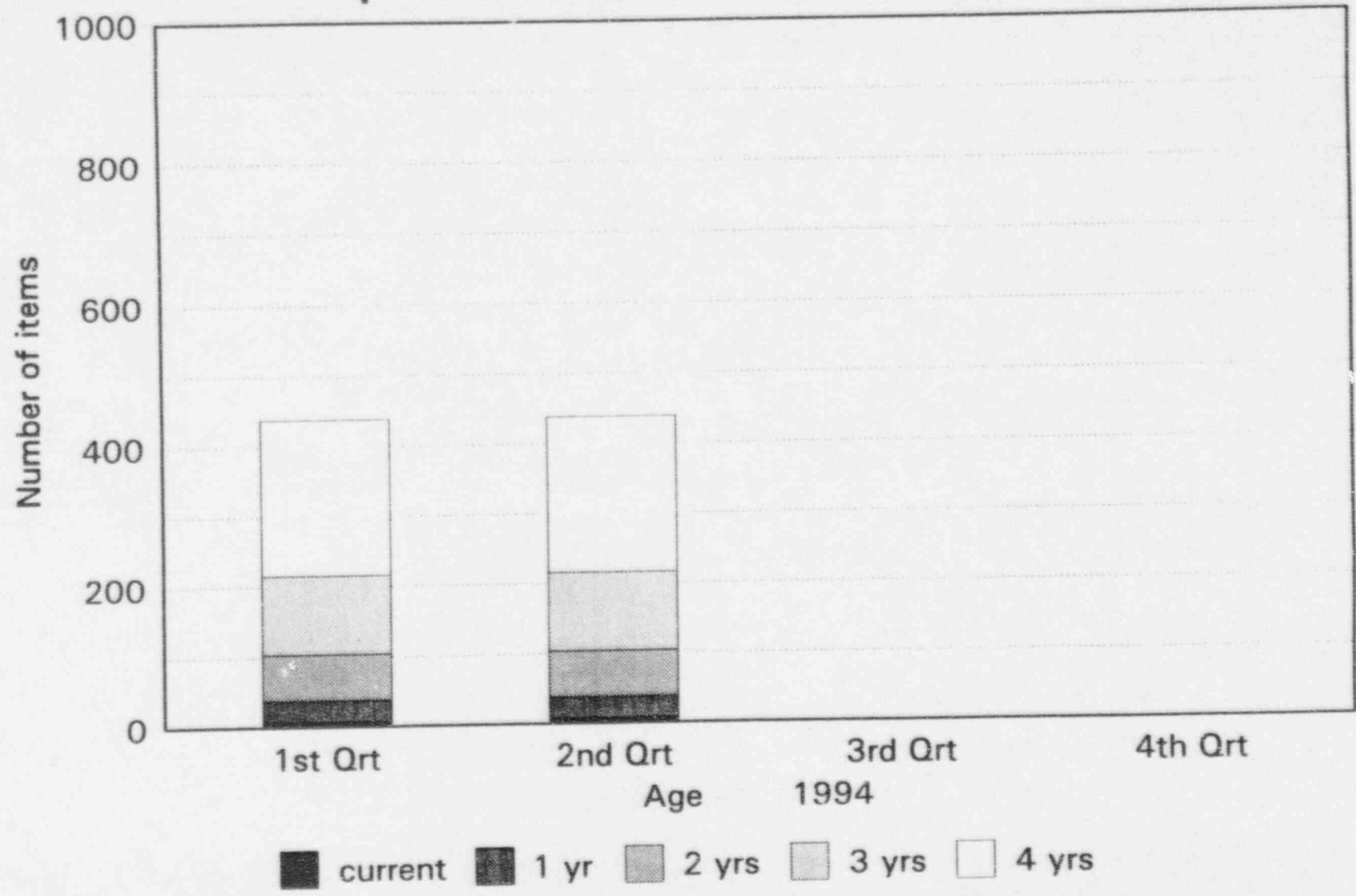
5/23/94 200-4H

Engineering Work Requests Nuclear Dept



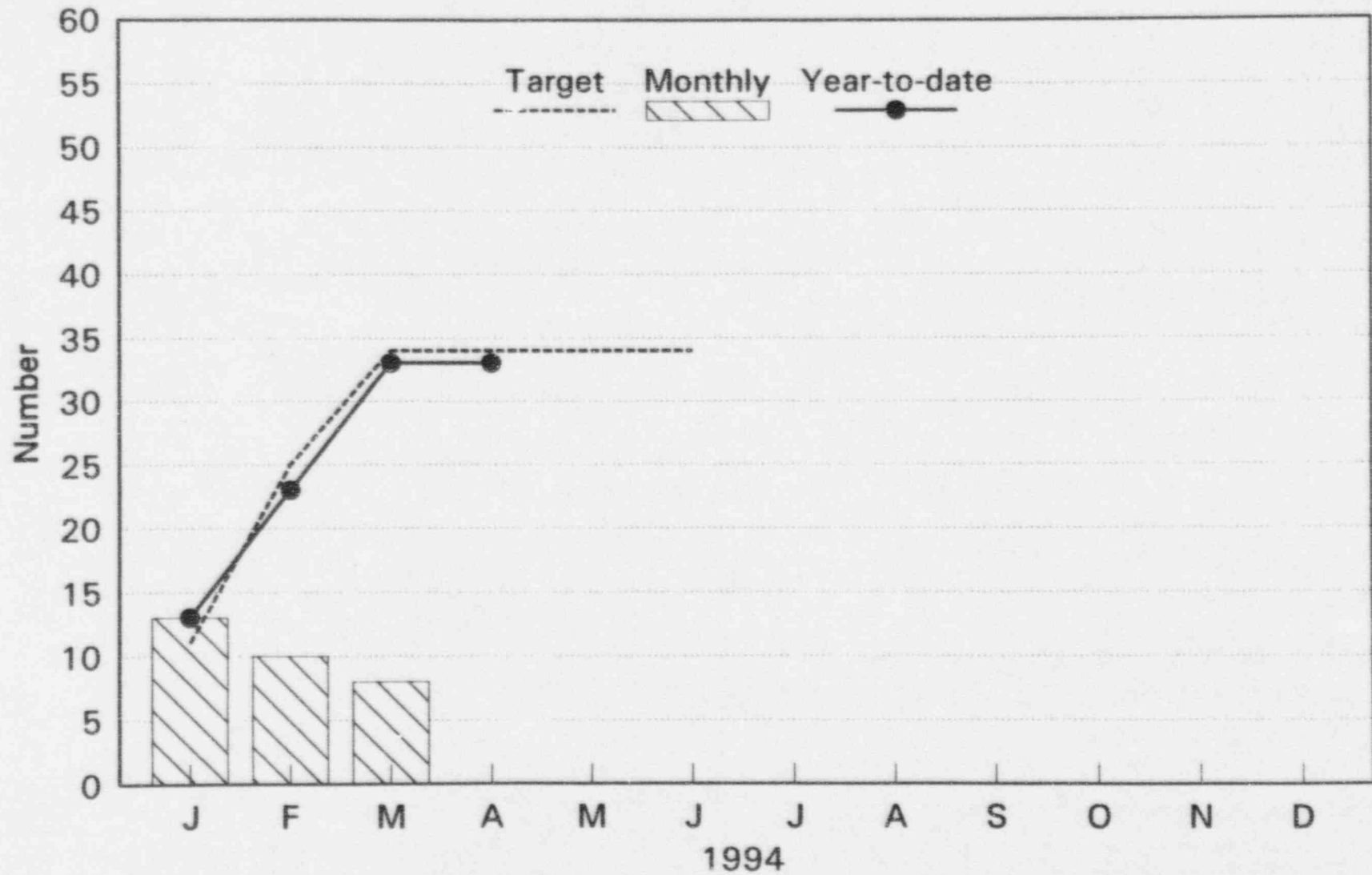
ENG7

Nuclear Dept Resource Allocation Process

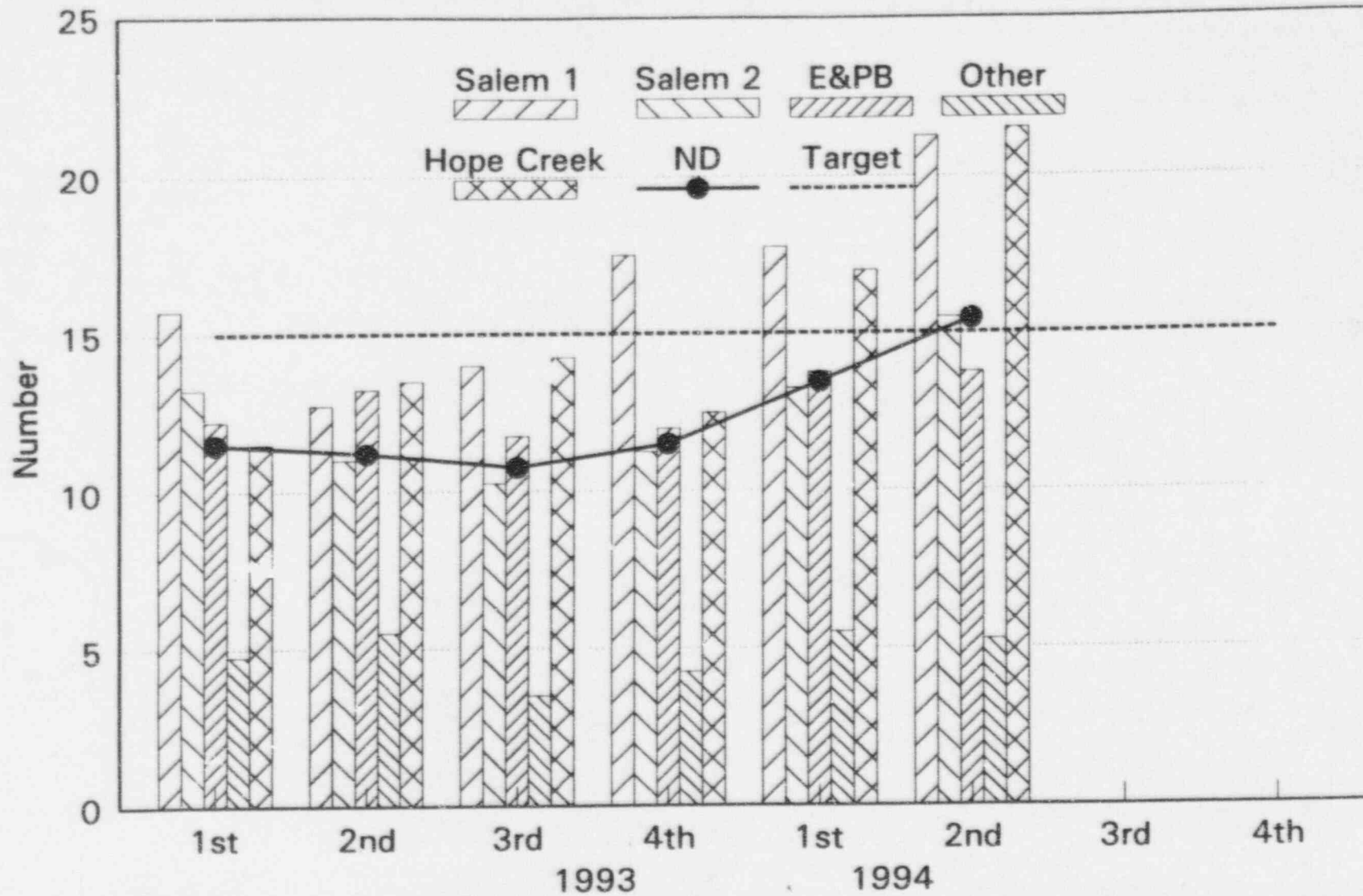


40NDRAP

DCPs SORC Approval Status E&PB

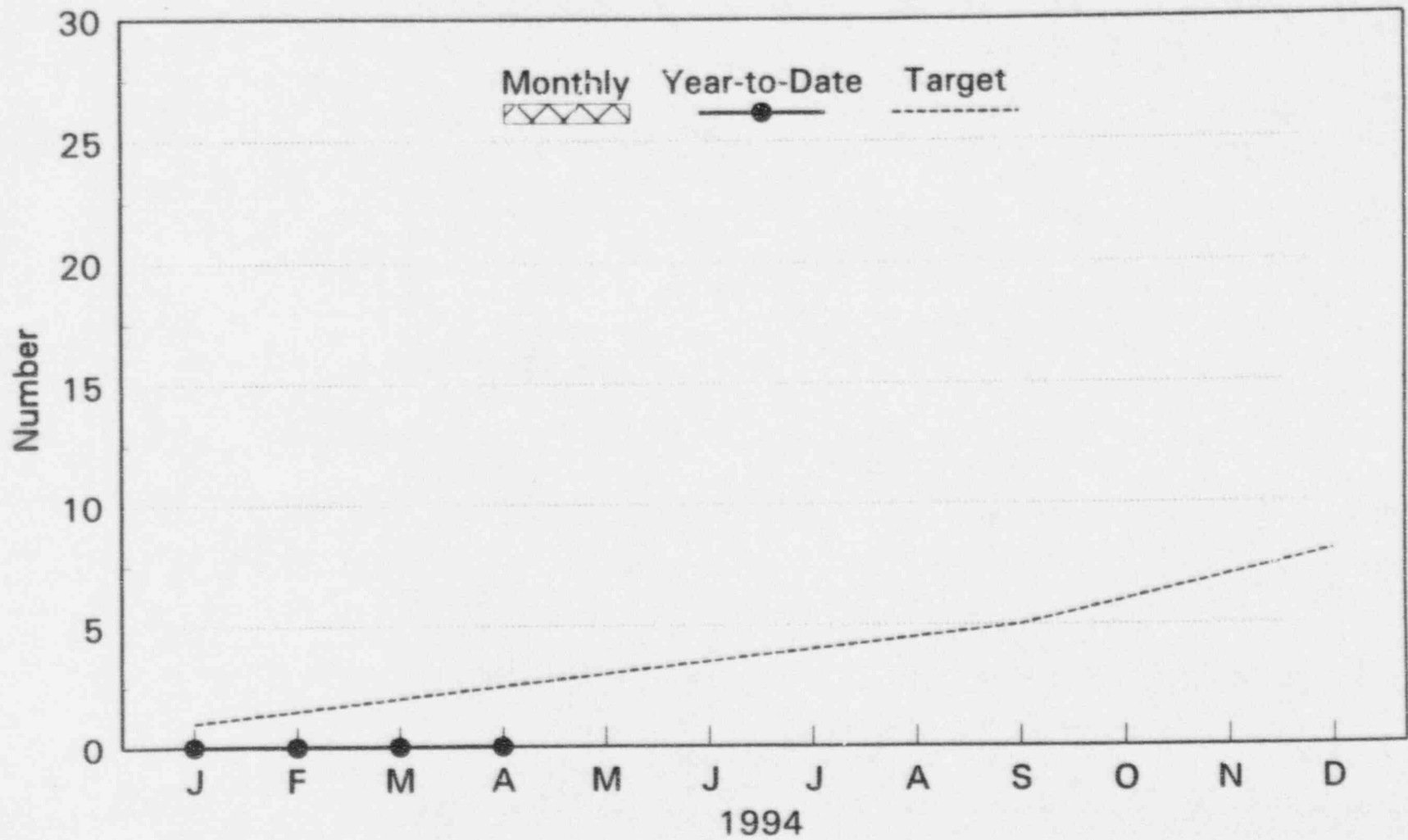


Total Human Performance Events



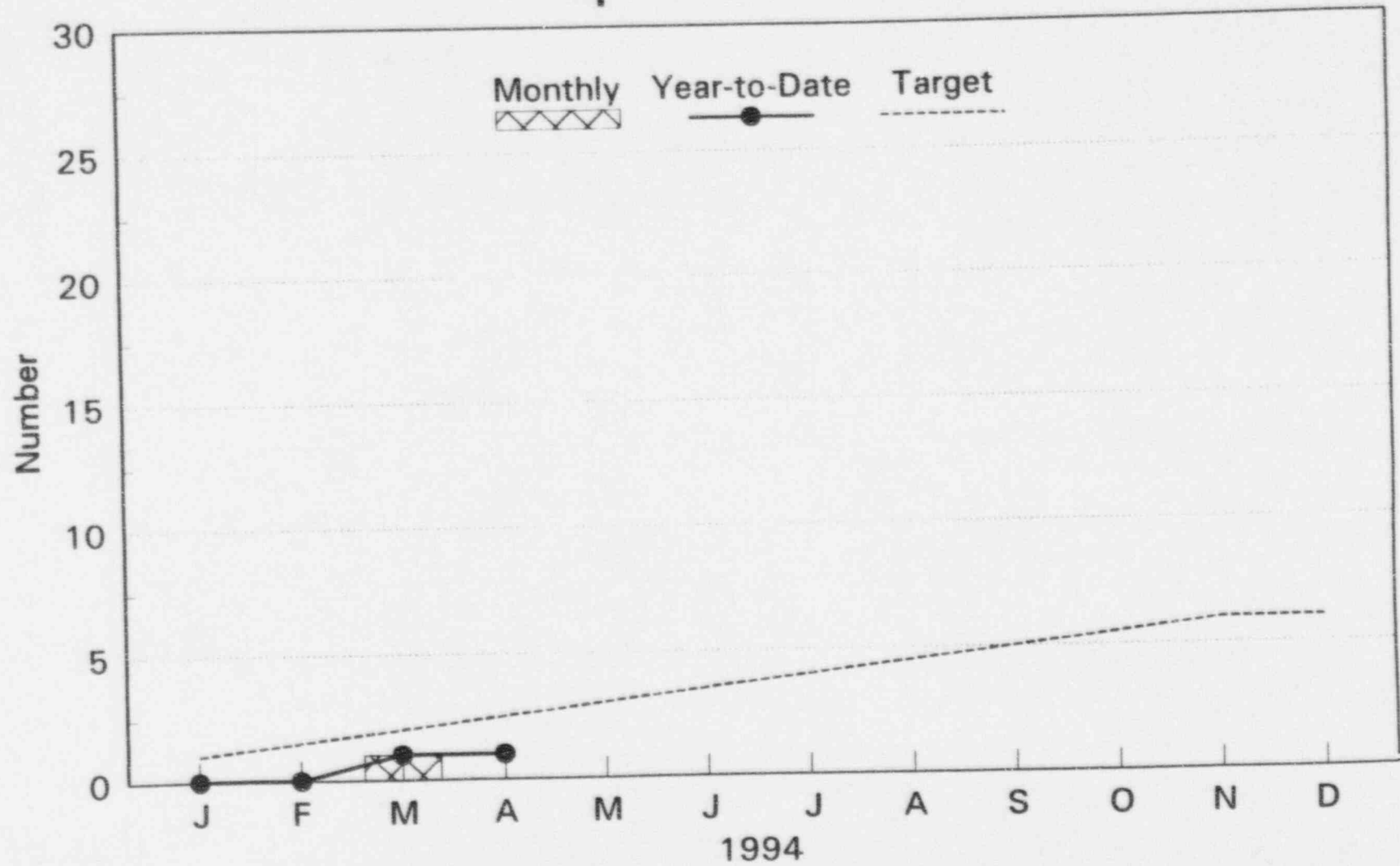
REAS3 12 month avg

LER Personnel Related Salem Station



28s

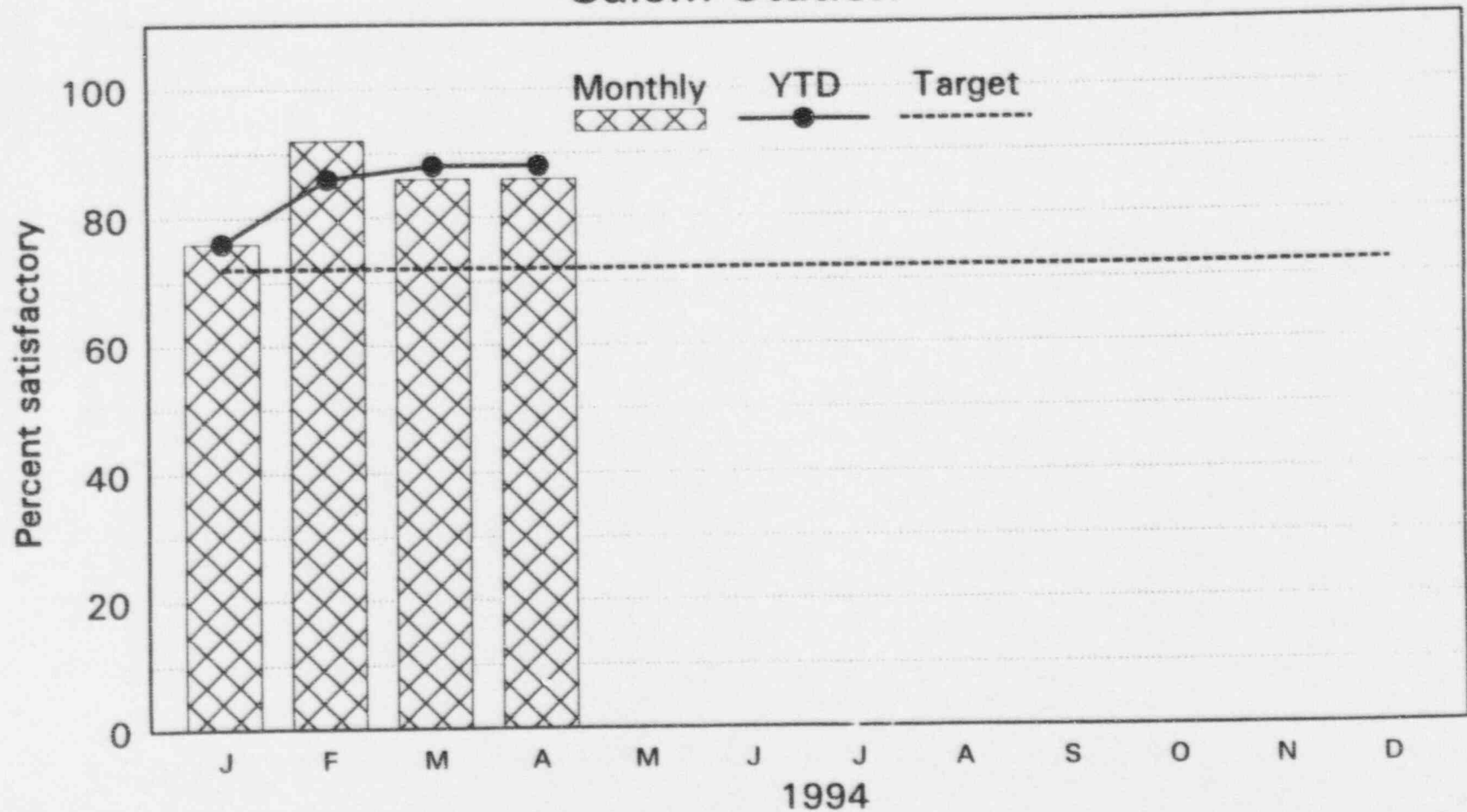
LER Personnel Related Hope Creek



Work Practices & Standards Performance

QA Monitoring

Salem Station



53s

Nuclear Department Tactical Plan - CPAT M-4

Key Focus Item Supported: Content and Delivery of Management Training to Effectively Support Individuals and Groups (CPAT M-4)

Sponsor: General Manager - Nuclear Human Resources and Administrative Services

Activity	Sponsor	Support	Start	Stop
<p><u>Develop and Implement Four Business Leadership Development Programs in 1994 Consisting of:</u></p> <ul style="list-style-type: none"> • Week one --- group process and team building • Week two --- leadership and personal impact • Week three --- the leader as diagnostician and change agent • Week four --- the leadership dialogue and stakeholder analysis • Week five --- effective conflict management --- the leader's greatest challenge <ul style="list-style-type: none"> • Group #1 - 2/28-3/4, 4/11-15, 5/9-13, 6/13-17, 8/15-19 • Group #2 - 4/18-22, 5/23-27, 6/20-24, 7/18-22, 8/8-12 • Group #3 - 9/12-16, 10/10-14, 11/14-18, 12/12-16, 1/16-20/95 • Group #4 - 9/19-23, 10/17-21, 11/28-12/2, 1/30-2/3/95, 2/27-3/3/95 <p><u>STATUS:</u> Program developed and implementation underway.</p>	GM-NHR&AS	Mgrs	1/94	12/94

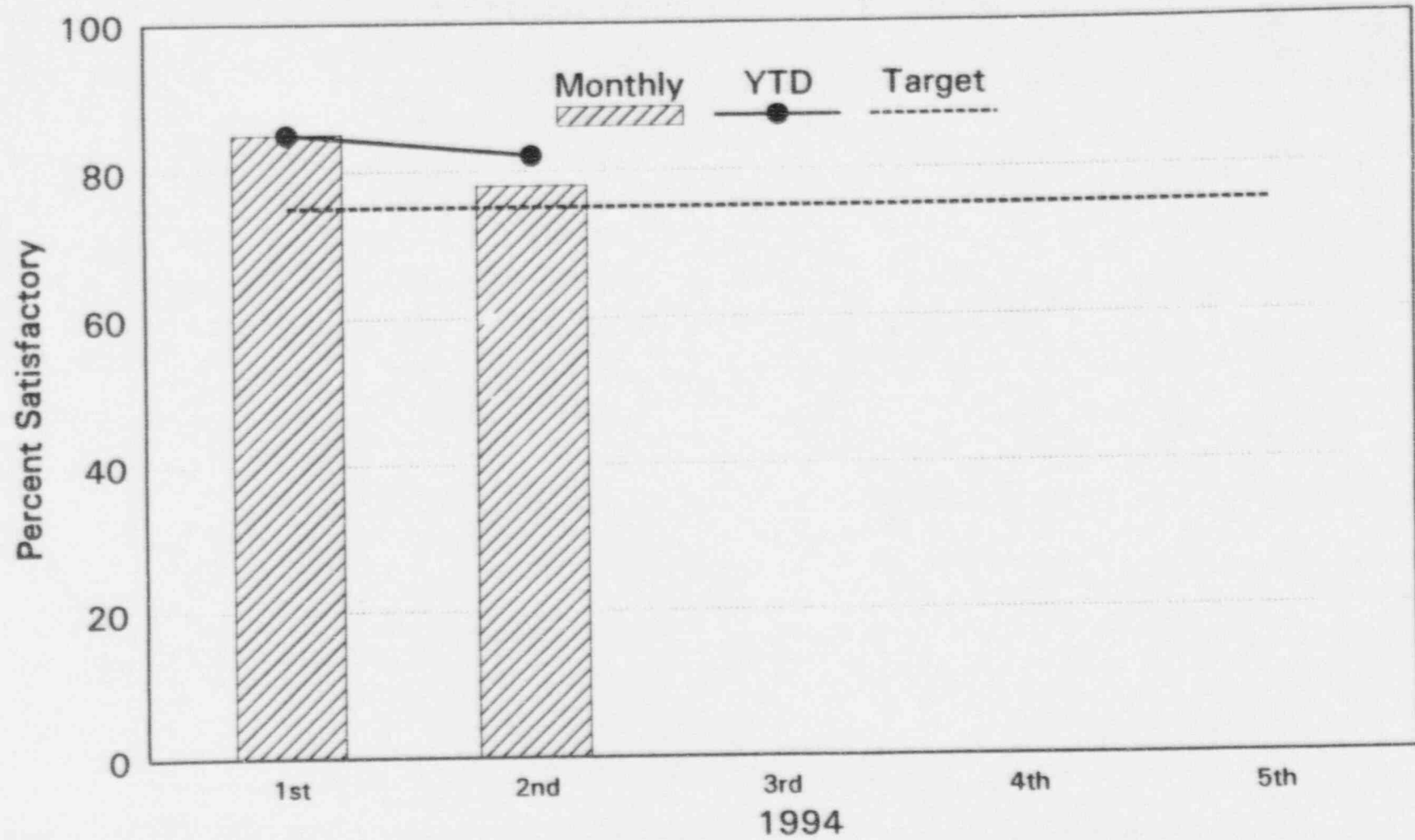
Measures

M-4 Create environment to experience and develop new behavior based on new leadership values

MEASURES:

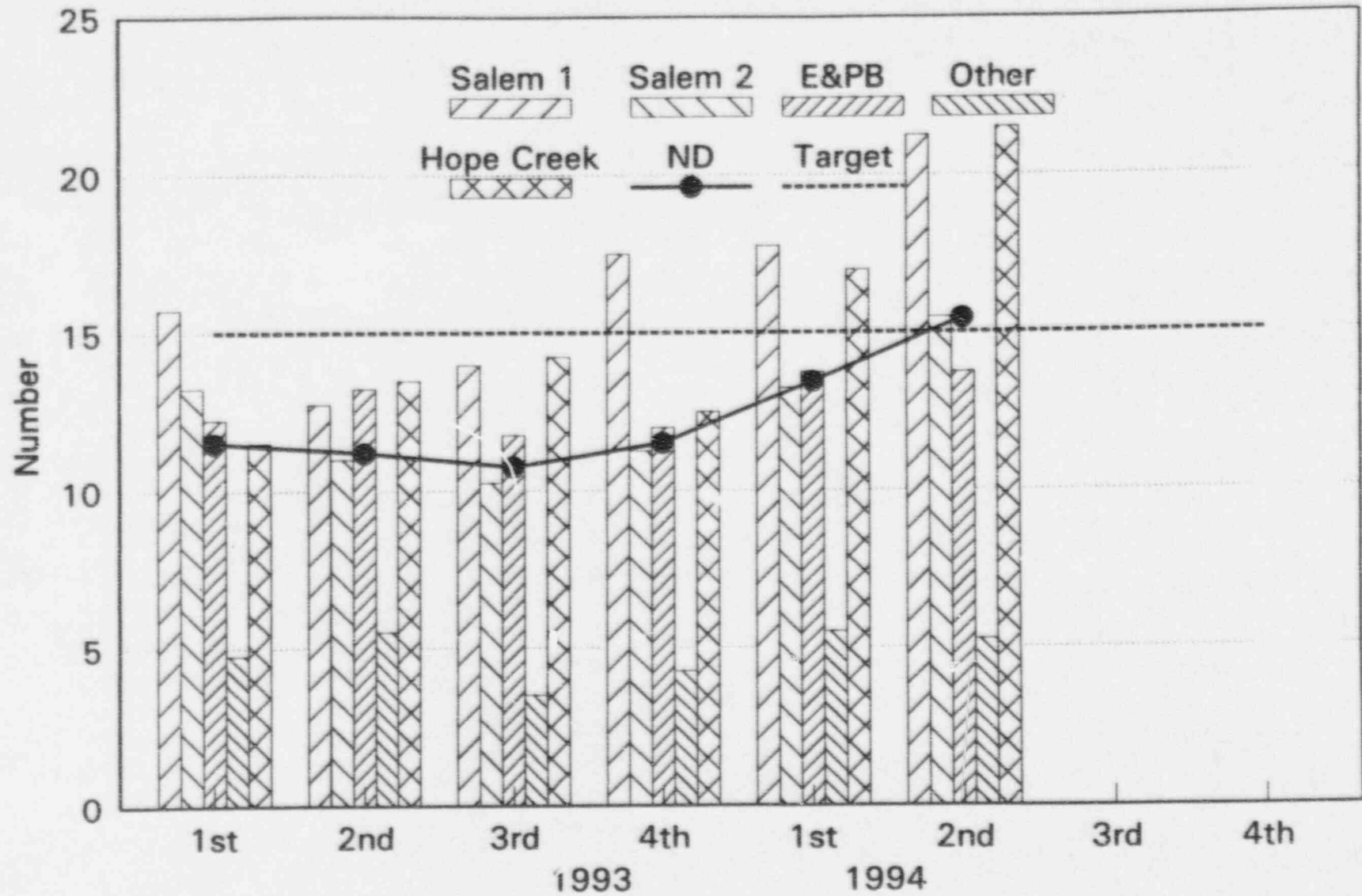
- Business Leadership Development Content Applicability
- Total Human Performance Events
- Licensee Event Reports (Personnel Error)

BLD Content Applicability Nuclear Dept



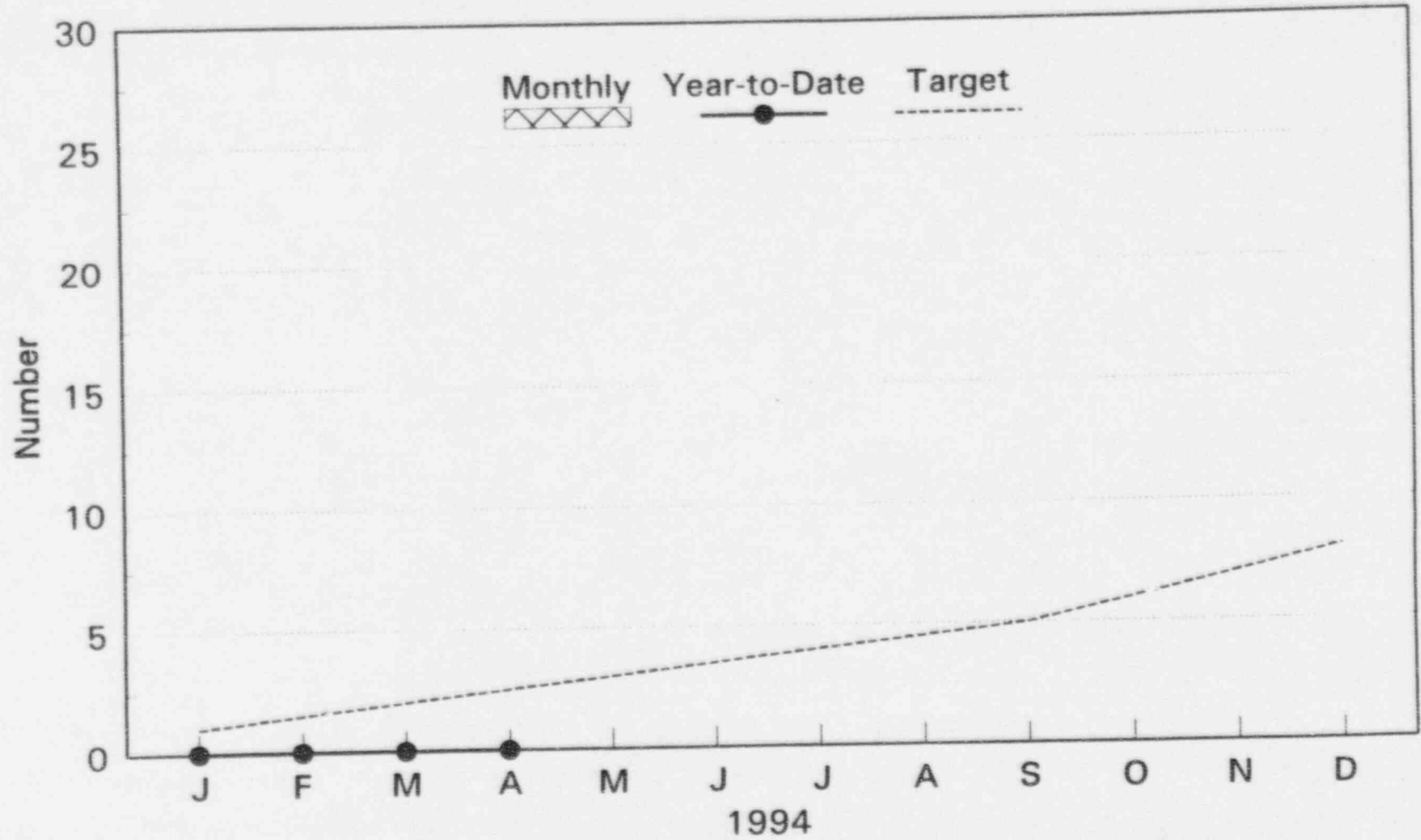
CPM1

Total Human Performance Events



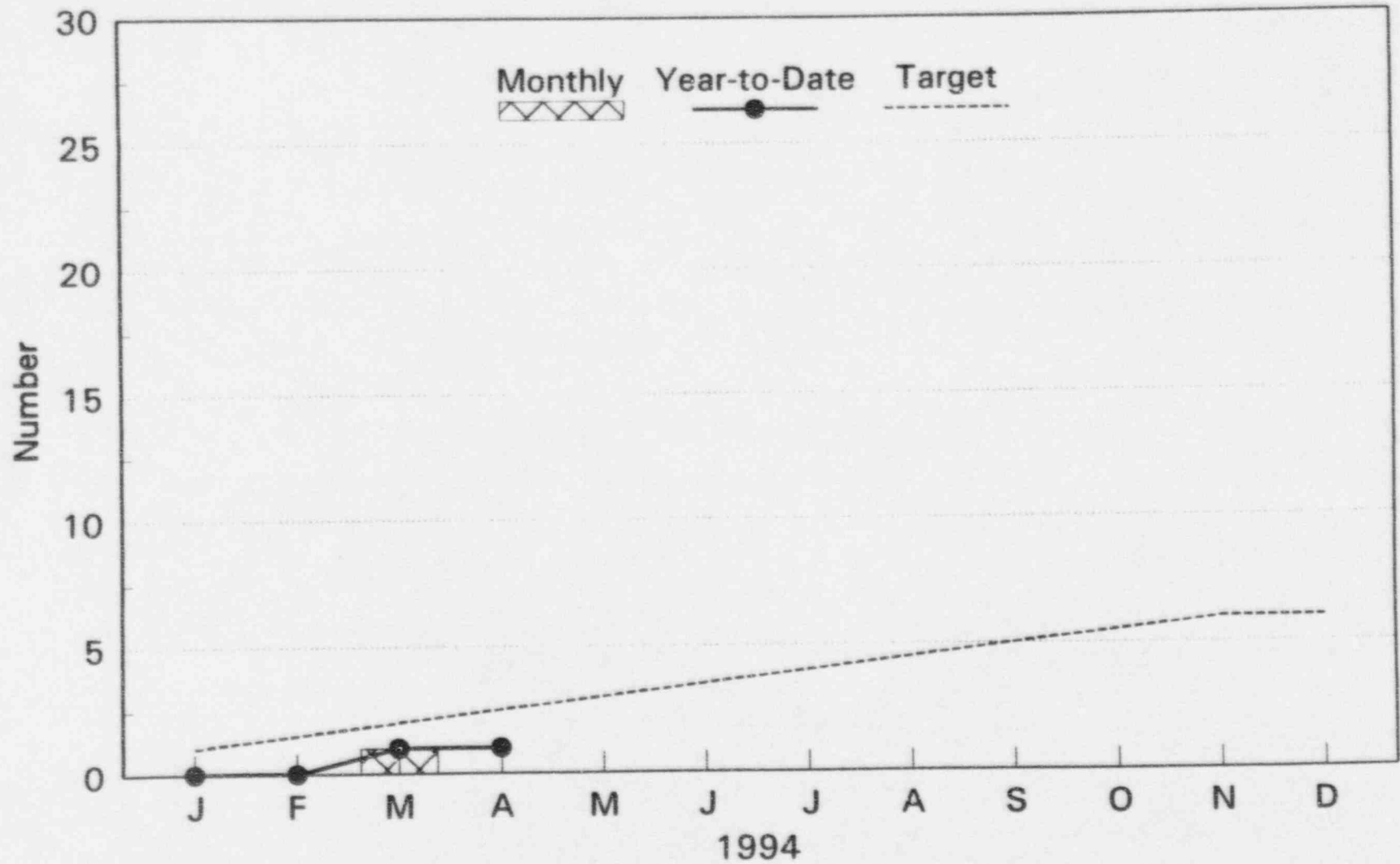
REAS3 12 month avg

LER Personnel Related Salem Station



28s

LER Personnel Related Hope Creek



Nuclear Department Tactical Plan - CPAT M-5

Key Focus Item Supported: Management Self-Assessment Process (CPAT M-5)

Sponsor: General Manager - Quality Assurance/Nuclear Safety Review

Activity	Sponsor	Support	Start	Stop
A. Expectations for Self-Assessment and Corrective Action (Promulgate uniform understanding of Self Assessment and Corrective Action Process).				
1. Presentation to SEM/Director Reports STATUS: Completed 2/8/94.	GM-QA/NSR	S-2 Team	2/94	2/8/94
1a. Updated Presentation STATUS: Ready for presentation on 6/1/94.	GM-QA/NSR	Mgr-QAP&A	5/94	6/94
2. Manager's Dialogue Presentation STATUS: Awaiting Schedule Slot.		HR Plan & Devel Mgr	3/94	7/94
3. Supervisorys Dialogue Breakout Groups: Self Assessment & Corrective Action	Mgr-QA P&A		5/94	9/94
4. Revise Corrective Action Procedure (NAP 58)	Mgr-QAP&A		7/94	10/94
5. Define Expectations at Ke Manager's staff meetings	Mgr-QAP&A		9/94	1/95
B. Corrective Action Data Base Project				
1. Test Module in Procurement STATUS: Completed 8/93.	Principal Engr QA Programs	QA Staff	1992	8/93
2. DR, IR, DEF Inclusion STATUS: Implement 6/1/94.		Mgr-M&S	9/93	5/94

Nuclear Department Tactical Plan - CPAT M-5 (cont'd)

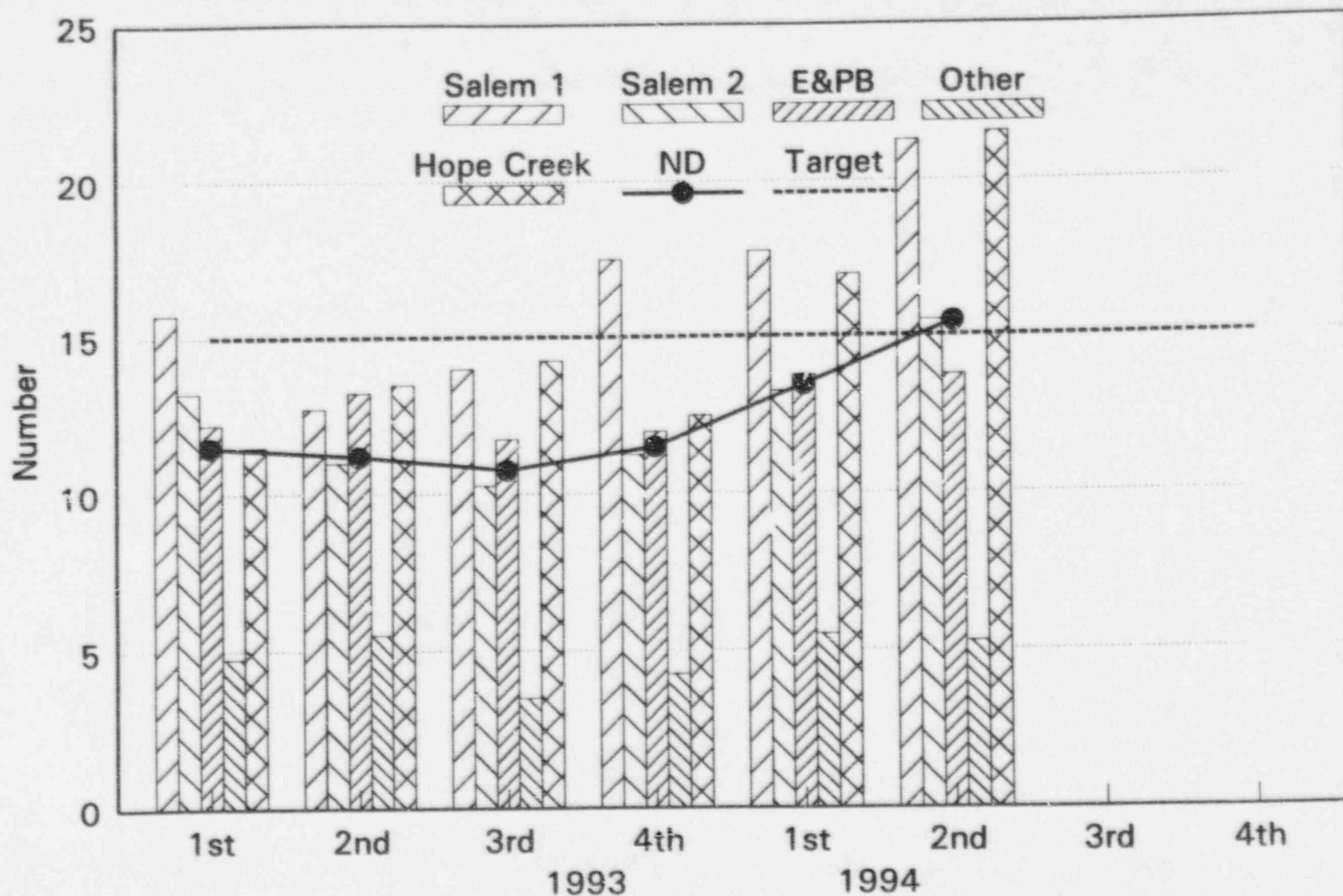
Activity	Sponsor	Support	Start	Stop
3. Training and Implementation STATUS: On schedule.	Each Dept.	Mgr-M&S	5/94	7/94
4. Process Assessment and Adjustments	Mgr-QAP&A	Principal Engr QA Programs	12/94	4/95
C. Follow-up				
1. Modify QA audit process to include effectiveness review of line management self-assessment practices. STATUS: On schedule.	GM-QA/NSR	Mgr-QAP&A	5/94	7/94
2. Develop Trends Report for Corrective Action	GM-QA/NSR	Mgr-QAPA&	9/94	quarterly
3. Issue Corrective Action Trend Reports	Mgr-QAP&A	QA Staff	9/94	quarterly
4. Strengthen Acceptance Criteria for Corrective Action Responses	GM-QA/NSR	Mgr-QAP&A		
• Develop Criteria STATUS: Completed.			1/94	3/94
• Roll out to Senior Management STATUS: Initial discussion at SEM's staff meeting			3/94	6/94
• Incorporate in QA Program • Implement			7/94 10/94	10/94 10/94
5. Managers and Supervision accountable for the permanent solution to each problem	VPs & GMs	GM-QA/NSR		ongoing
6. Increase integration of QA surveillances and audit activities. Develop methods to evaluate self-assessment practices during surveillances activities. STATUS: In process, included in QA/NSR improvement plan.	GM-QA/NSR	Mgr-QAP&A Station QA Mgrs.	3/94	12/94

M-5 Measurement Self-Assessment Process

MEASURES:

- Total Human Performance Events
- Composites Safety Index Performance
- NRC Violations

Total Human Performance Events



REAS3 12 month avg

Salem Composite Safety Index Status as of 4/30/94 (Year-End Goal/YTD Actual)

Red Unplanned Auto Scrams Unit 1 (1/3)	Green NRC Violations (8/5)	Green NRC & INPO Significant Events (1/1)	Green Licensee Event Reports Unit 1 (18/6)	Green Personnel Error LER's Unit 1 (4/0)
Green Unplanned Auto Scrams Unit 2 (1/0)	Green Radiation Exposure (250/21)	Green Skin & Clothing Contaminations (175/21)	Green Licensee Event Reports Unit 2 (17/4)	Green Personnel Error LER's Unit 2 (4/0)
Yellow Safety System Unavailability Unit 1 (0.15/0.22)	Green Safety System Unavailability Unit 2 (.015/.006)	* Green Lost Time & Restricted Duty Accident Rate (0.95/0.00)		

Legend:
 * Green - significantly exceeds goal
 Green - achieves goal
 Yellow - needs improvement
 Red - significant weakness

Hope Creek Composite Safety Index

Status as of 4/30/94

(Year-End Goal/YTD Actual)

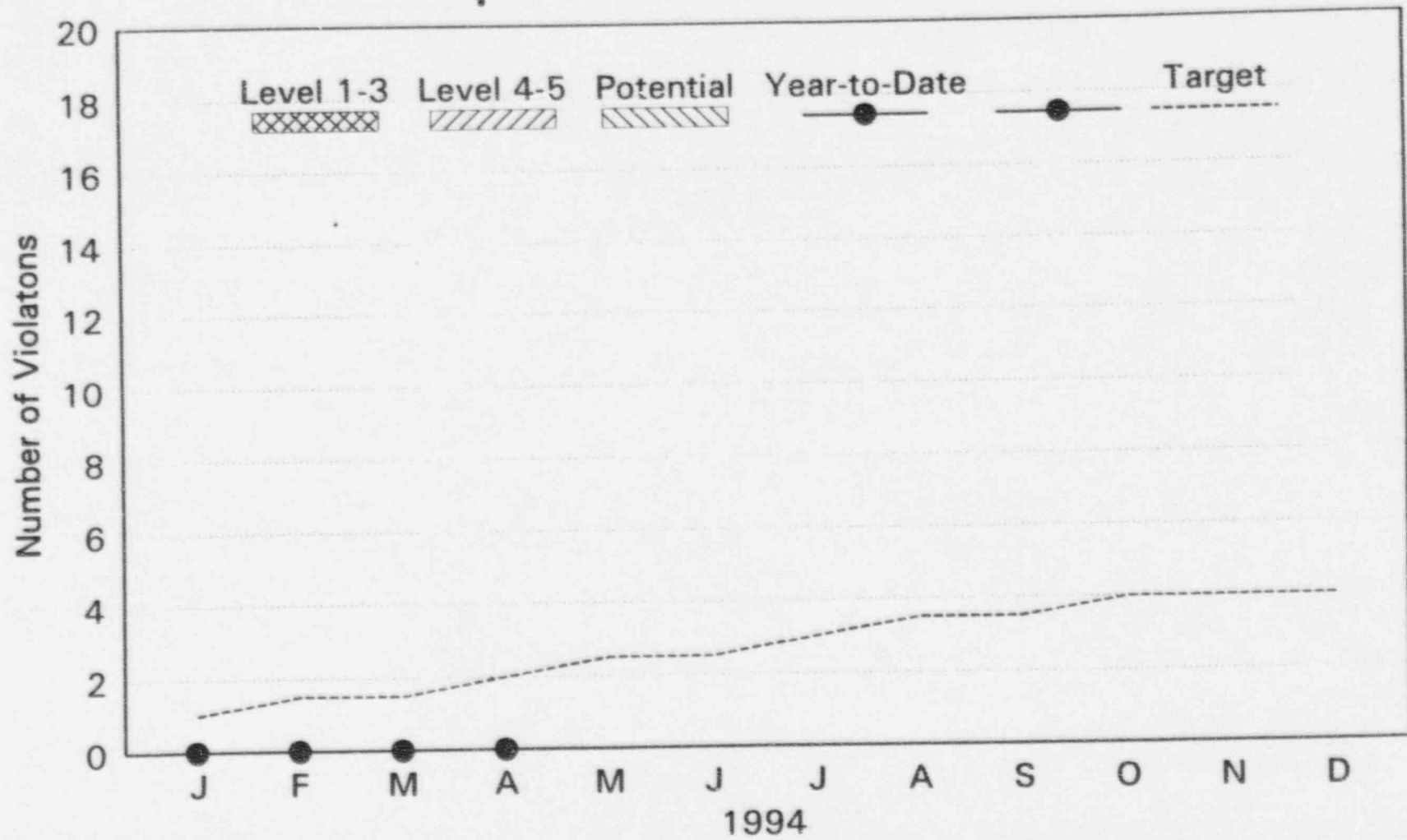
Green Unplanned Auto Scrams (1/0)	Green NRC Violations (4/0)	Green NRC & INPO Significant Events (1/0)	Green Licensee Event Reports (20/2)	Green Personnel Error LER's (6/1)
Green Safety System Unavailability (0.015/0.002)	Green Radiation Exposure (340/279)	Green Skin & Clothing Contaminations (130/38)	Green NJPDES Permit Violations (3/1)	* Green * Lost Time & Restricted Duty Accident Rate (0.95/0.030)

Legend:

- * Green - significantly exceeds goal
- Green - achieves goal

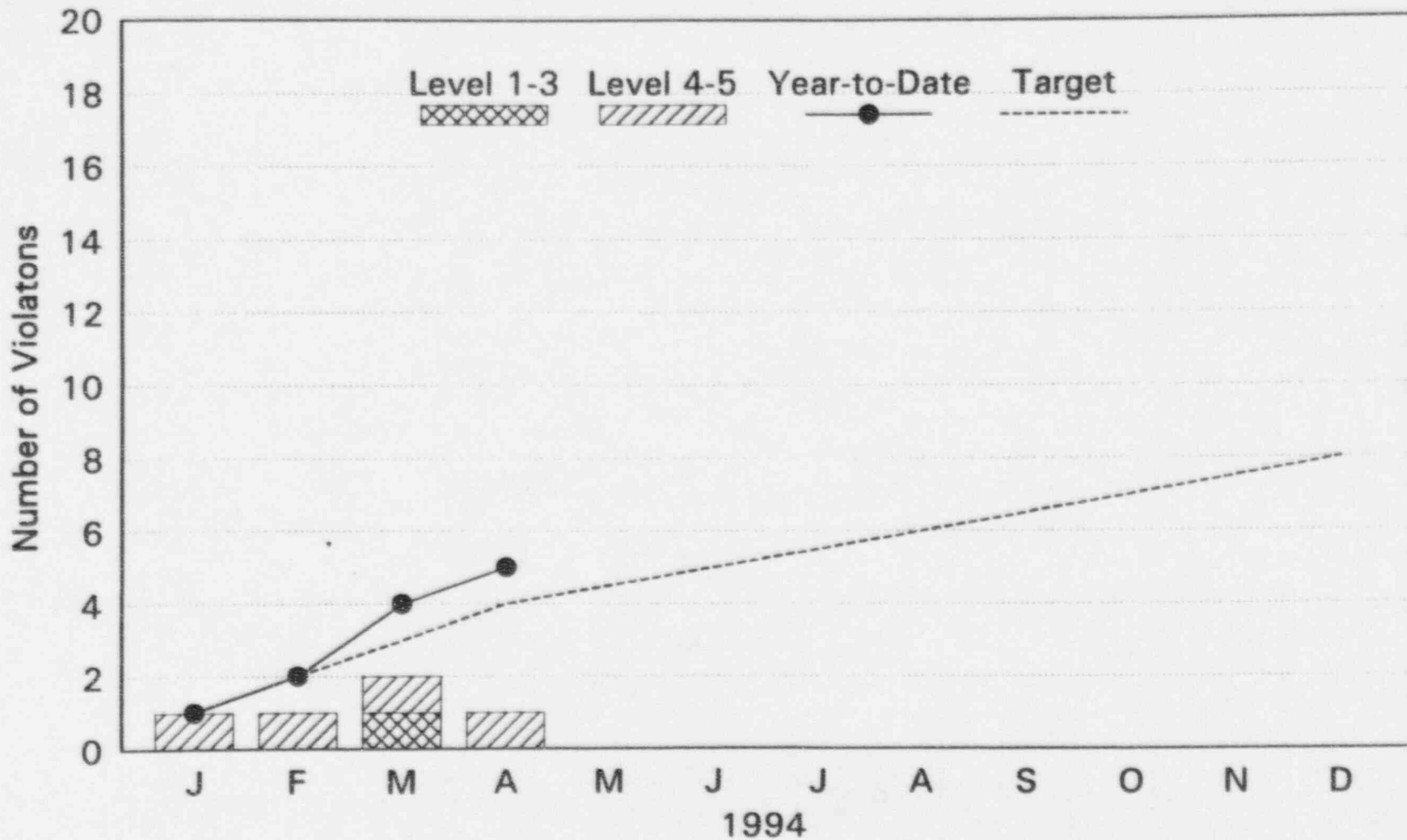
- Yellow - needs improvement
- Red - significant weakness

NRC Violations Hope Creek Station



13H

NRC Violations Salem Station



13S

Nuclear Department Tactical Plan - CPAT W-1

Key Focus Item Supported: Access to Timely and Accurate Technical Information versus reliance on interpersonal contacts (CPAT W-1)

Sponsor: Vice President - Nuclear Operations

Activity	Sponsor	Support	Start	Stop
<u>Vendor Information Control</u>				
<ul style="list-style-type: none"> Re-enforce requirements for control of vendor information received from sources other than the TDRs or EDCC to all personnel. <p><u>STATUS:</u> Annual letter on vendor information control process to be issued by 6/1/94.</p>	NEStd Mgr	CCG Supv.	4/92	6/94
<ul style="list-style-type: none"> Confirm adequacy of procedural guidance for control of vendor information received from sources other than the TDRs or EDCC. <p><u>STATUS:</u> Completed - (ref. STN-94-0111)</p>	NEStd Mgr	CCG Supv. Mgr - NP&MM Mgr-QAE&P	1/94	2/94
<ul style="list-style-type: none"> Confirm Salem Revitalization Project is correctly processing vendor information received with shipments. <p><u>STATUS:</u> Completed - (ref. STN-94-0111)</p>	NEStd Mgr	CCG Supv. Mgr - Sp Proj	2/94	2/94
<ul style="list-style-type: none"> Retrain stock handlers to the procedural requirements for processing of vendor information received with shipments. <p><u>STATUS:</u> Open - awaiting verification</p>	Mgr-NP&MM		2/94	2/94

Nuclear Department Tactical Plan - CPAT W-1 (cont'd)

Activity	Sponsor	Support	Start	Stop
<p>MMIS Maintenance</p> <ul style="list-style-type: none"> Confirm that no gaps exist in the DCP process to assure that database impacts are recognized & incorporated. <p>STATUS: In process as part of BOM collegial self assessment.</p>	NEStd Mgr	CCG Supv.	2/94	6/94
<ul style="list-style-type: none"> Complete BOM Validation Project (1994 Scope) <p>STATUS: BOM collegial self assessment for assessing BOM Control and Validity in process.</p> <ul style="list-style-type: none"> Assess BOM Control Assess BOM Validity FDR/FDDI Impact Review (HC) Solenoid Valve Verification (Salem) Recommend future needs 	NEStd Mgr	CCG Supv.	1/94	12/94
<ul style="list-style-type: none"> Communicate MDF Resolution Status to Nuclear Department <p>STATUS: Communication plan under development. Roll-out dependent on collegial self assessment results due 6/94.</p>	NEStd Mgr	CCG Supv	2/94	7/94
<ul style="list-style-type: none"> Communicate MMIS Control & "Get-Well" Process <p>STATUS: Communication plan under development. Roll-out dependent on collegial self assessment results due 6/94.</p>	NEStd Mgr	CCG Supv	2/94	7/94
<ul style="list-style-type: none"> Develop ASME parts/Component Specification Sheets Screen established, never populated May be able to drive completion from CJP process <p>STATUS: Collegial self assessment initiated. Results will address this issue and are due 8/94.</p>	NEStd Mgr	NME Mgr NESci Mgr	5/94	8/94

Nuclear Department Tactical Plan - CPAT W-1 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> Establish standard construction material lists and inventory levels <ul style="list-style-type: none"> Technical Standard (TS) under consideration <p><u>STATUS:</u></p>	Mgr-NP&MM	NEStd Mgr NME Mgr NEE Mgr NESci Mgr	1/93	TBD
<u>Computer Hardware and Software Control</u>				
<ul style="list-style-type: none"> Support NC.NA-AP.ZZ-0036(Q) policies regarding the procurement of computer hardware and software <p><u>STATUS:</u> No activity started - may be deleted once NA-AP-0036(D) requirements are clarified. See next item.</p>	Mgr-M&S	All ND Mgrs	2/94	ongoing
<ul style="list-style-type: none"> Clarify NC.NA-AP.ZZ-0036(Q) requirements regarding the procurement and development of customized computer software and hardware <p><u>STATUS:</u> Communication plan under development.</p>	Mgr-M&S	N/A	2/94	6/94
<u>Engineering Document Control and Distribution</u>				
<ul style="list-style-type: none"> Provide "Working Copies" from EDCC (DCPIT Task #30) <p><u>STATUS:</u> In process</p>	Mgr - NED	CCG Supv	1/93	12/94
<ul style="list-style-type: none"> Provide "Working Copies" from DMS (DMS Project Scope) <p><u>STATUS:</u> In process.</p>	Mgr - M&S	DMS Proj. Mgr Disc	1/93	12/94
<ul style="list-style-type: none"> Bank Changes to Drawings other than OWDs (DCPIT Task #32) - DUTT activity <p><u>STATUS:</u> In process.</p>	Mgr - NED	CCG Supv	1/93	7/94
<ul style="list-style-type: none"> Post MCRs against DCP CDs and MDs (DCPIT Task #31) <p><u>STATUS:</u> In process.</p>	Mgr - NED	CCG Supv	1/93	12/94
<ul style="list-style-type: none"> Access scanning MCRs into DMS <p><u>STATUS:</u> In process.</p>	Mgr - M&S	DMS Proj Mgr Disc	2/93	12/94

Nuclear Department Tactical Plan - CPAT W-1 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> Communicate CBD Development Plan/Status for Salem - original plan STATUS: Communication plan under development. 	Mgr - NED	CBD Proj Mgr S&A Supv	1/91	ongoing
<ul style="list-style-type: none"> Communicate DMS Development Plan/Status - original plan STATUS: Communication plan under development. 	Mgr - M&S	DMS Proj Mgr Disc	1/93	6/95
<ul style="list-style-type: none"> Communicate DCPIT Task #30, 31, 32 Implementation Plans STATUS: Monthly reports generated through Mgr - NED 	Mgr - NED	CCG Supv	2/93	ongoing
<ul style="list-style-type: none"> Complete Salem Setpoint Project STATUS: On schedule. 	NEE Mgr	Salem I&C Supv	6/91	12/95
<ul style="list-style-type: none"> Communicate Current TDR/EDCC Services and responsibilities STATUS: Communication plan under development. 	Mgr - M&S	DCG Supv CCG Supv	2/94	4/94
<ul style="list-style-type: none"> "Baseline Reference Documents" identified and input to DMS STATUS: Assessment of which documents are considered "Baseline Reference Documents" in process. 	Mgr - M&S	DMS Proj Mgr CCG Supv DCG Supv	1/94	12/94
Spare Parts/Components and Construction Component Availability				
<ul style="list-style-type: none"> Communicate the inventory "Write-Off" strategy to the working levels of the impacted organizations STATUS: Communication plan under development. 	Mgr - NP&MM	Mgr - P&MC Plng Mgr- Salem Maint Mgr- Salem Mgr - NED	2/94	5/94

Nuclear Department Tactical Plan - CPAT W-1 (cont'd)

Activity	Sponsor	Support	Start	Stop
<u>Salem Maintenance Procedures</u>				
<ul style="list-style-type: none"> • Eliminate procedure revision backlog <u>STATUS:</u> Reducing backlog to meet planned maintenance needs. 	Tech Mgr	Tech Staff	1/94	TBD
<ul style="list-style-type: none"> • Improve turn-around time for procedure revisions <u>STATUS:</u> The long term goal is less than two month turnaround depending on priority. 	Tech Mgr	Tech Staff	1/95	TBD
<ul style="list-style-type: none"> • Develop "New/Old" procedure cross-reference for repetitive tasks <u>STATUS:</u> Cross reference index developed. 	Tech Mgr	Tech Staff	1/94	TBD

Measures

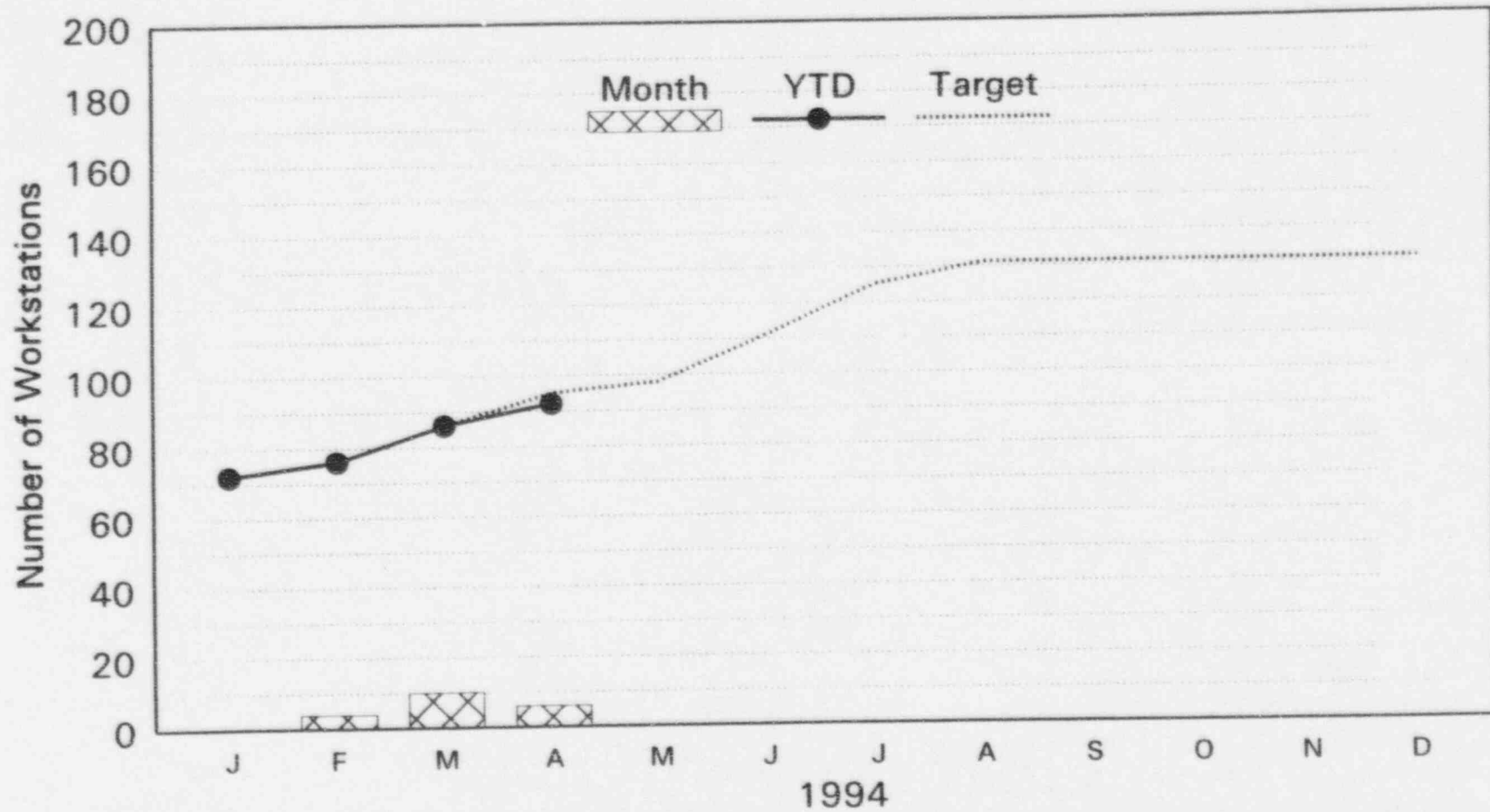
W-1 Access to timely and accurate technical information versus reliance on interpersonal contacts

MEASURES:

- Number of DMS Work Stations Installed versus Work Station Installation Plan
- Number of Documents Scanned and indexed into DMS by Type
- Average Hours of DMS Availability per Week
- MMIS Work-in-Progress Load

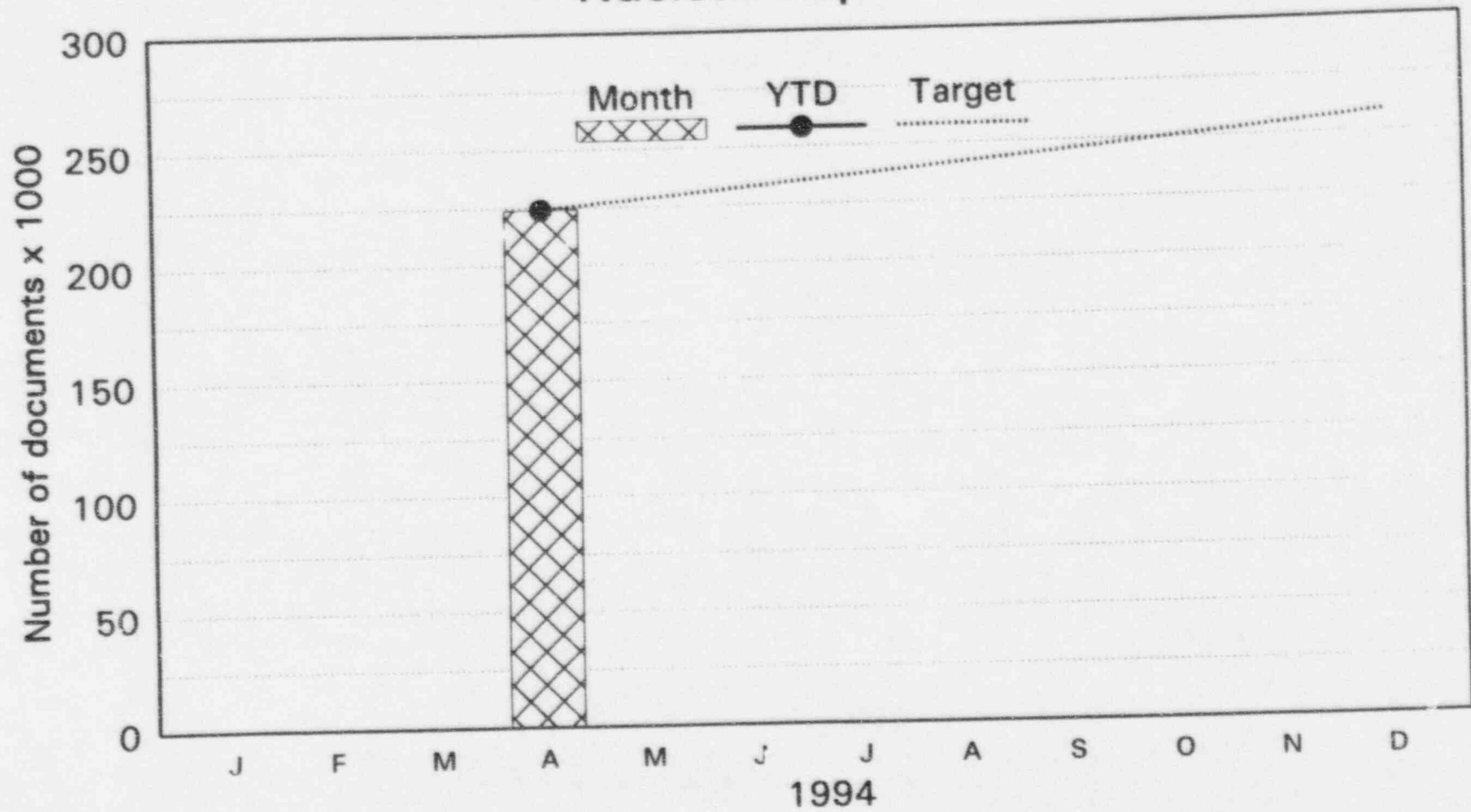
Document Management System Workstations Installed

Nuclear Dept



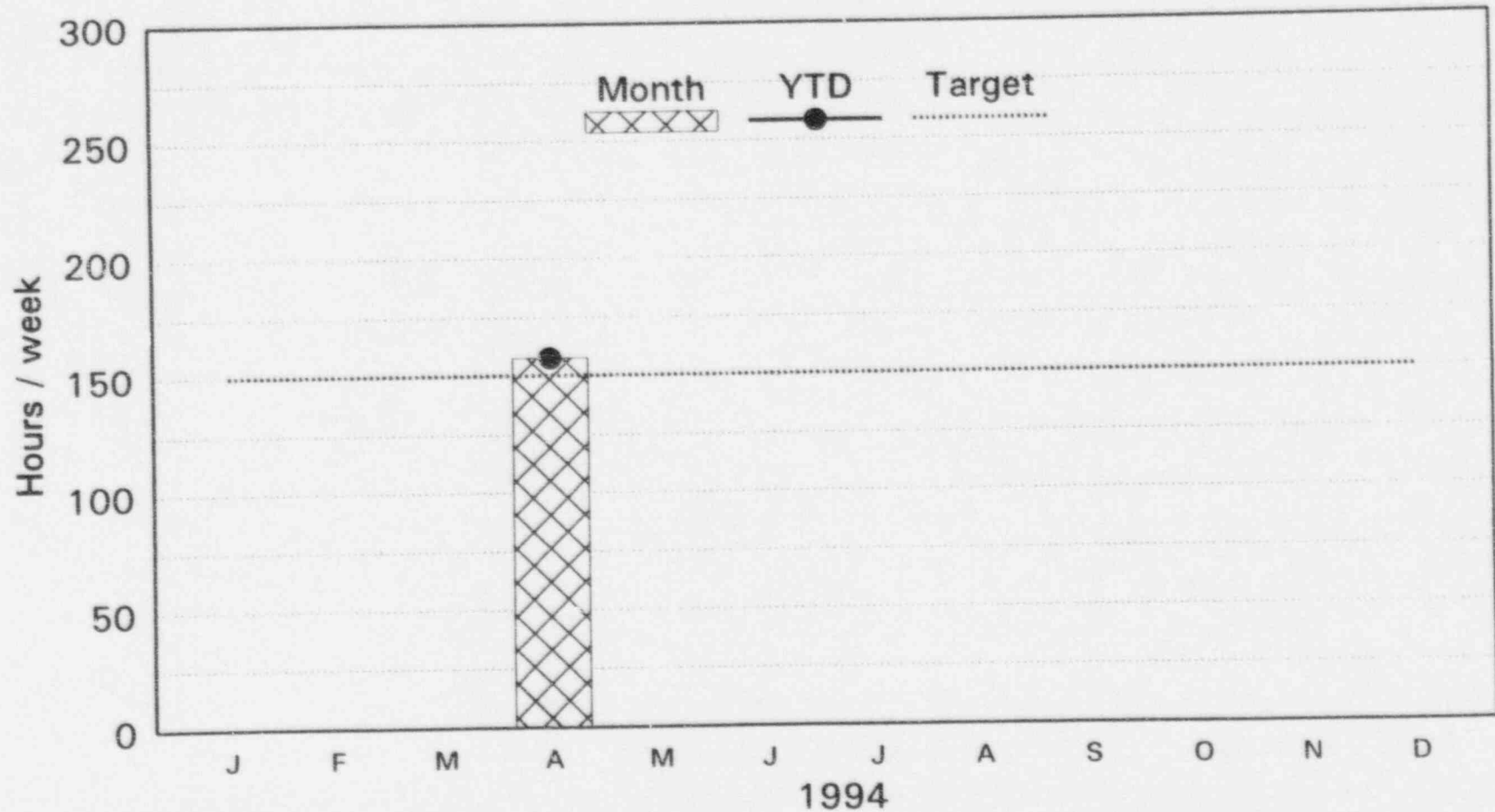
CPW1A

Document Management System Documents into System Nuclear Dept



CPW1B

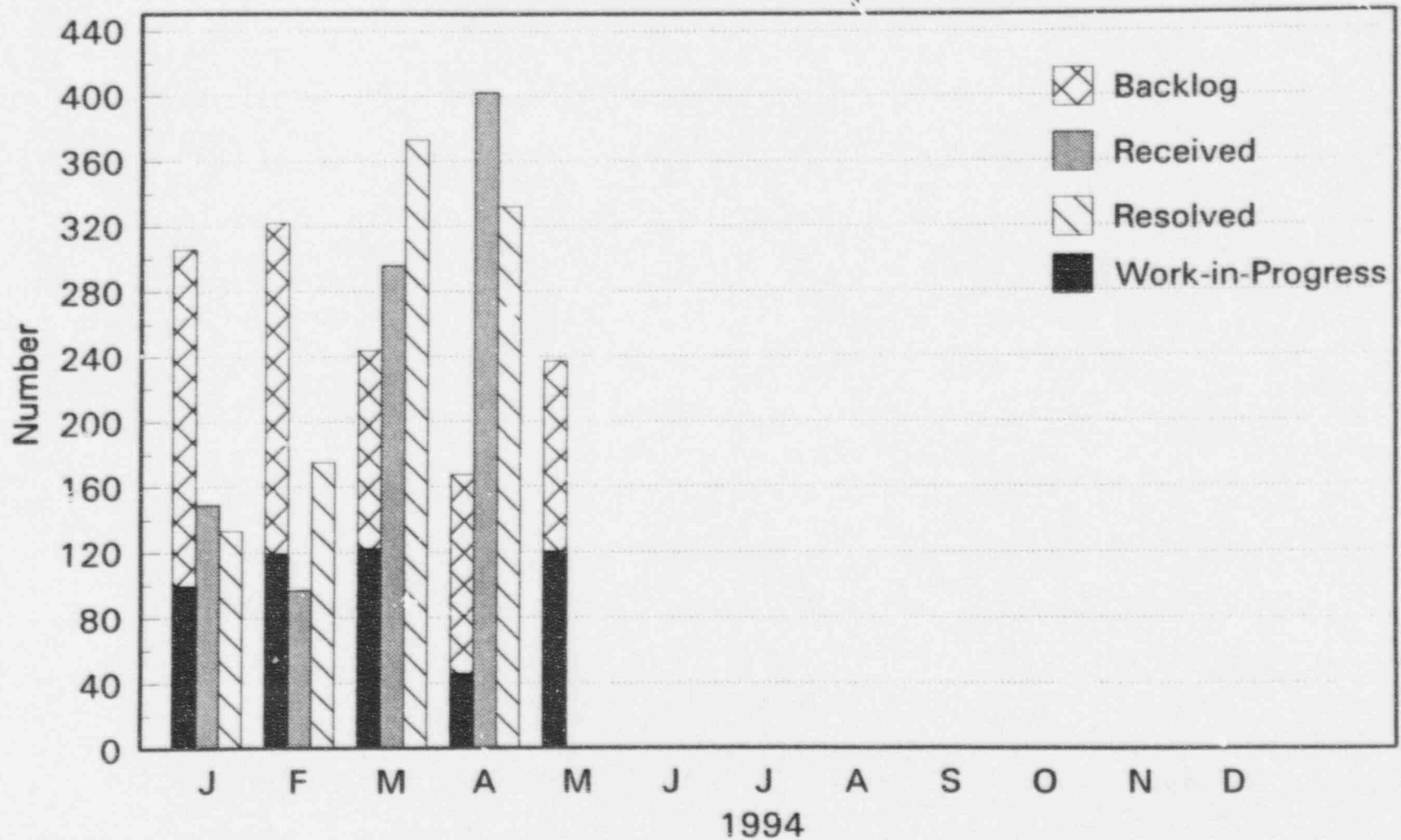
Document Management System Time Available Nuclear Dept



CPW1C

MMIS Work-in-Progress Load

Nuclear Dept



ENG6b

Nuclear Department Tactical Plan - CPAT W-2 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> • Nuclear Procurement and Material Management <ul style="list-style-type: none"> • Assess and optimize new warehouse productivity <p>STATUS: Complete</p> <ul style="list-style-type: none"> • Optimize utilization of WAMMS System <ul style="list-style-type: none"> • Performance indicators • Management reporting • Parts availability to clients <p>STATUS: Ongoing, performance indicator in place.</p> <ul style="list-style-type: none"> • Implement corporate material management personnel development program <p>STATUS: Working - bargaining unit (3rd quarter 1994), Material Control (2nd half of 1994), Procurement (1st quarter 1994).</p>	Mgr-NP&MM	M&S S/HC-Maint Planning	7/92	
	GM-Mat Mgmt (Corporate)	Mgr-NP&MM MMSO (Corp)	3/94	ongoing
<ul style="list-style-type: none"> • Implement Work Packages <ul style="list-style-type: none"> • Work package standards monitoring • Realign customer focus with work departments <p>STATUS: Working</p>	Sta Planning - Mgr Salem		1/94	ongoing

Nuclear Department Tactical Plan - CPAT W-2 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> • Work towards including: <ul style="list-style-type: none"> • Why is job being done • Tech Spec Action Statement • ALARA • Heat Stress • Plant Conditions • Work Impact • Contingency Plans • Tagging Requirements <p><u>STATUS:</u> Working</p> <p><u>Implement Salem Unitization Plan</u></p> <p><u>STATUS:</u> On schedule.</p> <p>Form a process improvement team to "Work Control" and implement activities.</p> <p><u>STATUS:</u> Full time team assigned, process on schedule.</p>				

Measures

W-2 Effective use of work planning and schedules

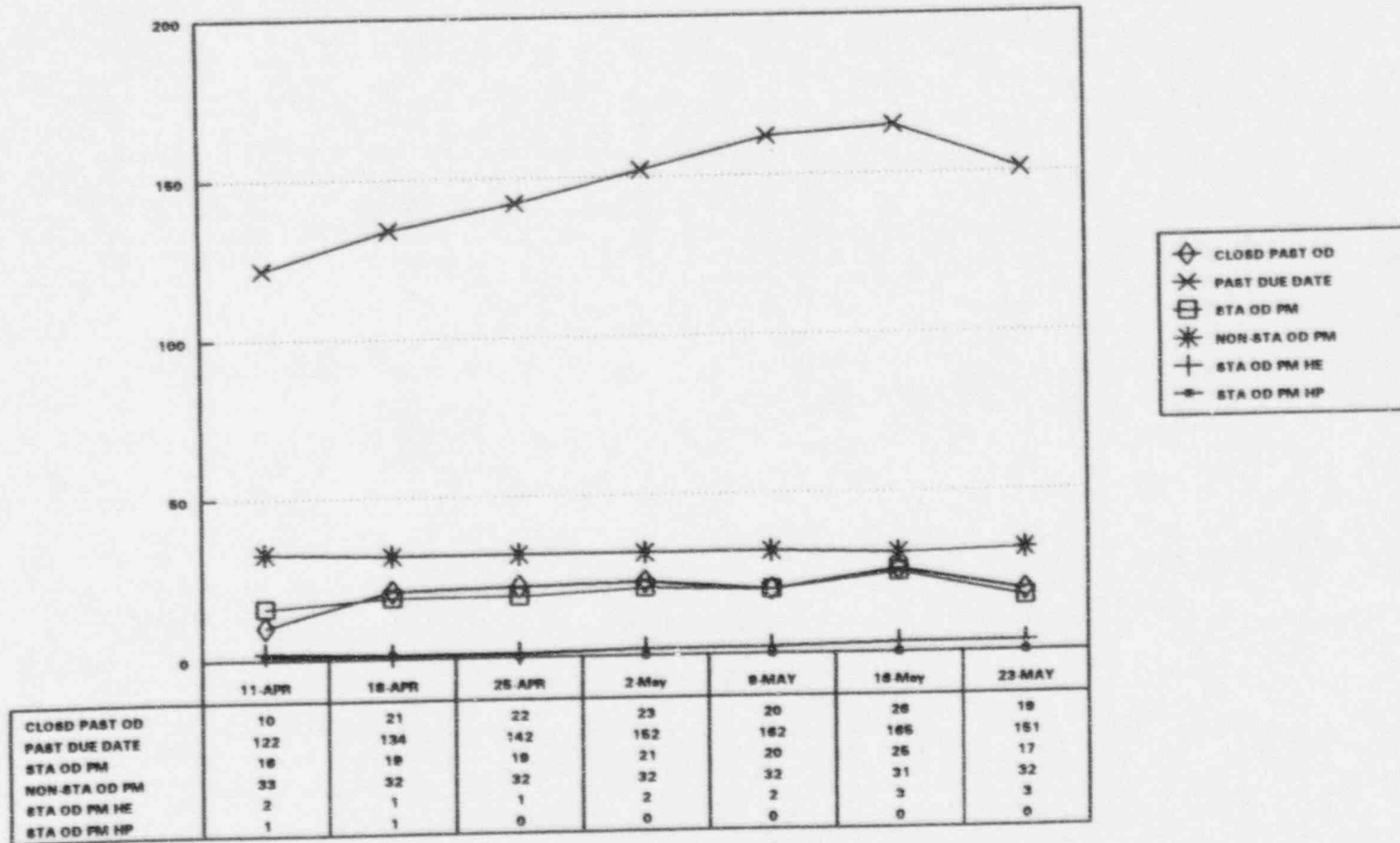
MEASURES:

- Corrective Maintenance Backlog and Aging
- Preventative Maintenance Overdue
- Schedule Achievement (non-outage)
- Outage Window Performance

Shutdown
Rx Disassembly
Drain RCS
Midloop
Core Reload
Mode 5
Mode 5 to 4
Mode 4 to Unit Synchronization

U1 NON-OUTAGE PREVENTIVE MAINT. TREND

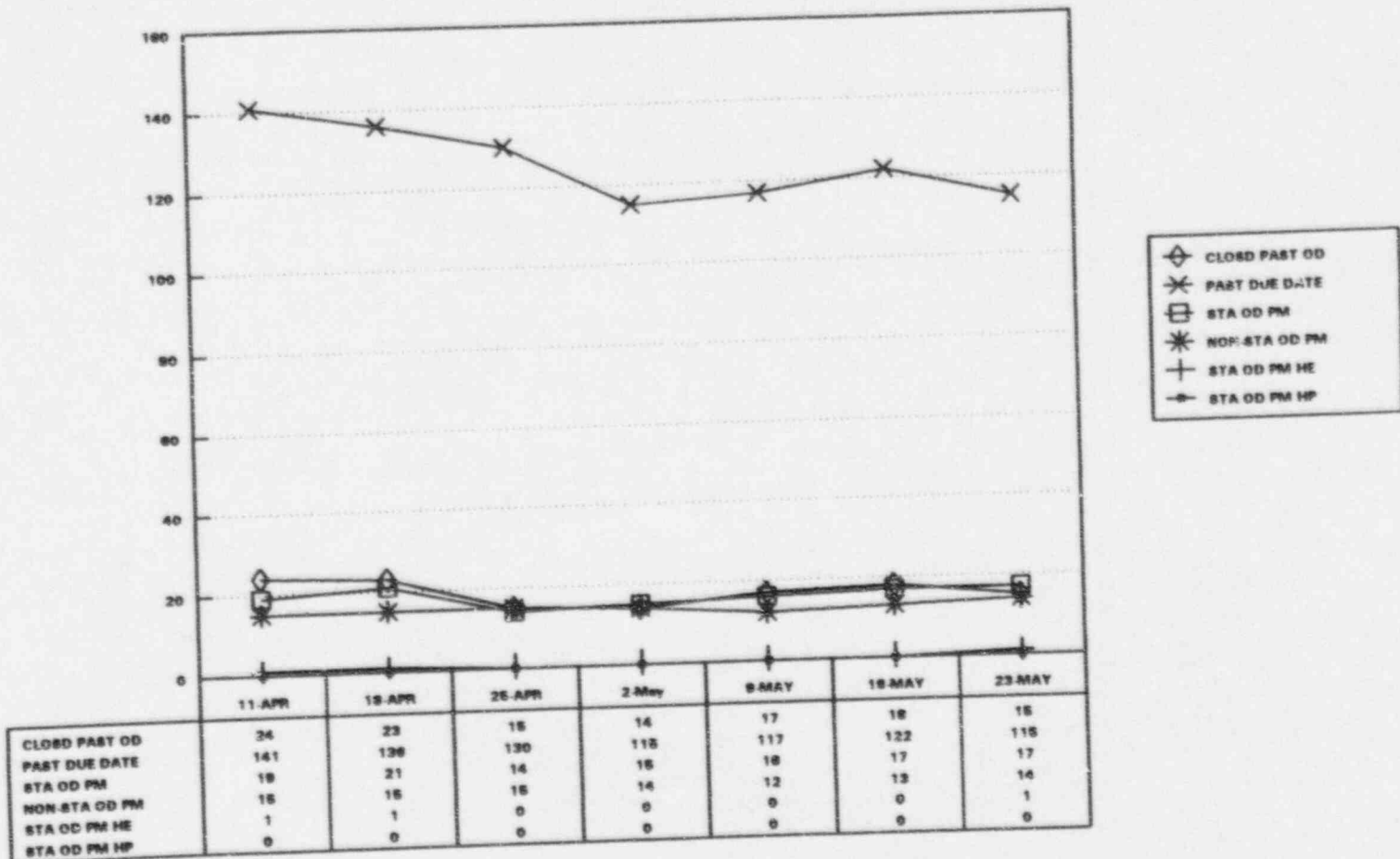
STATION DEPT'S ONLY (EXCEPT AS NOTED)
EXCLUDES HISTORY, REJECT, RDYRT & RTCPT



U1PMNO
May 23, 1994

U2 NON-OUTAGE PREVENTIVE MAINT. TREND

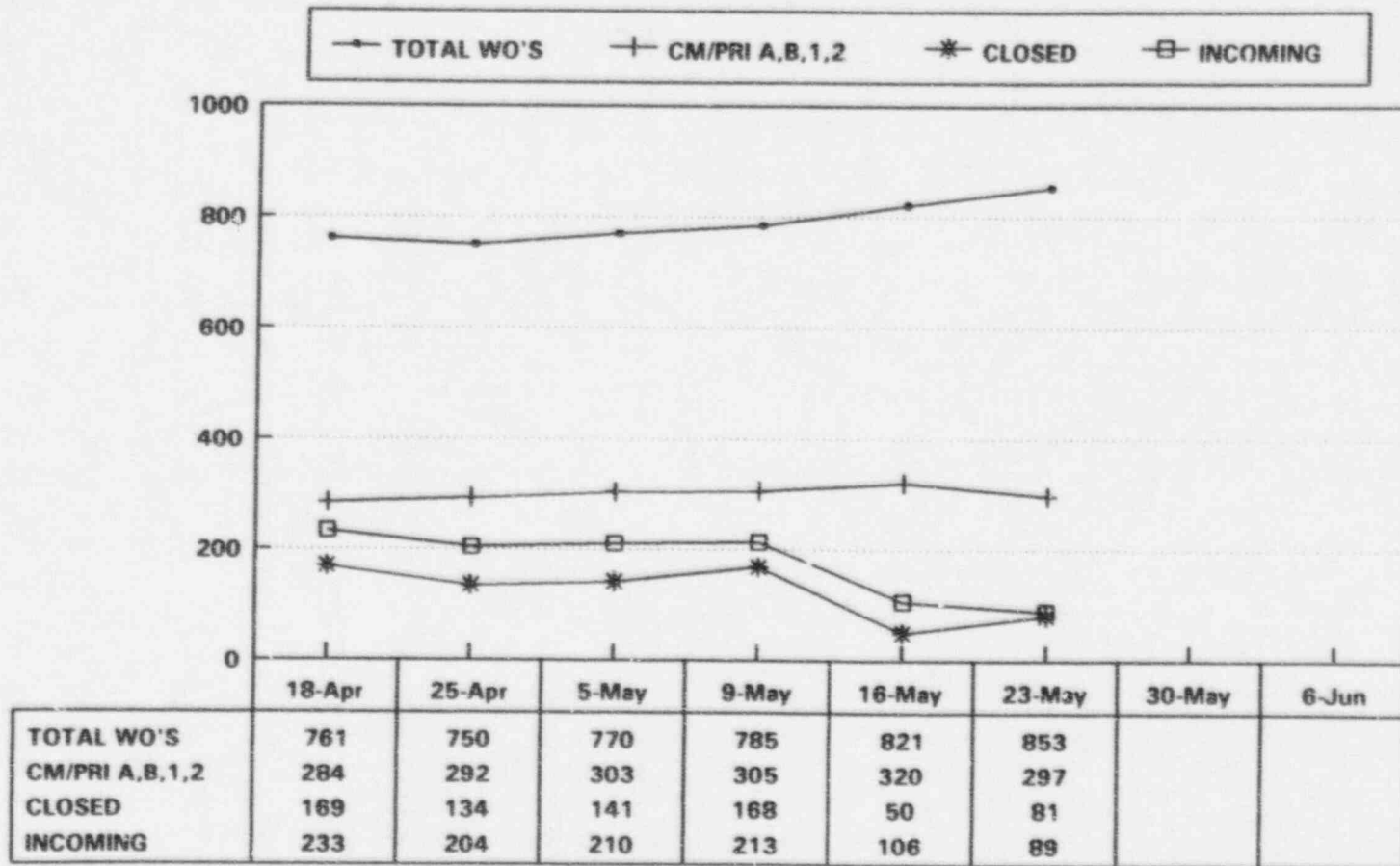
STATION DEPT'S ONLY (EXCEPT AS NOTED)
EXCLUDES HISTORY, REJECT, RDRYRT & RTCPT



U2PMNO
May 23, 1994

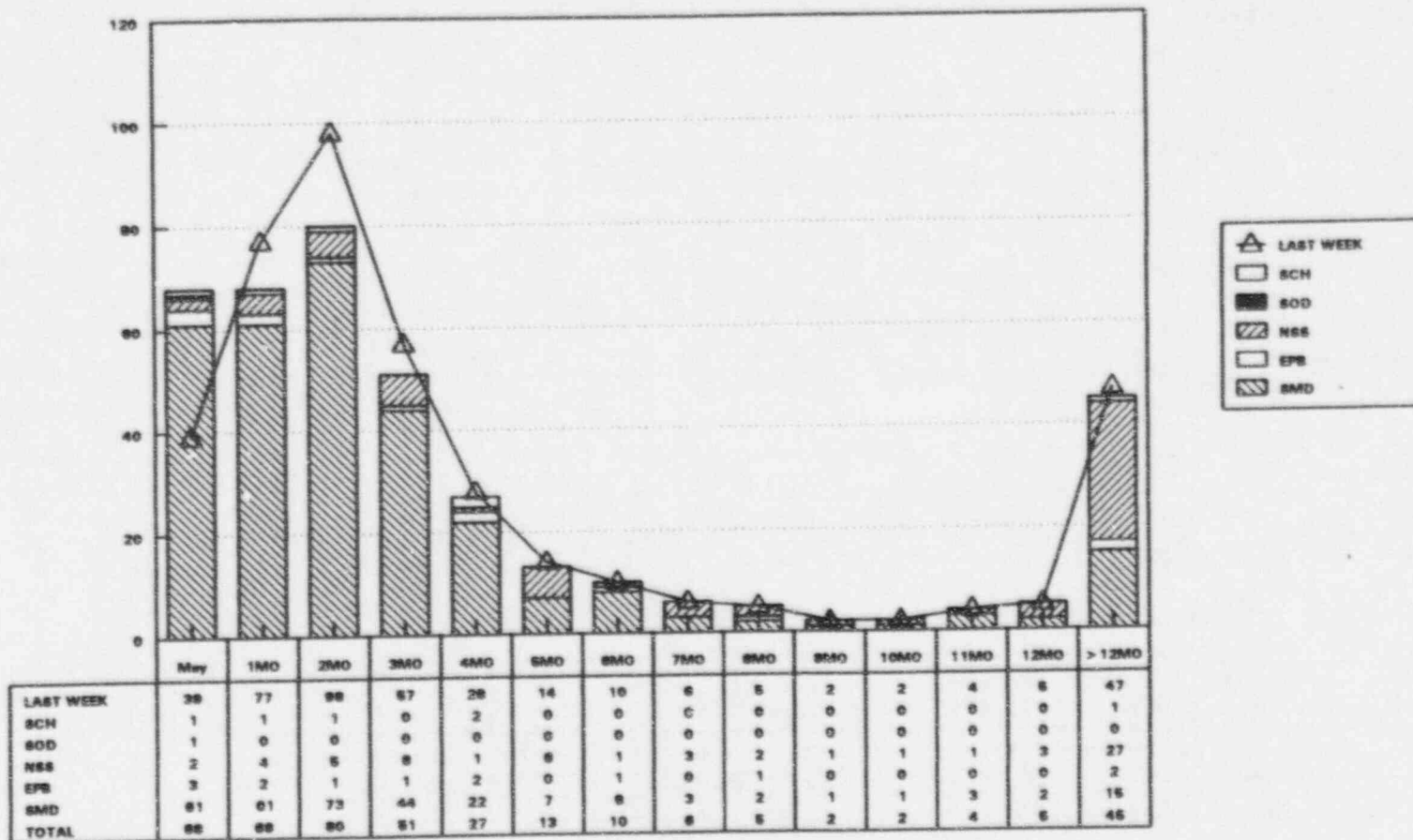
U1 MAINTENANCE W/O BACKLOG

NON-OUTAGE CM/PL WORKORDERS
STATION DEPARTMENTS ONLY



U1CMNO
U1CMNOA/B/C|NOC1B
May 23, 1994

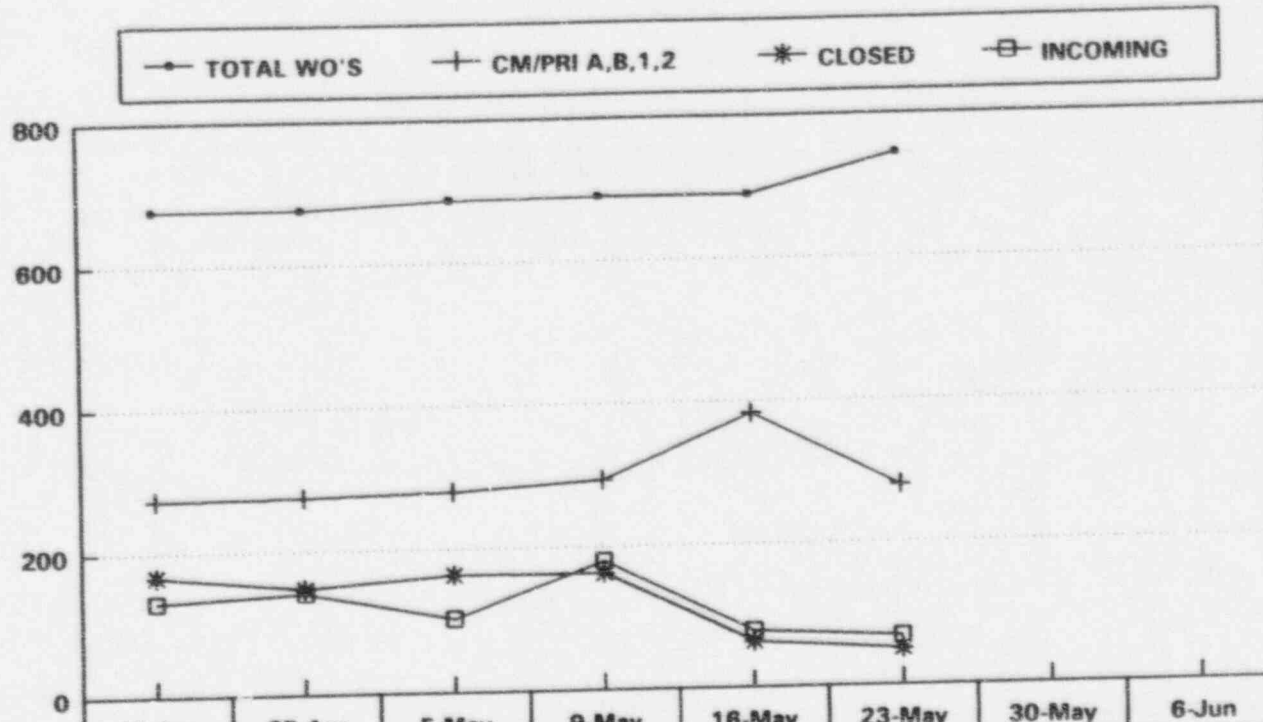
U1 NON-OUTAGE CORRECTIVE MAINT. W/O'S
 SORTED BY DEPARTMENT/GROUPS/PRI A,B,1,2
 EXCLUDES HISTORY, REJECT, RDYRT & RTCPT



MONTHS OLD 1994

U1CMNO2
 U1CMNO2-1
 May 23, 1994

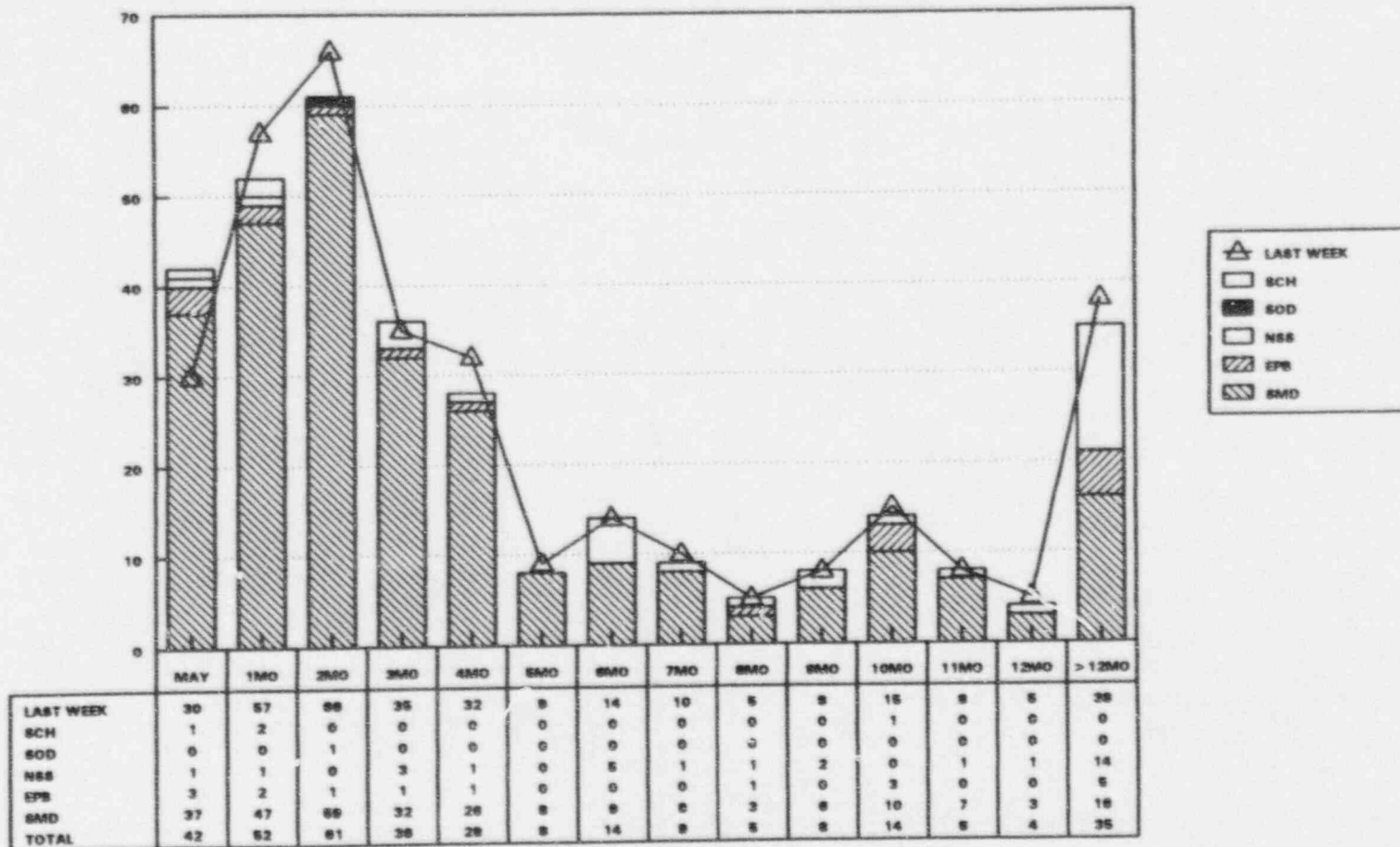
U2 MAINTENANCE W/O BACKLOG
NON-OUTAGE CM/PL WORKORDERS
STATION DEPARTMENTS ONLY



	18-Apr	25-Apr	5-May	9-May	16-May	23-May	30-May	6-Jun
TOTAL WO'S	677	677	688	690	689	745		
CM/PRI A,B,1,2	273	275	280	293	382	279		
CLOSED	167	148	164	163	83	50		
INCOMING	130	141	102	180	78	68		

U2CMNO
 U1CMNOA/B/C|NOC1B
 May 23, 1994

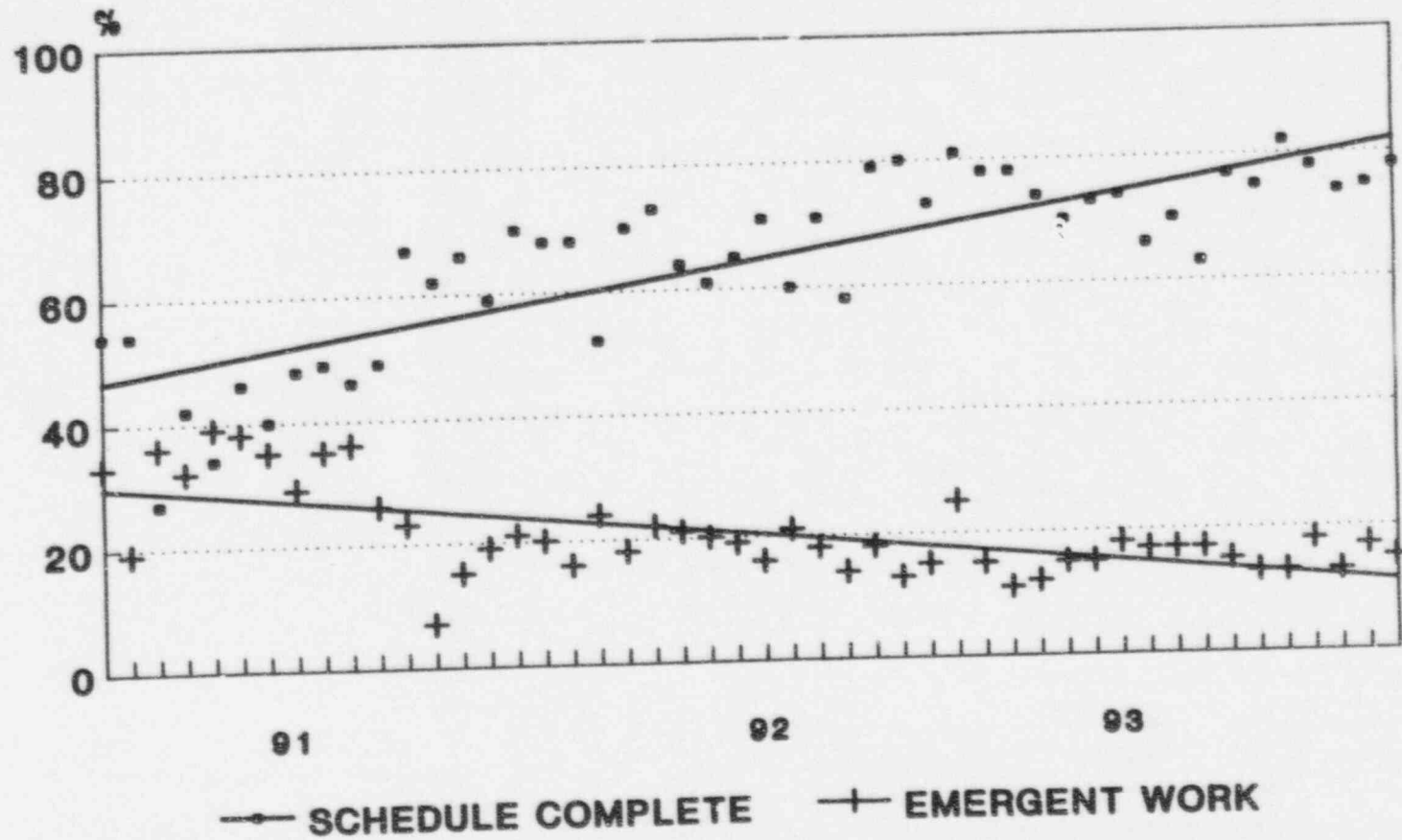
U2 NON-OUTAGE CORRECTIVE MAINT. W/O'S
 SORTED BY DEPARTMENT/GROUPS/PRI A,B,1,2
 EXCLUDES HISTORY, REJECT, RDYRT & RTCPT



MONTHS OLD 1994

U2CMNO2
 May 23, 1994

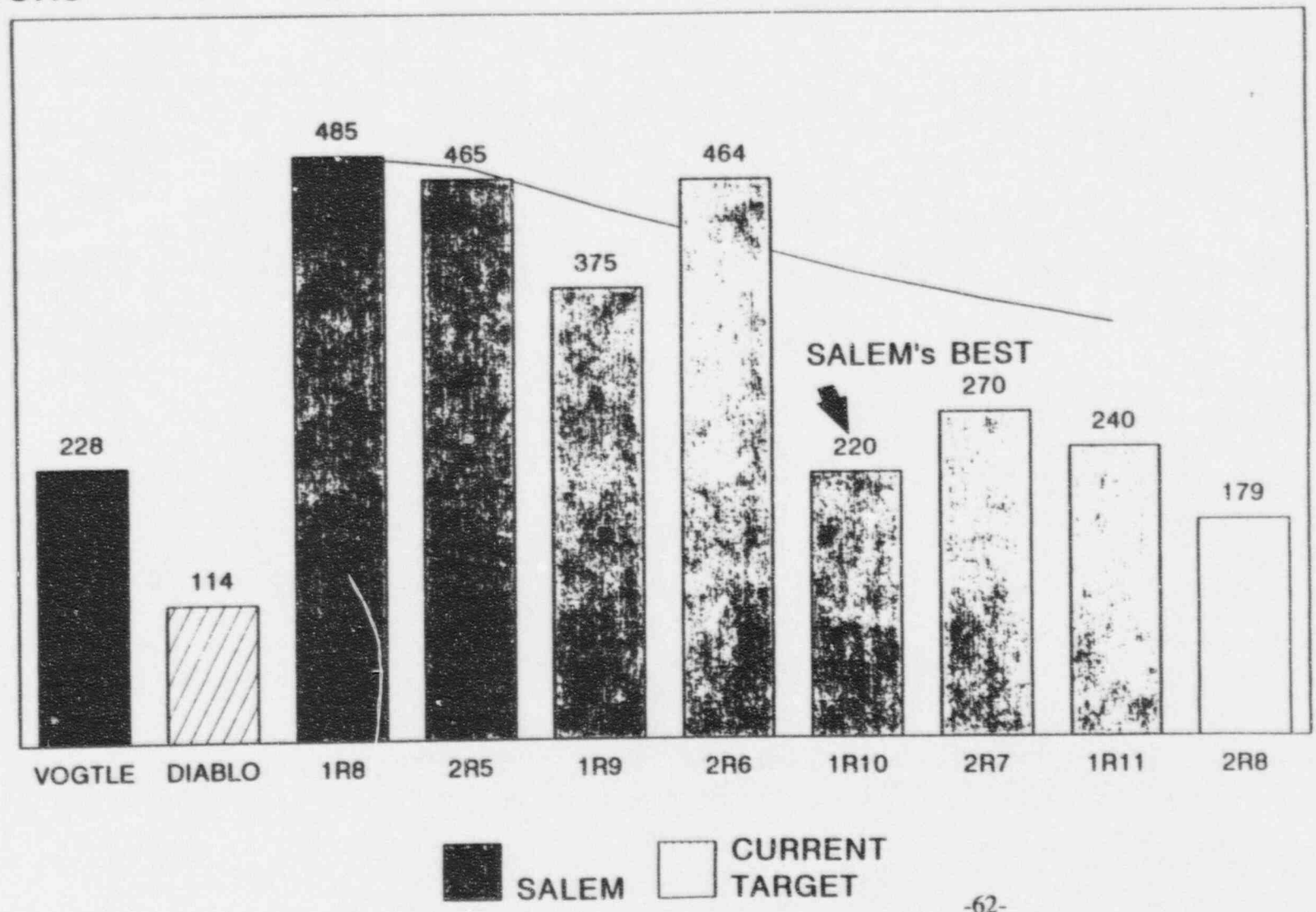
SALEM NUCLEAR GEN NON OUTAGE SCHEDULE ACHIEVEMENT



MAJOR WINDOW COMPARISON

SHUTDOWN THRU RX HEAD ON STAND

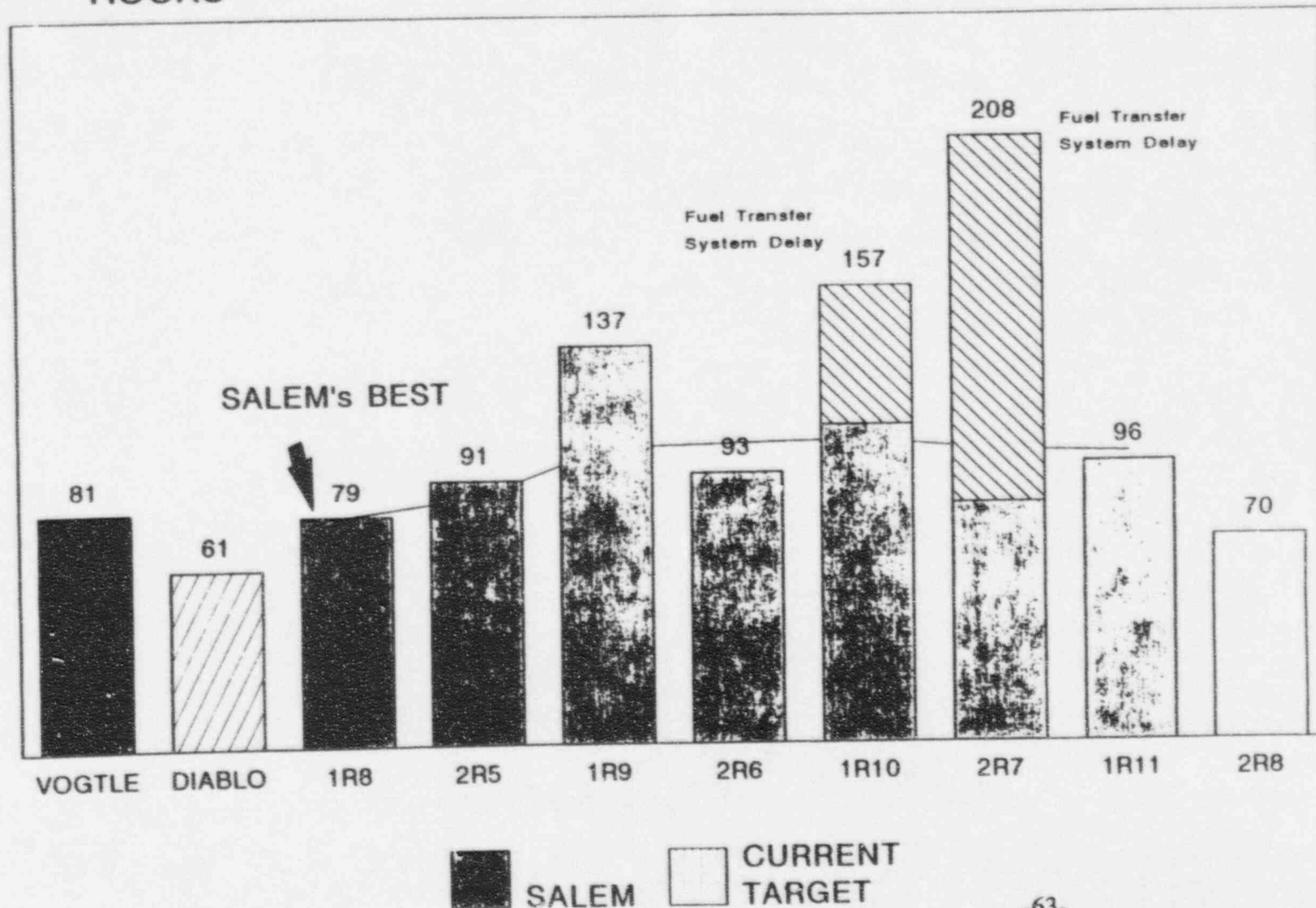
HOURS



MAJOR WINDOW COMPARISON

REACTOR DISASSEMBLY THRU CORE OFFLOAD

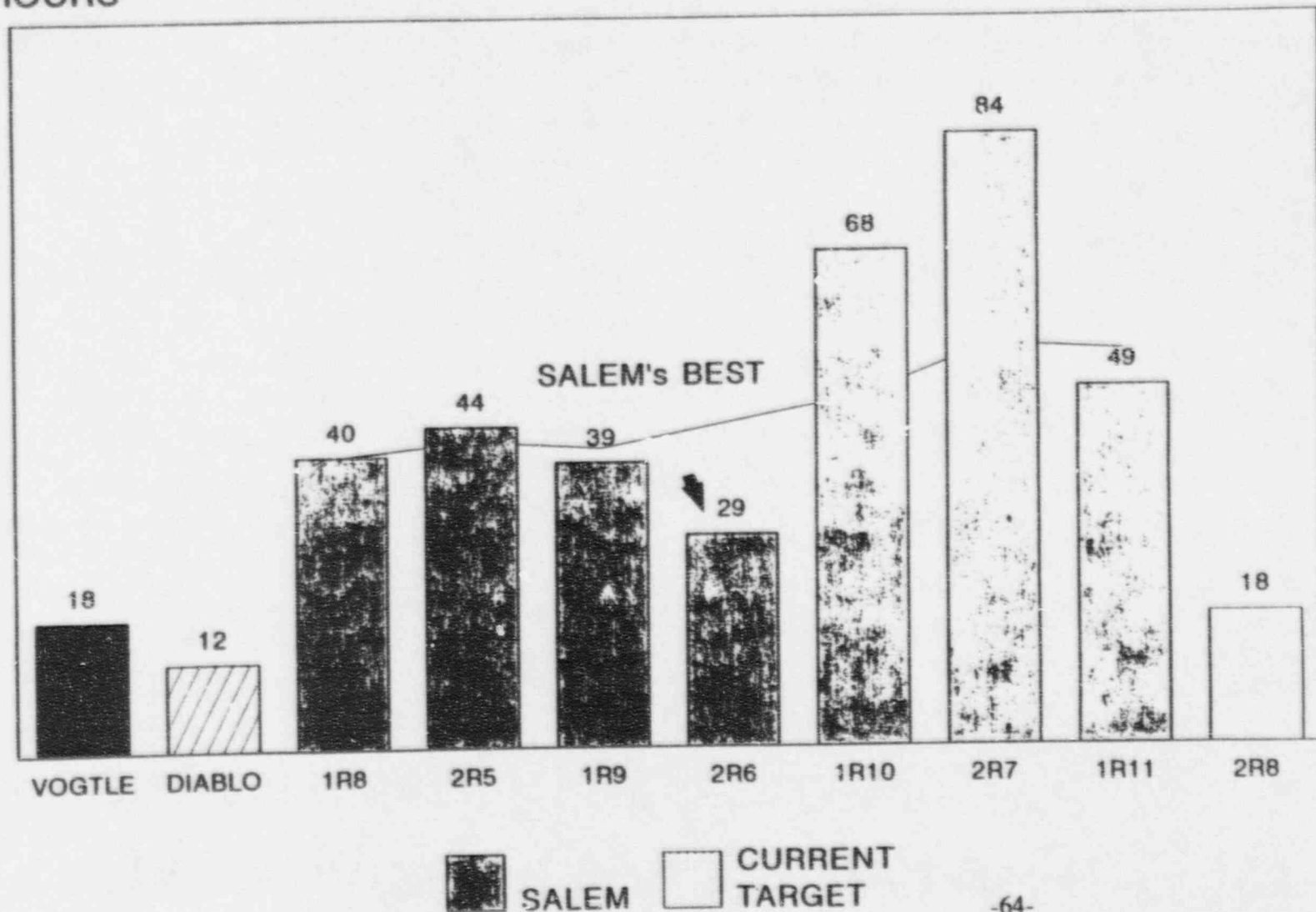
HOURS



MAJOR WINDOW COMPARISON

DRAIN RCS

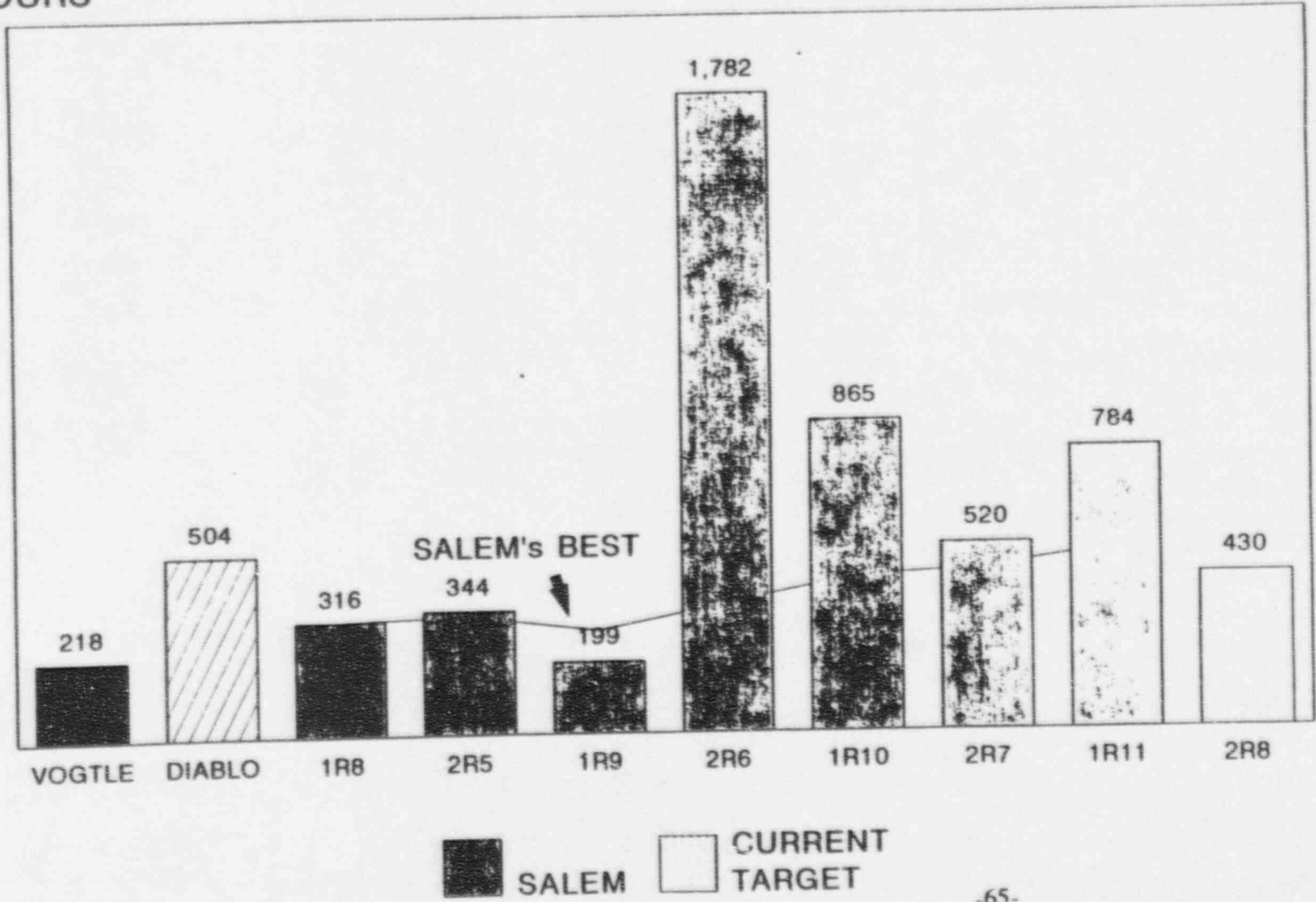
HOURS



MAJOR WINDOW COMPARISON

MIDLOOP OPERATIONS

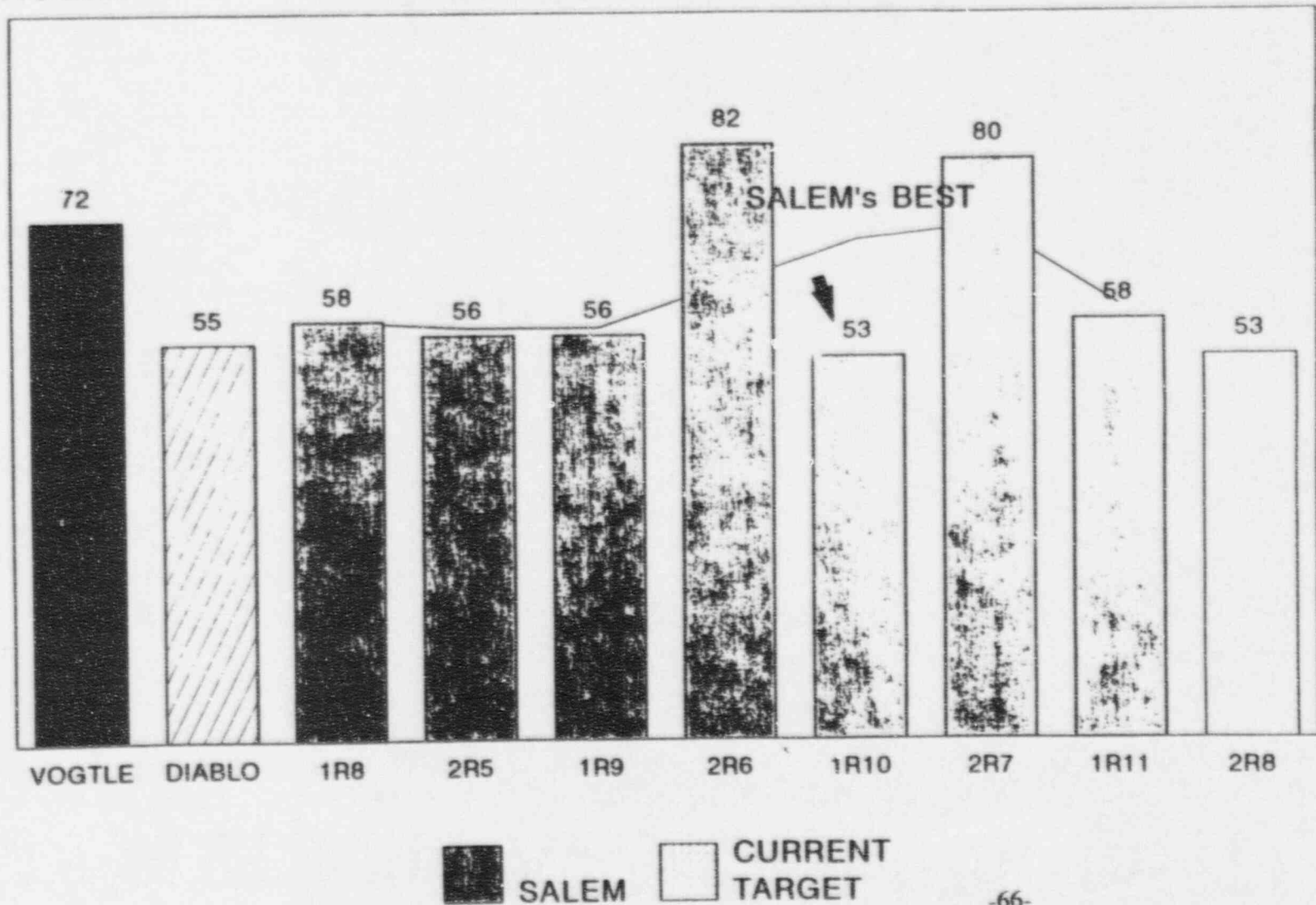
HOURS



MAJOR WINDOW COMPARISON

CORE RELOAD

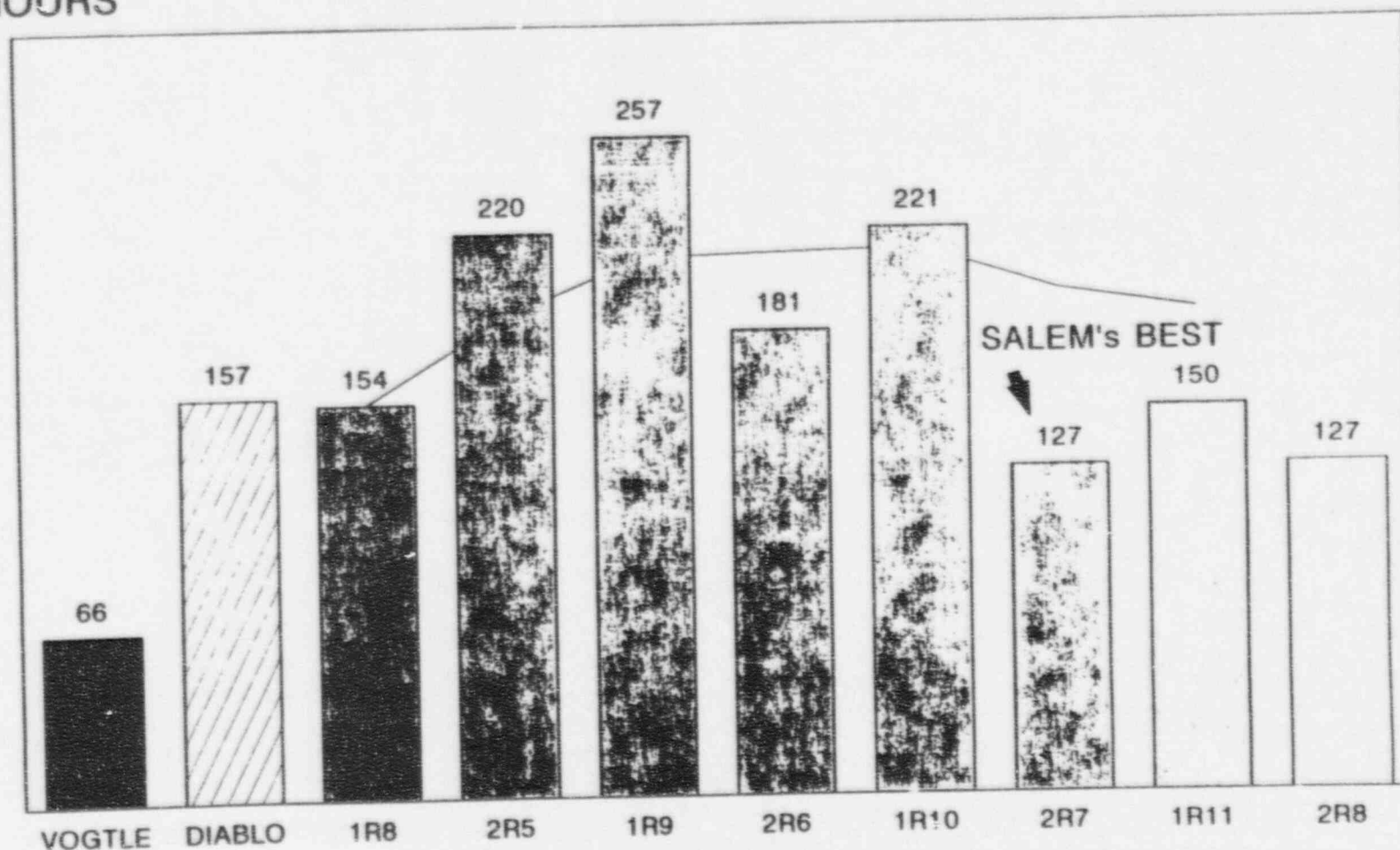
HOURS



MAJOR WINDOW COMPARISON

COMPLETED CORE RELOAD TO MODE V

HOURS

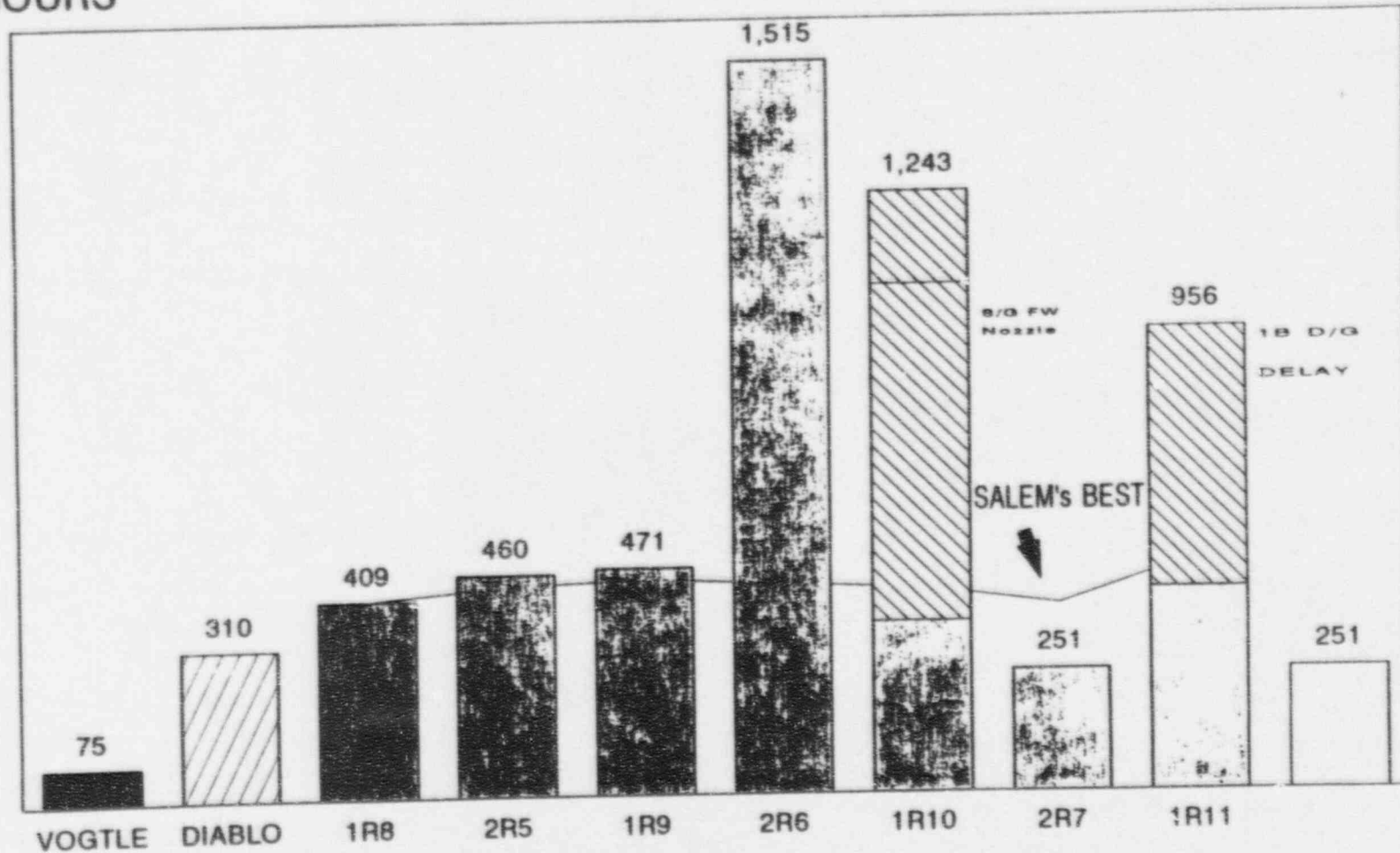


SALEM CURRENT TARGET

MAJOR WINDOW COMPARISON

MODE V TO IV

HOURS

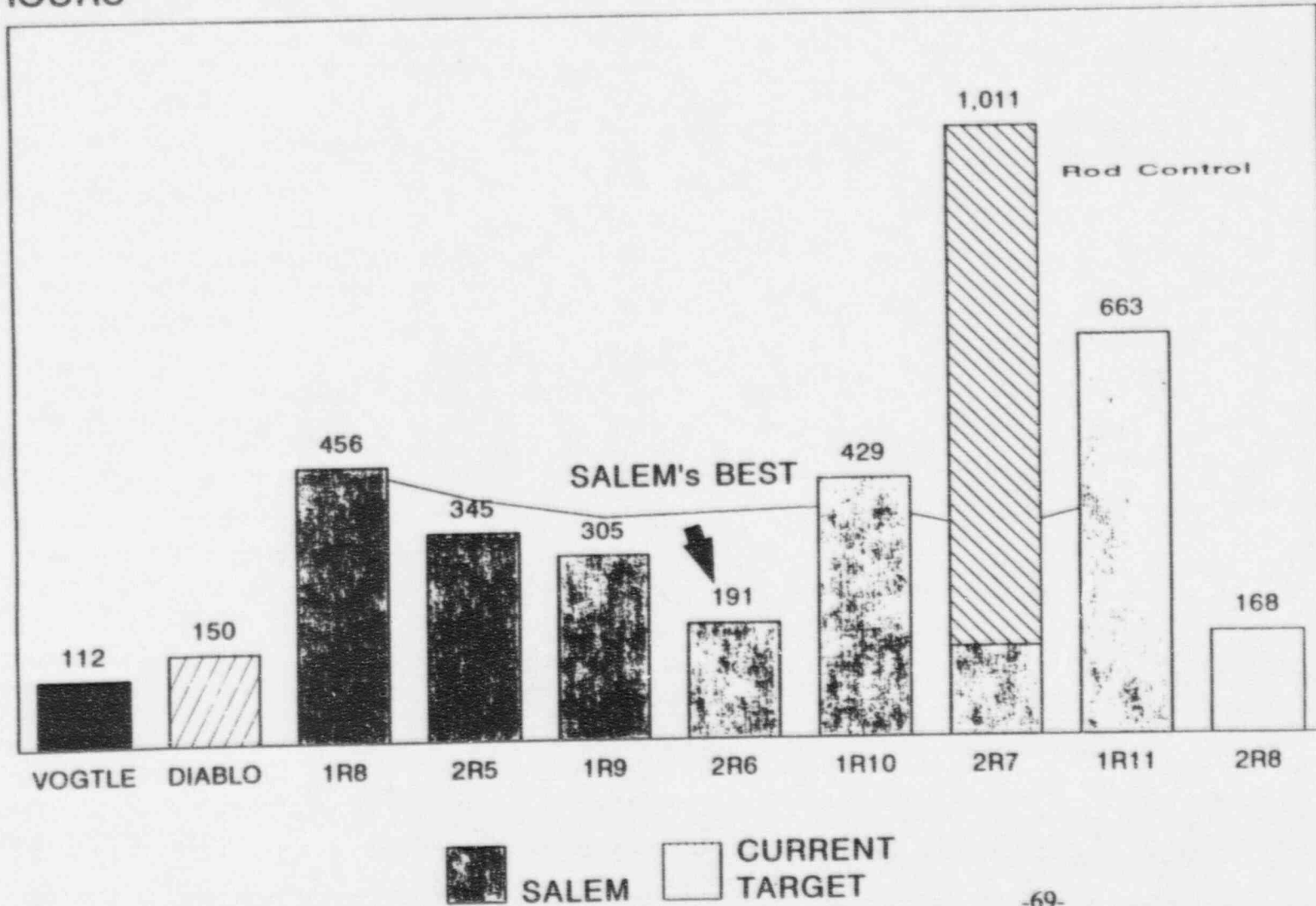


SALEM CURRENT TARGET

MAJOR WINDOW COMPARISON

MODE IV TO FINAL SYNC

HOURS



Nuclear Department Tactical Plan - CPAT W-3

Key Focus Item Supported: Process work-around versus ownership and continuing improvement (CPAT W-3)

Sponsor: Vice President - Nuclear Operations

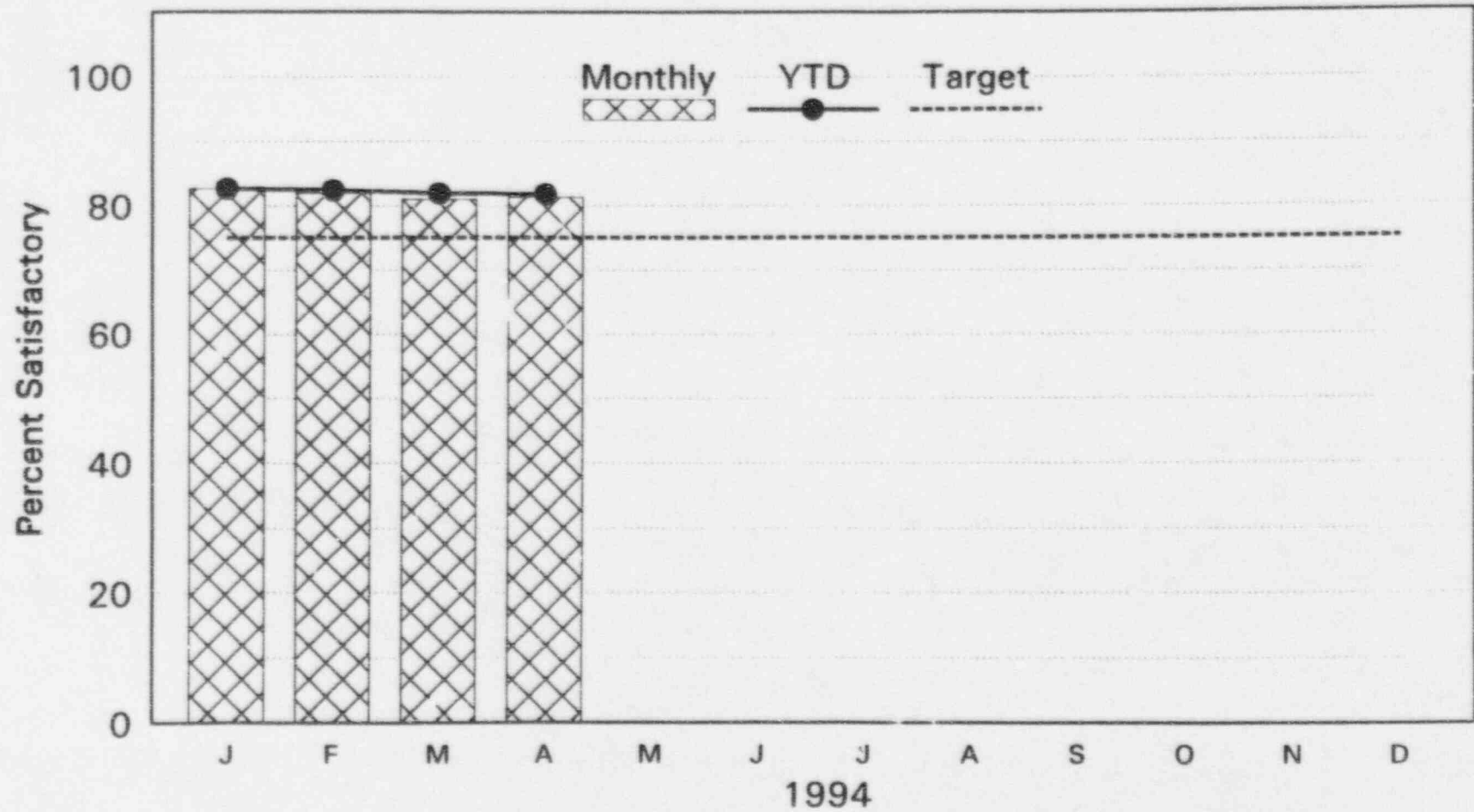
Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> Combine NAP 1 (Nuclear Department Procedure System) and NAP 32 (Preparation, Review and Approval of Procedures) into one procedure. <p>STATUS: Completed 3/94</p>	GM-HCO	W-3 Team	1/94	5/94
<ul style="list-style-type: none"> Review NAP 59 (10CFR50.59 Reviews and Safety Evaluations) for simplification, followed by the approximately 40 NAPs which are sponsored by Nuclear Operations <p>STATUS: NAP 59 issued 5/17/94, others by 12/94</p>	GM-HCO	W-3 Team	3/94	5/94
<ul style="list-style-type: none"> Further simplify NAPs by separating those procedures which directly impact plant safety and are more subject to regulatory scrutiny from those which are not, permitting more simple processes for writing, reviewing, and implementing administrative procedures <p>STATUS: In progress</p>	GM-HCO	W-3 Team	3/94	12/94
<ul style="list-style-type: none"> Roll out lessons learned to RC Managers Evaluate transition of station procedures back to responsible departments 	GM-HCO GM-HCO	W-3 Team W-3 Team	5/94 6/94	12/94 12/94
<p>Identify and Correct Work-arounds</p> <ul style="list-style-type: none"> Evaluate work-arounds during field time and/or work monitoring <p>STATUS: Working</p>	VP-NO	GM-SO GM-HCO	2/94	ongoing
<ul style="list-style-type: none"> Include lessons learned in SL-40, SD-16, work standards handbook Review work continue process to eliminate potential for work-arounds 	GM-HCO Dir-PI	W-3 Team Work Control PIT	11/94 2/94	6/95 12/94
<ul style="list-style-type: none"> Review development of software on LAN's 	Mgr-M&S	Staff		

W-3 Process work arounds versus ownership and continuing improvement

MEASURES:

- Work Practices and Standards Monitoring by Line Management
- Work Practices and Standards Monitoring by QA
- Total Human Performance Events
- Licensee Event Reports (Personnel Error)

Work Practices & Standards Performance Line Management Monitoring Salem Station

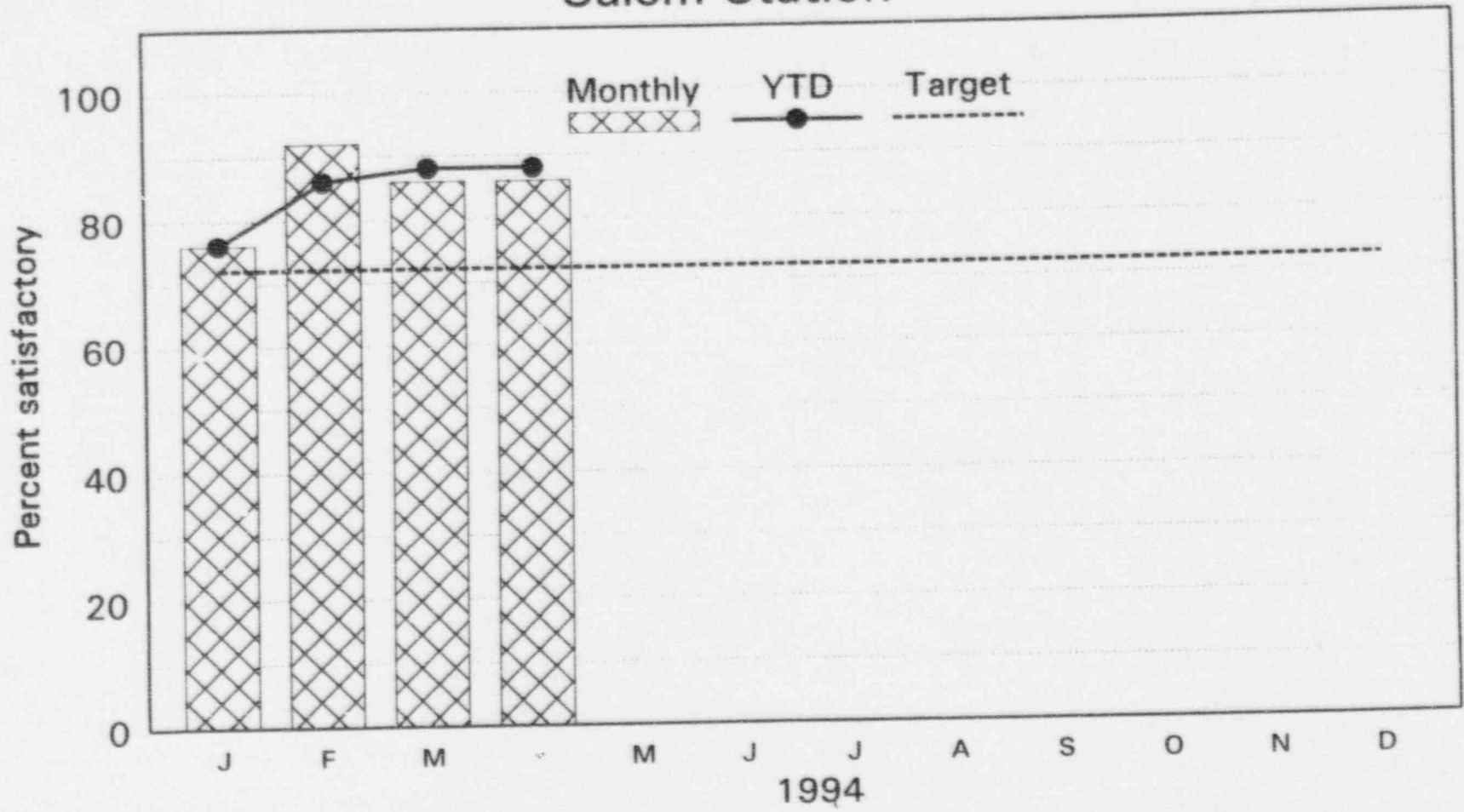


55s

Work Practices & Standards Performance

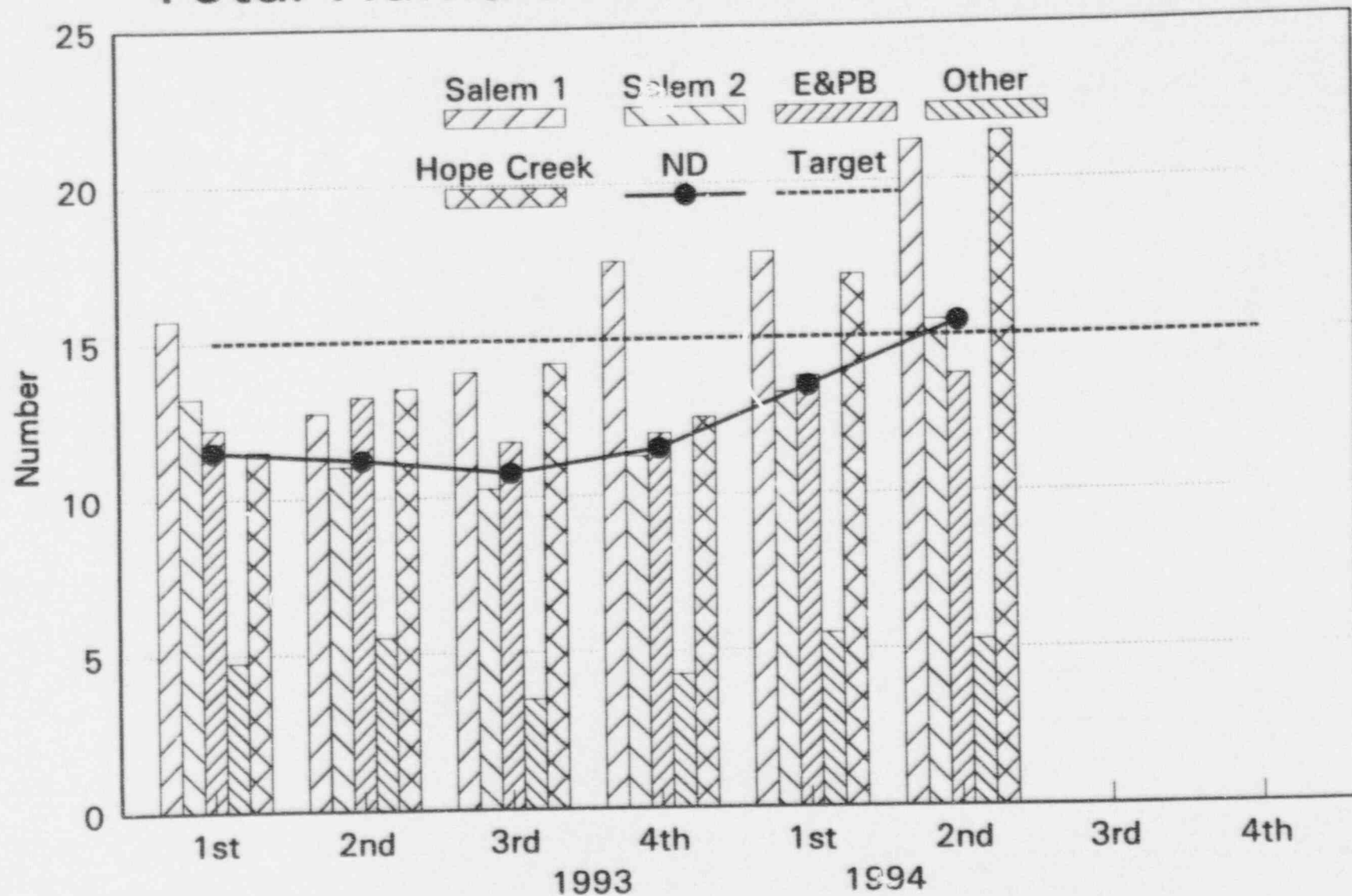
QA Monitoring

Salem Station



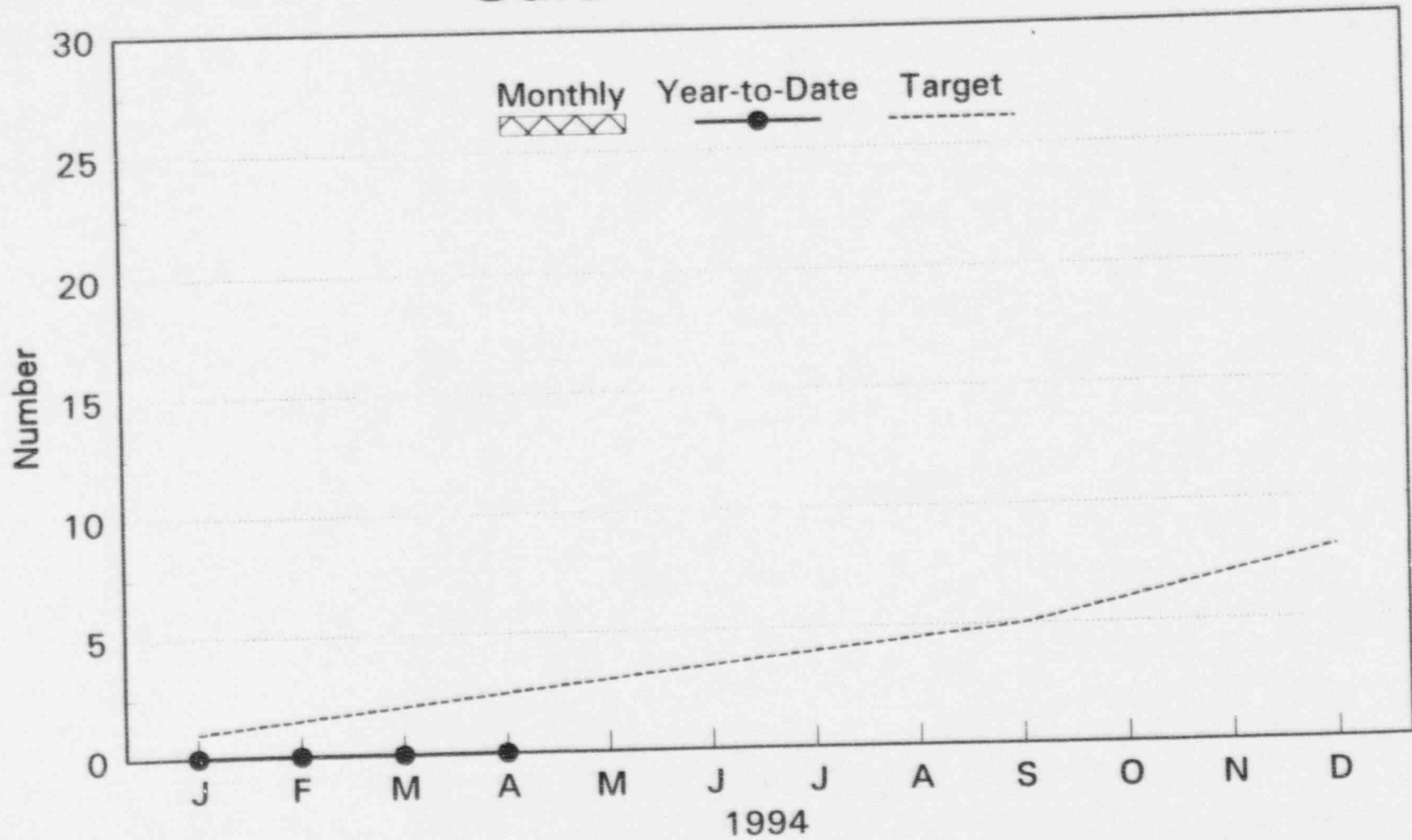
53s

Total Human Performance Events



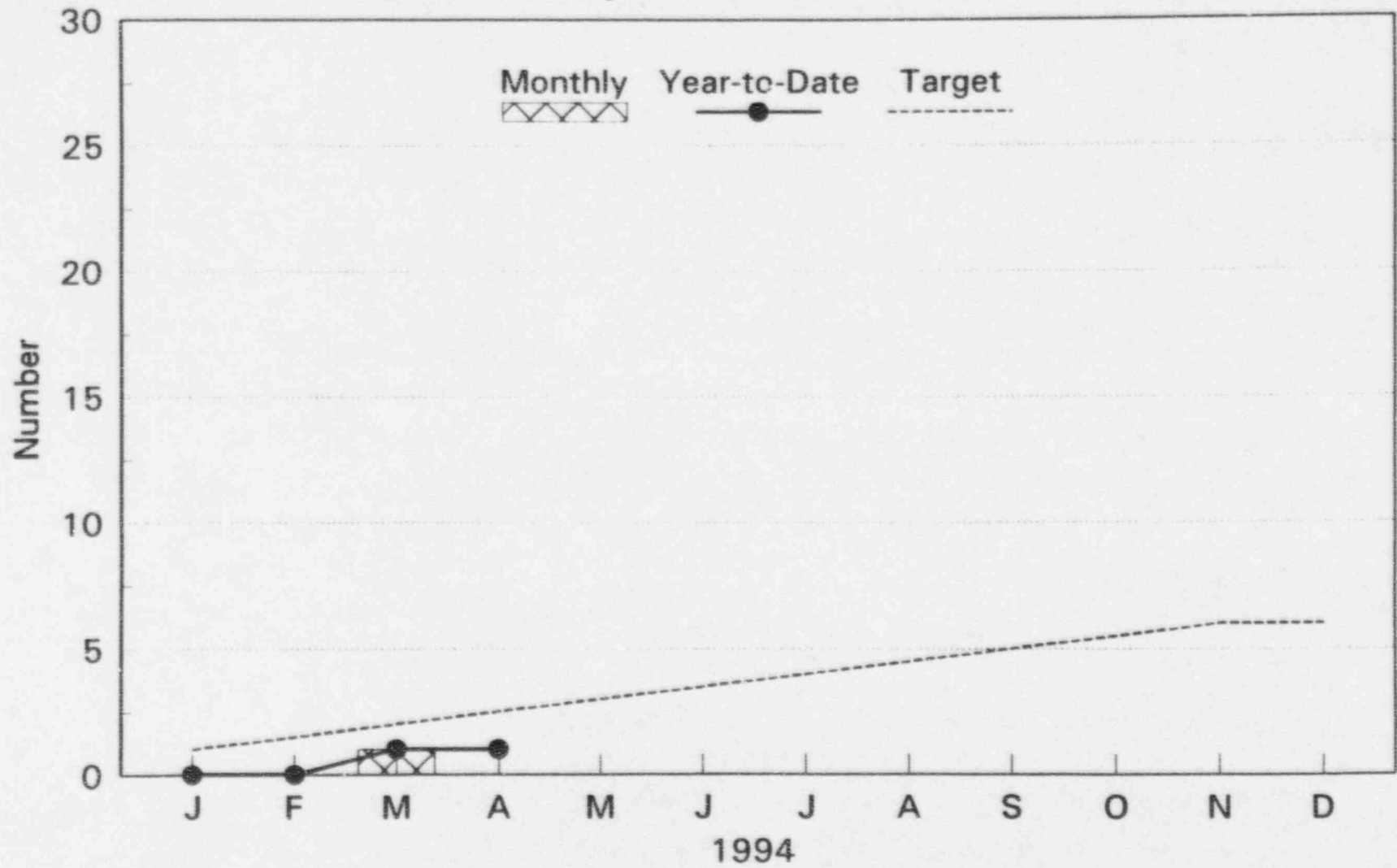
REAS3_12 month avg

LER Personnel Related Salem Station



28s

LER Personnel Related Hope Creek



Nuclear Department Tactical Plan - CPAT W-4

Key Focus Item Supported: Timely and Accurate Part Information and Availability with Appropriate levels of end-user intervention (CPAT W-4)

Sponsor: Vice President - Nuclear Operations

Activity	Sponsor	Support	Start	Stop
<p>Formalize Training Program (Codes, Standards, Hardware, Forklift, Safety Procedures)</p> <ul style="list-style-type: none"> Continuing training MMIS, PDIS, VPNO, AP-18, AP-19, AP-09, AP-38 Conduct training needs survey (W4, Bullet 6) <p>STATUS: Work started - formed NP&MM Team & J. Samson is doing client survey. (5/24/94) J. Samson is still developing client network for WAMMS and APPO Training Issues/Concerns.</p>	Mgr-NP&MM	Mgr-NTC	1/94	ongoing
		Mgr-NTC	1/94	ongoing
		GM-NHR&AS	4/94	7/94
<p>Implement Recommendations of Process Improvement Team on Obsolete Spare Parts (W4, Bullet 2, 8)</p> <p>STATUS: Complete implementation - procurement engineering is tracking status of PEs & OSPs. (5/24/94) NP&MM/Per are actively developing tracking process/client feedback and status tool.</p>	Mgr-NP&MM		11/93	6/94
<p>Align Nuclear Procurement & Material Management with Corporate Organization Structures</p> <p>STATUS: New NP&MM organization announced on 5/16/94. Now implementing.</p> <ul style="list-style-type: none"> Conduct organization review Implement new organization <p>STATUS: Working - expect implementation May 1994.</p>	Mgr-NP&MM		1/94	12/95
		GM-NHR&AS Mgr-P&MC	1/94 2/94	4/94 7/94

Nuclear Department Tactical Plan - CPAT W-4 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> • Monitor NP&MM effectiveness by client perception/service and specific performance indicators • Conduct client survey & implement client feedback mechanism (W4, Bullets 3, 4, 5, 7, 10, 14) <p>STATUS: Per Salem Maint. Planning - report on CM/PLS hold for parts >90 days old w/priority 1, 2, A or B. (5/24/94) Client survey completed. Feedback of results to NP&MM 5/1/94 (still evaluating comments).</p>		Mgr-P&MC S/HC/E&PB Planning Depts.	3/94	7/94
<ul style="list-style-type: none"> • Conduct periodic self assessments (W4, Bullets 3, 4, 5, 7, 10, 14) <p>STATUS: Specific strategy working - not yet finalized.</p>	Mgr-NP&MM		1/94	ongoing
<p><u>Implement On-Line Purchase Requisitions with APPO</u> (W4, Bullet 14)</p> <ul style="list-style-type: none"> • Develop Nuclear specific programming • Implement on-line System • P3/B3 Services • P2/B2 Inventory • P1/B1 Direct Charge Material <p>STATUS: Current - P1, P2, P3 and B3, needs B1, B2, Material & working. (5/24/94) Phase I APPO implemented 3/28/94. Phase II Project Initiation approved/funded by Corporate Business Partners. Scheduling still being developed for 94/95.</p>	Mgr-NP&MM	Mgr-M&S Dir-NF Corp IS	1/94	12/94
<p><u>Reduce Current Inventory Level</u></p> <ul style="list-style-type: none"> • Absorb inflation/supplier price increases • Obtain funding (including co-owner approval) to support five year reduction plan <p>STATUS: 1994 goal \$107m - current level (3/31/94) \$111.5m. (5/24/94) New year-end 1994 goal is =\$102.5M 5/23/94 value =\$110.3M.</p>	Mgr-NP&MM	Dir-Nuc Fin NEStd Mgr	1994 6/93	Ongoing 1996

Nuclear Department Tactical Plan - CPAT W-4 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> • Implement corporate material management process improvements <ul style="list-style-type: none"> • Common coding (W4, Bullet 2, 11) • Inventory consolidation STATUS: Still in process/\$2M Inventory Reduction so far. • Supplier performance (W4, Bullet 1) STATUS: Supplier performance - Implementation plan to be issued in June 94. Contact M. Rosenzweig. • Material & resource planning (MRP) • Resource recovery STATUS:Paulsboro First Surplus Salem Nov/Dec 1994. • Continue to develop supplier partnerships STATUS: Working • Continue expansion of JPC (Joint Procurement Corporation) activities STATUS: Master Purchase Agreement - 1. MCCB's, 2. Limitorque Parts, 3. Bearings - PC2 and PC3. Still development with bearings. MCB's/Limitorque parts in place. • Develop/communicate corporate inventory reduction strategy (W4, Bullet 9) STATUS: Common Coding - started 1/94 inventory consolidation on track, supplier performance - corporate PIT - finalizing plan - target 6/94. (5/24/94) Consolidation Project in progress. No action on common coding at nuclear - scheduled Nov. 1994. 	Mgr-NP&MM	GM-MM	1/94	12/95
		Mgr-P&MC	9/94	7/95
		GM-MM	1/94	10/94
		Mgr-Nuc Purch	9/93	6/94
		Mgr-MGP Corp	1/94	1/95
		Mgr-Res	1/94	1/95
		Recovery	9/93	12/95
		Mgr-Nuc Purch	1/94	7/94
		Mgr-P&MC	1/93	ongoing
		Mgr-P&MC Dir-NF GM-MM	1/94	5/94

Measures

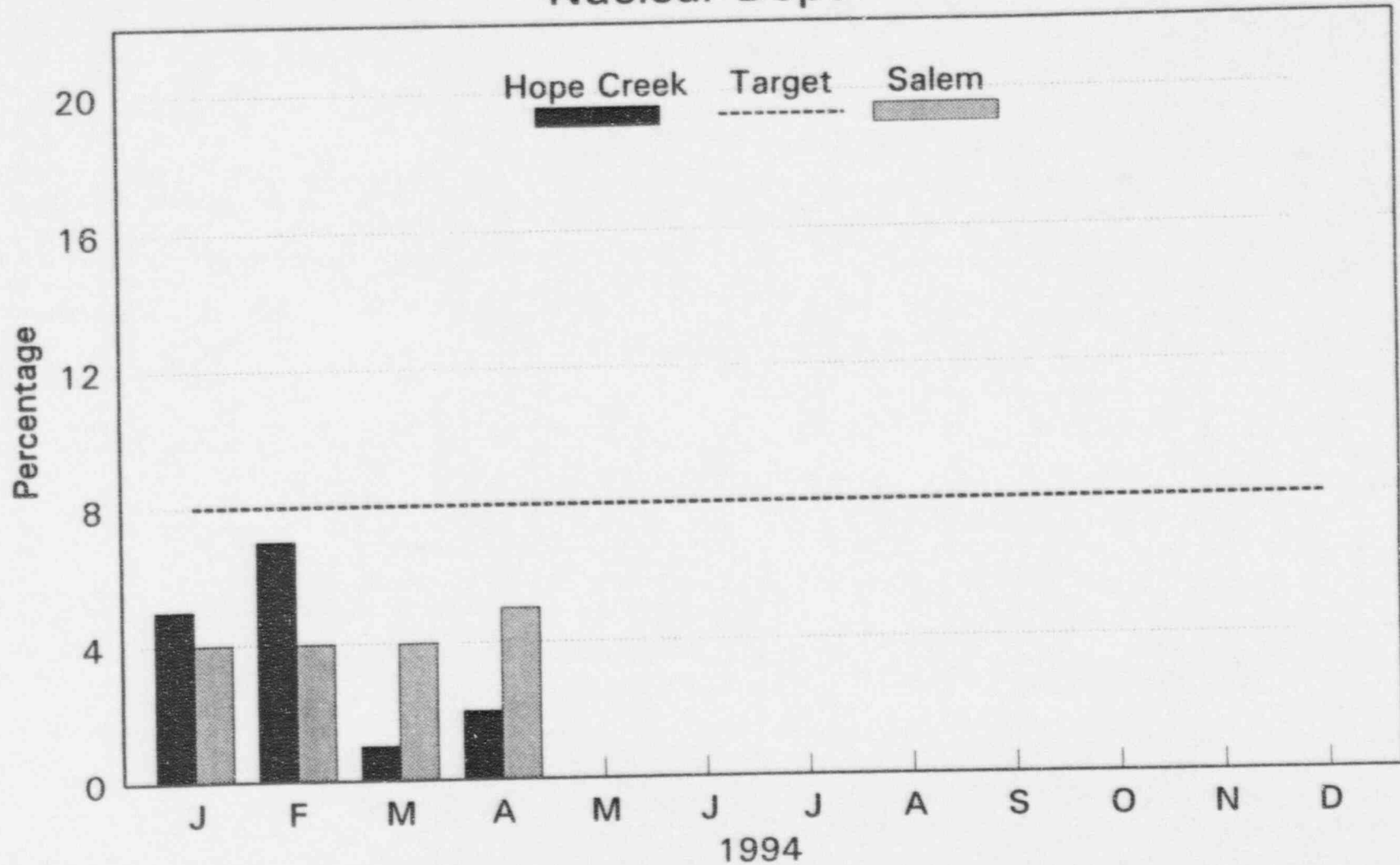
W-4 Timely and accurate part information and availability with appropriate levels of end-user intervention

MEASURES:

- Workorders on Hold for Inventory Parts

Workorders on Hold for Inventory Parts

Nuclear Dept



PROC1

Nuclear Department Tactical Plan - CPAT W-5

Key Focus Item Supported: Content & Delivery of Technical Training to Effectively Support Individuals and Groups (CPAT W-5)

Sponsor: Vice President - Nuclear Operations

Activity	Sponsor	Support	Start	Stop
<p><u>Integrated Total Quality Initiatives into Initial and Continuing Technical Training Programs</u></p> <ul style="list-style-type: none"> • Assess Mechanical Maintenance program • Assess Controls Maintenance program based upon results of above <p><u>STATUS:</u> Process Improvement Team named, first meeting 5/94. Postponed due to HC SERT involvement. Plan start 6/94.</p>	Mgr-NTC		5/94 6/94	complete 12/94
<ul style="list-style-type: none"> • Continue to integrate increased awareness to work standards and management expectations in all training programs. (Train-the-Trainer on Quality/Diversity conducted Jan/Feb, 1994) <p><u>STATUS:</u> Working</p>			1/92	ongoing
<ul style="list-style-type: none"> • Assess value of on-the-job refresher and/or increased use of "just-in-time" training • Implement enhanced outage planner/scheduler training <ul style="list-style-type: none"> • Planning skills and technical knowledge • Scheduling skills and project management • Computer • Rotational Assignments • Job Observation (Planners) • Work Control Center (Schedulers) <p><u>STATUS:</u> Working</p>	Sta Planning - Mgr Salem	Dept. Mgrs Mgr-NTC GM-NHR&AS Mgr-M&S Supervisors	4/94 1/94	12/94 ongoing

Nuclear Department Tactical Plan - CPAT W-5 (cont'd)

Activity	Sponsor	Support	Start	Stop
<p><u>OPTIMIZE REFUELING OUTAGE DURATION</u></p> <p><u>Improve "Planned" Outage Schedules</u></p> <ul style="list-style-type: none"> • Develop long range "3 outage plan" • Outage optimization with Westinghouse <p><u>STATUS: Working</u></p> <p><u>SUCCESSFULLY COMPLETE THE SALEM UNIT 2 8TH REFUELING OUTAGE</u></p> <p><u>Achieve Key Milestone Dates for 2R8</u></p> <p><u>STATUS: Working</u></p>	<p>Sta Planning Mgr</p>		<p>1/94</p>	<p>ongoing</p>

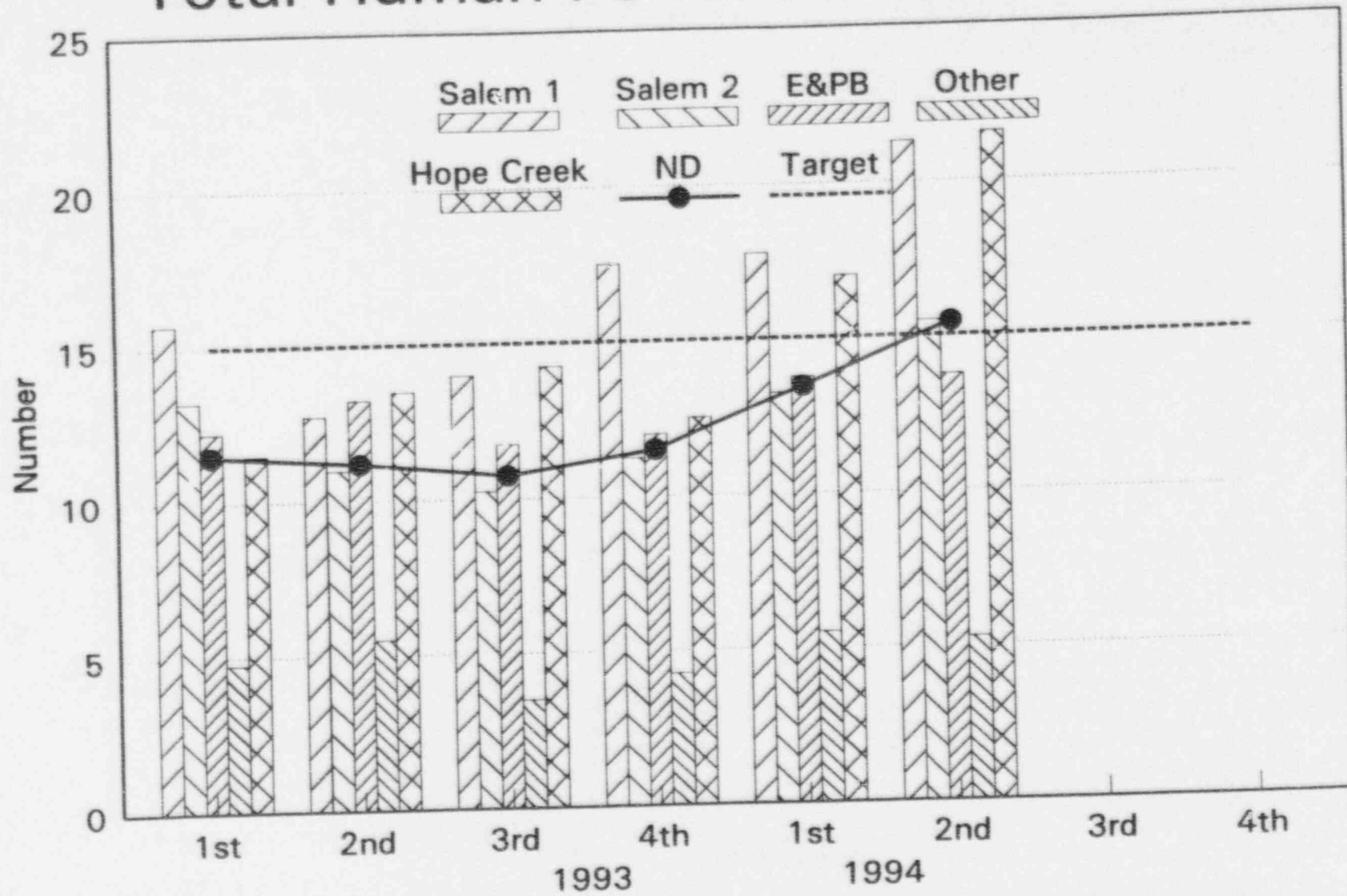
Measures

W-5 Content and Delivery of technical training to effectively support individuals and groups

MEASURES:

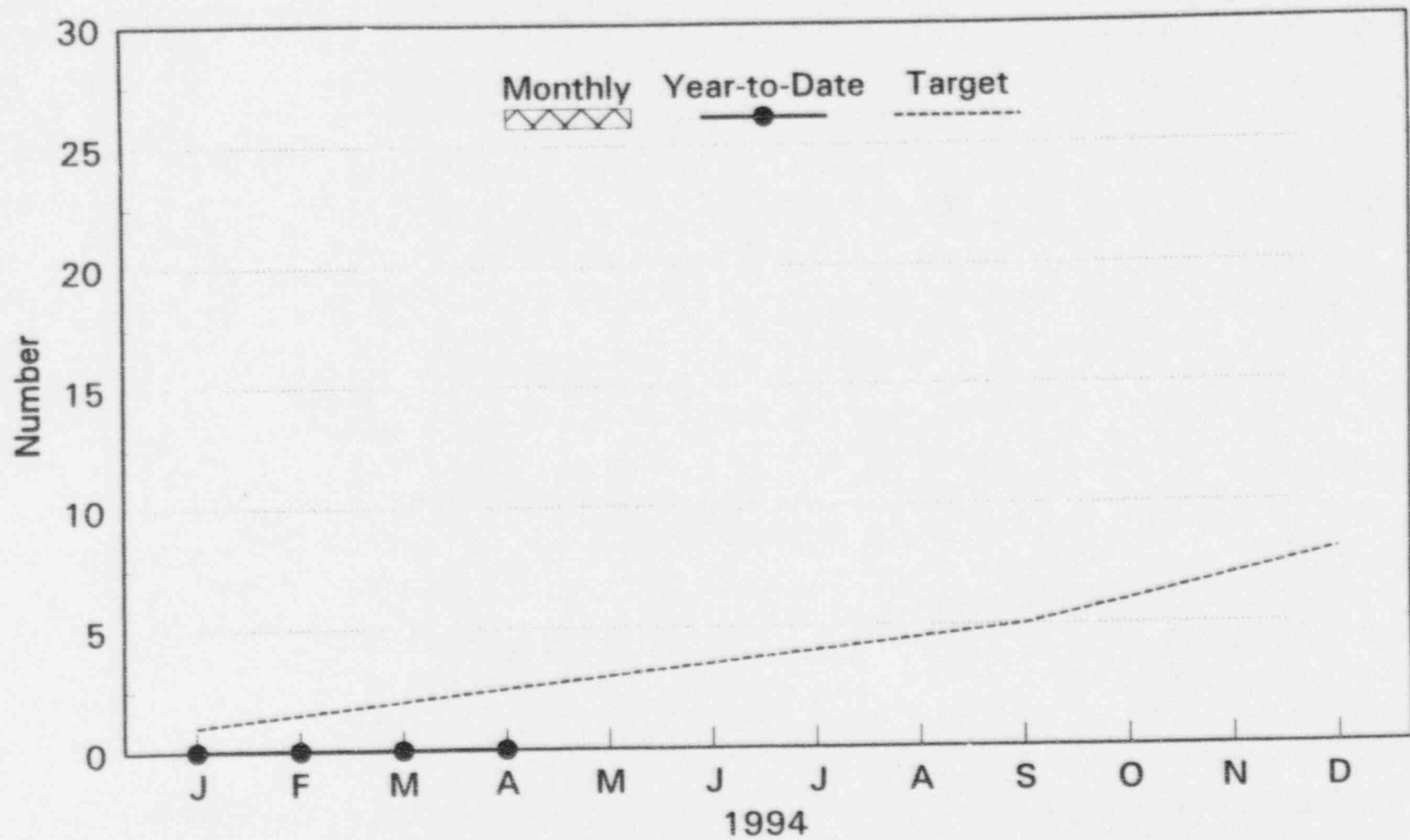
- Total Human Performance Events
- Licensee Event Reports (Personnel Error)

Total Human Performance Events



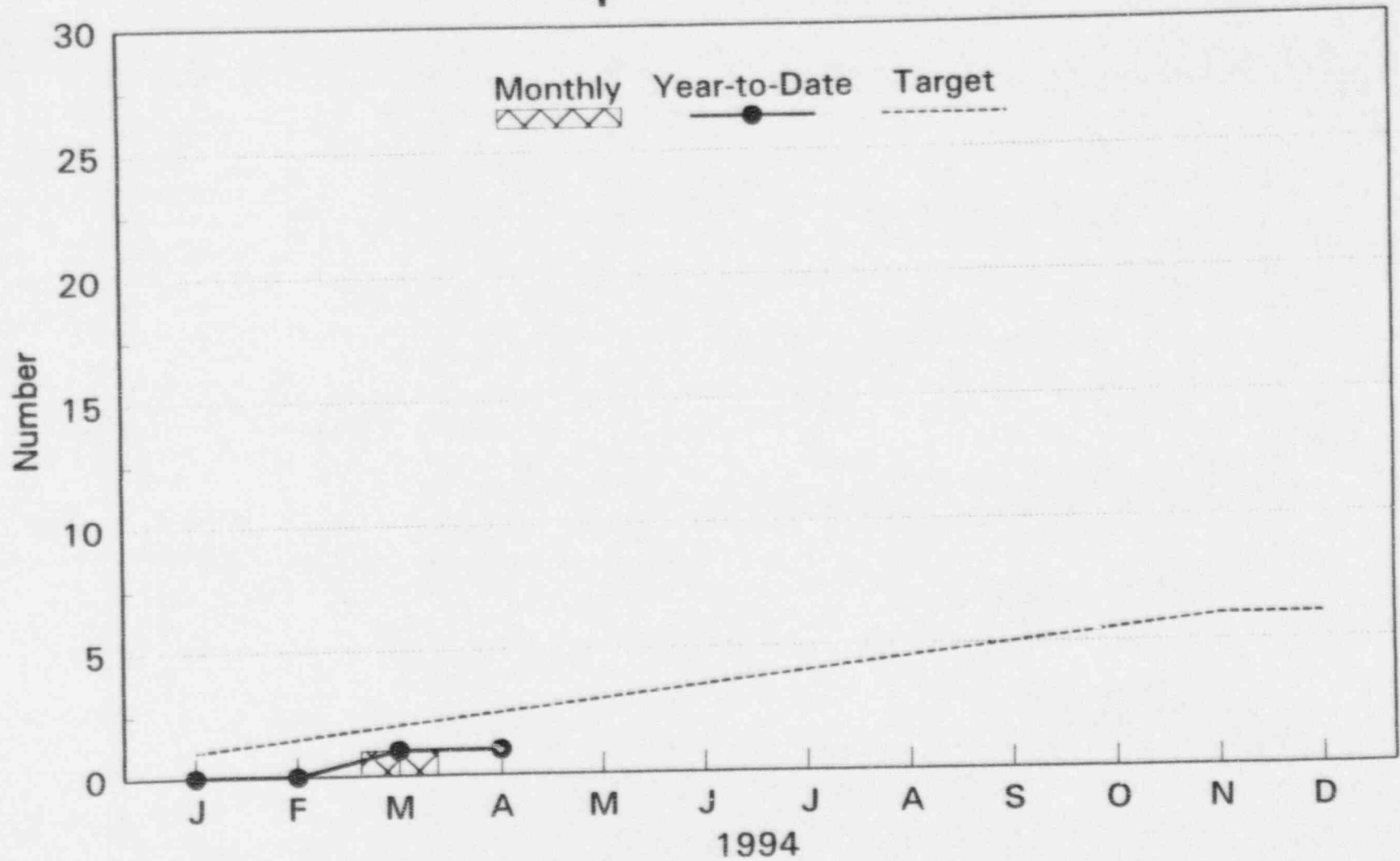
REAS3 12 month avg

LER Personnel Related Salem Station



28s

LER Personnel Related Hope Creek



Nuclear Department Tactical Plan - CPAT W-6

Key Focus Item Supported: Standards and Methods of Contractor Performance (CPAT W-6)

Sponsor: Vice President - Nuclear Engineering

Activity	Sponsor	Support	Start	Stop
<p><u>Improve contractor industrial safety performance through:</u></p> <ul style="list-style-type: none"> • Monitoring previous safety compliance problem areas (safety team) <u>STATUS:</u> Fully implemented • Conducting safety talks with all contractors prior to the start of outages, emphasizing safety priority and performance expectations <u>STATUS:</u> Fully implemented • Including contractors in Safety Dept. "Safety/Professional Recognition Gift Program" <u>STATUS:</u> Fully implemented • Conducting special training for all contractor management and supervisory personnel in the new "Confined Space Permit" program <u>STATUS:</u> Fully implemented 	<p>Mgr-Site Pro.</p> <p>Mgr-NEP</p> <p>Mgr-Site Pro.</p> <p>Mgr-Site Pro.</p>	<p>GM-SO GM-HCO Mgr-NEP Nuc. Med Dir. Contractor Mgmt.</p> <p>Mgr - Site Pro.</p> <p>Mgr-NEP</p> <p>Mgr-NEP</p>	<p>1993</p> <p>1993</p> <p>1993</p>	<p>ongoing</p> <p>ongoing</p> <p>ongoing</p>

Nuclear Department Tactical Plan - CPAT W-6 (cont'd)

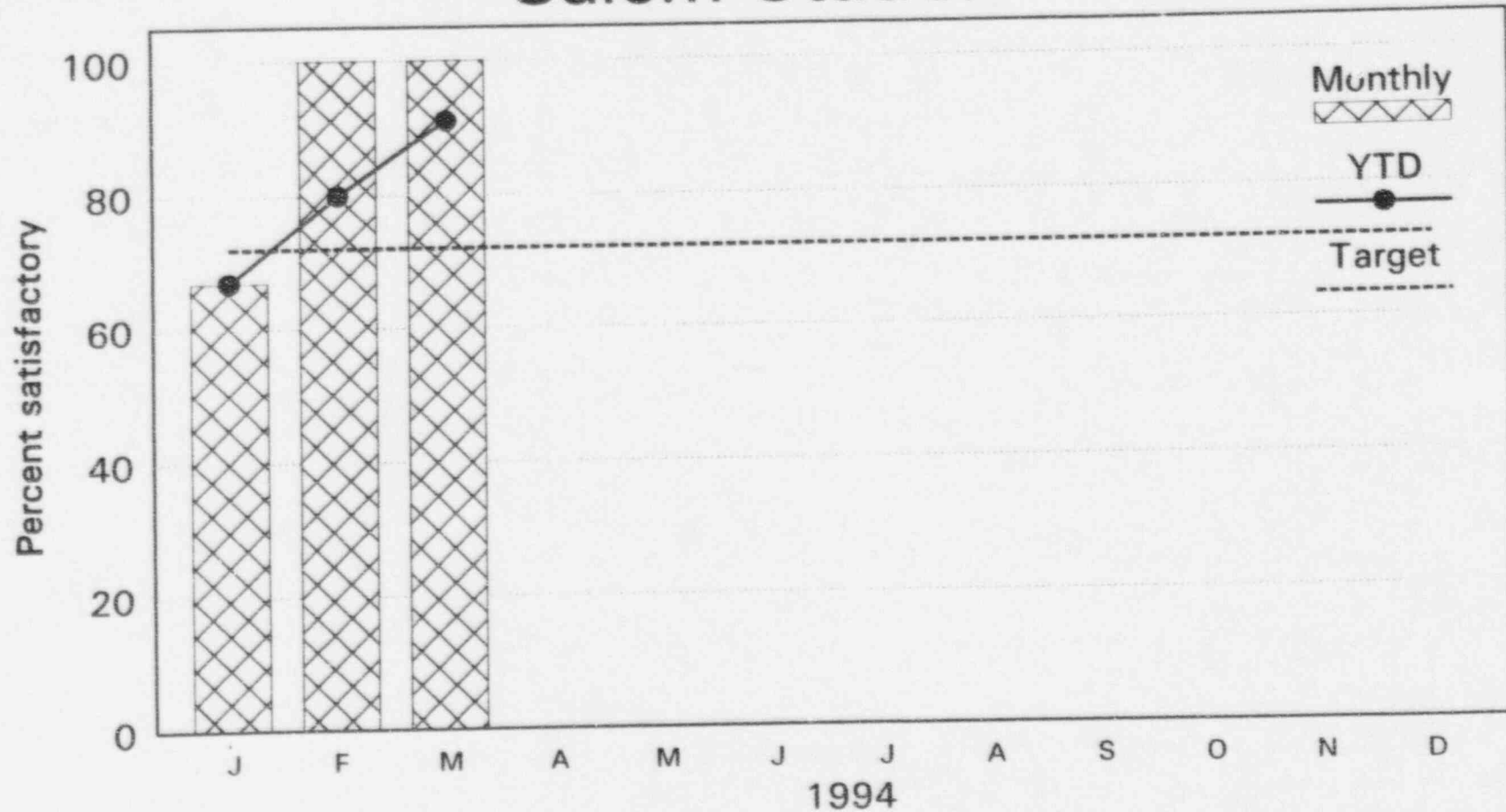
Activity	Sponsor	Support	Start	Stop
<p>Improve overall contractor performance</p> <ul style="list-style-type: none"> Maintain adequate supervisory - to - craft ratio. STATUS: Complete for HC outage. Increase supervisory field presence STATUS: Complete for HC outage. Evaluate the need to manage and train contractors with single group STATUS: Open - discussion & negotiation with Station Maintenance Managers required. Complete job observation training for ITEs and PMs STATUS: Complete and implemented in HC outage Specify training manhours separately in proposals Bring foreman/non-manuals in earlier for DCP familiarization STATUS: Implemented for HC outage. Implement initiatives from Safety Tagging Review Team Report STATUS: Recommendation No. 2 Implemented for HC outage and ongoing for future outages 	<p>Mgr - NEP</p> <p>Mgr - NEP</p> <p>Mgr - NEP</p> <p>VP-NE</p> <p>Mgr - NEP Mgr - NEP</p> <p>Ops Mgr - Salem</p>	<p>Station Maintenance, Nuclear Support & Services</p> <p>Station Maintenance</p> <p>Mgr-NEP</p> <p>Mgr - NEP Ops Mgr - HC</p>	<p>1/14/94</p> <p>1/14/94</p> <p>1/14/94</p> <p>1/14/94</p> <p>6/1/94 1/14/94</p> <p>1/14/94</p>	<p>ongoing</p> <p>ongoing</p> <p>9/1/94</p> <p>ongoing</p> <p>ongoing</p> <p>ongoing</p>

W-6 Standards and methods of contractor performance

MEASURES:

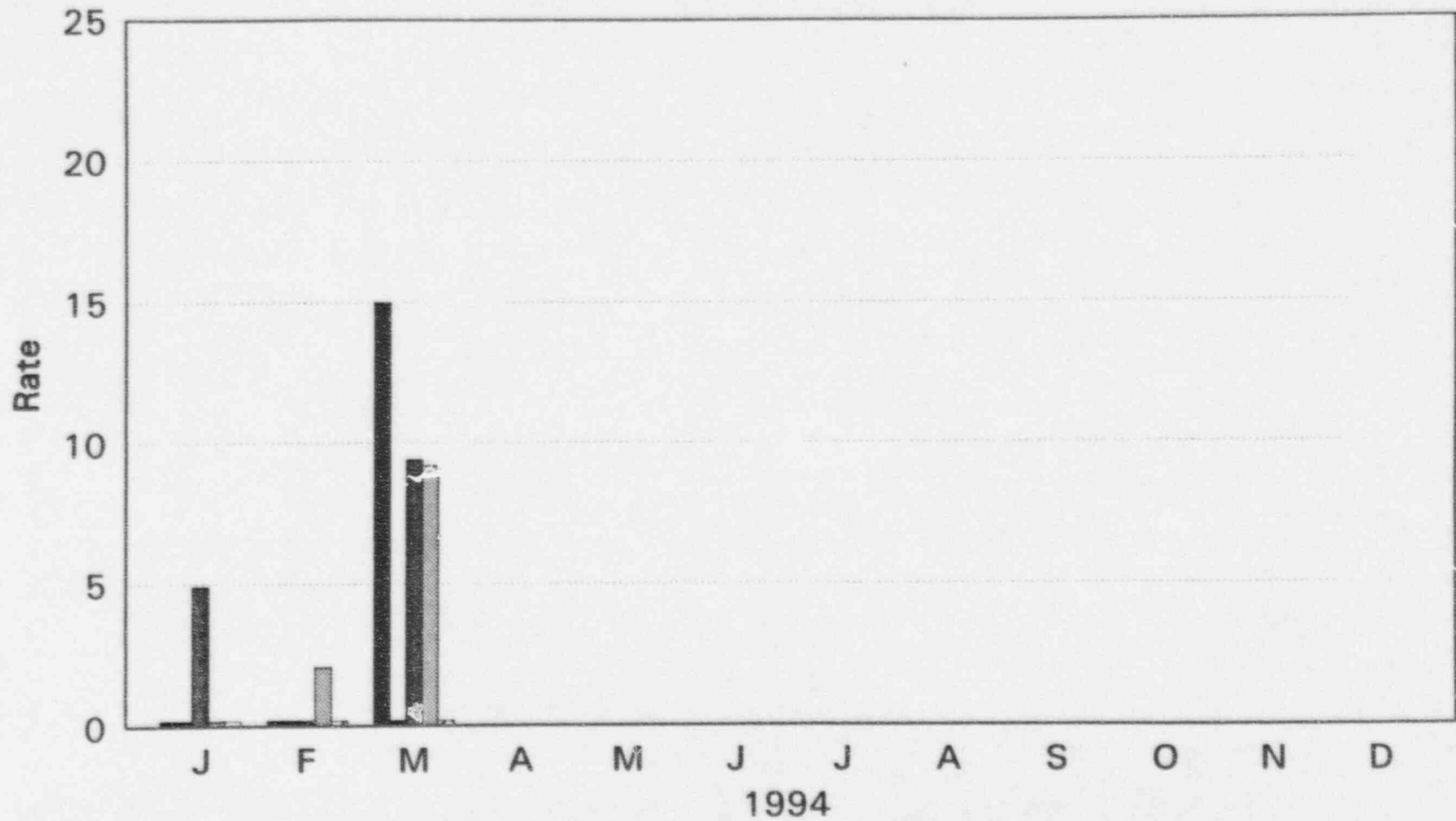
- OSHA Accident Rate (Contractor)
- Work Practices and Standards Monitoring (Contractor)
- Number of Contractor Related Incident Reports (**under development**)
- Outage Performance Goals (**under development**)
 - First Aid Incident Rate
 - Hold Point Rework
 - Cost Performance

Work Practices & Standards Contractor Performance, QA Monitoring Salem Station



53sc

OSHA Accident Rate Contractors



■ Bechtel ■ UE&C ■ Stone & Webster ■ P.T.I. □ Lukenwath

Nuclear Department Tactical Plan - CPAT S-1

Key Focus Item Supported: Root Cause Determination (CPAT S-1)

Sponsor: Vice President - Nuclear Operations

Activity	Sponsor	Support	Start	Stop
<p>1. Develop and implement process for identifying and documenting root cause(s) for all corrective maintenance work orders, and preventive maintenance work orders which result in some corrective maintenance. A graded approach would insure that root cause determinations are made when appropriate, and at the proper level of detail.</p> <ul style="list-style-type: none"> • Develop process and describe in appropriate procedures. <p><u>STATUS:</u> In progress</p> <ul style="list-style-type: none"> • Aligned CM work handling with Maintenance Rule implementing group. • Implement on balance of Salem and Hope Creek systems 	GM-HCO	S-1 Team	1/94	6/94
<p>2. Develop generic Root Cause Analysis (RCA) procedure for use within the Nuclear Department. This procedure would provide guidance for conducting appropriate RCA on a variety of problems, from low level of significance and complexity to those highly significant and/or complex problems requiring extensive investigation and</p> <p><u>STATUS:</u> In progress</p>	CM-HCO	S-1 Team	3/94	6/94
<p>3. Develop measures of effectiveness.</p> <p><u>STATUS:</u> In progress</p>	GM-HCO	S-1 Team	3/94	12/94

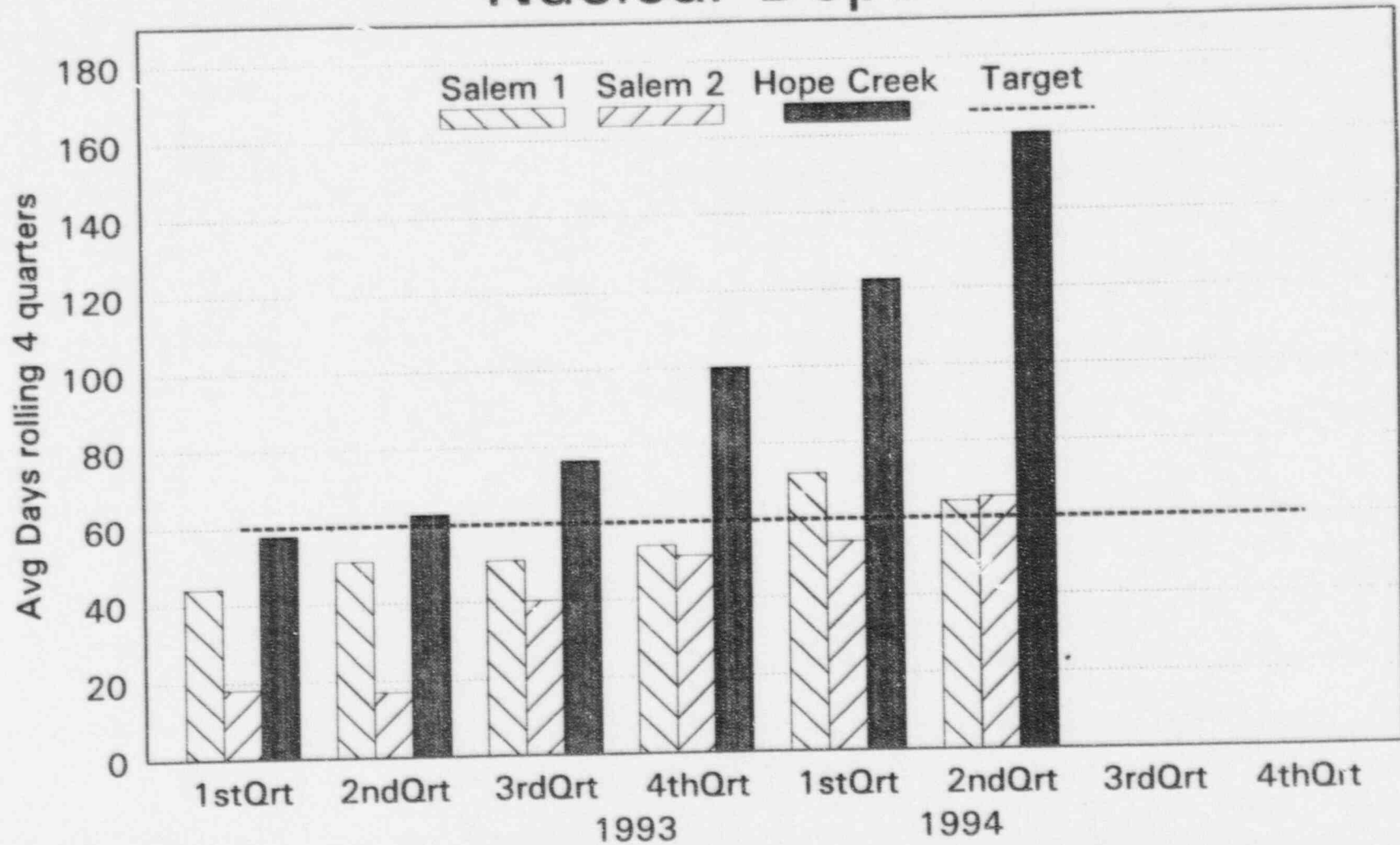
Measures

S-1 Root Cause Determination

MEASURES:

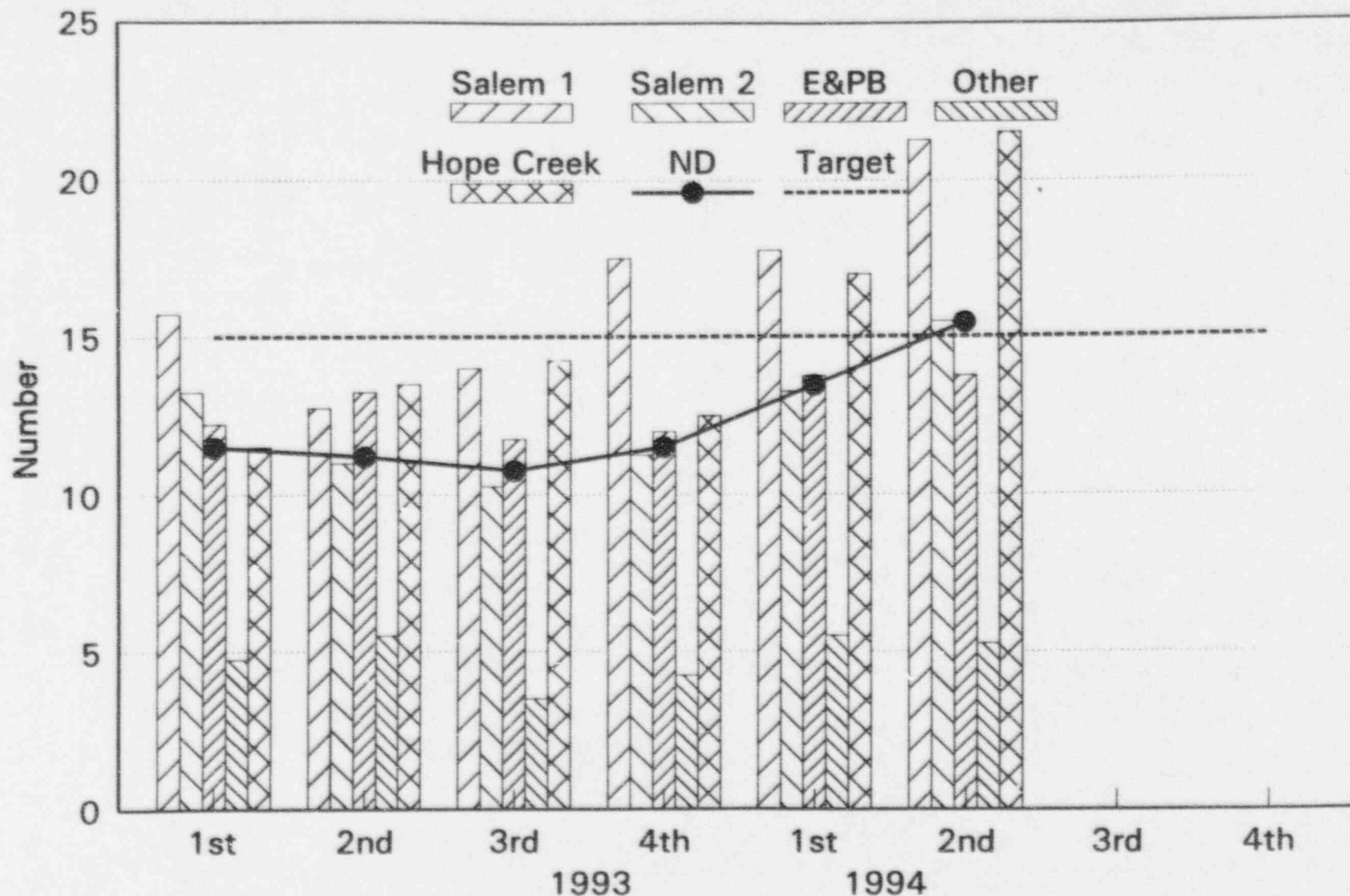
- Repetitive Equipment Problems (under development)
- Time Between Events
- Total Human Performance Events

Time Between Events Nuclear Dept



REAS5A

Total Human Performance Events



REAS3 12 month avg

Nuclear Department Tactical Plan - CPAT S-2

Key Focus Item Supported: Corrective Action and Follow-Through (CPAT S-2)

Sponsor: General Manager - Quality Assurance/Nuclear Safety Review

Activity	Sponsor	Support	Start	Stop
<p>Management Expectations for Corrective Action (Promulgate uniform understanding of the Corrective Action Process)</p> <ul style="list-style-type: none"> Presentation to CNO Team (raise standard for corrective action thru existing process) <p>STATUS: Presentation made 2/94. Decision made to combine roll-out of S-2 (Corrective Action and Follow-through) with M-5. New presentation to CNO Team will be ready June 1994.</p>	GM-QA/NSR		2/94	6/94
<ul style="list-style-type: none"> Manager's Dialogue presentation (combined with self-assessment) <p>STATUS: Modified schedule to deal with issue of prioritization.</p>			6/94	6/94
<ul style="list-style-type: none"> Supervisors Dialogue breakout groups GM quarterly meetings Follow-up Communications Activities 		GM's Mgr-Nuc Comm	7/94 TBD TBD	9/94
<p>Corrective Action Data Base Project</p> <ul style="list-style-type: none"> Phase I (Procurement Module Pilot) implemented. The consolidation of various independent processes for identification of discrepancies in receiving, warehouse, vendor programs/process, procurement documents, and QA into a single "problem report" system using the Corrective Action Database (CADB) is underway. <p>STATUS: On schedule.</p>	GM-QA/NSR		12/92	12/93 complete

Nuclear Department Tactical Plan - CPAT S-2 (cont'd)

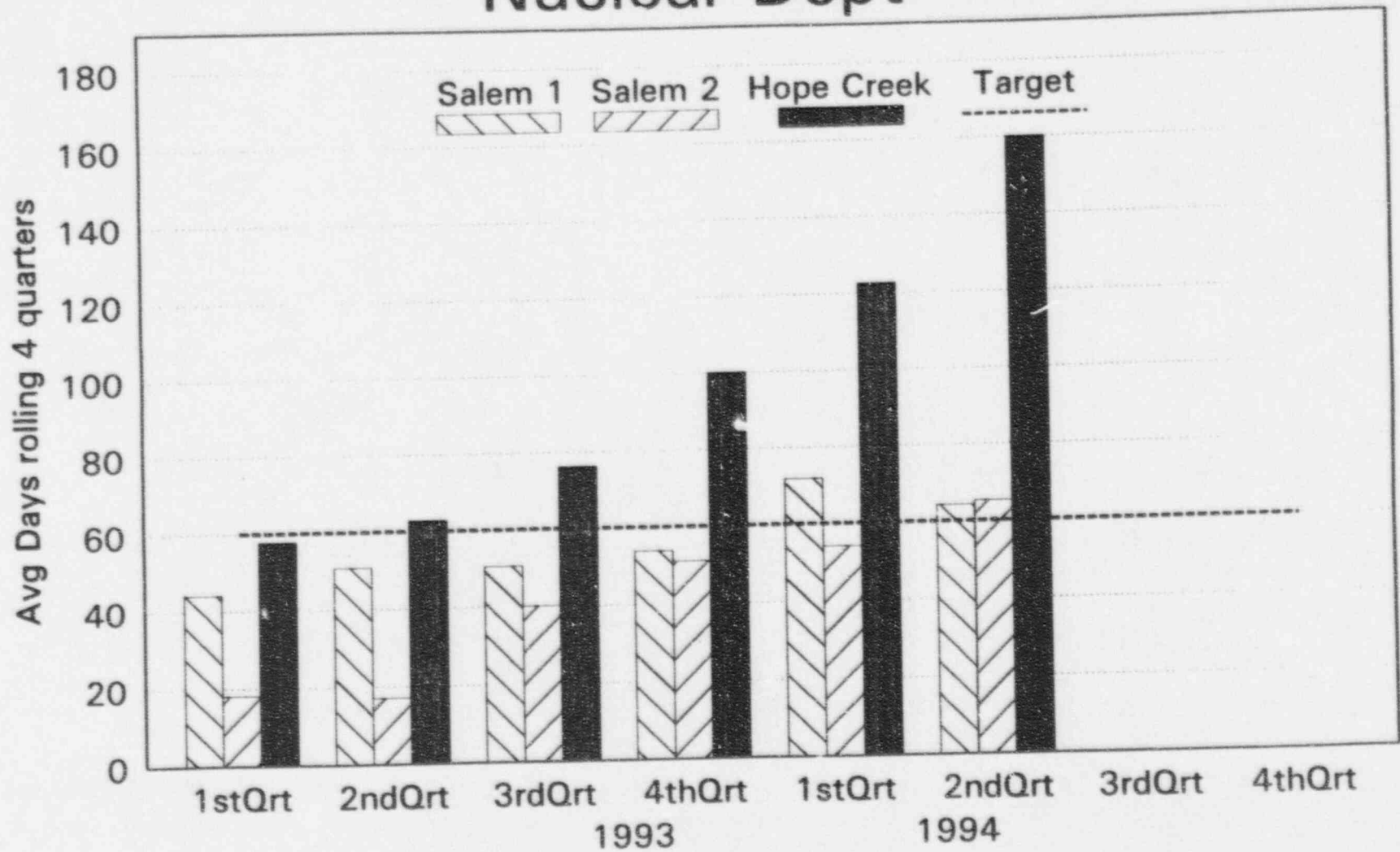
Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> Phase II currently under development for consolidation of Hope Creek, Salem and E&PB corrective action processes (DEF, IR, DR) 			1/94	7/94
<p><u>STATUS:</u> On schedule.</p>				
<ul style="list-style-type: none"> Training and Implementation 			5/94	7/94
<p><u>Follow-up</u></p>	GM-QA/NSR			
<ul style="list-style-type: none"> Develop indicators to trend of corrective action 			5/94	7/94
<ul style="list-style-type: none"> Develop indicators to trend corrective action database contents 			7/94	ongoing

S-2 Corrective Action Follow Through

MEASURES:

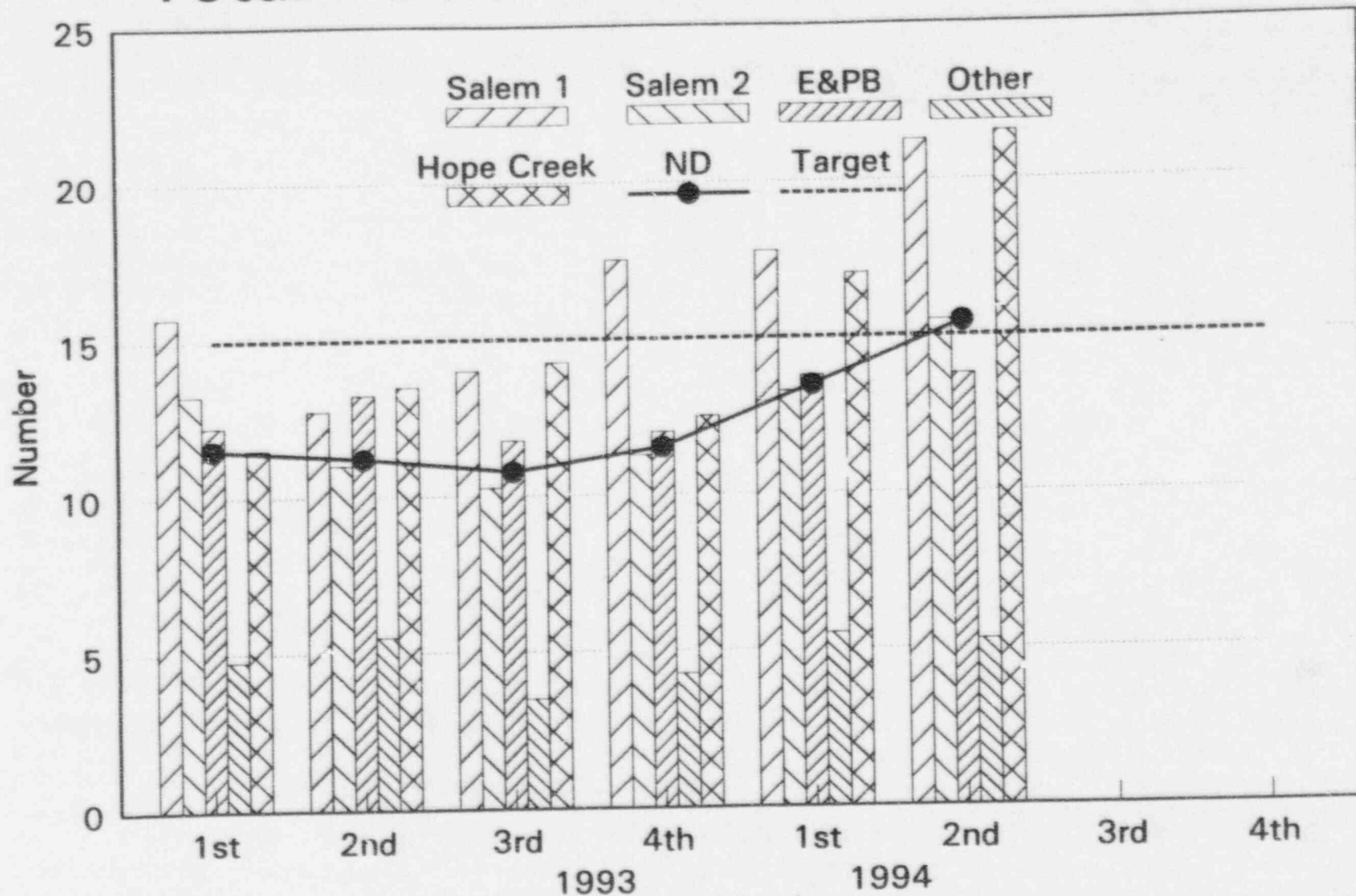
- Time Between Events
- Total Human Performance

Time Between Events Nuclear Dept



REAS5A

Total Human Performance Events



REAS3 12 month avg

Nuclear Department Tactical Plan - CPAT S-3

Key Focus Item Supported: Safe, Uneventful Operations/Performance Trending for Systems and Equipment (CPAT S-3)

Sponsor: Vice President - Nuclear Operations

Activity	Sponsor	Support	Start	Stop
<u>Optimize Preventive Maintenance (PM) through Reliability Centered Maintenance (RCM) effort</u> <ul style="list-style-type: none"> Complete RCM implementation at Salem <p>STATUS: Analysis complete, implementation by mid-year.</p> <ul style="list-style-type: none"> Perform RCM analysis on 8 Hope Creek Systems <p>STATUS: Ongoing</p>	Mgr-R&A		1/94 1994 1995 1995	12/94 1994 1995 1995 6/96
<u>Eliminate Scrams through Identification of Design Changes</u> <p>STATUS: Ongoing</p>		Sta. Mgrs Mgr-NSR Mgr-NED		
<u>Continue Technical Specification Improvements to Reduce Risk of On-Line Surveillance</u> <p>STATUS: Ongoing</p>	Mgr-L&R	Sta. Mgrs	1/94	
<u>Continue Procedure Improvements to Reduce Incidence of Personnel Error Improve Use of Operating Experience (internal/external)</u> <ul style="list-style-type: none"> Continue OEF trending program <p>STATUS: Improvement plan is in progress. NOIT effort has started.</p>	Sta. Mgrs Mgr-R&A	Sta. Mgrs	1/94	

Nuclear Department Tactical Plan - CPAT S-3 (cont'd)

Activity	Sponsor	Support	Start	Stop
<p><u>Improve Maintenance Effectiveness</u></p> <ul style="list-style-type: none"> • Perform maintenance self-assessments as part of NUMARC commitment by 1994. <p><u>STATUS:</u> In progress.</p>	Maint. Mgr.	Sta. Mgrs NE/QA/NSR	1/94	
<p><u>Continue Focus on Work Standard & Compliance</u></p> <p><u>STATUS:</u> Ongoing process continually reinforced through supervisory monitoring.</p>	GM-SO			
<p><u>Performance Trending for Systems and Equipment (S3)</u></p> <p>1. Break down performance trending information subactivities as follows:</p> <ul style="list-style-type: none"> • Data collection • Database input • Graph generation • Graph and database monitoring & analysis • Negative trend actions • Identification of trend parameters, goals, and action levels • Setup and revisions to database and graphs • Configuration of database (software) <p><u>STATUS:</u> Software upgrade in process (Cumulus)</p>	HC Tech			complete
<p>2. Analyze each subactivity, implement solutions. One subactivity each month</p> <p><u>STATUS:</u> Same as above - database upgrades first subactivity.</p>	HC Tech	HC/Salem: Technical Maintenance Operations R&A	3/1/94	1/1/95

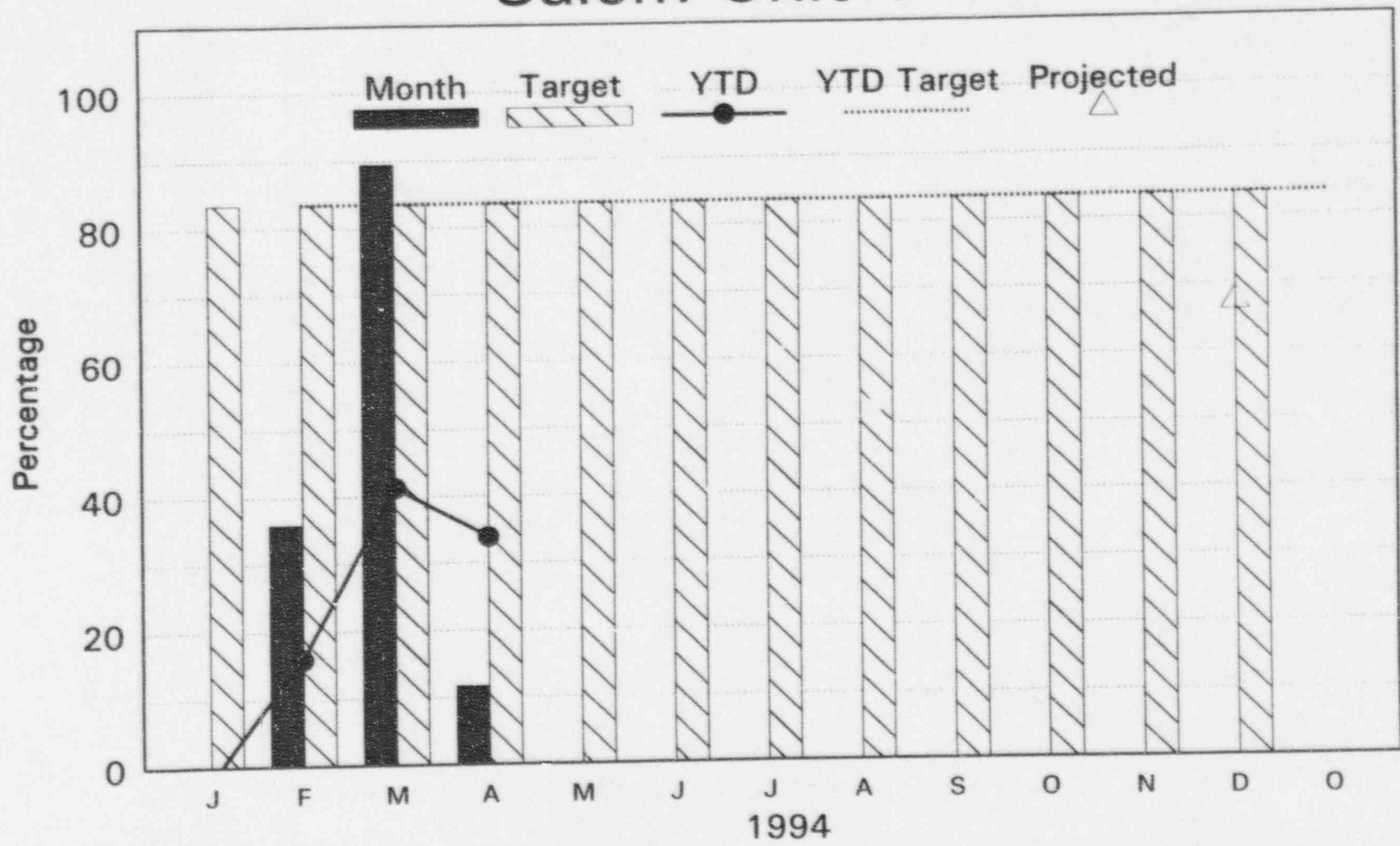
Measures

S-3 Performance trending for systems and equipment important to reliability and operational control action upon results

MEASURES:

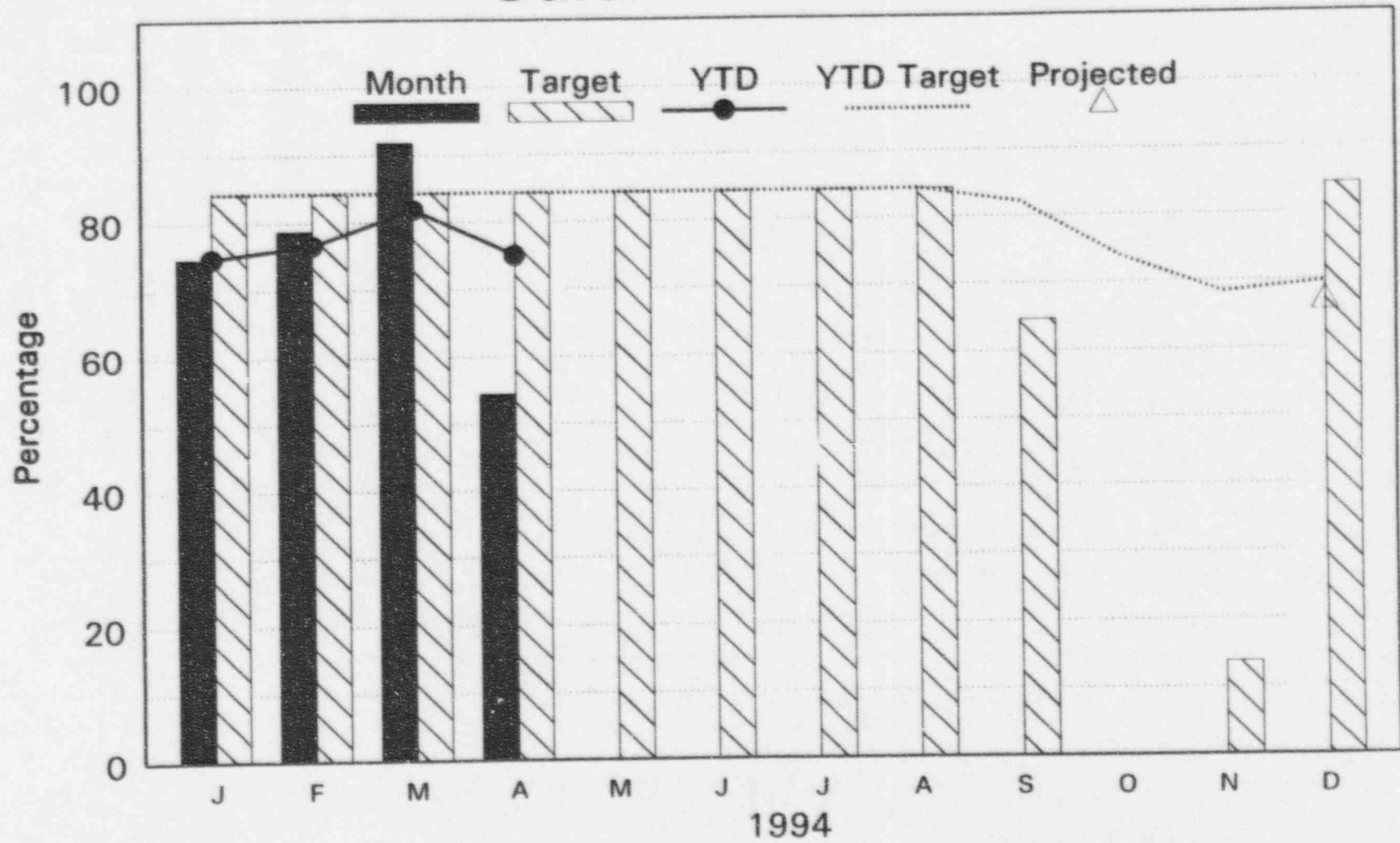
- Capacity Factor
- Licensee Event Reports (Equipment)
- Repetitive Equipment Problems (**under development**)
- Unplanned Automatic Scrams per 7000 Hours Critical
- Number of systems which have a prepared list of performance indicators (**under development**)
- Number of workorders generated as a result of trending performance indicators (**under development**)
- Number of parameters trended (by group) (**under development**)
 - By manual means
 - By electronic means

Capacity Factor Salem Unit 1



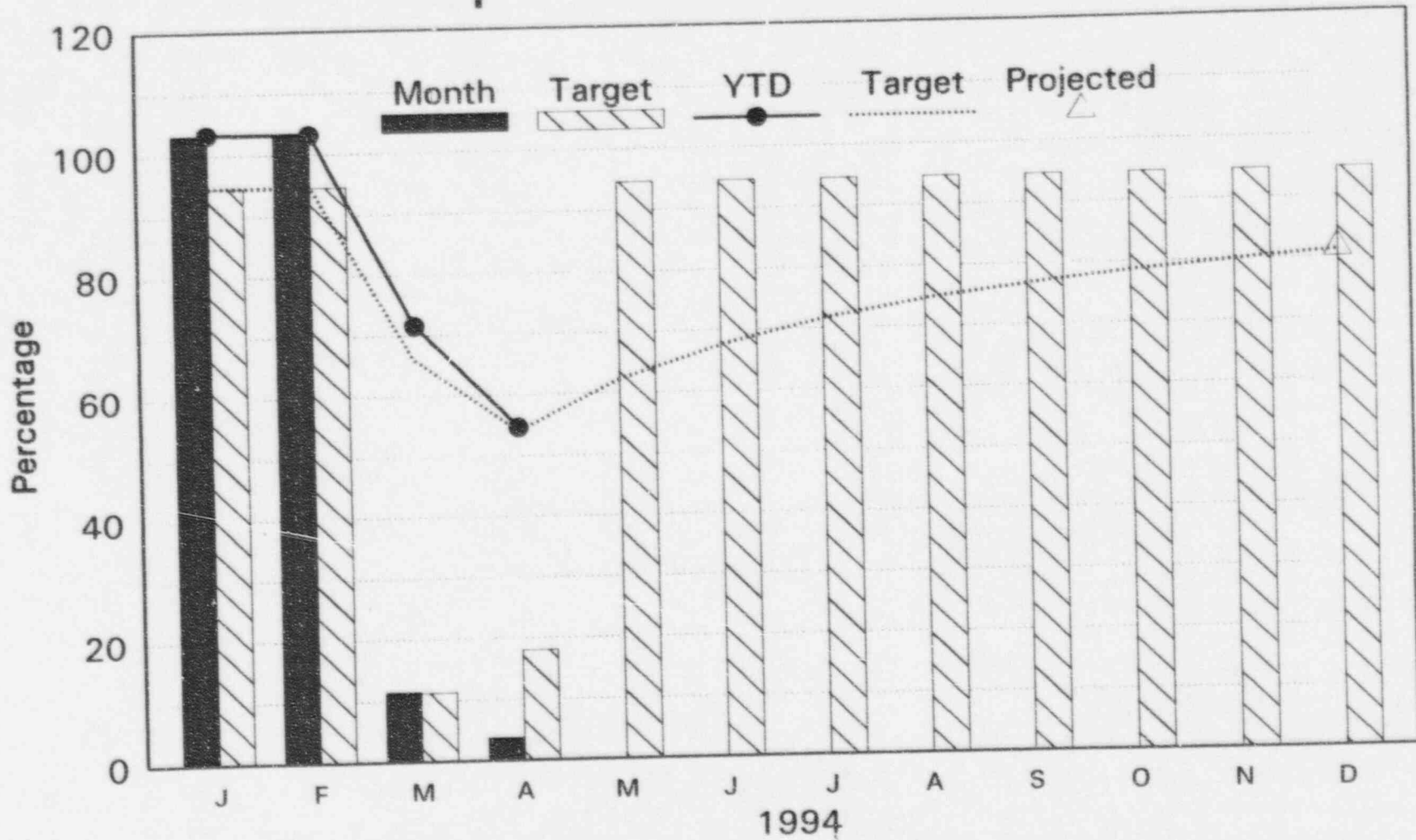
3s1

Capacity Factor Salem Unit 2



3s2

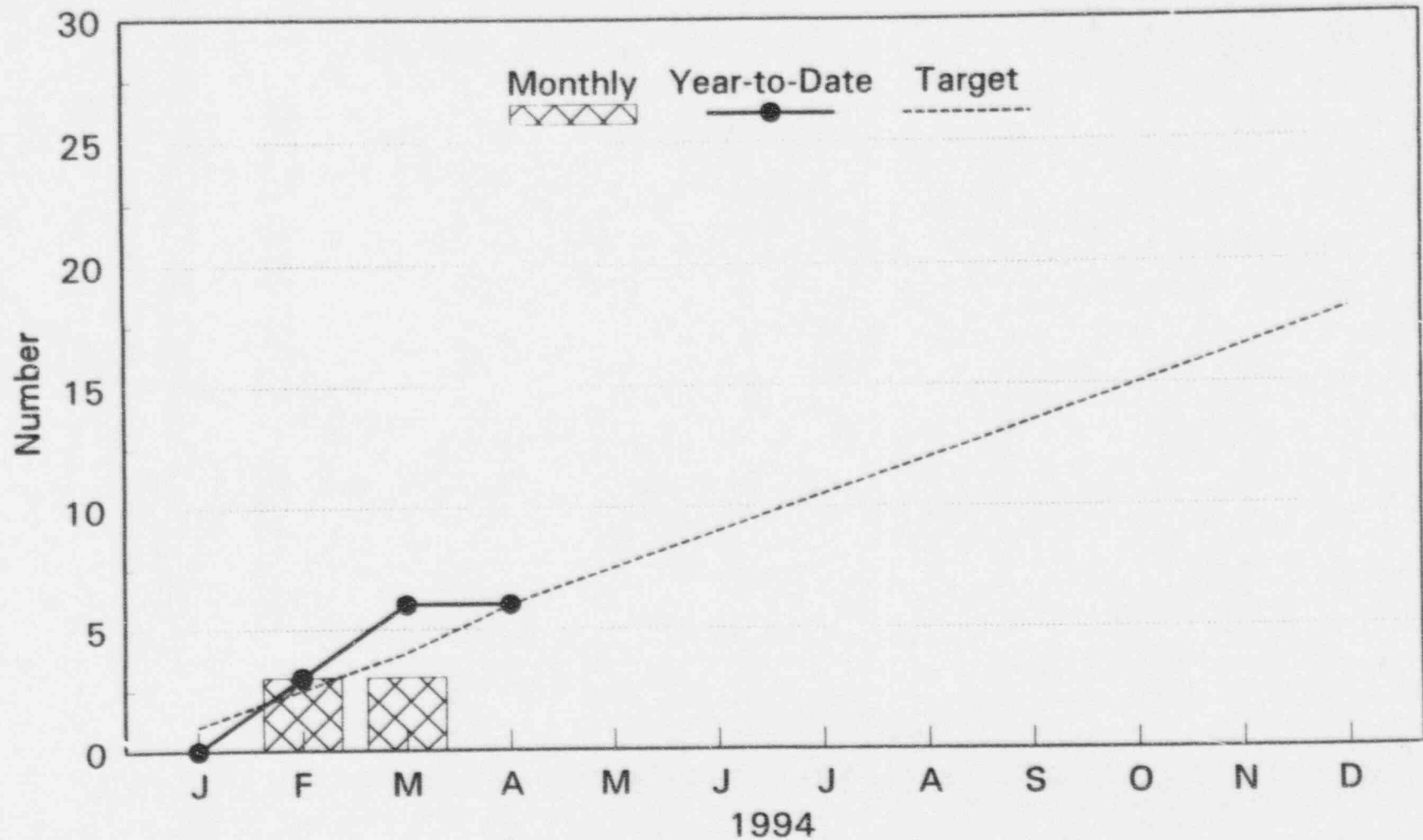
Capacity Factor Hope Creek Station



3h

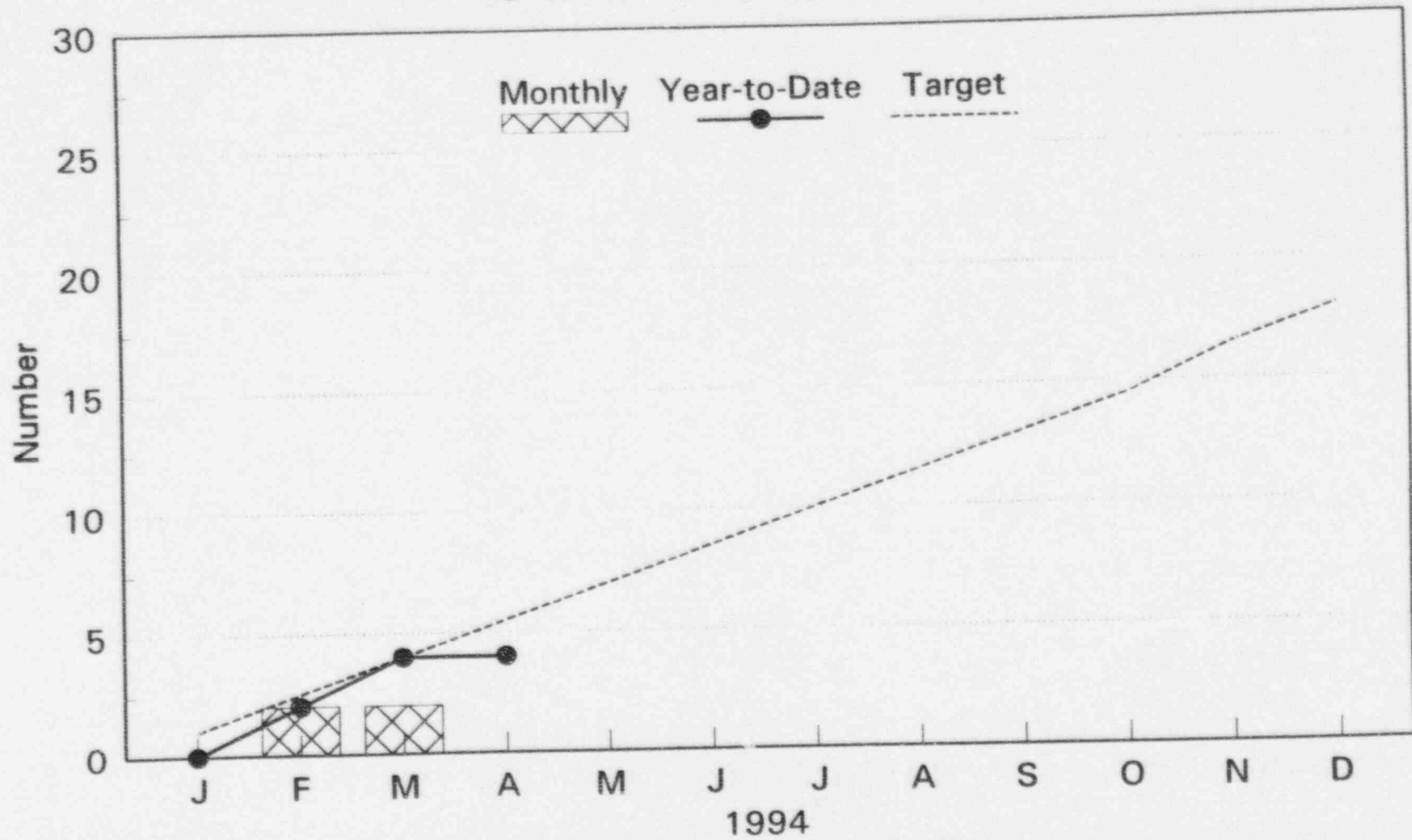
Licensee Event Report

Salem Unit 1



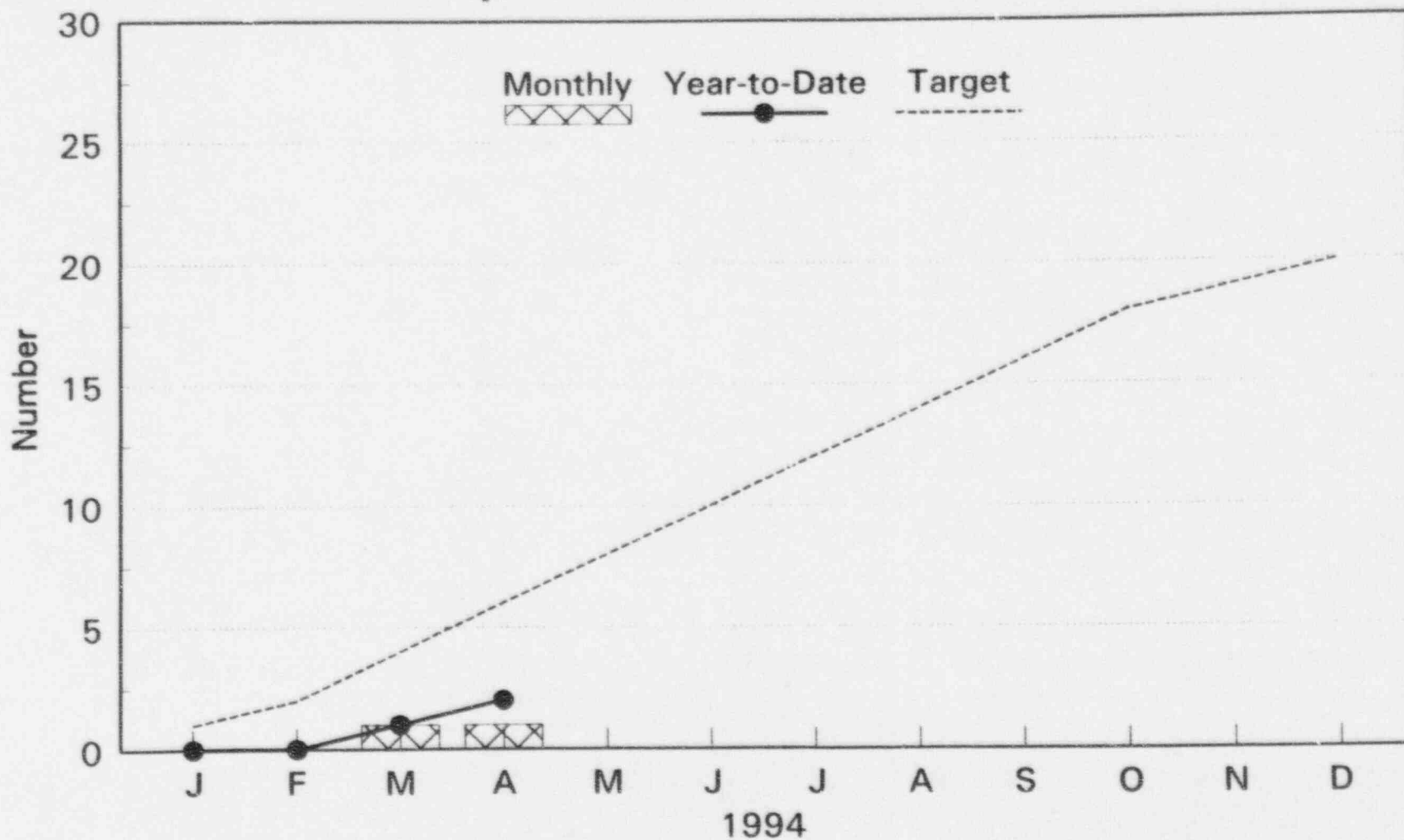
28TS1

Licensee Event Report Salem Unit 2



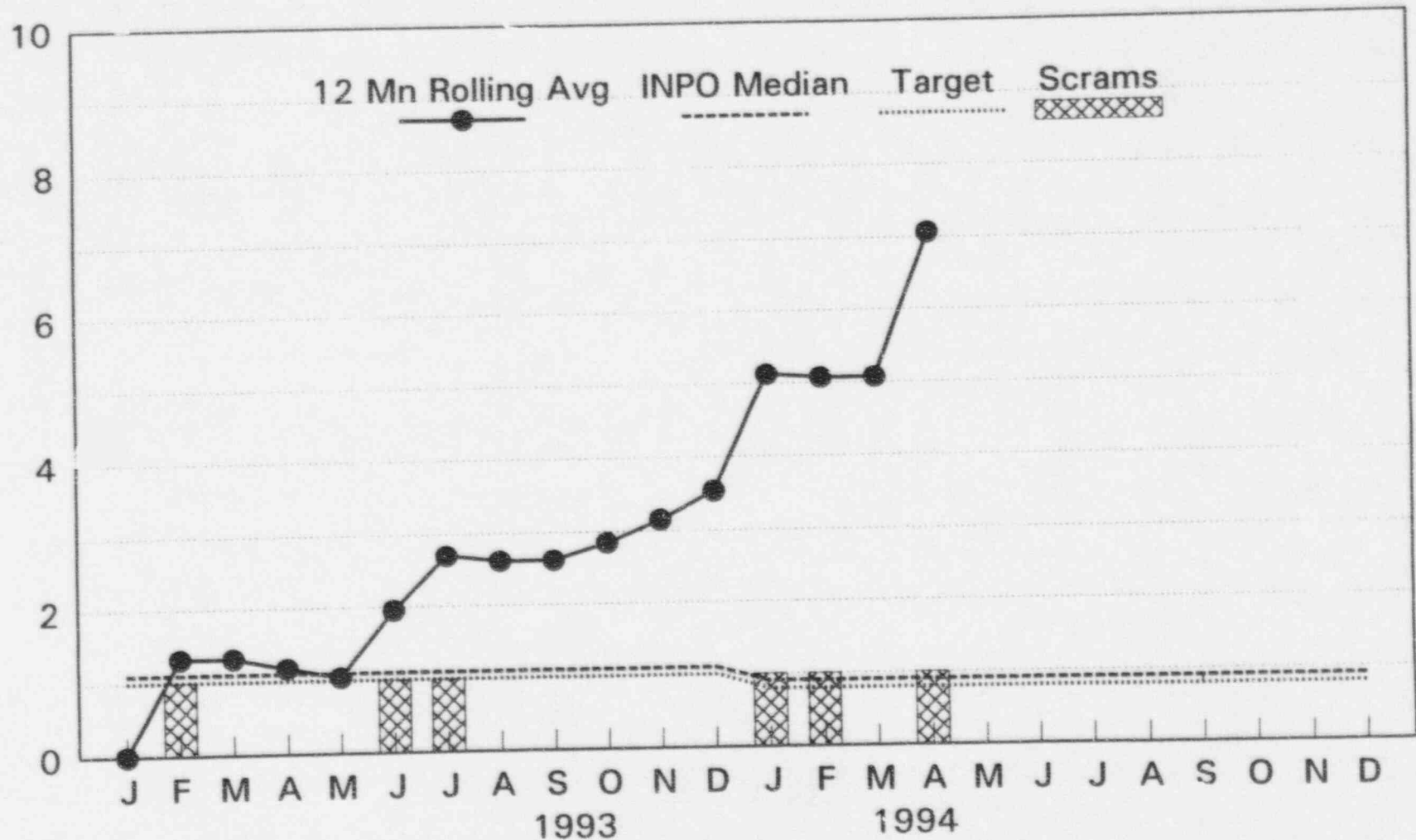
28TS2

Licensee Event Report Hope Creek Station



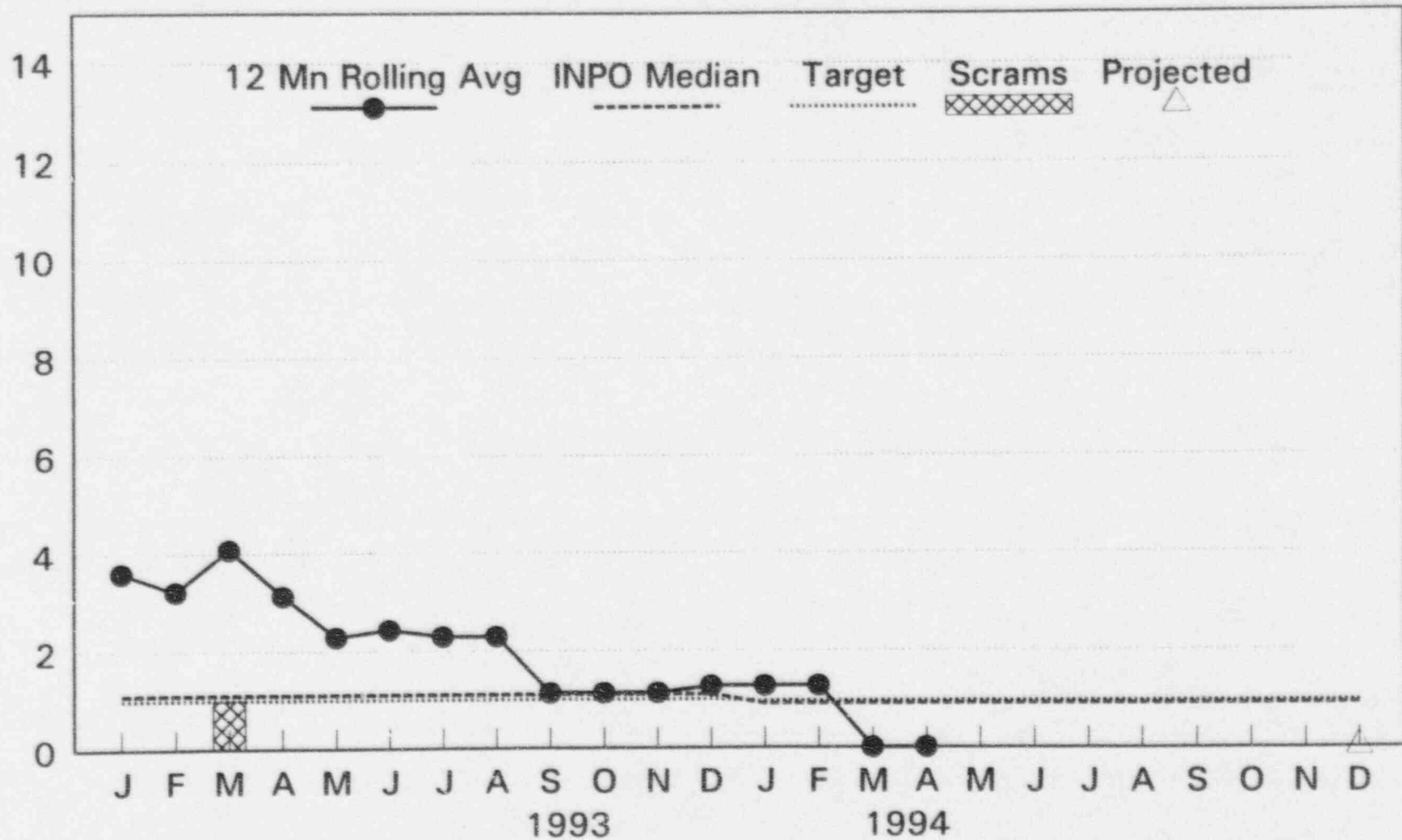
28TH

Unplanned Auto Scrams/7k Hours Salem Unit 1



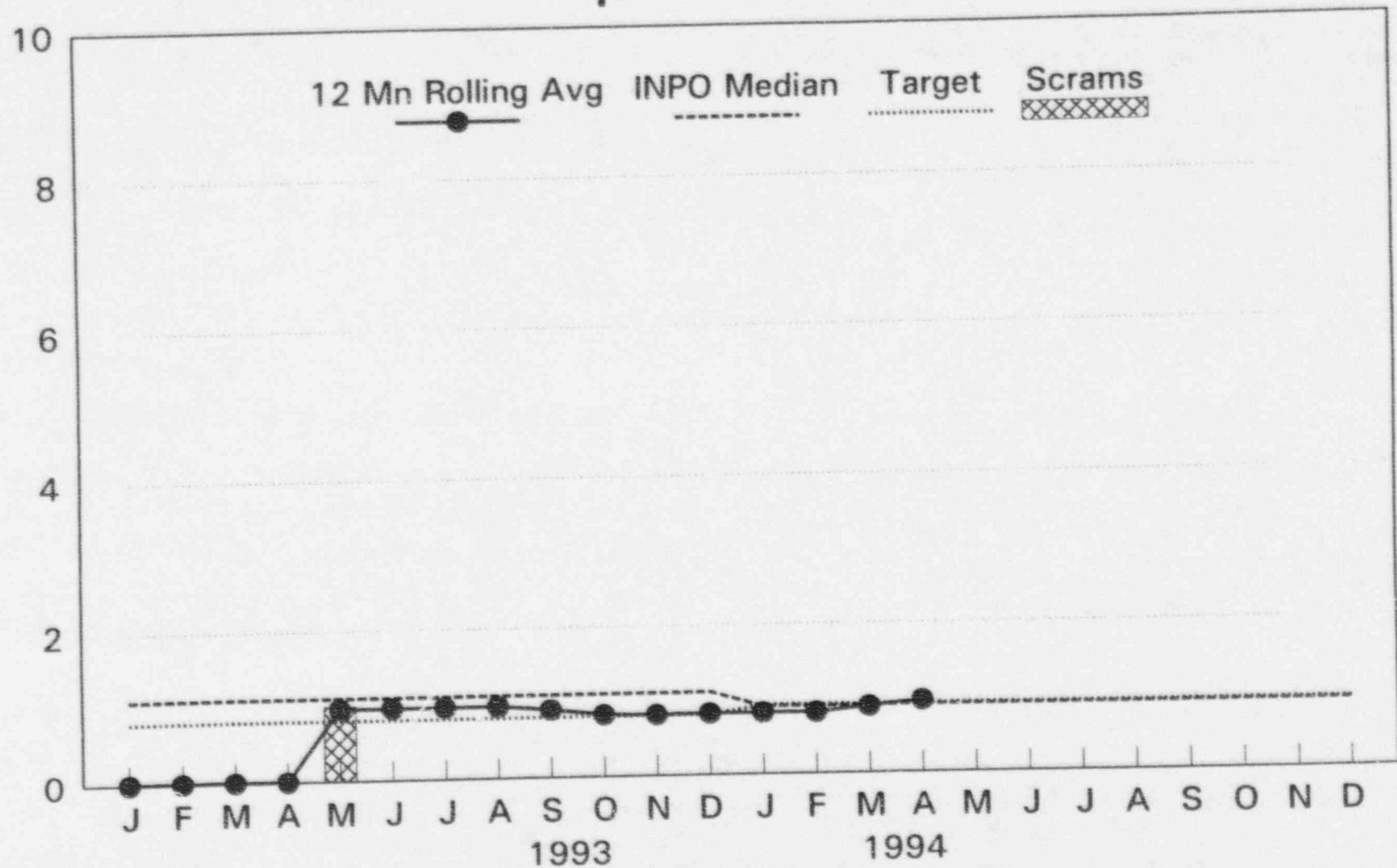
45s1

Unplanned Auto Scrams/7k Hours Salem Unit 2



45s2

Unplanned Auto Scrams/7k Hours Hope Creek



Nuclear Department Tactical Plan - CPAT S-4

Key Focus Item Supported: Operating Experience Feedback (OEF) delivery and tracking that meets job needs of recipients for information (CPAT S-4)

Sponsor: Vice President - Nuclear Operations

Activity	Sponsor	Support	Start	Stop
Salem				
<p><u>Review operating experience on an ongoing basis</u></p> <ul style="list-style-type: none"> Hold small group meetings to increase familiarity with OEF program <p>STATUS: Requires data base to be available for island use - in development with other departments.</p>	GM-SO	Mgr-R&A	1/94	ongoing
<ul style="list-style-type: none"> Provide personalized distribution of Daily Nuclear Network <p>STATUS: Complete</p>	Mgr-R&A		5/1/94	5/1/95
<ul style="list-style-type: none"> Provide individual access to historical OEF information <p>STATUS: Working with methods tied to first item.</p>	Mgr-R&A		5/1/94	5/1/95
<ul style="list-style-type: none"> Improve decision making at weekly OEF for those events that need in-depth root cause follow-up <p>STATUS: Complete. Station managers adhering to NAP-6, discuss each IR to determine root cause analysis depth.</p>	GM-SO		3/1/94	12/31/94

Nuclear Department Tactical Plan - CPAT S-4 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> Set expectations for timeliness of completing incident report close-out <p><u>STATUS:</u> Working.</p>	GM-SO		3/1/94	9/1/94
<ul style="list-style-type: none"> Improve accountability for close-out of external OEF documents <p><u>STATUS:</u> Working.</p>	GM-SO	Station Mgrs	3/1/94	9/1/94
<ul style="list-style-type: none"> Improve Manager accountability for review of responses to internal and external documents <p><u>STATUS:</u> Working.</p>	GM-SO		3/1/94	9/1/94
<ul style="list-style-type: none"> Provide more in-depth review of re-opened external documents based on internal event trends <p><u>STATUS:</u> Working.</p>	GM-SO	Station Mgrs	3/1/94	12/1/94
<ul style="list-style-type: none"> Increase frequency of management review of causal factor and event trends (present quarterly) <p><u>STATUS:</u> Ongoing.</p>	GM-SO	Mgr-R&A	3/1/94	
<ul style="list-style-type: none"> Re-assess station NPRDS coordinator function <p><u>STATUS:</u> Station coordinator assigned.</p>	GM-SO	Mgr-R&A	3/1/94	5/1/94
<ul style="list-style-type: none"> Increase priority of preparing operating experience reports to share with industry based on internal event experience <p><u>STATUS:</u> OEs to be prepared for notable events, 4 OEs shared w/industry 1st quarter.</p>	GM-SO	Mgr-R&A	3/1/94	9/1/94

Nuclear Department Tactical Plan - CPAT S-4 (cont'd)

Activity	Sponsor	Support	Start	Stop
Hope Creek				
<u>Review operating experience on an ongoing basis</u>	GM-HCO	Mgr-R&A	1/94	
• Implement NOIT OER improvements			4/94	5/94
• Re-assess OEFRDS coordinator function within R&A	GM-HCO	Mgr-R&A	3/1/94	5/1/94
<u>STATUS:</u> Working				
<u>E&PB</u>				
<u>Review operating experience on an ongoing basis</u>	GM-HCO	Mgr-R&A	1/94	
• Hold small group meetings to increase familiarity with OEF program			5/1/94	5/1/95
<u>STATUS:</u> Requires data base to be available for island use.	Mgr-R&A			
• Provide personalized distribution of Daily Nuclear Network	Mgr-R&A		5/1/94	7/1/94
<u>STATUS:</u> Complete.				
• Provide individual access to historical OEF information	Mgr-R&A		5/1/94	5/1/95
<u>STATUS:</u> Working.				
• Set expectations for timeliness of completing incident report close-out	Mgr-NED		3/1/94	9/1/94
<u>STATUS:</u> R&A to provide list of all IR open items.				
• Improve accountability for close-out of external OEF documents	Mgr-NED	Station Mgrs	3/1/94	9/1/94
<u>STATUS:</u> Working				
• Improve Manager accountability for review of responses to internal and external documents	Mgr-NED		3/1/94	9/1/94
<u>STATUS:</u> Working				

Nuclear Department Tactical Plan - CPAT S-4 (cont'd)

Activity	Sponsor	Support	Start	Stop
<ul style="list-style-type: none"> Provide more in-depth review of re-opened external documents based on internal event trend <p><u>STATUS:</u> Current trend being developed.</p>	Mgr-NED	Station Mgrs	3/1/94	12/1/94
<p><u>Training</u></p> <ul style="list-style-type: none"> Provide "Train the Trainer" program for all instructors by the end of 1994. <p><u>STATUS:</u> Working</p>	Mgr-NTC	Mgr-R&A	1/94	12/94
<ul style="list-style-type: none"> Present OEF Training twice a year rather than the current four times per year to allow greater preparation time. <p><u>STATUS:</u> Working</p>	Mgr-NTC		1/94	12/94
<ul style="list-style-type: none"> Perform a "Validity of Commitment" check to determine value added in training on SOER's in the Controls area on a repetitive basis. <p><u>STATUS:</u> Working</p>	Mgr-NTC		1/94	12/94

Measures

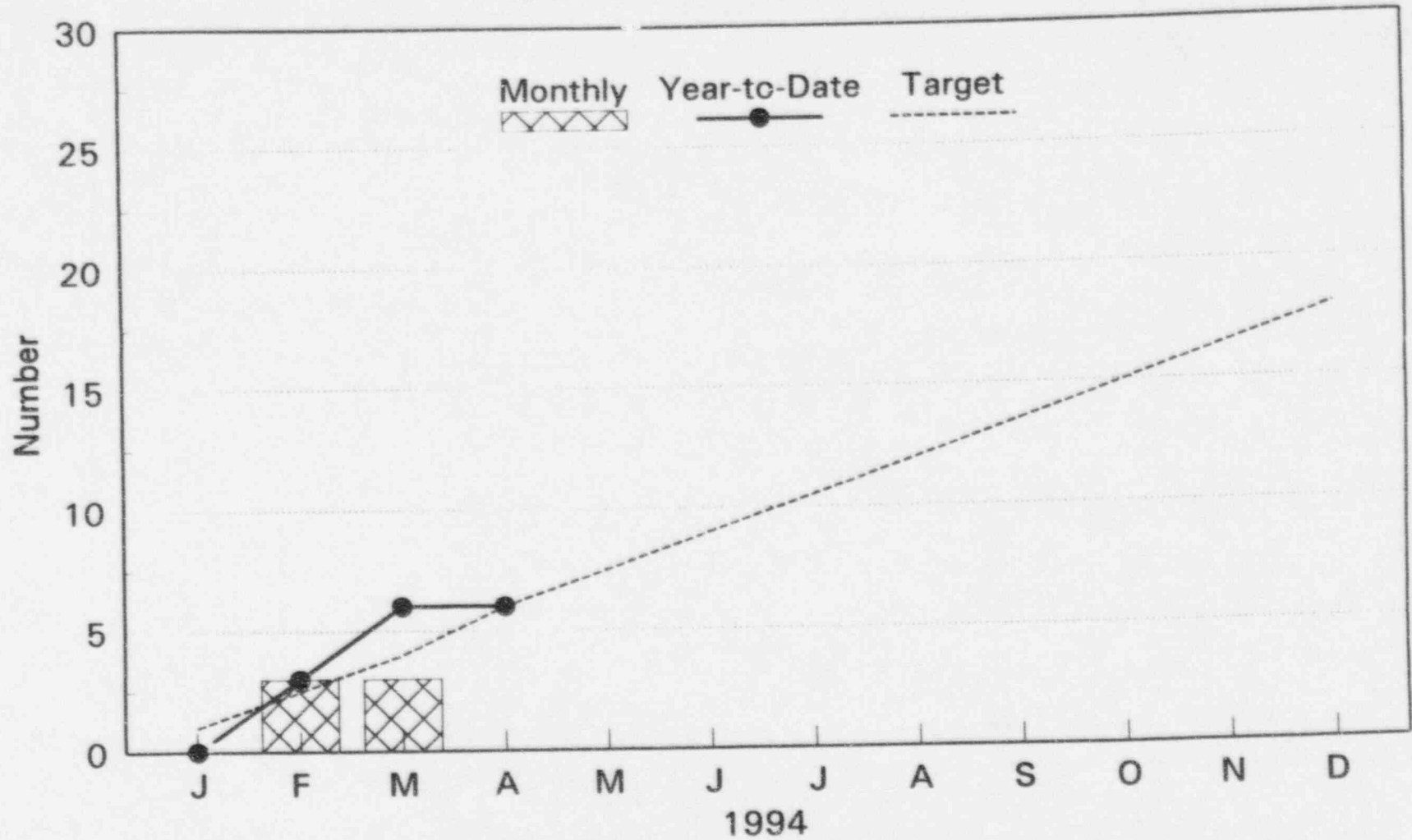
S-4 Operating experience feedback delivery and tracking that meets job needs of recipients for information.

MEASURES:

- Licensee Event Reports
- Licensee Event Reports (Personnel Error)
- Repetitive Equipment Problems (**under development**)
- Time Between Events
- Total Human Performance Events

Licensee Event Report

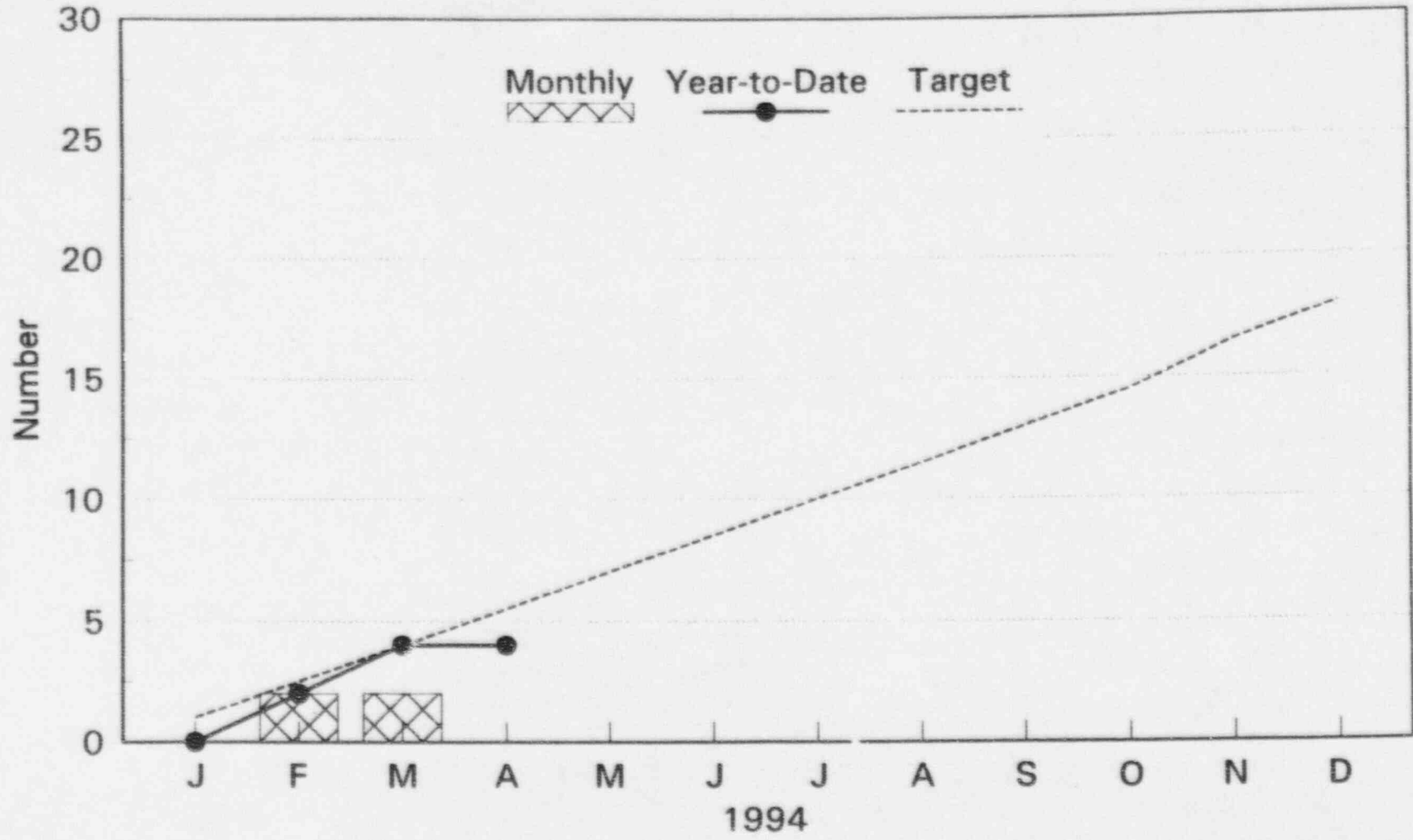
Salem Unit 1



28TS1

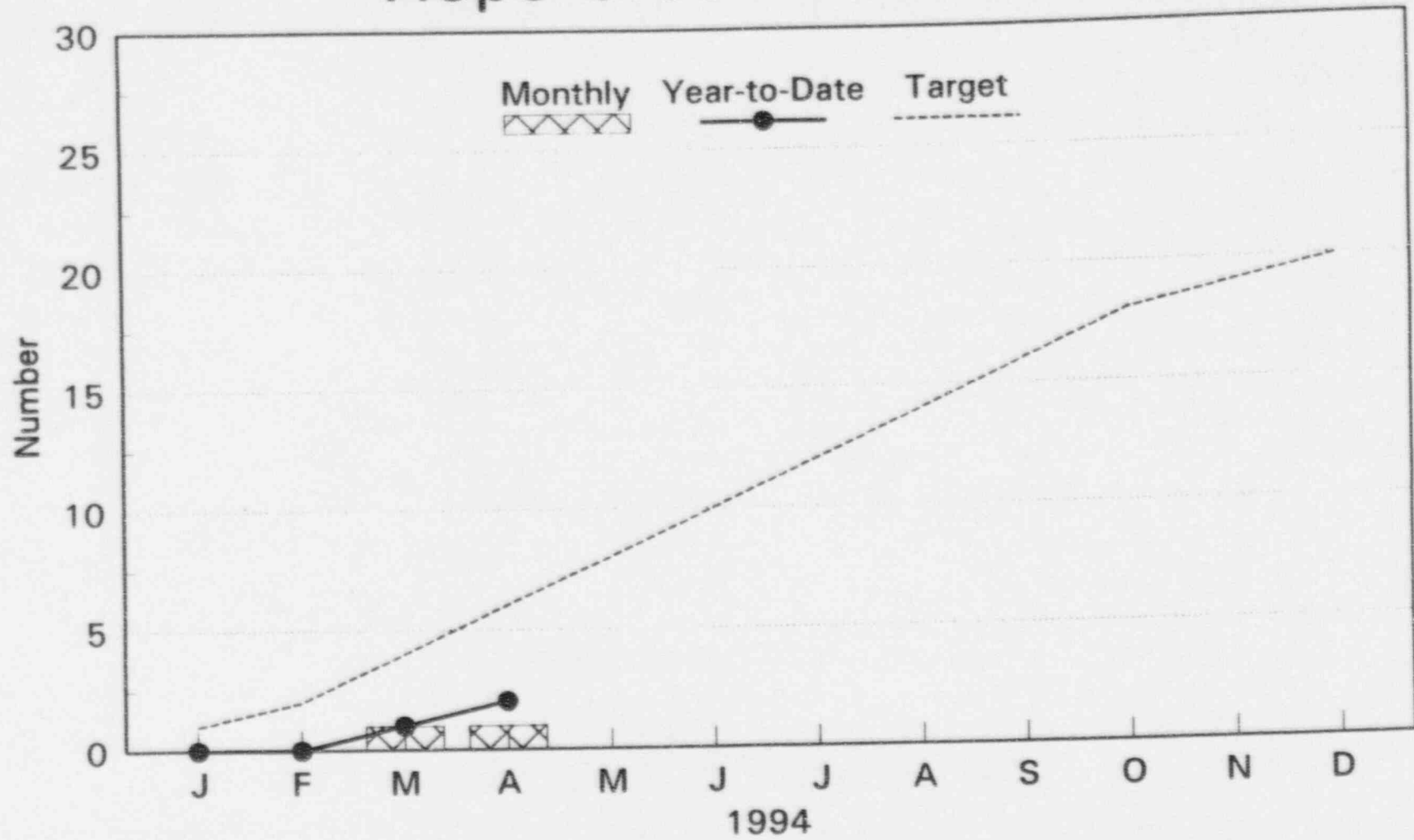
Licensee Event Report

Salem Unit 2



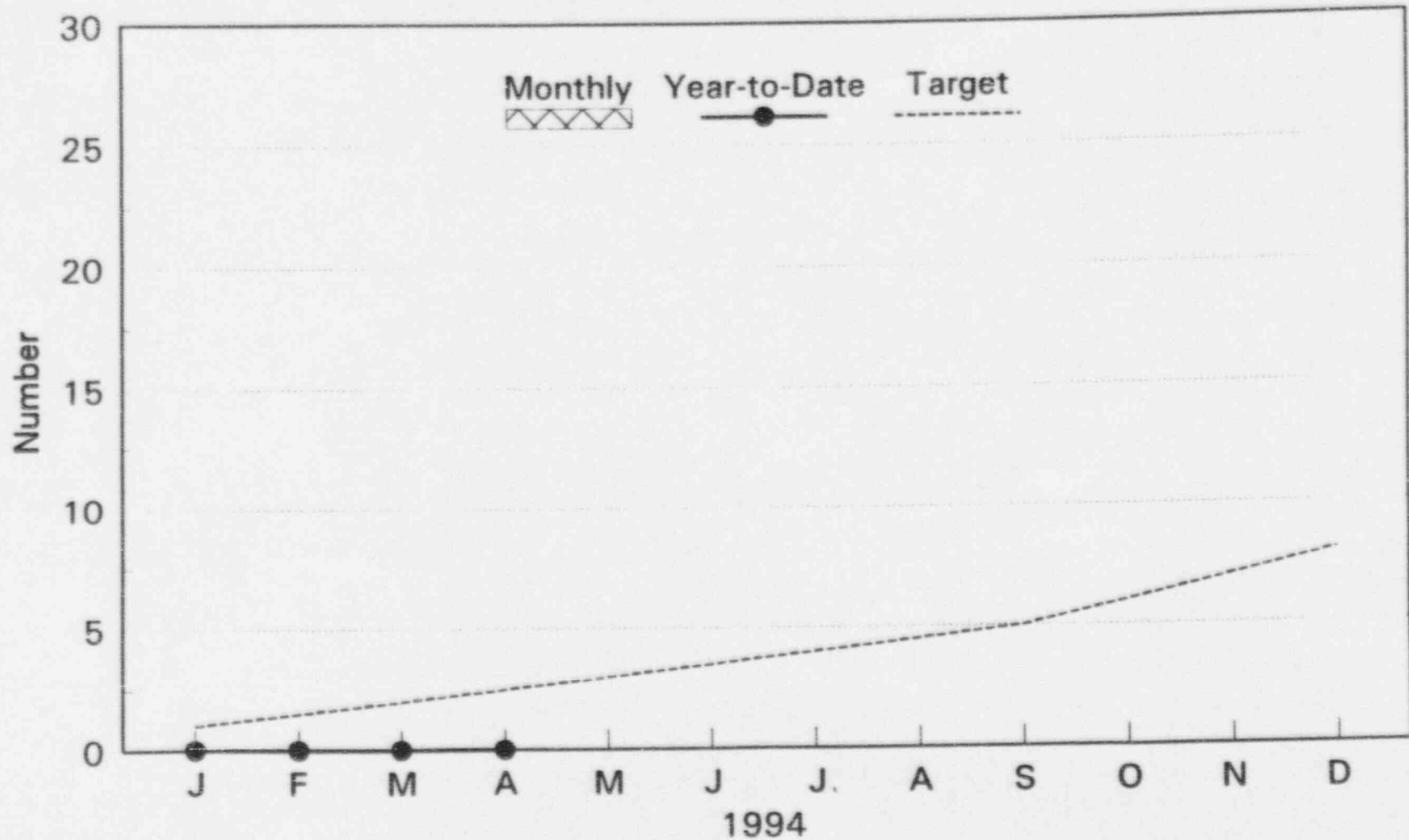
28TS2

Licensee Event Report Hope Creek Station



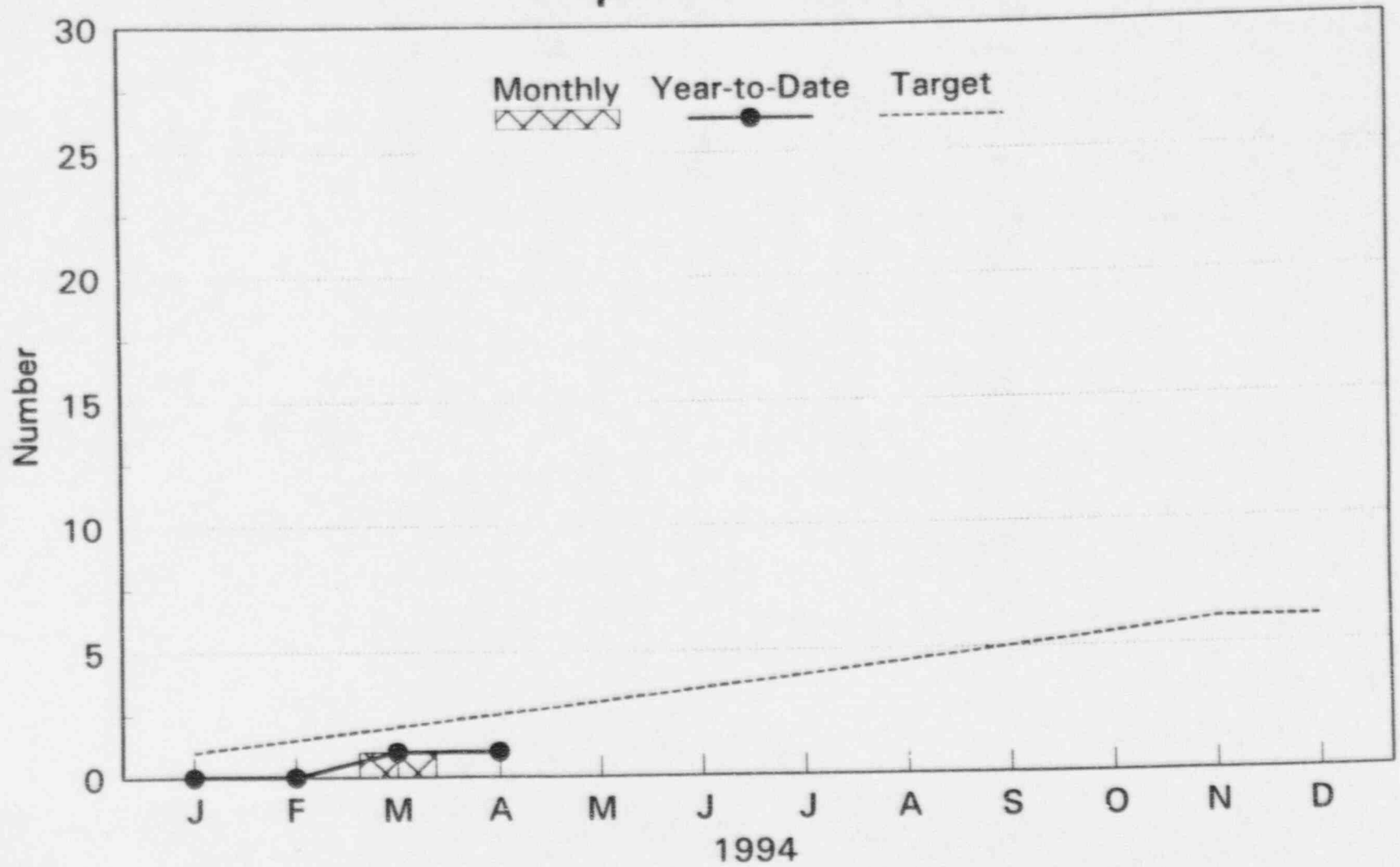
28TH

LER Personnel Related Salem Station

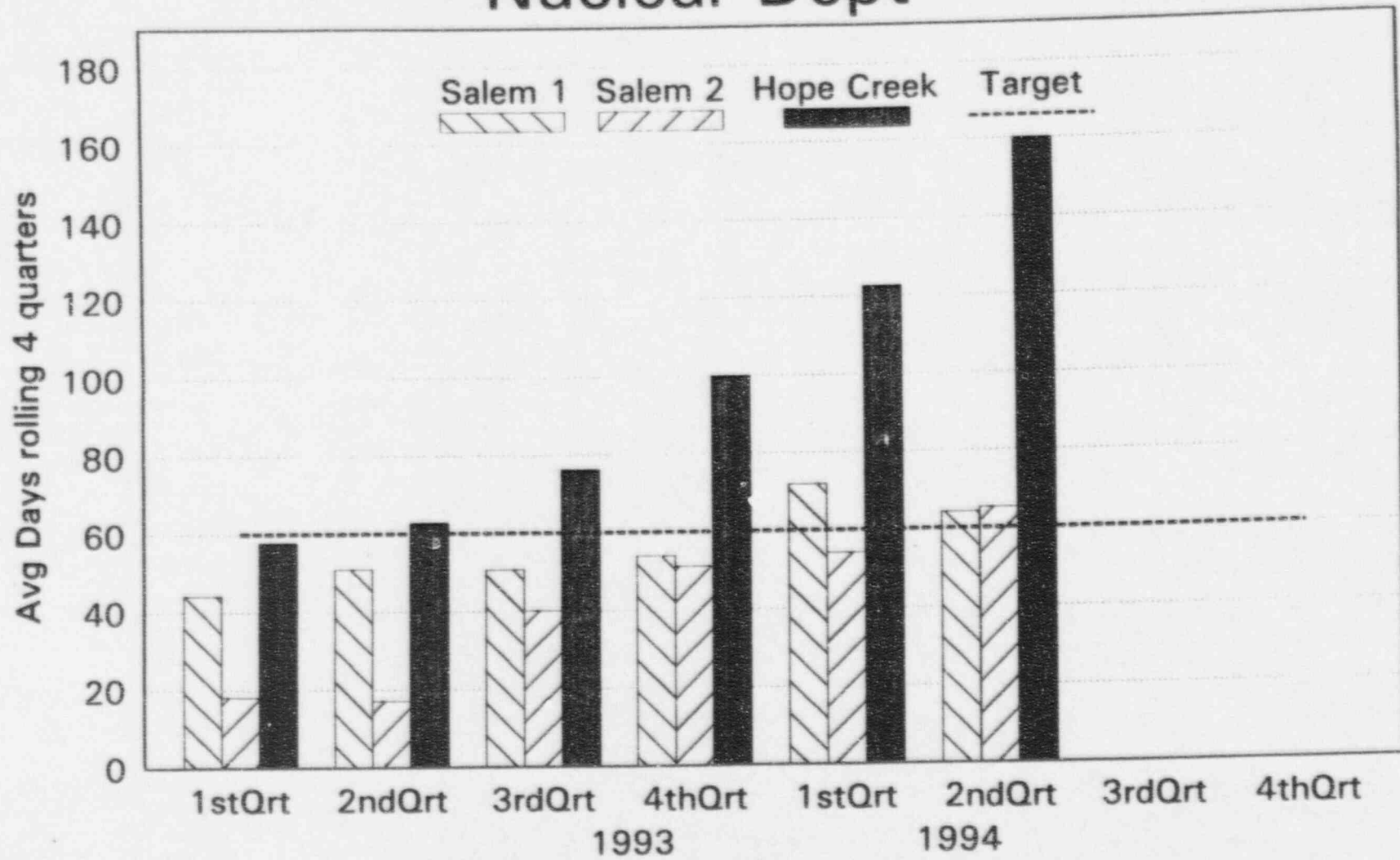


28s

LER Personnel Related Hope Creek

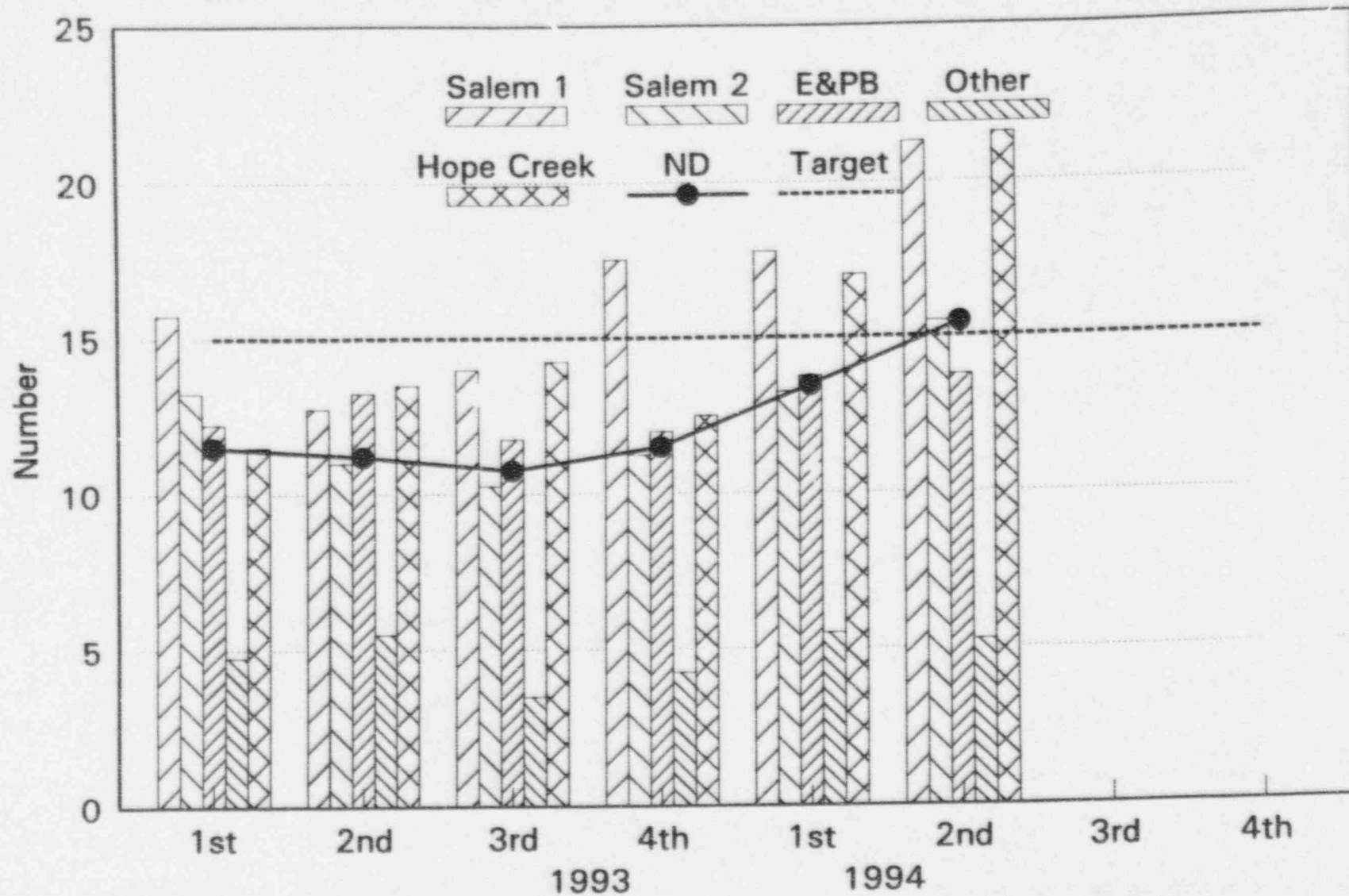


Time Between Events Nuclear Dept



REAS5A

Total Human Performance Events



REAS3 12 month avg

1

2

3

4

5

6

7

8

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

COMMUNICATION OF EXPECTATIONS

- 3 VP's meet with all employees on Island (completed 1993)
 - Reinforce standard of quality and barrier model
 - Salem/HC status and progress to date
 - CPAT rolldown (completed 1/94)
- Salem employee meeting with new VP/GM (completed 2/94)
- New vision rolldown (completed 2/94)
- Status of the department year end meeting (completed 2/94)
- S. Miltenberger meeting with Salem employees
- Management time in plant to observe and enforce standards
- Expectation that all personnel will self-identify errors
 - Establish standards which strive for mistake-free performance
 - Create climate in which all co-workers honor good faith efforts
 - Culture supports owning up to mistakes

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

UNITIZATION OF SALEM

● **Objectives**

- **Keynote: Focus - Ownership - Teamwork**
- Improve at all levels
- Position individuals appropriately - skills match job
- Provide time to do right thing (proactively solve problems)
- Minimize challenges (single unit focus)
- Provide opportunity for significant changes
- Less overtime per person
- Improved quality of work life

● **Scope**

- Operations
- Maintenance
- Station planning and scheduling
- Outage planning and scheduling

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

UNITIZATION OF SALEM

● **Implementation**

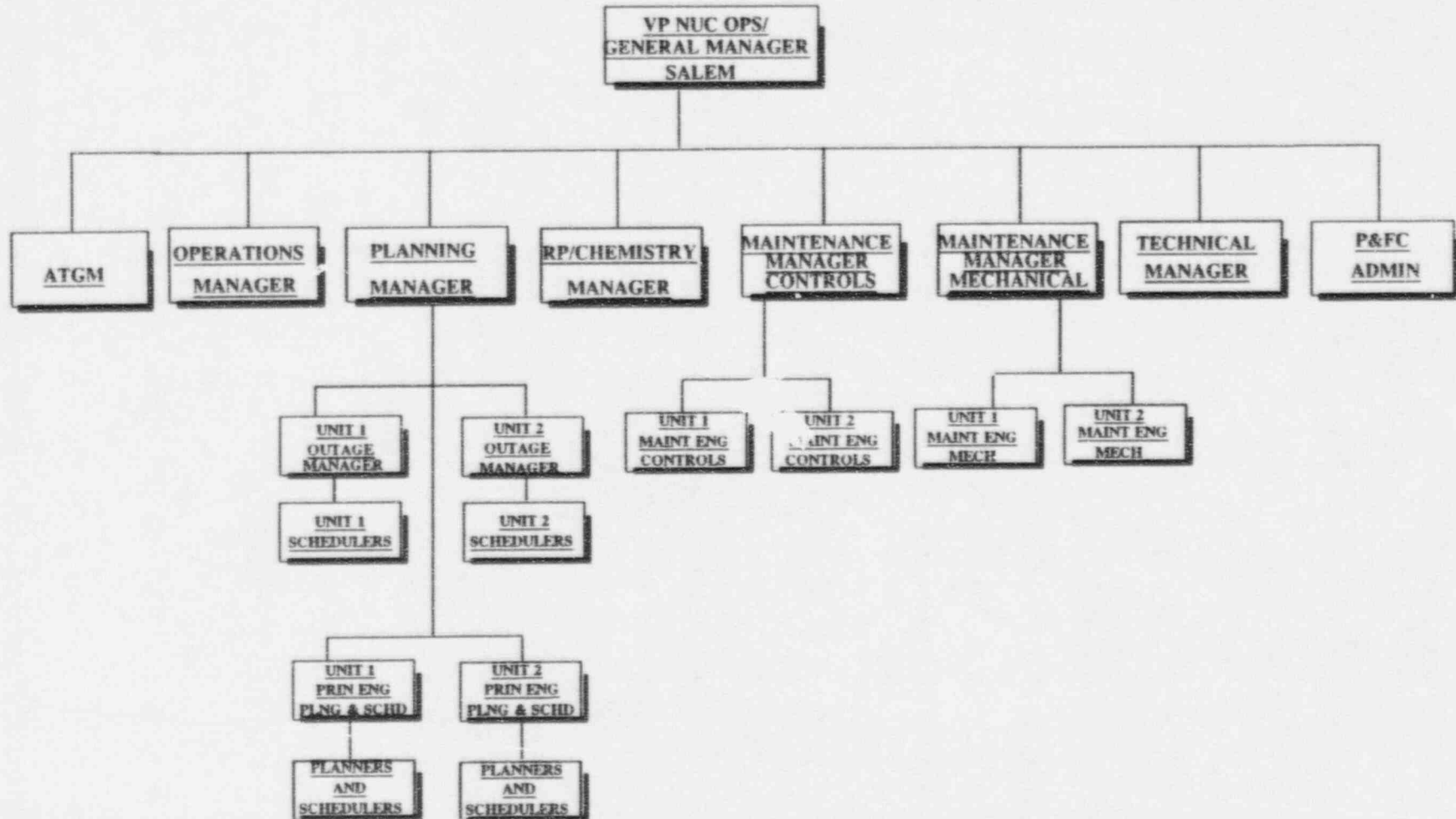
- Requires additional staff
- Rename Management/Supervisory team
- Re-bid Supervisory/Management positions - as needed
- Hiring methods (Targeted Selection)
 - ▲ Behavioral component
 - ▲ Supervisory as well as technical skills
- Hire from outside - opportunity to raise qualification/standards

● **Schedule**

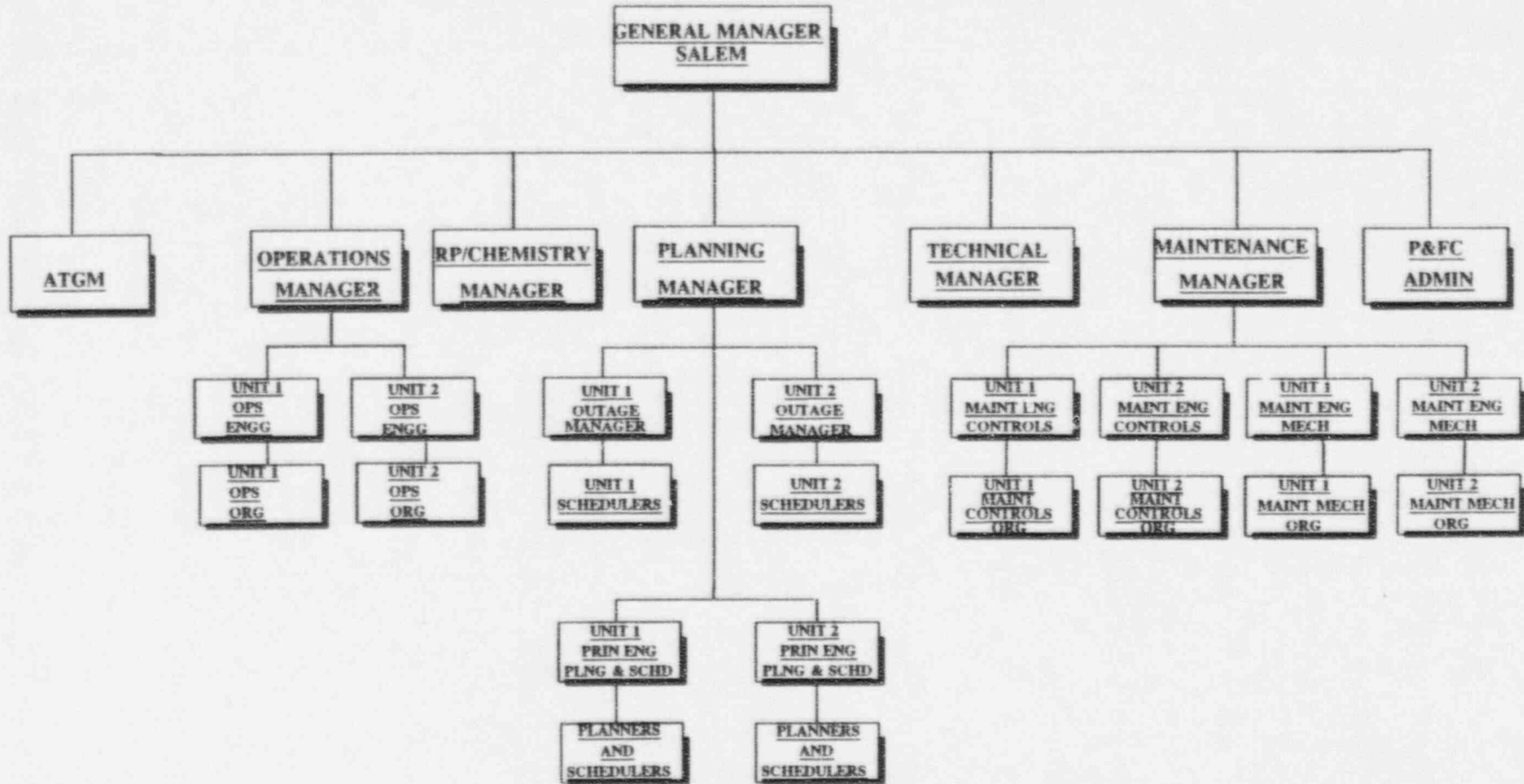
- Interim division of Maintenance Mechanical and Control groups - completed February 1994
- Planning and Scheduling - Spring 1994
- Mechanical Maintenance - Summer 1994
- Controls Maintenance - 4th Qtr 1994/1st Qtr 1995
- Operations - based on license classes - 1st Qtr 1996

PSE&G

SALEM INTERIM ORGANIZATION



PSE&G SALEM UNITIZATION ORGANIZATION



**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

**IMPROVED MANAGEMENT/SUPERVISORY
OVERSIGHT**

Organizational changes

- J. Hagan - Vice President - Nuclear Operations and (acting) Salem Station General Manager
 - Reassigned other duties to VP-NE and VP-CNO
- Station management enhancements
- Maximize effective management time in field
- Improved monitoring/assessment/feedback
 - Enforcement of standards of performance

Supervisor/Manager oversight

- Increased time in field

Maintenance - Controls

- Additional management oversight
- Controls troubleshooting
 - Mid-level management personnel provide on-shift reviews of I&C troubleshooting plans

Work standards monitoring

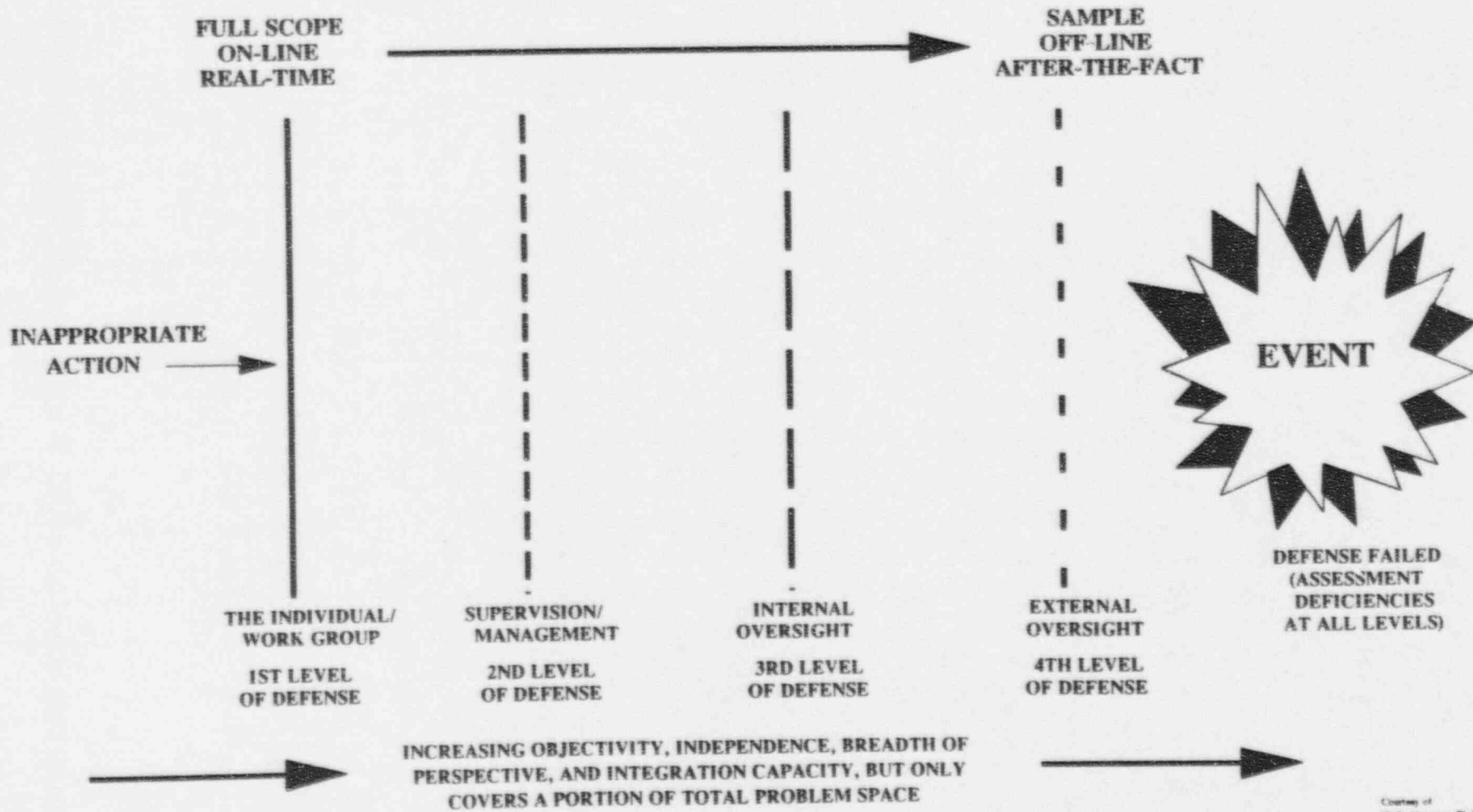
- Performance indicators

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

**IMPROVED SAFETY REVIEW/QUALITY
ASSURANCE OVERSIGHT**

- Implemented four barrier model
 - Role of independent and self assessment
 - Rolled down through organization
 - Findings and corrective actions include barrier assessment
- QA an safety philosophies
 - "Safety is our first priority"
 - Roles of QA and nuclear safety
 - Risk based assessments
- Reorganization of NSR and formation of Nuclear Review Board (NRB)
 - Focus to more global assessment of nuclear safety
- Independent NSR effectiveness review performed by outside organization

THE FOUR LEVELS OF DEFENSE OF QUALITY



Courtesy of
W.R. Conway, Ph.D., P.E.

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

AUGMENTED ON-SHIFT OVERSIGHT

Purpose

- Provide additional independent management oversight of plant operations

Scope

- All plant operations with the potential to impact plant reliability and safety

Responsibilities

- Monitor/Observe plant evolutions to assess compliance with work standards, procedures, and professional conduct
- Typical evolutions to be monitored
 - Reactor startup and shutdown
 - Low power operations
 - Special tests
 - Selected surveillance
 - Selected major system evolutions
 - Shift turnovers and Plan of the Day meetings
 - Key maintenance evolutions
 - Material condition walkdowns
 - Control room demeanor and conduct

**SALEM GENERATING STATION
NRC VISIT
STRATEGY FOR IMPROVEMENT**

AUGMENTED ON-SHIFT OVERSIGHT

● **Implementation**

- Initiated May 17, 1994
- 5 people covering 5 shifts
- Senior, well-experienced people - respected, high credibility
- Free reign to look at anything
- Provide daily feedback to Station GM and Managers
- Provide weekly feedback to Chief Nuclear Officer

**SALEM GENERATING STATION
NRC VISIT
MEASURES OF SUCCESS**

**MONITORING EFFECTIVENESS OF
PERFORMANCE THROUGH PEOPLE**

Performance Indicators

- Work practices and standards monitoring by line management and Quality Assurance
- Supervisory face-to-face time
- Human performance indicators
- Leadership feedback results
- Personnel error Licensee Event Report
- Composite safety index performance

**SALEM GENERATING STATION
NRC VISIT
SUMMARY**

- PSE&G's commitment to continued improvement has been demonstrated by a comprehensive self-diagnostic assessment
- Physical changes occur more readily than cultural/people changes
- Focus on Salem improvement
- Nuclear Department Priorities for 1994
 - Emphasis on people and performance
 - Safe uneventful operations
 - Successful refueling outages
 - Results oriented, cost effective operations

OPEN ENFORCEMENT CONFERENCE SURVEY

Licensee Public Service Electric + Gas
 Facility Salem
 EA 94-112
 Date of Enforcement Conference 7/28/94
 Presiding NRC Official Tim MARTIN

• **Impact on The NRC's Ability to Conduct an Enforcement Conference and/or Implement The Agency's Enforcement Program**

1. Was there a delay in the enforcement process due to holding an open enforcement conference? Slightly
 a. Yes b. No

If yes, what was the cause for the delay?

- a. Providing sufficient public notice of the conference.
 b. Licensee requested additional time to prepare for the open enforcement conference.
 c. Other. Explain. Had to send Commission Paper to get approval to be open because of public interest

If yes, how long was the delay? couple weeks

2. Were any members of the public disruptive to the proceedings? a. Yes b. No

• **Impact on Licensee's Participation During the Open Enforcement Conference**

3. Does the staff believe that the licensee's communication with the staff during the open enforcement conference was less candid or more guarded than in past enforcement conferences or in other meetings where the public was not present? In answering this question, consideration should be given to whether the licensee tended to answer staff questions more narrowly or whether the licensee volunteered additional information or whether the staff had to be more persistent in questioning the licensee to gain full information during the open enforcement conference. Consideration should also be given to whether there was any change in practice in the licensee having an attorney present at the conference.

- a. No difference.
 b. Little difference.
 c. Big difference. Explain. _____

mlb

4. Did the licensee propose to respond to a staff question at a later time, either verbally or in writing, in lieu of verbally responding during the conference?
a. Yes **b. No**

If yes, explain. _____

5. Did the licensee provide a thorough explanation of the root cause(s) of the violation? **a. Yes** b. No

6. Did the licensee admit the violation(s)? **a. Yes** b. No

Except a few

7. Does the staff believe that the licensee's presentation during the open enforcement conference was more formal than in past enforcement conferences?

- a.** No difference.
b. Little difference.
c. Big difference. Explain. _____

8. Does the staff believe that the open enforcement conference was significantly longer or shorter than other enforcement conferences?

- a. No difference.
b. Longer. Explain. *Slightly longer, but due to issues, rather than fact the conference was open.*
c. Shorter. Explain. _____

• Impact on NRC Resources

9. Was there adequate seating capacity for all persons interested in attending the open enforcement conference?
a. Yes b. No

10. Was it necessary for the NRC to arrange for a public meeting room outside of the regional office? a. Yes **b. No**

If so, what was the cost? _____

11. Did the regional office need to purchase any equipment/services as a result of holding the open enforcement conference? a. Yes **b. No**

If so, what was the purchase and what was the cost? _____

12. Was substantially more staff time spent in preparing for the open enforcement conference? a. Yes b. No

If yes, explain. Although more people involved

In answering questions thirteen through nineteen, the staff should give consideration to such issues as the need for certain staff members to attend the open enforcement conference, the need to provide escorts, the need to make copies of handouts, the need to answer questions from the audience after the conference, the need to respond to the open enforcement conference survey, etc.

13. Was a higher level of management involved in the open conference than the level of management typically involved in closed conferences? a. Yes b. No

If yes, explain. Regional Administrator normally does not attend ELS, but attended this one

14. Were there substantially increased demands on the public affairs staff? a. Yes b. No

If yes, explain. Although alot of media attended

15. Were there substantially increased demands on the legal staff? a. Yes b. No

If yes, explain. _____

16. Were there substantially increased demands on the security staff? a. Yes b. No

If yes, explain. _____

17. Were there substantially increased demands on the enforcement staff? a. Yes b. No

If yes, explain. _____

18. Were there substantially increased demands on the technical staff? a. Yes b. No

If yes, explain. _____

- 19. Were there substantially increased demands on the administrative staff? a. Yes b. No

If yes, explain. Tap ELT provide escorting

- 20. If not specifically addressed in the responses to questions thirteen through nineteen, estimate the additional demands on the staff in staff-hours.

- a. Zero to five staff-hours.
- b. Five to 10 staff-hours.
- c. Ten to 20 staff-hours.
- d. Over 20 staff-hours. Specify. _____

• Public Interest/Public Benefit

- 21. How many members of the media attended the open enforcement conference? 13

- 22. How many members of the public attended the open enforcement conference? 7

- 23. How many State Government representatives attended the open enforcement conference? 6 (including 2 members of Senator Biden's staff)

- 24. Were any interested individuals denied access to the enforcement conference due to conference room limitations? a. Yes b. No

- 25. Did the majority of the audience stay for the duration of the enforcement conference? a. Yes b. No

- 26. Did members of the media or public ask the NRC questions after the enforcement conference? a. Yes b. No

Media hit staff with cameras immediately by time media stopped, no other members remained

Please provide any additional comments based on either positive or negative impacts of conducting the open enforcement conference.

Please enclose the attendance sheet with the completed survey.

The following articles may not be brought into this location without first obtaining permission from the Division of Security:

- Camera and Film
- Radio Transmitters & Receivers
- Firearms and Ammunition
- Explosives
- Narcotics

- Recording Devices
- Incendiaries
- Copying and Reproduction Devices
- Alcoholic Beverages
- Radioactive Materials

Also, any article, the possession of which is considered illegal or is a violation of Federal, State or Local Laws.

All boxes, packages, briefcases, luggage and similar articles are subject to inspection.



VISITOR REGISTER

LOCATION

DATE 7/28/94

NAME FIRST MI. LAST	AGENCY/COMPANY REPRESENTED	CITIZEN OF WHAT COUNTRY	PERSON TO BE VISITED	LOCATION OF PERSON VISITED	PURPOSE OF VISIT	TIME		VISITOR'S BADGE NUMBER	ESCORTS SIGNATURE	ESCORTS BADGE NUMBER
						IN	OUT			
PRINT: TED STROMAN SIGNATURE: <i>Ted Stroman</i>	Starkey	US			Eng Log REG			1033		
PRINT: Matt Gilly SIGNATURE: <i>Matt Gilly</i>	Toby Jordan	US						1026		
PRINT: Robert J. Pitter SIGNATURE: <i>Robert J. Pitter</i>	CR2	US						1028		
PRINT: VOTER CANTON SIGNATURE: <i>Voter Canton</i>	CA 2	US						1045		
PRINT: R. L. McMillan SIGNATURE: <i>R. L. McMillan</i>	News-Towne	US						1037		
PRINT: Maggie Smith SIGNATURE: <i>Maggie Smith</i>	MTA	US						1052		
PRINT: Linda Taylor SIGNATURE: <i>Linda Taylor</i>								1049		
PRINT: Bob Wise SIGNATURE: <i>Bob Wise</i>								1052		
PRINT: Gene O. Ashby SIGNATURE: <i>Gene O. Ashby</i>	WBY-TV							1038		
PRINT: Patricia Evans SIGNATURE: <i>Patricia Evans</i>								1035		
PRINT: L. Hines SIGNATURE: <i>L. Hines</i>								1011		
PRINT: A. Mitchell SIGNATURE: <i>A. Mitchell</i>	INDIAN							1001		
PRINT: Michael J. Atkinson SIGNATURE: <i>Michael J. Atkinson</i>	Public Radio Advertis							1013		
PRINT: R. G. Sears SIGNATURE: <i>R. G. Sears</i>	WVPI-TV	US						1007		
PRINT: _____ SIGNATURE: _____										
PRINT: _____ SIGNATURE: _____										

The following articles may not be brought into this location without first obtaining permission from the Division of Security:

- Genetics and Film
- Radio Transmitters & Receivers
- Firearms & Ammunition
- Explosives
- Radioactive
- Nitrocellulose

Also, any article, the possession of which is considered illegal or is a violation of Federal, State or Local Laws

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NRC FORM 276
 (1-84)
 (REVISED 12-81)



U.S. NUCLEAR REGULATORY COMMISSION
 VISITOR REGISTER

LOCATION

DATE 7/28/94

NAME FIRST MI LAST	AGENCY/COMPANY REPRESENTED	CITIZEN OF WHAT COUNTRY	PERSON TO BE VISITED	LOCATION OF PERSON VISITED	PURPOSE OF VISIT	TIME		VISITOR'S BADGE NUMBER	ESCORT'S SIGNATURE	ESCORT'S BADGE NUMBER	
						IN	OUT				
PRINT JAMES W. WILSON SIGNATURE <i>[Signature]</i>	PS&E	US	<i>[Signature]</i>	<i>[Signature]</i>	Eng Comp PS&E			1031	<i>[Signature]</i>		
PRINT JOSEPH S. HAGAN SIGNATURE <i>[Signature]</i>	PS&E	US			11				1016		
PRINT DEBRA A. PETERSON SIGNATURE <i>[Signature]</i>	PS&E	USA							1009		
PRINT BETTY KELLY SIGNATURE <i>[Signature]</i>	NRC/DOE	US									
PRINT KRISTY JONES SIGNATURE <i>[Signature]</i>	ATLANTIC ELECTRIC	US			Meeting						
PRINT PHIL DUCH SIGNATURE <i>[Signature]</i>	DEMARIVA DIVISION	US			Meeting	9:35	9:35	1041			
PRINT SIGNATURE											
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PRINT SIGNATURE											

PRINTED ON RECYCLED PAPER

The following articles may not be brought into this location without first obtaining permission from the Division of Security:

- Cameras and Film
- Radio Transmitters & Receivers
- Firearms and Ammunition
- Explosives
- Narcotics

- Recording Devices
- Incenseburners
- Copying and Reproduction Devices
- Alcoholic Beverages
- Radioactive Materials

Also, any article the possession of which is considered illegal or is a violation of Federal, State or Local Laws.

NRC FORM 206
(1-84)
 REVISED 12-1



VISITOR REGISTER

U.S. NUCLEAR REGULATORY COMMISSION

LOCATION

DATE 7/28/94

NAME FIRST M.I. LAST	AGENCY/COMPANY REPRESENTED	CITIZEN OF WHAT COUNTRY	PERSON TO BE VISITED	LOCATION OF PERSON VISITED	PURPOSE OF VISIT	TIME		VISITOR'S BADGE NUMBER	ESCORT'S SIGNATURE	ESCORT'S BADGE NUMBER
						IN	OUT			
PRINT DENNIS ZIMMORY SIGNATURE <i>Dennis Zimmory</i>	NY-030	USA			Eng Conf/Rsg			1016		
PRINT ROBERT K. KOPPEL SIGNATURE <i>Robert K. Koppel</i>					"			1015		
PRINT NEIL BEOWN SIGNATURE <i>Neil Beown</i>	PSC 01	USA			"			1051		
PRINT TOMPA HUBER SIGNATURE <i>Tompa Huber</i>	Sea Bader							1048		
PRINT PATT TAVIRIA SIGNATURE <i>Patt Taviria</i>	" "							1014		
PRINT MIKE MCALP SIGNATURE <i>Mike McAlp</i>								1006		
PRINT MICK CASSEY SIGNATURE <i>Mick Cassey</i>	Severe Club	USA						1012		
PRINT C. P. LASKY SIGNATURE <i>C. P. Lasky</i>	SELF	USA								
PRINT										
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The following articles may not be brought into this location without first obtaining permission from the Division of Security:

- Cartridges and Film
- Radio Transmitters & Receivers
- Firearms and Ammunition
- Explosives
- Narcotics

- Recording Devices
- Incendiarium
- Copying and Reproduction Devices
- Alcoholic Beverages
- Radioactive Materials

Also, any article the possession of which is considered illegal or is a violation of Federal, State or Local Laws.

NRC FORM 206
(1-96)
 NRC-60-121



U.S. NUCLEAR REGULATORY COMMISSION

VISITOR REGISTER

DATE

7/28/94

LOCATION

TO BE COMPLETED BY VISITOR

NAME FIRST M.I. LAST	AGENCY/COMPANY REPRESENTED	CITIZEN OF WHAT COUNTRY	PERSON TO BE VISITED	LOCATION OF PERSON VISITED	PURPOSE OF VISIT	TIME		VISITOR'S BADGE NUMBER	ESCORT'S SIGNATURE	ESCORT'S BADGE NUMBER
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- Camera and Film
- Radio Transmitters & Receivers
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- Explosives
- Narcotics

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NRC FORM 205
1-64
REVISED 12-1



U.S. NUCLEAR REGULATORY COMMISSION

LOCATION

DATE 7/28/94

NAME FIRST M. LAST	AGENCY/COMPANY REPRESENTED	CITIZEN OF WHAT COUNTRY	PERSON TO BE VISITED	LOCATION OF PERSON VISITED	PURPOSE OF VISIT	TIME		VISITOR'S BADGE NUMBER	ESCORTS SIGNATURE	ESCORTS BADGE NUMBER
						IN	OUT			
PRINT G. GERRITS SIGNATURE <i>G. Gerrits</i>					Eng Comb PSEG			10013	<i>[Signature]</i>	
PRINT J. ALFORD SIGNATURE <i>J. Alford</i>								10023		
PRINT FRANK THOMAS SIGNATURE <i>Frank Thomas</i>	PSEG	U.S.A	J. WHITE					1037		
PRINT FRANK WETZEL SIGNATURE <i>Frank Wetzel</i>	WES	US	WHITTY					1046		
PRINT DIWADSON SIGNATURE <i>Diwadson</i>	PSEG	US	J. WHITE					1032		
PRINT WILLIAM STEWART SIGNATURE <i>William Stewart</i>	PSEG	US	WHITTY					1035		
PRINT J. GRAY SIGNATURE <i>J. Gray</i>	NRC	US	Hildery							
PRINT KELLY CATHERMO SIGNATURE <i>Kelly Cathermo</i>	PSEG	US	WHITE					1027		
PRINT STEVE WILKINSON SIGNATURE <i>Steve Wilkinson</i>	PSEG	US	J. WHITE					1040		
PRINT CRAIG LINDSEY SIGNATURE <i>Craig Lindsey</i>	PSEG	US	J. WHITE					1043		
PRINT DAVID SHAK SIGNATURE <i>David Shak</i>	DEMA	USA	J. WHITE					1039		
PRINT JAMES PERRY SIGNATURE <i>James Perry</i>	MD PSC	USA						1044		
PRINT ARNOLD A. KROGER SIGNATURE <i>Arnold A. Kroger</i>	NEO	USA	John White					1042		
PRINT HILTON HERRINGTON SIGNATURE <i>Hilton Herrington</i>	NRCL	USA	Karl & Smith					87557		
PRINT THOMAS S. KALINOSKI SIGNATURE <i>Thomas S. Kalinoski</i>	N. J. OVERLANE	USA	STEVE WHITE					1036		

5

Last Day Briefing w/PSE & G

- I. Purpose of the AIT:
 - A. Verify the circumstances and evaluate the significance of the following event: The Salem Unit 2 OHA system was lost without knowledge or response by the operating staff for about 1.5 hours.
 - B. The Charter gives the scope of the inspection. This scope included detailed fact-finding, identification of generic issues, determination of root causes, and examination of PSE&G operational and managerial performance.
- II. The inspection included document review, over 2 dozen interviews, observation of a simulator demonstration, extensive discussions with OHA system vendor, review of test and troubleshooting, equipment examination with walkthru's, and observation of operating crew performance.
- III. The team believes that the OHA system is now performing its function to provide information to the operating crews. Current system checks and admin controls adequately verify system status.
- IV. The failure of the OHA system was most likely initiated by a person from the control room operating crew making the wrong key strokes on a computer workstation for the OHA system. This error, coupled with a panel switch in the wrong position, placed the OHA system CPU in a mode where it was waiting for additional commands that never came. This prevented the OHA system from displaying alarms in the control room.
- V. The team determined that the root causes for the event were as follows (please note that these are only preliminary conclusions and subject to additional team and NRC management review):
 - A. Procedure STOP-SO.ANN-0001(Q) was not followed. (switch, keystrokes)
 - B. Operators were not trained to recognize system problems.
 - C. Poor Human Machine Interface (failure not readily detectable, workstation - keystrokes & lack feedback & black box sw)
 - D. Design vulnerabilities (response to annunciators overridden by lower priority task.
- VI. Observations
 - A. Failure to notify the NRC within one hour of the event.
 - B. Operations had concerns about some system problems before the event.

[Handwritten signature]

- C. Delay in notifying senior management of the event.
- D. Knowledge LTA of OHA system coverage by technical and operations.
- E. Communication LTA about A45 window between Eng and Ops.
- F. Lack of technical understanding of the detail operation of the OHA system through understanding of the software.
- G. Design vulnerabilities exist in the system that make the OHA system susceptible to errors (data link to the distributed logic cards, workstation)
- H. Operators were not sensitized to the complexity of the system.
- I. Lack of Abnormal Procedure for partial or total loss of annunciator systems. Also, individual ABs don not contain alternate indication for annunciators.
- J. No simulator training on loss of annunciators.
- K. No operator classroom training on the OHA system.
- L. On Unit 1, there is no alternate continuous monitoring of the RWST tank level in the control room. (May affect ECCS system operation during post-LOCA injection phase).
- M. Operations personnel did not observe precaution 3.1 in ANN-0001 concerning unauthorized personnel trying to gain access to password protected features of the OHA workstation.
- N. Vendor manual was LTA. No top level software description. The word "lock-up" is used but not defined or discussed.
- O. Routine test of redundant components was not in place (was planned).
- P. Software review of DCP LTA.
- Q. System not designed to aid troubleshooting redundant components.
- R. No system virus check.
- S. NCO actions to deduce the OHA loss w/o training showed a good questioning attitude.
- T. System engineer responded well to the event (showed ownership).
- U. PM process looked good.

- V. DCP was well documented.
- W. Installation of the OHA system went smoothly and was well-planned.
- X. Use of OHA system to enhance trending a plus.

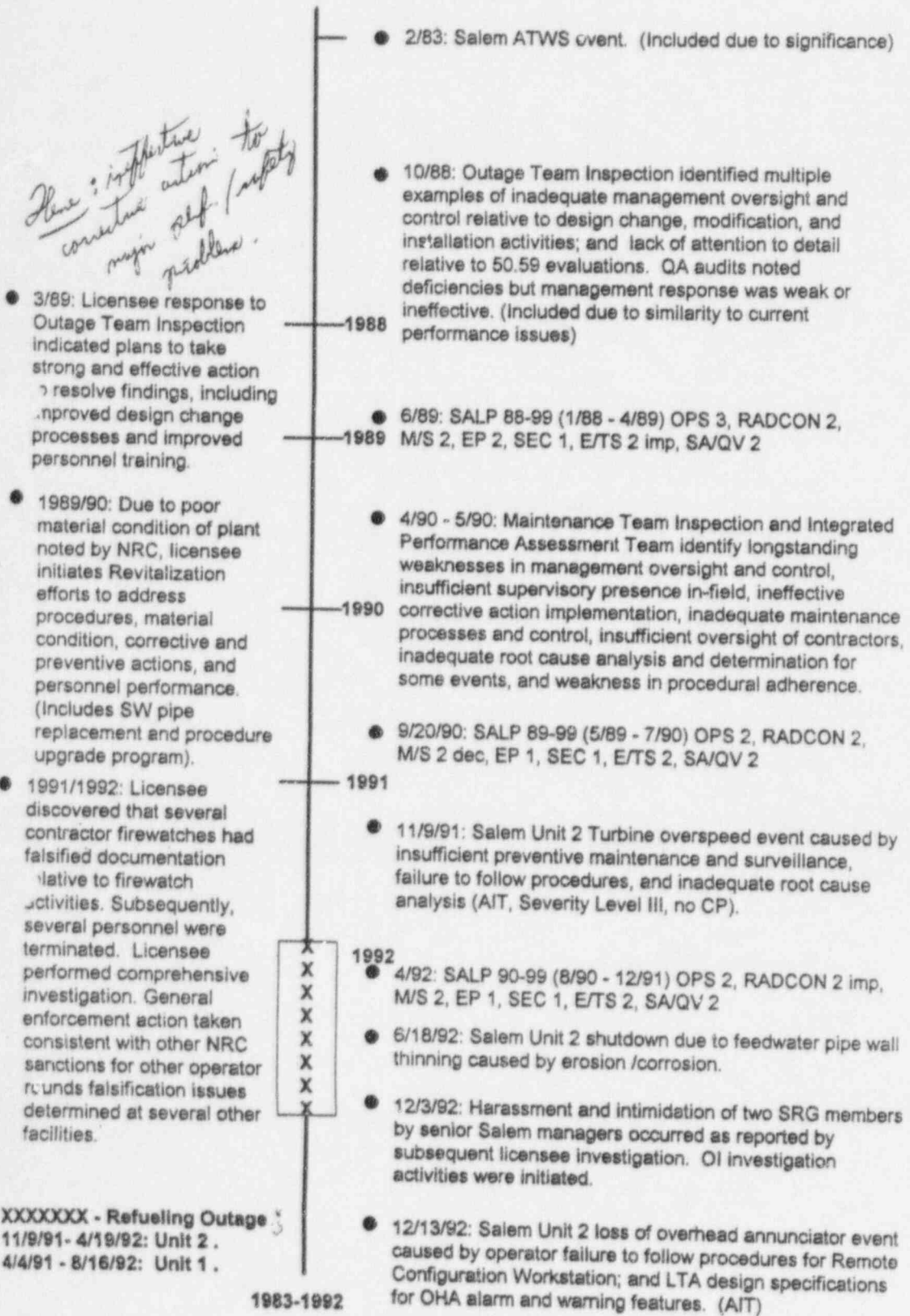
Your staff provided outstanding support. Formal exit date TBD. Thank you. Merry Christmas.

SALEM

General Activity and Licensee Response History

General Occurrence and Event History

Handwritten note:
 This is ineffective
 corrective action to
 major safety
 problems.



XXXXXXX - Refueling Outage
 11/9/91 - 4/19/92: Unit 2
 4/4/91 - 8/16/92: Unit 1

1983-1992

Handwritten signature:
 W/Z

SALEM

General Activity and Licensee Response History

General Occurrence and Event History

March

X
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X
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X

XXXXXXXXXX

3/16/93 - 6/30/93 : Unit 2 refueling outage

- 5/93: NRC met with licensee and discussed recurrent programmatic deficiencies that contributed to the previous AITs, and the licensee inability to understand and resolve cause of deficient conduct and performance.

- 5/24/93 - 6/4/93: Several aborted Salem Unit 2 startup attempts due to rod control problems. Inadequate root cause analysis was a principal contributor. Poor problem resolution technique and ability was demonstrated. (AIT)

June

- 7/93: PSE&G initiates Comprehensive Performance Assessment to assess Artificial Island events, incidents, and occurrences for previously undiscovered, underestimated, or overlooked root causes.

- 9/93: SALP 91-99 (12/91 - 6/93) OPS 2, RADCON 1, M/S 2, EP 1 dec, SEC 1, E/TS 2, SA/QV 2
- 10/12/93: Salem Unit 2 shutdown due to cracked EDG cylinder liners.
- 10/93 - 11/93: \$50,000 CP & Severity Level III violation f numerous examples of inadequate procedure adherence with personnel safety implications (live 125VDC cable cutting incident several incidents involving failure to adhere to tagging procedures, , etc).
- 10/1/93 - 1/24/94: Salem Unit 1 refueling outage (1R11), extended due to EDG cylinder liner problems (crack liners attributed to procurement deficiencies); Aux Feedwater pump problems (attributed to replaced parts that were of a different design than required); and, Main Feedwater pump problems (attributed to design changes implemented to support later digital feedwater modifications, i.e., the licensee did not fully understand the cause of oscillations, consequently the MFP was restored to original configuration.)

SALEM

General Activity and Licensee Response History

- 1/94: PSE&G concludes comprehensive assessment, concludes there are significant deficiencies in root cause determination, and the performance of offsite and line QA organizations. Subsequently, a complex Strategic Improvement Plan is established that identifies corrective measures and schedule for completion.
- 2/94: After being at power for 3 days, unit 1 tripped.
2/94: Cal Vondra, General Manager-Salem Operations reassigned to non-nuclear position in PSE&G. Joe Hagan, Vice President-Nuclear Operations assigned as General Manager until permanent replacement is appointed.
4: Salem reorganization initiated, including plant unitization, and establishment of new department managers for System Engineering/Tech Support, Maintenance, and Outage Planning.
- 2/4/94: Salem management took both units off line to dredge grass and mud in front of the Salem circulating water intake structure.
- 2/24/94: Management Meeting to discuss CPAT findings and licensee plans and schedules for program improvement.
- 6/24/94: Salem Unit 1 rapid shutdown from 75% power due to condensate suction header overpressurization and water hammer.

General Occurrence and Event History

- 1/27/94 - 2/13/94: Salem Unit 1 was subject to 2 reactor trips (1/27/94-trip from 10% due to feed reg valve problems attributable to previously ineffective troubleshooting efforts; 2/10/94-trip from 100% due to coincident loss of both 15 VDC control power supplies to EHC system due to unexpected actuation of over-voltage protection (crowbar), suspected to be caused by maintenance activities. On 2/11/94-licenses discovered that the mode switches to both air compressors for 1B EDG were in the off position due to work control problems; and on 2/13/94, while the unit was in Mode 2, an I&C technician error involving a pressure transducer associated with the atmospheric steam dump system caused the steam dumps to actuate. Consequently, excessive cooldown occurred and power increase from 2% to 5.6%, causing an unplanned mode change.
- 4/7/94: Salem Unit 1 trip from 25% due to operator error (Operators reduced power to 10% to compensate for grass intrusion, which enabled the 25 low power trip setpoint. To restore lower than normal flow, operators withdrew control rods which increased power in excess of 25%, which resulted in trip. Trip was complicated when two MSIVs and two FW isolation valve failed to close; and two turbine driven feed pumps failed to trip. SI actuated, PRT rupture disk blew-out, and the licensee declared a UE followed by an ALERT. AIT dispatched. Consequently, escalated enforcement action was taken (4 Severity Level IIIs with a \$500,000 CP). General cause involve ineffective corrective action for pre-existing equipment deficiencies that provided challenges to operators (MS10), inadequate operator command and control, and ineffective management communication of expectations to the staff, and poor operator performance issues. (AIT)

Precursors to this event (grass affecting plant operation) occurred twice in 1993, and once in 2/94. Subsequent problems with grass occurred in 6/94 and 12/94.
- 6/14/94: Salem Unit 2 rapidly reduced power from 100% to 70% due to grass intrusion.

Jan.- June 1994

SALEM

General Activity and Licensee Response History

- 7/94: NRC Commissioners receive PSE&G presentation on April 7, event. Chairman informs PSE&G that Salem performance (4 AITs in 4 years) was unacceptable.

7/11/94 - 8/25/94: NRC conducted a special Performance Assessment of Salem. Generally the assessment team found that there was no aggressive quality oversight of activities, and no proactive effort existed to correct existing system and equipment deficiencies that had the potential to challenge operators and system performance. Weakness were also found in maintenance programs relative to procedure adherence, post-maintenance testing, and control of work activities. In operations, a significant number of "work-around" issues were identified that operators had accommodated and accepted as normal. Though engineering activities were generally assessed positively, weaknesses were noted in engineering oversight of vendor-designed modifications. Plant support activities were acceptable.

7/30/94: PSE&G executive management, as part of an overall performance improvement effort (which involved assessing the performance of all personnel assigned to support Salem), terminated or otherwise forced the resignation of about 55 personnel that were deemed to be low-level performers in the Salem organization. The terminations mainly affected supervisors and technical personnel in non-bargaining positions, and included L. Reiter, General Manager-Quality Assurance and Nuclear Safety Review and other managers in that organization.

8/94: EDO informs Miltenberger, LaBruna, and Hagan that he will not be able to defend continued Salem operation in the event of another AIT.

- 10/94 Steve Miltenberger, Vice President and Chief Nuclear Officer was replaced by Leon Eliason. Subsequently, Eliason presides over the reorganization of PSE&G's nuclear division into a subsidiary reorganization of Nuclear Division, Nuclear Business unit. Eliason is named President of NBU.

General Occurrence and Event History

- 10/13/94 - 2/16/95: Salem Unit 2 refueling outage (2R8). Projected 77 day refueling outage delayed due to leaking pressurizer code safety valves and single failure susceptibility of the Solid State Protection System.

10/29/94-11/4/94: several ineffectively controlled non-safety related maintenance activities, including near miss cutting 4160V cable.

July-Oct.
1994

SALEM

General Activity and Licensee Response History

General Occurrence and Event History

- 11/94: As a result of investigation of a Hope Creek matter involving insufficient staffing of the control room in 1992, the licensee determined that some similar staffing issues occurred at Salem over an extended period of time. OI investigation is progressing.
- 12/13/94: John Summers named as new General Manager-Salem Operations; Joe Hagan resumes normal duties of Vice President of Nuclear Operations.
- 1/95: PSE&G named Jeffery Benjamin as new General Manager-Quality Assurance and Nuclear Safety Review. A new manager and new supervisors were subsequently appointed to the Salem QA organization.

1/30/95: Leon Eliason announced functional realignment of Nuclear Business Unit and Performance Improvement initiatives. NBU functional areas were established as Operations (Hagan), Support (LaBruna), Assessment (Benjamin), Human Resources and Administration (Johnson), External Affairs, (Burrice), and Strategic Planning and Financial (Cohen). Reorganization to be announced later.
- 2/13/95: Leon Eliason announced reorganization of NBU to support previously announced functional realignment.

2/17/95: Leon Eliason informed the EDO that he has commissioned an independent team of senior nuclear industry executives to perform a Organizational Effectiveness Review of Salem in an effort to determine why program improvement has not been realized.
- 2/27 - 3/10/95: INPO Plant Evaluation and Accreditation Team (28 persons) in progress.
- 2/95: Enforcement Conferences were held with PSE&G and three former managers (Cal Vondra, former GM-Salem Operations; Vince Polizzi, former Operations Manager-Salem, and L. Reiter, former GM-QA/NSR) relative to harassment and intimidation issues stemming from a 12/3/92 incident involving two SRG engineers. Enforcement pending.
- 3/95: John Morrison, formerly Manager-Technical Department is reassigned. Licensee is currently considering outside replacement.

Nov. 1994 - Present

- 11/18 - 28/94: the Salem Units experienced four electrical transients including two losses of 4160V station power transformers, one loss of a 13 KV substation, and arcing of a 4KV supply cable to safety related busses.
- 12/11/94: rapid Salem Unit 1 power reduction from 100% power to 51% power in response to grass intrusion.
- 10/94 - 2/95: Unit 2 outage, planned to be 60 days but extended due to extensive problems involving leak-by on pressurizer safety relief valves.
- 1/95: Salem Unit 2 replaces no 23 RCP seal due to seal leakoff valve failure.

1/95: SALP 93-99 (6/93 - 11/94) OPS 3, M S 3, E/TS 2, PS 1
- 2/2/95: While unit 1 at 100% and unit 2 in Mode 2, PSE&G determined that SSPS vulnerability existed due to design deficiency. Requested NOED to effect design change. NOED granted by NRC. On 2/3/95 licensee determined that power supply problem existed relative to expected functioning of SSPS circuits and commenced troubleshooting activities. NRC subsequently rescinded NOED. Both units were required to go to Mode 5.
- 2/94 - 3/95: While shutdown, the licensee experienced difficulty in relative to MS10 performance on both units. Extensive troubleshooting and root cause analysis initiated. Determined several design and component deficiencies existed on controller cards and modules associated with MS10 operation that were not previously revealed by other licensee efforts to understand and resolve MS10 performance issues that contributed to the 4/7/94 Unit 1 trip.
- 2/95: After start up of the unit, within 3 days Salem Unit 2 was shutdown again to replace No. 21 RCP seal. Seal failure resulted from low leakoff flow apparently caused by a small amount of crud.

Mr. Leon Eliason
Chief Nuclear Officer and President
Nuclear Business Unit
Public Service Electric and Gas Company
P.O. Box 236
Hancocks Bridge, New Jersey, 08038

SUBJECT: SYSTEMATIC PERFORMANCE OF LICENSEE PERFORMANCE (SALP)
REPORT NO. 50-272;50-311/93-99

Dear Mr. Eliason:

This letter forwards the SALP report for Salem Generating Stations, Units 1 and 2, for the period between June 20, 1993 and November 5, 1994. The SALP was conducted in accordance with the Nuclear Regulatory Commission's revised process that was implemented July 19, 1993. This revised process assesses licensee performance in four functional areas: Operations, Maintenance, Engineering, and Plant Support (which includes radiation protection, physical plant protection and security, emergency preparedness, fire protection, chemistry, and housekeeping).

Operators generally responded appropriately with good command and control to the many plant trips and operational transients that occurred in this period except during the April 7, 1994, grass intrusion event. However, the operators did not effectively assure that plant systems and equipment were always sufficiently maintained to perform as designed. Too often, the operations organization accommodated long-standing equipment or system problems that frequently challenged the operation of the plant in normal and upset conditions. Further, the general lack of a questioning attitude by operators resulted in anomalous indications or conditions being unnoticed or not understood, and consequently, ineffectively resolved. Weaknesses in operability decision-making resulted in some determinations that were not conservative or otherwise lacked a solid technical basis. This functional area was rated as Category 3.

The maintenance organization was weak in the implementation of programs and activities. Consequently, there were frequent occurrences involving procedure adherence, procedural adequacy, and control and oversight of work. Some improvements, such as better communications with the operating organization, improved prioritization and scheduling of work, and improved material condition have been achieved. Notwithstanding, weaknesses still prevail relative to the effectiveness of corrective actions, troubleshooting and resolution of recurrent equipment problems, and management oversight of work activities. This functional area was rated as Category 3.

The performance of engineering was inconsistent. The quality of design and modification activities was generally good. However, engineering priorities did not reflect the needs of the plant. Significant problems were

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evident in the quality of root cause assessment activities and resolution of repetitive equipment problems. While the quality and technical ability of the Engineering and Plant Betterment organization appears good, the organization did not effectively engage itself in the diagnosis, root cause assessment, and resolution of the chronic plant system and equipment problems that have adversely affected overall plant performance. This functional area was rated as Category 3.

Performance in the plant support area continued to be strong. Well trained and capable management and staff contributed to the effectiveness of radiation protection and ALARA efforts, and the radiological environmental and effluent monitoring programs. The performance of the emergency preparedness organization improved in this period and was effectively demonstrated in drills and actual event responses. The plant security organization performed well, notwithstanding problems with assessment aids and occasional weaknesses relative to supervisory oversight and personnel performance. Performance relative to fire protection program and activities improved during this period. This functional area was rated as Category 1.

In summary, the NRC is concerned with the performance decline in three of the four areas during this period. The NRC is particularly concerned with the frequent challenges to plant systems and to the operators caused by repetitive equipment problems and personnel errors that had the potential to, or actually did, adversely affect plant or personnel safety. We recognize that your organization has, within the last year, initiated several comprehensive actions that have the potential to improve overall plant performance. While we acknowledge some recent incremental performance gains, these efforts have not yet resulted in any noticeable overall performance improvement.

In arriving at this assessment, our staff determined the following apparent contributing factors: (1) The tendency of your operations staff to accept and accommodate system performance that was not in accordance with design, or otherwise, less than optimum; (2) The tendency of your organization to ~~assume~~ ^{to} the most proximate cause of degraded conditions or unexpected system performance, and dismiss or not adequately consider other possible contributors or factors without substantial technical basis or rationale; (3) The reluctance of maintenance and operations organizations to solicit technical support from the engineering organization for the resolution of plant system or equipment issues; and the engineering organization's reticence to engage in the diagnosis or resolution of plant technical problems without requirement or request; (4) The lack of value attributed to, or expected from, on-site safety review and quality assurance activities, and the consequent ineffectiveness of the function; and (5) Insufficient critical self-assessment initiatives to evaluate the adequacy and performance of personnel, procedures, and hardware.

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Mr. Leon Eliason

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We have scheduled a management meeting on January 12, 1995, at the Salem Generating Station Access Processing Facility to formally present this Systematic Assessment of Licensee Performance. The meeting will be open for public observation in accordance with NRC policy. Following that meeting, we request that you provide written comments, including any correction of factual information, within 20 days of the date of the meeting. The enclosed report and your response will be placed in the NRC Public Document Room.

We appreciate your cooperation.

Sincerely,

Thomas T. Martin
Regional Administrator

Docket No. 50-272/50-311

Enclosure: Systematic Assessment of Licensee Performance Report No.
50-272/93-99 & 50-311/93-99

cc w/encl:

J. J. Hagan, Vice President-Operations/General Manager-Salem Operations
S. LaBruna, Vice President - Engineering and Plant Betterment
C. Schaefer, External Operations - Nuclear, Delmarva Power & Light Co.
F. Thomson, Manager, Licensing and Regulation
J. Robb, Director, Joint Owner Affairs
A. Tapert, Program Administrator
A. Giardino, Acting Manager, Quality Assurance
B. Hall, Acting Manager, Nuclear Safety Review
R. Fryling, Jr., Esquire
M. Wetterhahn, Esquire
P. J. Curham, Manager, Joint Generation Department,
Atlantic Electric Company
Consumer Advocate, Office of Consumer Advocate
William Conklin, Public Safety Consultant, Lower Alloways Creek Township
Public Service Commission of Maryland
The Chairman
Commissioner Rogers
Commissioner de Planque
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
K. Abraham, PAO (24 copies)
NRC Resident Inspector
State of New Jersey
State of Delaware

Mr. Leon Eliason

4

bcc w/enc:
 Region I Docket Room (with concurrences)
 J. Taylor, EDO
 J. Milhoan, DEDO
 SALP Program Manager, NRR/ILPB (2)
 J. White, DRP
 S. Barber, DRP
 K. Gallagher, DRP

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 L. Olshan, NRR
 W. Dean, OEDO
 J. Stolz, PDI-2, NRR
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 M. Callahan, OCA
 W. Russell, NRR
 R. Zimmerman, NRR
 J. Lieberman, OE
 C. Holden, NRR/RPEB
 A. Thadani, NRR

bcc via E-Mail:
 Region I Staff (Refer to SALP Drive)

*John Stolz
 gave his
 concurrence to
 C. Marschall
 by phone
 12/19/94
 [Signature]*

DOCUMENT NAME: A:SALM9399.SLP

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NAME	Barber/k16/AB		White [Signature]		Hehl [Signature]	Stolz
DATE	12/16/94		12/16/94		12/16/94	
OFFICE	RI/DRS	E	RI/DRP		RI/DRA	RI/RA
NAME	Wiggins [Signature]		Cooper [Signature]		Kane	Martin
DATE	12/19/94		12/20/94			

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Mr. Leon Eliason

5

bcc w/enc:
Region I Docket Room (with concurrences)
J. Taylor, EDO
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SALP Program Manager, NRR/ILPB (2)
J. White, DRP
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W. Russell, NRR
R. Zimmerman, NRR
J. Lieberman, OE
C. Holden, NRR/RPEB
A. Thadani, NRR

bcc via E-Mail:
Region I Staff (Refer to SALP Drive)

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NAME	Stolz		Wiggins		Cooper		Kane
DATE							
OFFICE	RI/RA		/		/		/
NAME	Martin						
DATE							

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SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP)

SALEM UNITS 1 AND 2

REPORT NO. 50-272/93-99 & 50-311/93-99

I. BACKGROUND

The SALP Board convened on December 1, 1994, to assess the nuclear safety performance of the Salem Units 1 and 2 for the period June 20, 1993, to November 5, 1994. The board was convened pursuant to U.S. Nuclear Regulatory Commission (NRC) Management Directive (MD) 8.6, "Systematic Assessment of Licensee Performance (SALP)" (see NRC Administrative Letter 93-02). Board members were Richard W. Cooper, II (Board Chairman), Director, Division of Reactor Projects, NRC RI; James T. Wiggins, Director, Division of Reactor Safety, NRC Region I (RI); Charles W. Hehl, Director, Division of Radiation Safety and Safeguards, NRC RI; and John F. Stolz, Director, Project Directorate I-2, NRC Office of Nuclear Reactor Regulation. The board developed this assessment for approval by the Region I Administrator.

The following performance category ratings and the assessment functional areas are defined and described in NRC MD 8.6.

II. PERFORMANCE ANALYSIS - OPERATIONS

The Operations functional area was rated category 2 in the last SALP period. The licensee's performance was characterized by excellent operator response to trips and other operational transients. Supervision and management oversight of refueling and day-to-day operations was very good. However, the operators' attempt at several startups of Unit 2 without sufficiently determining the cause of repetitive rod control problems and effectively resolving the problem, was identified as a significant management control and oversight weakness.

Throughout the current SALP period, operators were often challenged by plant trips and other operational transients. Operators exhibited generally ~~strong~~ *good* command and control of the response to these events. For example, on June 10, 1994, operators demonstrated appropriate command and control in response to an automatic trip caused by failure of a main generator potential transformer. Likewise, on August 30, 1994, Unit 2 operators responded well to a condenser water box manway failure and reduced power to 75 percent. However, during the April 7, 1994, grass intrusion event, shift management personnel did not remain free to survey and analyze all operating parameters and, for a short period of time, lost control and perspective of the overall operations in the midst of attempting to stabilize plant conditions.

Operations and plant management ~~made~~ *generally lead to* operating decisions that ~~exhibited~~ conservative operation of the plant. For example, in June 1994, plant staff performed a methodical, controlled, safe startup of Unit 1 following the April 7, 1994 trip, after delaying startup in order to repair small leaks in the reactor head vents and a pressurizer safety valve. Additionally, operators

exhibited proficiency in making conservative, proper, and timely emergency declarations for six actual events that necessitated consideration of entering an emergency action level.

Notwithstanding the ~~poor~~ performance noted above, overall operations performance during this assessment period was characterized by significant weaknesses in several areas. Slow or inadequate resolution of equipment problems by other plant departments caused operators to become accustomed to working around or living with problems that created additional challenges to them in operating the plant in normal and upset conditions. For example, the licensee provided inadequate training, guidance, and procedures to the operators to cope with plant transients resulting from grass intrusion events that had occurred frequently at Salem and that had caused numerous safety system challenges, reactor trips, and significant conditions adverse to quality. Operator response to the April 7, 1994, grass intrusion event was also complicated by a safety injection that was caused by a spurious high steam flow signal of short duration that had been observed during three previous reactor and turbine trips but had never been fully investigated and resolved. In addition, during the transient, the atmospheric relief valve control system exhibited a recurring problem in which it had to be shifted to manual, then back to automatic after a short time delay to ensure proper operation. This problem existed for many years with no management action to correct it. Operators also did not aggressively pursue correction of longstanding problems with the rod control system that caused numerous occurrences of rods stepping into the core in half steps without appropriate process demand signals.

Some events that occurred during this assessment period demonstrated a weak questioning attitude by operators. For example, in April 1994 with the plant shut down, Unit 1 operators did not question a reading of 93% on the reactor vessel water level indication system (RVLIS). When brought to their attention by NRC, operators attributed the reading to a calibration problem instead of an actual reactor vessel void. Subsequently, a void was confirmed that was adequately eliminated by venting. Earlier in the SALP period, a cold leg accumulator's level was recorded in the control room logs as being above the upper technical specification limit without a corresponding technical specification entry. However, this was not identified by either self checking or supervisory review.

Operability decisions made by the Operations staff were often weak due to a poor understanding of the design basis of safety related equipment and systems, as well as, a lack of clear guidance and training on Generic Letter 91-18. The engineering organization was not consistently consulted on many of these more difficult operability determinations. For example, an initial operability evaluation for (PR25) did not involve any consultation with the engineering organization and failed to consider the design basis requirements of the valve. Other noteworthy examples that occurred during the SALP period involved weak operability determinations for degraded performance of the 1A emergency diesel generator, closure of the power operated relief block valves, and safety injection relief valve leakage. In addition, there were several examples over the assessment period in which operators took a non-conservative approach to entering and exiting Technical Specification limiting conditions

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for operation (LCOs) for the same underlying problem. For example, in May 1994, during a Unit 1 startup, operators made repeated entries into the Technical Specification (TS) LCO for the pressurizer vent path in response to minor leakage through two head vent valves, but inappropriately re-initialized the LCO entry each time. Operators also entered and exited a containment isolation TS LCO for the service air system twice in the same shift to perform maintenance that would have exceeded the original LCO time period.

Operations also exhibited difficulty managing and controlling outage activities. For example, operators created or contributed to a number of tagging errors. These included an operator who removed tags from a bleed steam coil drain tank pump which allowed steam to escape through an unsecured drain line, and an operator who erroneously opened a boundary valve that allowed water to a downstream valve that was undergoing a maintenance activity. Subsequently, the licensee established corrective measures and similar occurrences have not been observed. Also, during the refueling outage in October 1993, with the spent fuel pools cross connected, operators did not identify that a pre-existing high level condition in the Unit 2 spent fuel pool masked further increases in pool level which, when such an increase occurred, resulted in an overflow of the spent fuel pool water into the fuel handling building ventilation exhaust ductwork.

Inspection activities late in the SALP period revealed that Quality Assurance surveillance of Operations was not performance-based and was ineffective in identifying significant previously existing weaknesses in the Operations department. The lack of self assessment activities within the Operations organization, coupled with ineffective independent oversight by the Quality Assurance organization, resulted in little or no feedback to the operators and their management relative to the existence of significant performance problems in Operations.

In summary, operators generally responded appropriately with good command and control to the many plant trips and operational transients that occurred over the SALP period. Likewise, they demonstrated good proficiency in making emergency declarations for events for which such declarations should have been considered. However, performance over the assessment period demonstrated significant weaknesses in several areas. Operators did not practice ownership of the plant and did not aggressively enlist other plant departments to resolve longstanding equipment problems which frequently challenged them in normal and upset plant conditions. A lack of an appropriately questioning attitude by operators resulted in anomalous indications, or conditions being unnoticed or not understood and not being acted upon. A lack of guidance for and training of operators on operability decisions resulted in some decisions being nonconservative or having weak technical bases. Examples of nonconservative approaches to entering and exiting LCOs occurred over the period. Some difficulties were experienced managing and controlling outage activities. A lack of self assessment within the Operations department coupled with ineffective independent assessment of Operations by the Quality Assurance department contributed to the continuation of performance problems throughout most of the period.

The Operations functional area is rated as Category 3.

III. PERFORMANCE ANALYSIS - MAINTENANCE

In the previous assessment period, the Salem maintenance and surveillance functional area was rated Category 2. Personnel errors had decreased, but still caused three reactor trips and four engineered safety features actuations. ~~A number of trends indicated continuing improvement.~~ Three refueling outages were performed with strong planning and implementation. Improvements were noted in the preventive maintenance program, procurement, material control, and surveillance procedures quality through the procedures upgrade program.

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During the latter part of this assessment period, management improved its safety focus in prioritizing and scheduling maintenance activities. In the plan-of-the-day meetings and other work planning meetings and activities involving both operations and maintenance personnel, the emphasis was on safety rather than production. Interdepartmental communication, especially between maintenance and systems engineers, improved. However, supervisors did not always communicate effectively with workers while they were in the field and during pre-job briefings as evidenced by maintenance errors involving the governor gear box oil change and turbine overspeed trip test device made during preventive maintenance work on the Number 23 auxiliary feedwater (AFW) pump. The AFW pump tripped twice during post-maintenance testing before appropriate supervisory guidance was obtained for returning the pump to service.

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~~Management did not provide sufficient oversight and control of the maintenance program. Salem had a high recurrent equipment failure rate indicating that corrective action effectiveness remains a problem. There were several examples of the licensee's inability to resolve longstanding equipment and system deficiencies. For example, inadequate root cause analysis and training contributed to the delay in correcting long-term deficiencies in the various radiation monitoring systems; ~~inadequate root cause analysis~~ also contributed to repetitive failures of the automatic control of the steam generator feedwater regulating valves (BF19) over a two year period.~~

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Supervisory control and management oversight was also lacking for the numerous groups and organizations that perform maintenance work on site. Personnel errors, problems with procedural adherence, and excessive reliance on "skills of the craft" contributed to inconsistent implementation of the maintenance program. Most recently, the licensee found that a contractor electrician cut into the wrong 4160 VAC cable. A fatality was avoided only because the affected cable was tagged out of service to support other unrelated work.

In the area of problem identification and resolution, the licensee implemented an effective way of tracking equipment problems using a process called the equipment malfunction identification system (EMIS). However, the feedback process regarding problems that occur during maintenance activities was not effectively implemented by field maintenance personnel. This primarily ~~affected the~~ *delayed* correction of deficient procedures and work packages. Feedback did not always get into the planning system and in some instances the initiator of the feedback form was not informed as to the resolution of the

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problem. Troubleshooting and implementation of the root cause program was inconsistent, even though the licensee established a good root cause capability. For example, the licensee did a good job of troubleshooting and determining the root cause of intermittent rod stepping and oscillations on the AFW pump. However, in addition to inadequate root cause analysis and failure to resolve longstanding problems cited earlier, the licensee performed inadequate troubleshooting and root cause analysis on the four electro-hydraulic control power supply failures before determining the fundamental root cause of the failures. Some of the maintenance performance problems were related to conducting troubleshooting without a procedure such as the example where the ability to capture as-found defects was lost during removal of a failed emergency diesel generator cylinder liner.

The material condition of the plant improved following the licensee's establishment of the Salem Material Condition Revitalization Project. However, there remains evidence of degraded conditions in the service water intake structure and the residual heat removal pump rooms.

In general, surveillance testing activities were effective with respect to meeting the surveillance program objectives. However, the licensee failed to demonstrate the design basis capability of the emergency diesel generators to start on a single air start system while performing maintenance on the remaining air start system. Also during this period, a surveillance procedure deficiency resulted in the inadvertent discharge of a safety injection accumulator into the reactor coolant system while at low pressure.

Although the licensee completed a formal procedures upgrade program (PUP) in 1993, procedure adequacy continues to be a problem. For example, an excellent troubleshooting procedure was developed and implemented in the controls area, but a similar procedure in the mechanical maintenance area was not implemented. There were recurring maintenance problems that needed specific procedure changes which were being delayed because of an excessive procedure change backlog. In several instances, there was a planning failure to specify appropriate post-maintenance testing requirements in work order packages. This was attributed to the inadequacy of the controlling procedures for the planning process and training of planners in post-maintenance testing requirements.

The Salem in-service testing program was adequate. The use of spectrum analysis for vibration and high quality procedures were noteworthy. However, several shortcomings were identified in program oversight by station management. Many program weaknesses were identified by comprehensive and self-critical audits, but were not acted upon. The programs for inservice inspection, erosion/corrosion and steam generator leakage monitoring were adequately implemented.

In summary, weaknesses were evident in the implementation of the maintenance programs and activities, such as procedural adherence and adequacy, the feedback process, specification of post-maintenance testing requirements, and control of work activities by numerous onsite groups. Management improved its safety focus in prioritizing and scheduling maintenance activities. However, management oversight of corrective action program activities was weak as

evidenced by the high recurrent equipment failure rates. Inconsistencies in troubleshooting activities and root cause analysis contributed to the delay in correcting recurring problems. Material condition of the plant continued to improve, but there were several areas that still need improvement. Although the in-service testing program was adequate, management did not effectively resolve associated self-assessment findings. Programs for inservice inspection, erosion/corrosion and steam generator leakage monitoring were adequately implemented.

The Maintenance functional area is rated Category 3.

IV. PERFORMANCE ANALYSIS - ENGINEERING

In the last SALP, engineering was rated Category 2. Engineering provided good support for refueling and maintenance outages and strong performance was noted in addressing day-to-day activities. The training programs for engineering personnel were excellent. Weaknesses were noted in handling of engineering-related nonconformances, in the erosion/corrosion program implementation and in fire protection programs. Also, while the root cause training program was found to be strong, the threshold for initiating root cause analyses was not clear or consistent.

During this period, the quality of engineering activities was inconsistent and varied significantly from activity to activity. Quality depended on the issue involved and the perceived importance of that issue by engineering and plant management and staff. Management expectations for engineering performance were clearly articulated but were implemented inconsistently throughout the organization.

Communication and coordination among the Engineering and Plant Betterment (E&PB) organization, the Technical Department of the plant staff and the balance of the plant staff were not always effective. While there was good communication and coordination of highly-visible problems, day-to-day interactions were ineffective in resolving some repetitive equipment problems that continued to challenge the operation of the facility. While close interactions occurred between the Maintenance organization and Technical Department system engineers, the engineering expertise of the E&PB organization was not always effectively engaged. Engineering did not always proactively seek out and correct system and component deficiencies before they led to increasingly challenging plant events. Further, E&PB did not effectively involve itself in support of plant operations as demonstrated by the fact that, while backlogs of its activities were well controlled, its work priorities were not well-integrated with those of the operating organization. For example, the "Engineering Critical Issues List" did not match the plant's critical issues list and was not prioritized by safety significance. Further, none of the items that were being tracked as operator work-arounds made the engineering list. Notwithstanding, significant positive engineering leadership and good quality engineering work were demonstrated in the recovery from the overhead annunciator and rod control systems problems, in the main

steam line flow monitoring modifications and in the commitment of resources toward the switchyard betterment and radiation monitoring system upgrade programs.

Design engineering procedures were comprehensive and their quality was good. Work instructions associated with modification installation were generally good. Temporary modification activities were well controlled, with installed temporary modifications tracked and periodically assessed by the system engineer.

The quality of technical support provided to the Operations and Maintenance organizations was mixed. Engineering support was good in a number of instances, such as those associated with indications of condensate pump pedestal damage, with the identification of thermal fatigue cracks in Unit 1 steam generator feedwater nozzles, and with a leaking flange joint associated with the #22 reactor coolant pump. Further, the engineering evaluation of emergency diesel generator cylinder liner cracks was comprehensive and of high quality. However, several instances were noted where engineering support in response to equipment problems was poor. Examples included the ineffective response to control air compressor problems and the lack of a timely and effective review of the main steam line pressure pulse phenomenon prior to the April 7, 1994 event.

In a number of programmatic areas, performance was good. The motor-operated valve testing program was found to be progressing well toward its planned completion date. The erosion/corrosion program improvements achieved at the end of the last SALP period were maintained in effect. The steam generator inspection program was well controlled and implemented. Engineering support to maintenance troubleshooting activities was, in general, good. The Environmental Qualifications Master List was appropriately maintained. In addition, the engineering assurance program was revised and improved during this period. Configuration baseline documents were found to be of good quality, but a licensee self-assessment noted opportunities to improve their use. In the procurement area, commercial grade dedication packages were complete and the warehouse storage areas were well maintained; however the material issuance process failed to prevent issuance of the incorrect materials to support a modification of Unit 2 power-operated relief valves and to support emergency diesel generator fuel injector stud changeouts. Also, notwithstanding the problems identified in the licensee's reaction to the April 7, 1994, event, the licensee provided for an excellent and comprehensive investigation and monitoring program for grass intrusion into the circulating water/service water intake structure.

Problems with root cause analyses continued from the last SALP period and contributed to weaknesses in resolution of long-standing problems. In several instances, such as in response to indications of ground water leakage near auxiliary feedwater system piping penetrations, to indications of operation at greater than 100% power, and to repeated steam generator feedwater pump control oil power unit problems, root cause analyses performed by the plant maintenance and technical organizations tended to focus narrowly on the symptoms of equipment problems at hand. In reaction to NRC interest or as a result of an event, senior licensee management focused on specific issues and

commissioned more in-depth root cause activities, such as Significant Event Review Teams. The outcomes of these focused efforts were markedly better than those done routinely by the line organizations, indicating the licensee had the capability to perform these assessments and suggesting that the performance problem continued to be associated with the threshold established for initiating thorough root cause evaluations.

Engineering personnel, particularly reactor engineering personnel, were found to be very knowledgeable of their discipline, however system engineers were not trained in current NRC operability guidance despite the fact that they are routinely engaged in operability assessments. Personnel performance was generally good, however two noteworthy contractor control problems were noted associated with the auxiliary feedwater system controller and the primary water oxygen reduction modifications where the contractors engaged in installation activities failed to follow established station work process control procedures.

In summary, Engineering performance was inconsistent, with substantial variation in quality. The quality of the discipline design work was good, with significant engineering management focus shown in several modification activities. However, engineering work priorities did not always reflect plant needs. In several significant programmatic areas in which the Engineering organization had an important role, performance was, on balance very good. Significant problems, nonetheless were noted associated with root cause assessments and with equipment problem resolution. The fact that there existed engineering capability, that when focused by station management and brought to bear on important issues, demonstrated the ability to achieve very good performance suggested that a significant aspect of the problem was associated with the effective engagement of available engineering expertise in activities important to safe plant operations, such as in root cause assessment and equipment problem resolution.

The Engineering functional area is rated as Category 3.

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V. PERFORMANCE ANALYSIS - PLANT SUPPORT

This functional area is new, representing a significant change from the previous SALPs. The plant support functional area covers all activities related to plant support functions, including radiological controls, emergency preparedness, security, chemistry, fire protection, and housekeeping controls.

In the previous SALP the radiological controls, emergency preparedness and security functional areas were all rated as Category 1; however a declining trend was assigned to the emergency preparedness area. Performance observations in the radiation protection area included: strong management involvement, as shown by excellent as-low-as-reasonably-achievable (ALARA) oversight; effective supervision of on-going work; and challenging occupational exposure goals. The radioactive waste, transportation and contamination control programs demonstrated continued strong performance. The chemistry, effluent and environmental monitoring programs remained highly effective. Performance in the emergency preparedness area was excellent with

a high quality drill and exercise program, and extensive management involvement. Although the emergency plan was effectively implemented for four events requiring declarations of Unusual Events, weaknesses were identified in classifying and reporting the December 1992 loss of control room annunciator event at Salem 2. Additionally, problems with formulation of event classification and protective action recommendations during exercises were identified. The licensee maintained a very effective security program, with good management support, high quality maintenance support, excellent rapport with other plant groups, and effective audit and self-assessment programs. Although rated in conjunction with the Operations Area during the last SALP, the fire protection program exhibited some programmatic and personnel performance problems.

During the current SALP period, the licensee's radiation protection program performance continued to be a significant strength. Effective external and internal exposure control programs continued to be implemented. Effective application of engineering controls to control contamination resulted in commendably low air activity levels, resulting in low internal exposures. Continued effective ALARA program implementation was evidenced by dose reductions achieved through extensive application of temporary shielding during both unit outages, good radiation safety work coverage and pre-job briefings, and appropriate work area postings. The licensee effectively implemented the revised 10 CFR 20 by integration of the new requirements in applicable radiation protection procedures and in timely training of the work force. High quality training for radiation protection technicians and staff was evident. A very effective radioactive material and contamination control program was implemented. Radiological housekeeping was generally very good. Audits and surveillances of the radiation protection area were performance-based, performed by appropriately qualified individuals, and were effective in identifying performance problems. Corrective actions taken in response to identified problems were effective. The radioactive waste handling, processing, packaging, storage, and transportation programs continued to be very good. The licensee completed construction of a state-of-the-art radwaste storage facility. Radwaste generation reduction efforts were very effective as evidenced by the continuing downward trend in radwaste produced.

Performance in the radiological environmental monitoring and effluent control programs continued to be strong. Effective programs for measuring radioactivity in process and effluent samples were implemented as well as an effective program for the radiation environmental monitoring. Quality assurance audits were thorough and of good technical quality. Responses to audit findings were timely and identified appropriate corrective actions.

Continued excellent emergency preparedness (EP) program performance was noted during drills and exercises. An exercise strength was highlighted regarding Emergency Response Manager command and control. Effective management support was evidenced by active involvement of upper level management in the emergency response organization (ERO) qualification and drills, and rapid replacement of ERO members following recent employee layoffs. Several improvements were implemented during the period, including development of a radiologically-based protective action recommendation flow chart and improved containment boundary emergency action level, which enhanced response capability. The emergency

response facilities were well equipped and generally well maintained, however, problems were identified regarding periodic efficiency tests on the high efficiency particulate filters associated with the Emergency Operations Facility and radiation monitors for the Technical Support Center heating and ventilation system being out of service for 18 months.

The licensee continued to implement a very effective security program. Management attention and involvement generally continued at a high level. Maintenance support of security equipment from the maintenance staff was ~~highly~~ effective in minimizing the need for compensatory measures. However, some assessment aids had deteriorated to a point that even aggressive maintenance was not entirely effective in maintaining this equipment. The licensee continued to implement a good performance-oriented training and qualification program. However, personnel performance issues raised questions regarding complacency of security force members and supervisory oversight of routine security program implementation. The licensee initiated actions to address problems in this area.

The fire protection and prevention program was effectively implemented. Corrective actions put in place to address equipment and personnel performance problems highlighted in the previous SALP were effective. There was good fire-fighting equipment maintenance and surveillance. Responses to emergent equipment conditions were appropriate. Combustibles and ignition sources were well controlled. Performance during drills demonstrated the licensee's readiness and fire fighting capabilities. Audits were detailed and of appropriate depth.

In summary, the plant support functions contributed effectively to safe plant performance. Performance in the radiation protection area continued to be a significant licensee strength. Well trained technician and staff coupled with effective management resulted in aggressive ALARA program implementation with significant dose savings realized. Excellent performance in the radiological effluent and environmental monitoring programs was again noted. There was continued excellent performance in the emergency preparedness area. Security program performance continued to be a strength. Fire protection program implementation was substantially improved.

The Plant Support functional area is rated as Category 1.

SALEM EXECUTIVE SUMMARY

Overview

On July 29, 1993, the SALP board met to discuss PSE&G's performance at Salem during the period from December 29, 1991 to June 19, 1993. The board concluded that the licensee had operated the Salem units safely and that operator response to operational events was excellent. The overall performance in the Operations area was good. However, weaknesses were noted in the decisions to restart Unit 2 following the rod control system problems, in the failure to follow procedures resulting in the loss of Unit 2 annunciators, and in the inadequate oversight of the fire protection program.

PSE&G continued to implement effective radiological controls and ALARA programs during this period. The SALP board noted improvements in this functional area including strong management support and oversight. Quality Assurance audits in this area were of very good quality.

The board concluded that the Salem maintenance and surveillance programs contributed to the safe operation of the two units during the assessment period. In general, a declining number of personnel errors in both maintenance and surveillance indicated improving performance. However, the number of transients induced by component failures and the significant problems with the rod control system raise questions regarding the overall effectiveness of the maintenance and engineering support functions.

The SALP board determined that PSE&G maintained a generally strong and effective emergency preparedness (EP) program. However, the board was concerned with an apparent decline in the ability of the licensee to make correct initial Protective Action Recommendations during training, drills and annual exercises. This concern resulted in the board's assessment of a declining trend for this area. The board also concluded that PSE&G continued to maintain an effective and performance-oriented security program during this period. Overall, licensee performance in both EP and security remained excellent.

Engineering and technical support organizations provided good support for refueling and maintenance outages, and strong performance in addressing day-to-day problems. The SALP board noted that training programs for engineering personnel were excellent but that weaknesses were observed in the licensee's non-conformance, erosion/corrosion, and fire protection programs. Although the root cause training program was viewed as a strength, the board noted that the threshold for initiating actual root cause investigation was not clear or consistent.

PSE&G management continued to provide generally effective management support. Significant Event Response Team (SERT) reviews of major events have been effective. However, the board noted that in several instances, PSE&G failed to initiate adequate root cause evaluation or assessment of abnormal conditions. NRC interaction with PSE&G management was needed in a number of cases in order for full evaluation and corrective action to be taken in a timely manner. Once initiated, comprehensive assessment, root cause analysis and effective corrective

2/4

actions were implemented. Outage planning and training programs in all areas were considered strengths.

Facility Performance Analysis Summary

<u>Functional Area</u>	<u>Rating, Trend Last Period</u>	<u>Rating, Trend This Period</u>
1. Plant Operations	2	2
2. Radiological Controls	2, Improving	1
3. Maintenance/Surveillance	2	2
4. Emergency Preparedness	1	1, Declining
5. Security	1	1
6. Engineering/Technical Support	2	2
7. Safety Assessment/Quality Verification	2	2

Previous Assessment Period: August 1, 1990 through December 28, 1991

Present Assessment Period: December 29, 1991 through June 19, 1993

SALEM AND HOPE CREEK ISEG INPUT

Evaluation of Salem/Hope Creek ISEG equivalent organization:

- I. *Plant Tech Specs for Hope Creek and both Salem units require an onsite Safety Review Group (SRG), the ISEG equivalent.*
 - A. *Salem 1 is a pre-TMI plant. The licensee proposed a Tech Spec change in 1981 to require an SRG. The NRC approved the change in 1984.*
 - B. *Salem 2 and Hope Creek are post-TMI plants. The original Tech Specs for both units required SRGs.*
- II.
 - A. *The SRGs review appropriate documents with the potential for identifying issues. For example, the SRGs review plant Incident Reports (LER precedents), participate in the Operating Experience Feedback meetings, and scan available industry sources of information such as newsletters and electronic bulletin boards.*
 - B.
 1. *The form of the SRG product is practical and useable by line organizations. SRG issues monthly summary reports of activities. They provide independent reports on specific activities. SRG makes recommendations to line organizations; they are negotiated and tracked in the Action Tracking System.*
 2. *When the SRGs make recommendations, they are sound and justified. However, during interviews line management had difficulty recalling specific safety significant recommendations made by the SRGs. Also, line management identified that, at times, SRG may identify findings without making recommendations on how to resolve the problem. Based on review of SRG monthly summaries of findings for the past year, the inspectors concluded that the SRG recommendations were sound and practical, although generally not safety significant.*
 - C. *Line organizations tolerate/accept the SRG function. Some members of SRG are more respected for their individual accomplishments and qualifications. SRG recommendations are negotiated with line departments and subsequently tracked and implemented. Receptiveness to SRG opinions varies with the SRG member expressing the opinion (see respect comments above) and the line manager receiving the opinion. The licensee's organizational structure is designed to provide SRG independence from line organizations. Additionally, licensee Tech Specs and procedures do not prescribe or limit the SRG role to one typical of traditional QA/QC organizations. However, plant managers sometimes compromise SRG independence by often using SRG personnel to perform routine activities normally performed by line organizations. The inspectors determined that the Tech Specs and procedures do not establish a clear mission for the SRGs. As a result, SRG has no detailed guidance how to accomplish their function as defined by Tech Specs and does not develop a systematic approach to providing an assessment of the effectiveness of line organization activities. SRG rarely identifies opportunities for major improvements in plant safety. For example, the*

als

majority of SRG findings identify minor procedure discrepancies and process or equipment deficiencies with little or no effect on nuclear safety.

- D. The inspectors were unaware of any inspection or recognition by outside entities (INPO/NRC/others) of SRG contributions.*
 - E. Plant organizations occasionally seek out SRG to participate in special activities. The SRG participates in most, perhaps all, Safety Evaluation Review Teams (SERTs). The SRG assists SERT reviews of plant trips and significant plant events.*
 - F. The plant managers frequently request SRG review of events or activities. Some reviews are related to nuclear safety; many are not.*
- III. The Hope Creek organization performs SA/QV functions well. The Salem organization has been slow to identify issues and significant event precursors. Once the issues had been identified, the Salem organization responded with comprehensive efforts to understand and resolve them. Licensee senior management considered the Offsite Safety Review (OSR) group ineffective and assessed that SRG made some positive contributions to the plant. Licensee senior management initiated a contractor review of the effectiveness of OSR, SRG, and the quality organizations. Management intends to improve the effectiveness of these organizations. At the time of the inspection, the contractor had not completed the review of the SA/QV organizations.*

improve reliability of equip; do design before equip fails; improve internal comm within org;
 IMPACT --- 2 weeks; Unit 1 down --- mid June; Unit 2 full power --- Salem spent fuel capacity --- as NRC
 discussion
 Hope Creek - simpler, more plant preventive maintenance - competent staff - pending SALP but in decline!

BRIEFING NOTES ON RECENT SALEM PERFORMANCE

SALP

On its most recent SALP report, dated 1/3/95 covering the period between 6/20/93 and 11/5/94, Salem was awarded the following SALP Scores:

Operations-3; Maintenance-3; Engineering-2; Plant Support-1;

Overall performance noted to have declined, as both Operations and Maintenance had been rated category 2 the previous SALP. Accommodation and inability to resolve long-standing equipment problems and a general lack of a questioning attitude were major concerns.

Senior Management Meeting

Recently, Salem was a full discussion plant at the June 1994 and January 1995 SMMS. It will be a full discussion plant again at the June 1995 SMM. Though not put on the watch list or sent a trending letter, the senior managers recommended that the EDO, Regional Administrator, and Director, NRR meet with the Board of Directors of PSE&G. This meeting took place on March 21.

Current Issues

The licensee has implemented a plan to change the culture at the facility and achieve meaningful and measurable performance improvements. This will be a challenging task. Over the past year, several management changes have occurred, and there will be a few more before the licensee has the management team it wants in place. Continuing problems with the feedwater system plague the operation of the plant, causing frequent power changes to effect repairs. Other equipment problems occur with high frequency precluding sustained operation at 100% power. Unit 1 has a feedwater heater leak that will limit power to 94% until the next outage.

Since the beginning of 1995, the two units have had to shut down, reduce power, or delay startup due to problems with their solid state protection system, safety valves, reactor coolant pump seals, feed pump governors, main steam atmospheric relief valves, and heater drain pump level controllers.

Recent Resident Inspector inspection reports highlight continued problems in corrective action determination and effectiveness. Inconsistent system engineering involvement and effectiveness has also been a persistent problem.

- 1) - Hope Creek release monitored - contaminated N₂ gas tank --- able to track off-site --- brief --- Mike McCabe --- Tonya Baker --- satisfactory --- received allegations --- raised them
- 2) Unit 1 @ Salem higher than normal in containment @ Unit 1 --- didn't follow procedures --- containment --- noble gases --- pressurized
- 3) 100% night about Salem --- not in word plant
- 4) Salem --- correct on paper --- incorrectly old basis at plants --- weaker management

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SALEM GENERATING STATION [SENIOR MANAGEMENT MEETING] HISTORICAL PERSPECTIVE

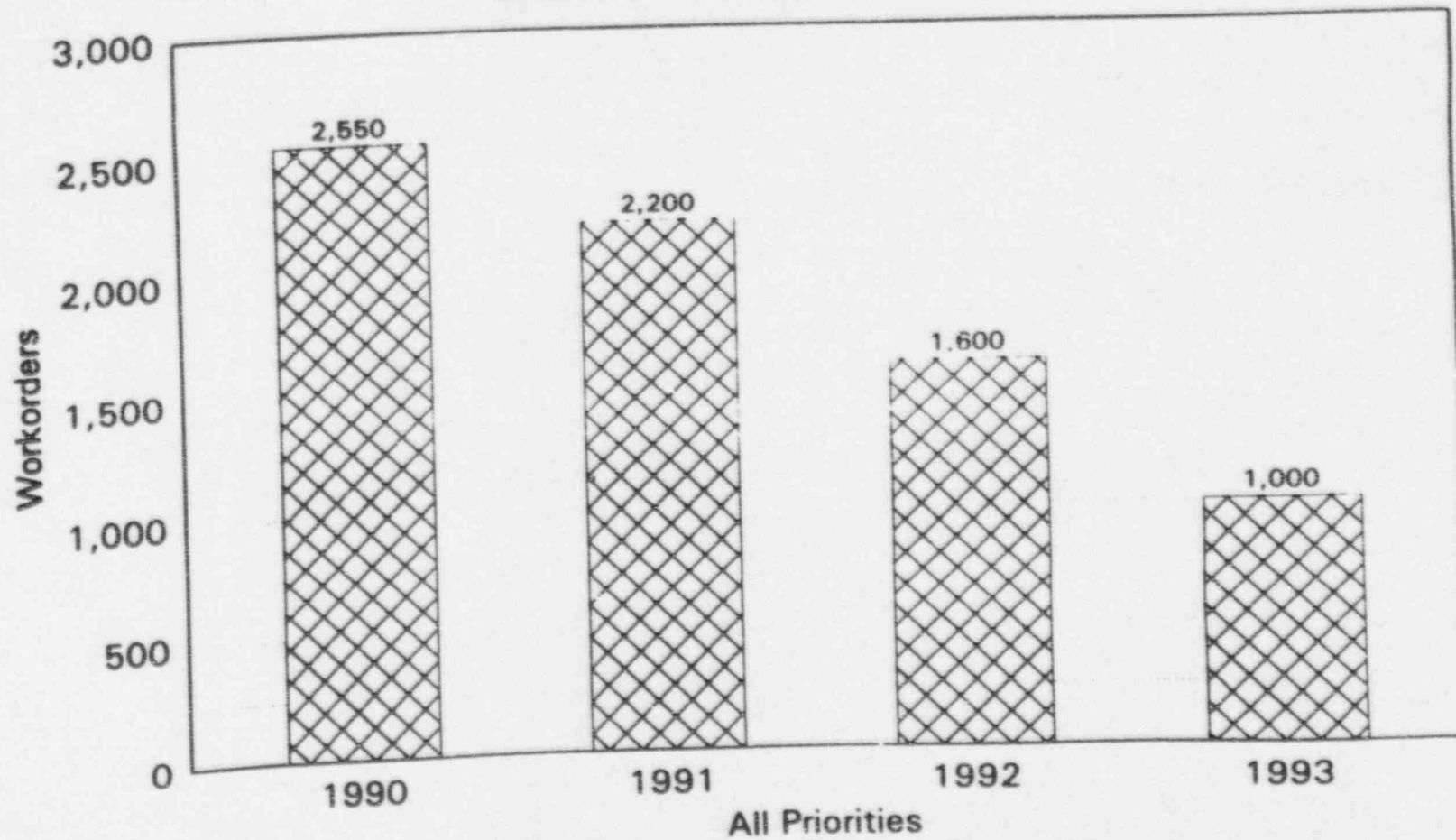
COMPLETED FOR UNIT 1 AND/OR UNITS

- CONTROL ROOM MODIFICATIONS AND HUMAN FACTOR UPGRADES
- UPGRADE OF 14,000 LINEAR FEET OF SERVICE WATER PIPING
- CLEAN CHEMISTRY LABORATORY
- MAJOR SWITCHYARD EXPANSION AND UPGRADE
- BUS INSTRUMENT INVERTER REPLACEMENT
- NO. 1 MAIN TRANSFORMER UPGRADES
- STEAM GENERATOR SAFETY VALVE REPLACEMENT
- CIRCULATING WATER FISH TROUGH REPLACEMENTS
- CONTAINMENT STEAM GENERATOR BLOW DOWN VALVE UPGRADE
- PRESSURIZER INSULATION REPLACEMENT
- SAFEGUARDS EQUIPMENT CONTROLLER INSTALLATION
- LUBE OIL STORAGE FACILITY
- INSTALLATION OF SYSTEM TO ADD CHEMICALS TO AUXILIARY FEED SYSTEM
- UPGRADE RADWASTE PANEL (1&C)
- REPLACEMENT OF MISCELLANEOUS CONDENSATE STRAINERS
- ROD CONTROL 24 VDC POWER SUPPLY REPLACEMENT
- MID LOOP INSTRUMENTATION MODIFICATIONS
- GENERATOR HYDROGEN DRYER DEW POINT MONITOR PURGE/VENT
- DIESEL GENERATOR HVAC IMPROVEMENTS
- G/G FEED PUMP INDEPENDANT CONTROL OIL SYSTEM
- CONDENSATE POLISHING BUILDING UPGRADES

SALEM GENERATING STATION SENIOR MANAGEMENT MEETING HISTORICAL PERSPECTIVE

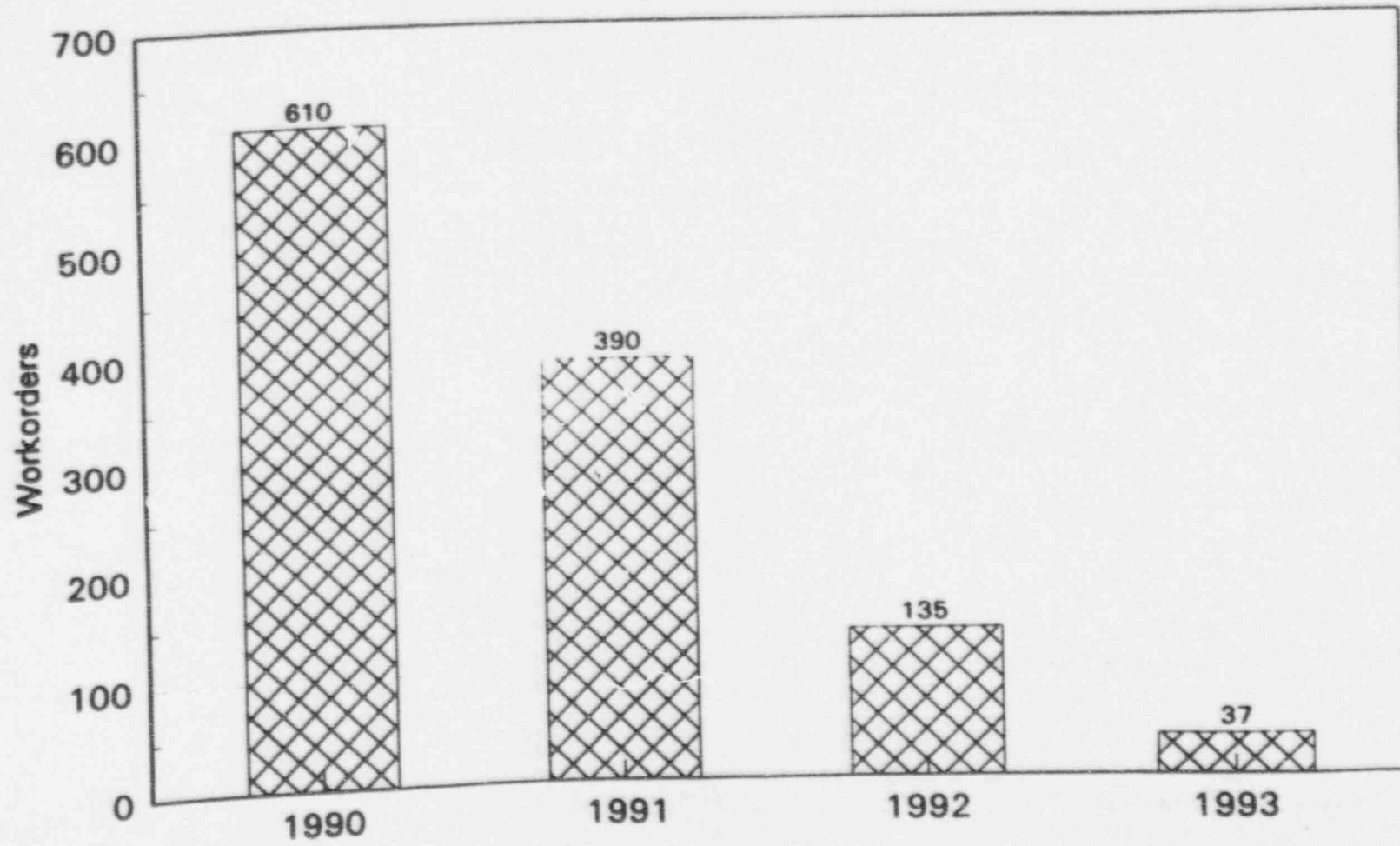
- CIRCULATING WATER MECHANICAL UPGRADES
- BORIC ACID CONCENTRATION REDUCTION
- CIRCULATING WATER AIR REMOVAL SYSTEM
- UPGRADED INTERNALS FOR PRESSURIZED CODE SAFETY VALVES AND ELIMINATED LOOP SEALS
- UPGRADED PORV AND SPRAY VALVE ACTUATORS
- UPGRADED INTERNALS OF ALL AUX FEED WATER CONTROL VALVES
- UPGRADED WASTE GAS SYSTEM ANALYZER
- UPGRADED CONTROL AIR AND NITROGEN VALVES TO CONTAINMENT
- UPGRADED BORIC ACID AND PRIMARY WATER FLOW INSTRUMENTATION
- SMALL BORE PIPING REPLACEMENT > 5,000 FEET
- ELECTRO HYDRAULIC CONTROL PUMP UPGRADES
- STEAM GENERATOR FEED PUMP CONTROL OIL SYSTEM UPGRADE
- INSTALLED PERMANENT BACK-UP POWER SUPPLIES TO ELIMINATE TEMPORARY POWER FEEDS
- DURING OUTAGES
- UPGRADED THE SEC AUTO TEST CIRCUIT
- UPGRADED THE CONTROL ROOM ANNUNCIATOR SYSTEM
- REPLACED ROD CONTROL STEP COUNTERS
- UPGRADED MAIN STEAM FLOW MEASUREMENT

Corrective Maintenance Backlog Salem Station



Preventive Maintenance Overdue

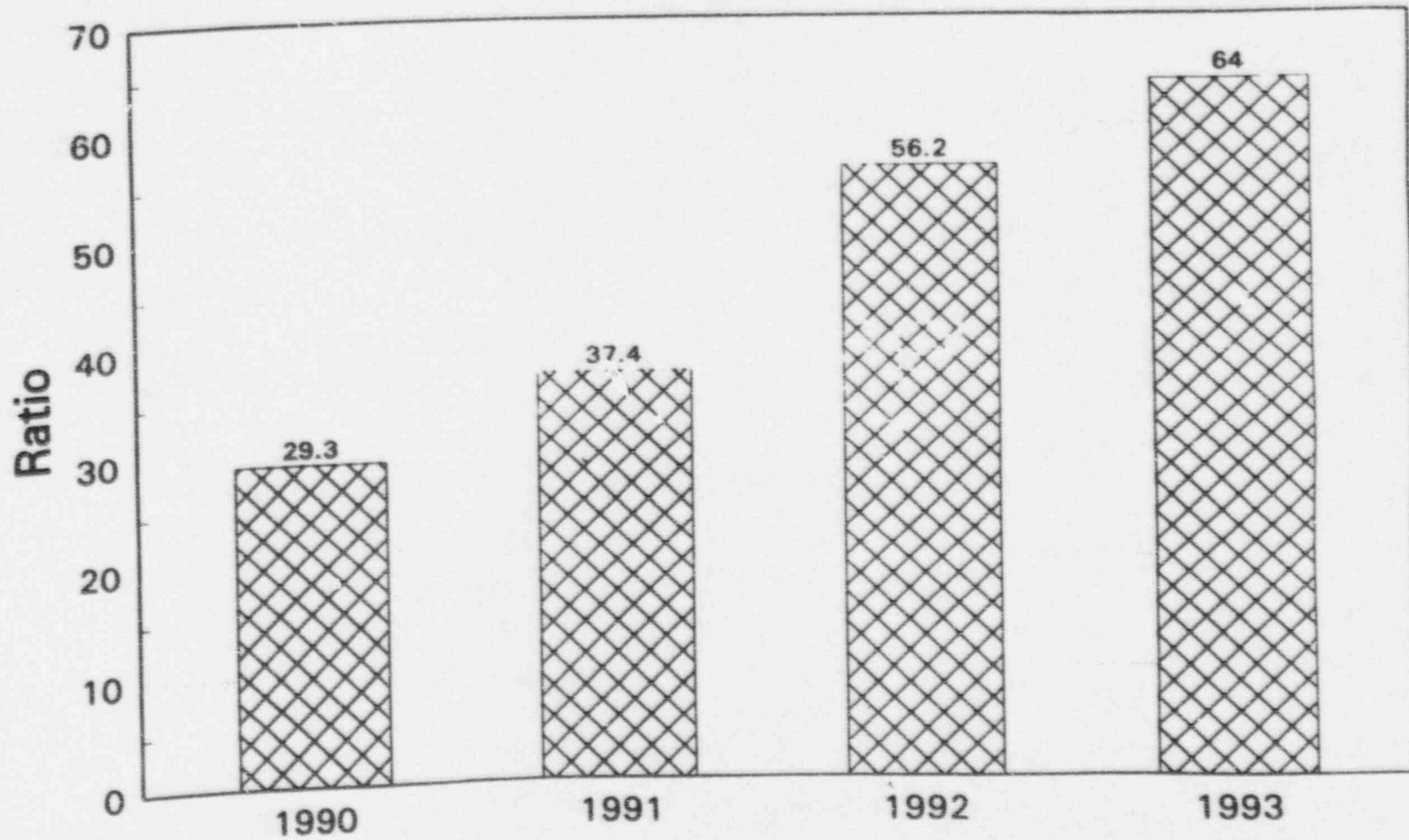
Salem Station (Maint Dept)



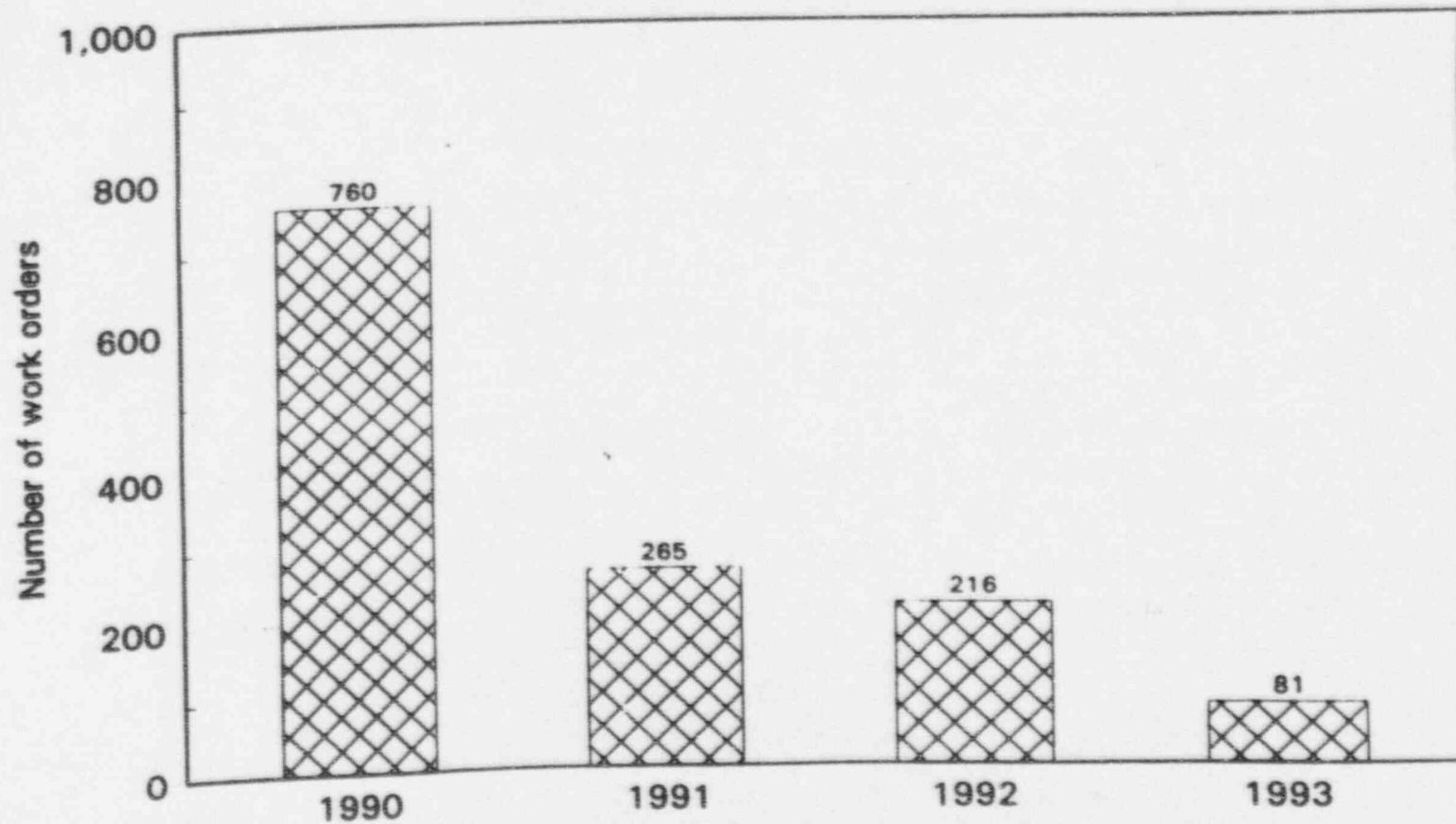
1/17/94 20T0-3MS

Preventive Maintenance Ratio

Salem Station

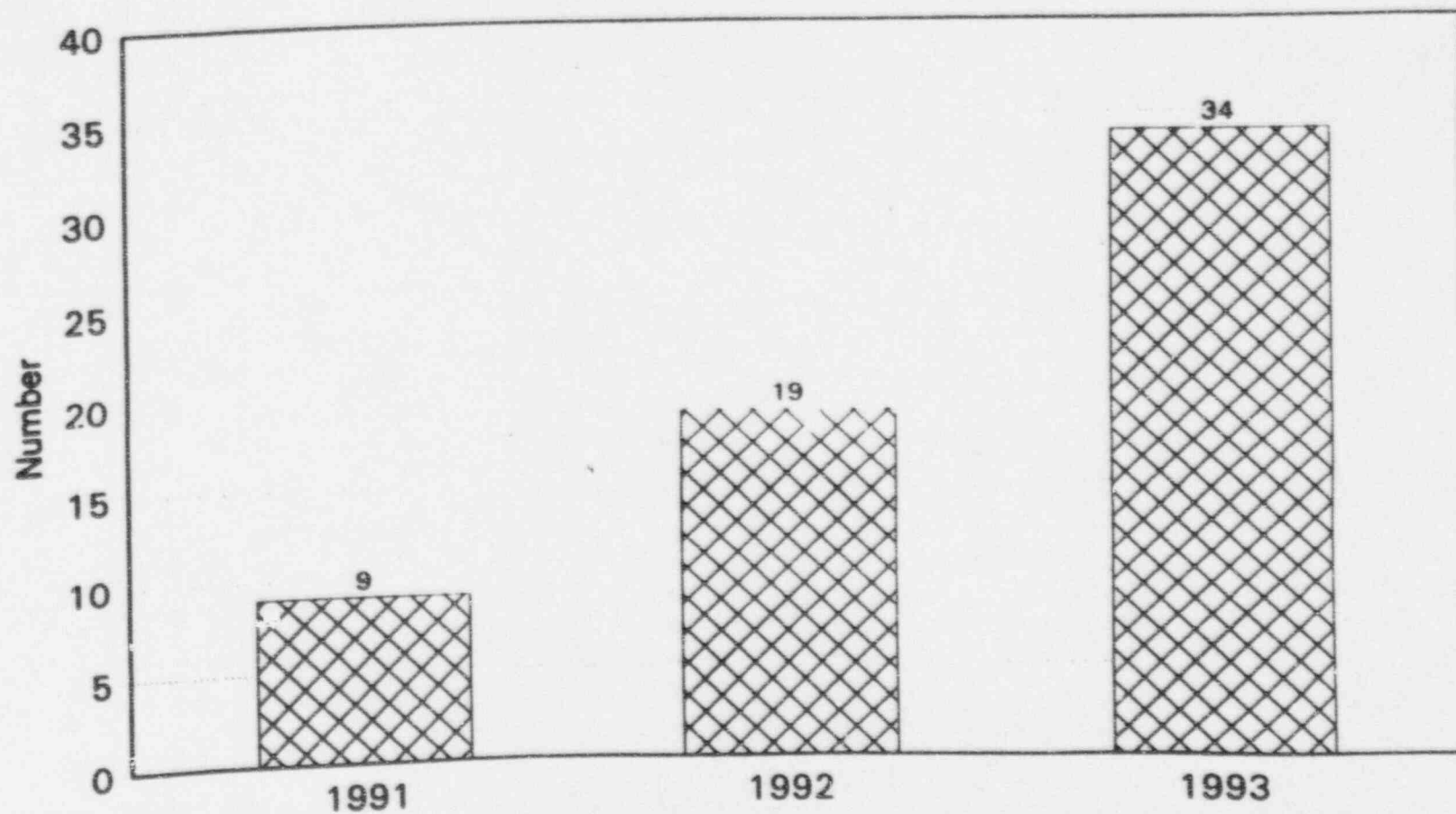


Total Leaks Salem Station



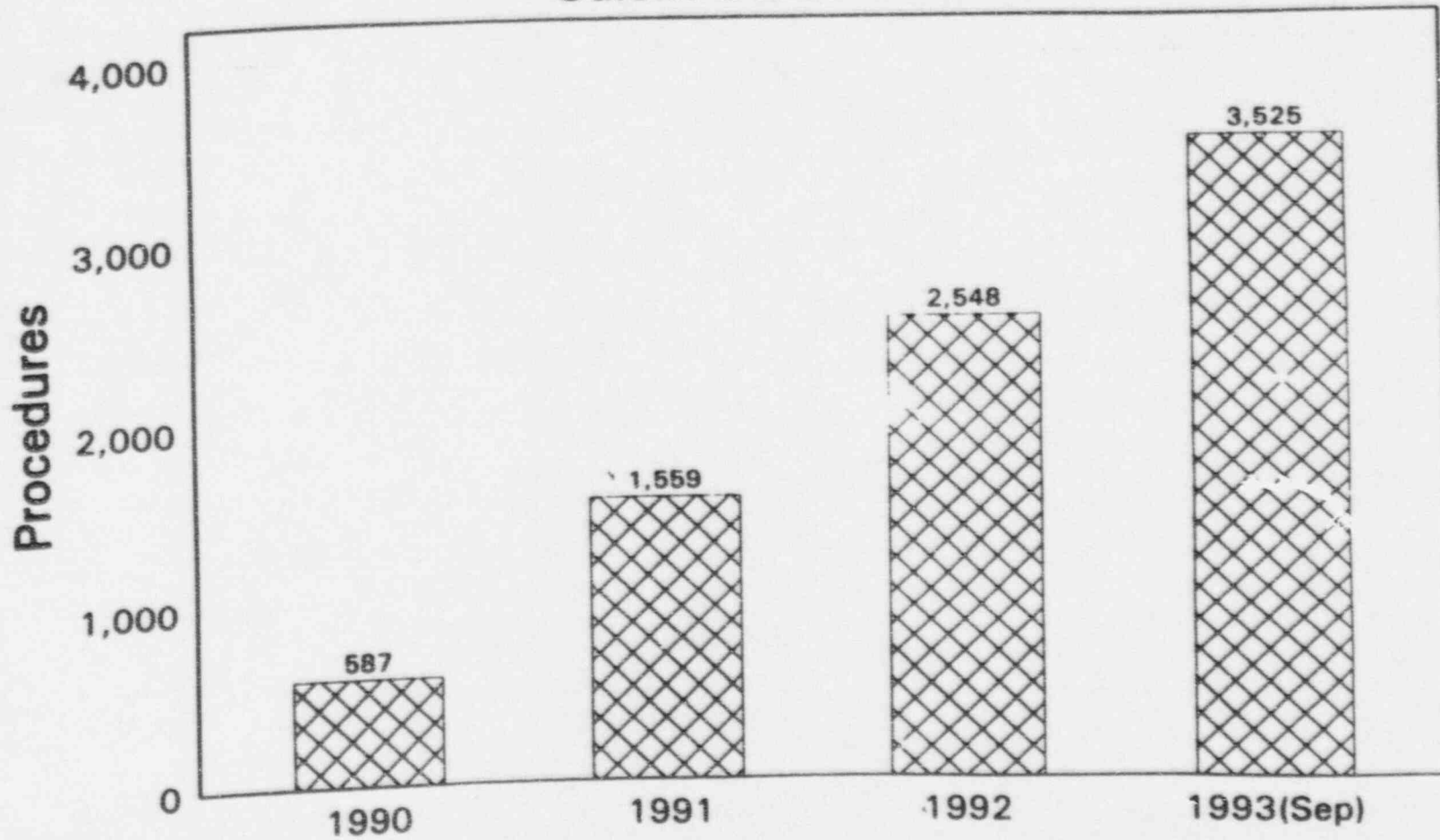
1/17/94 17MLO-3S

Reliability Centered Maintenance Salem Station



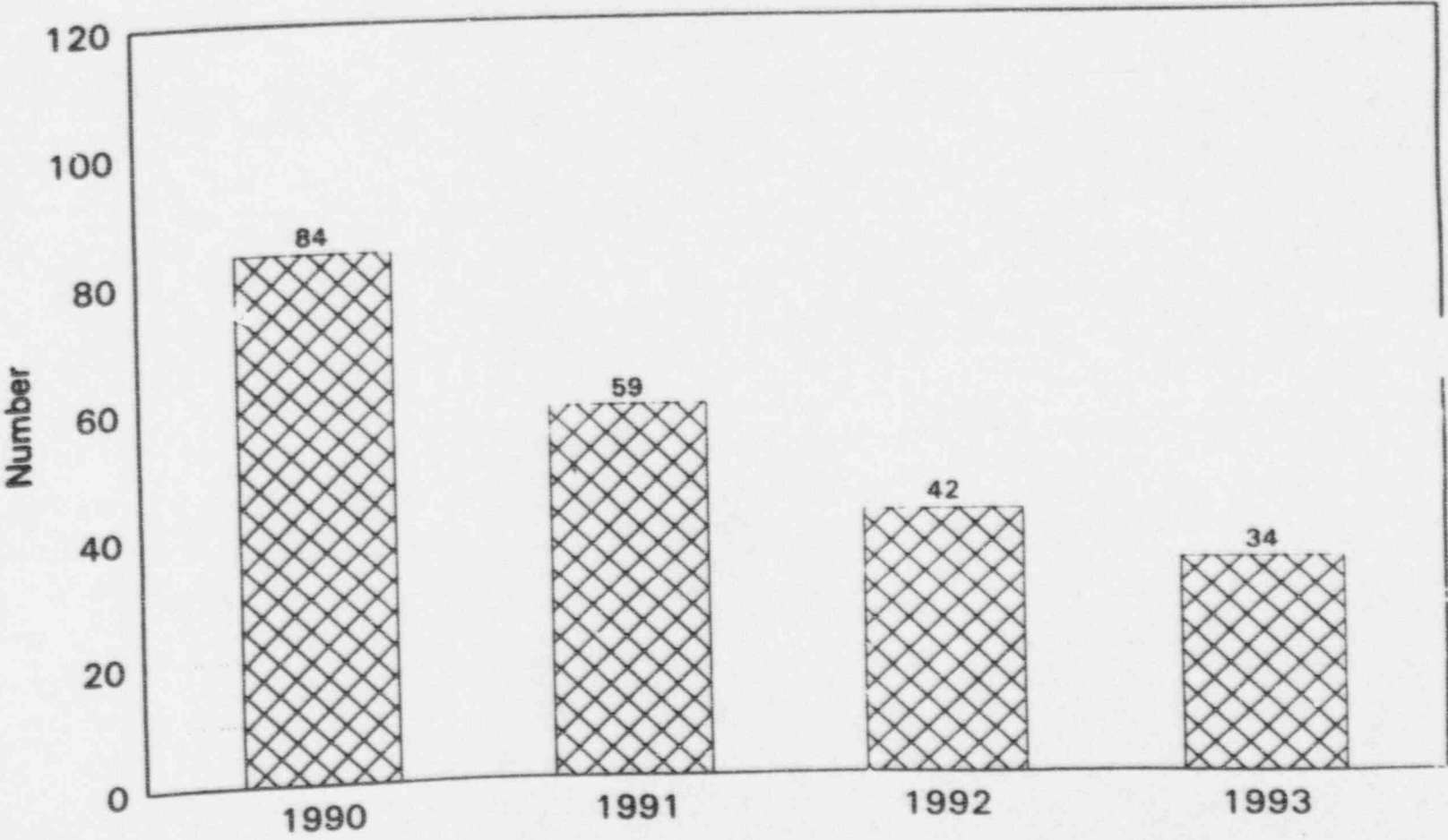
1/11/94 581-3S
(Project Completed)

Procedures Upgrade Project Salem Station

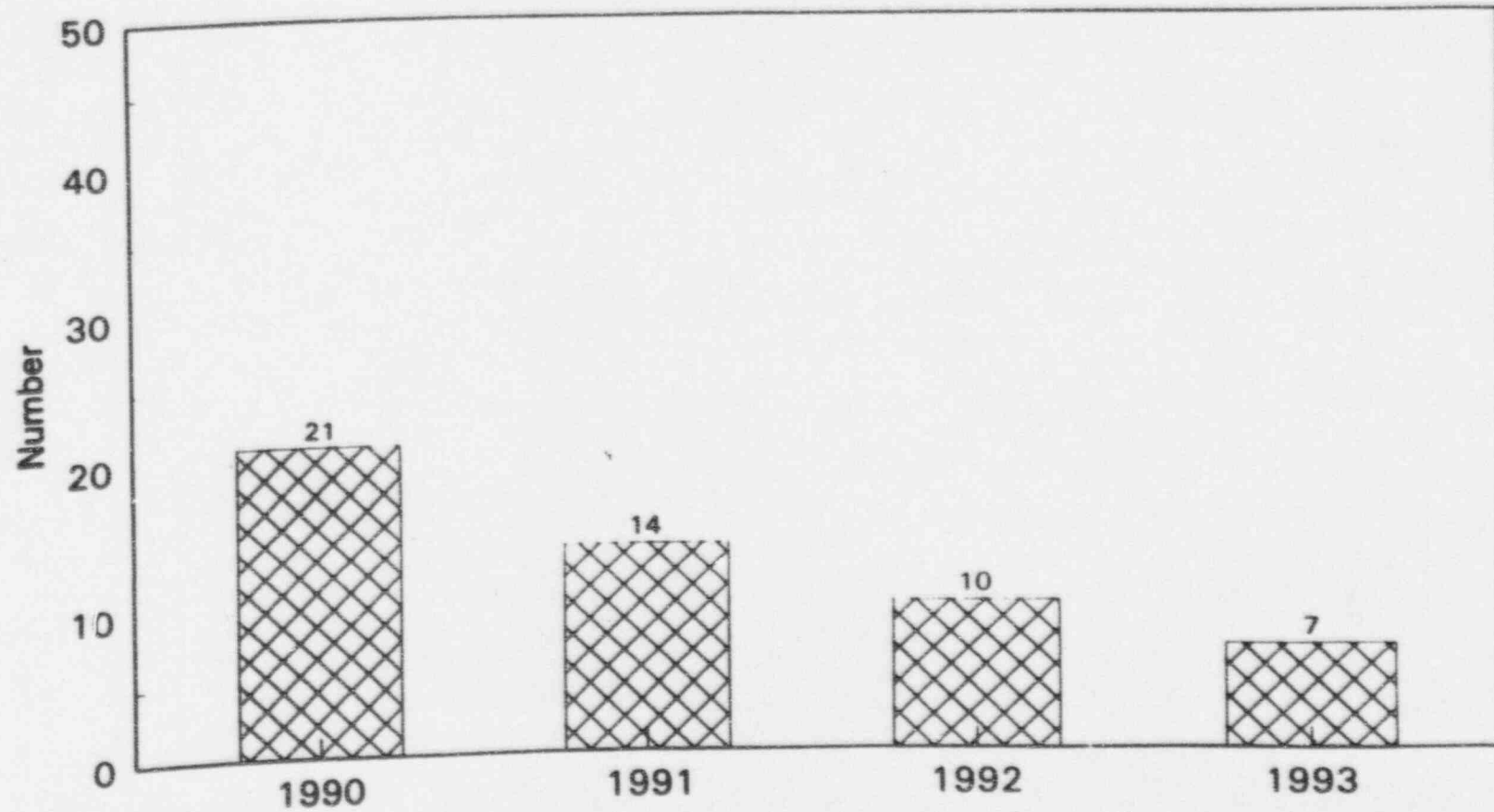


1/10/94 PUBLIC
(Project Completed)

Licensee Event Reports Salem Station



Personnel LER's Salem Station



PSE+6Co Meeting 4/19/93

JOE HAGAN

STEVE LABRUNA

STEVE MILTONBORGER

FRANK

- Dick Swann - former engineering, not QA to intense move to 4 barrier concept (insured, supervisor, QA, outside)
- Larry Ryder now leads up TQM team establishment
Will use full time teams to re-engineer processes
- TQM - nuclear quality council; use executive sponsors for each QIT; had until now used PT teams
- Redeployment - a right sizing effort 12000 - 500
basically captures vacancies created by retirement & resign
Completion scheduled \approx Feb-94
Will be adding 81 people at SASTM, have ¹¹⁰ added ⁵⁰ onsite area maintenance group, are cutting back on contractors.
Shorty to cut 300-400 contractors in '92
Having freeze with Miltonberger safety valve for skills mix
Expect S/HC permanent staff to actually increase by 81
- 85-86 completion of DB reconstitution effort schedule
- Now using PSE+6Co person responsible for contractor work effort
- LERS \downarrow

M/S

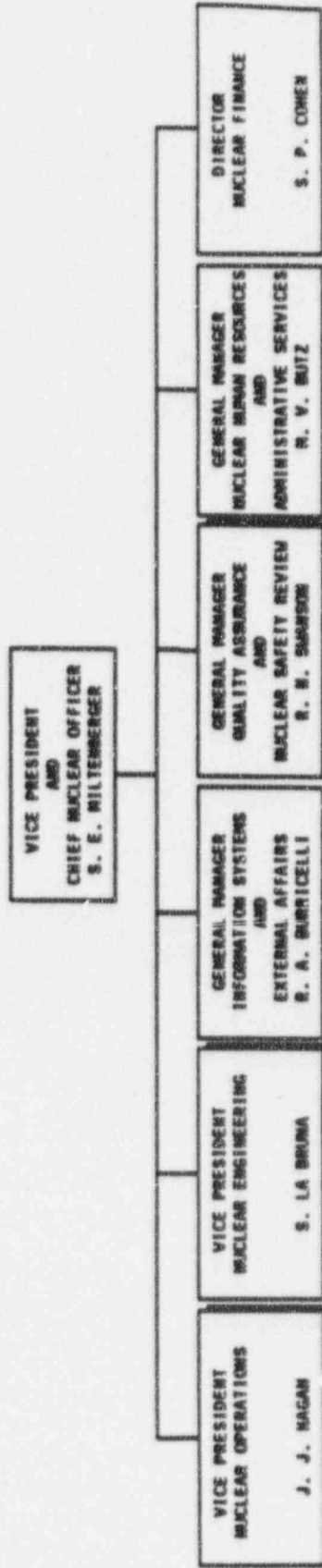
**MANAGEMENT MEETING - REGION I
APRIL 19, 1993**

AGENDA

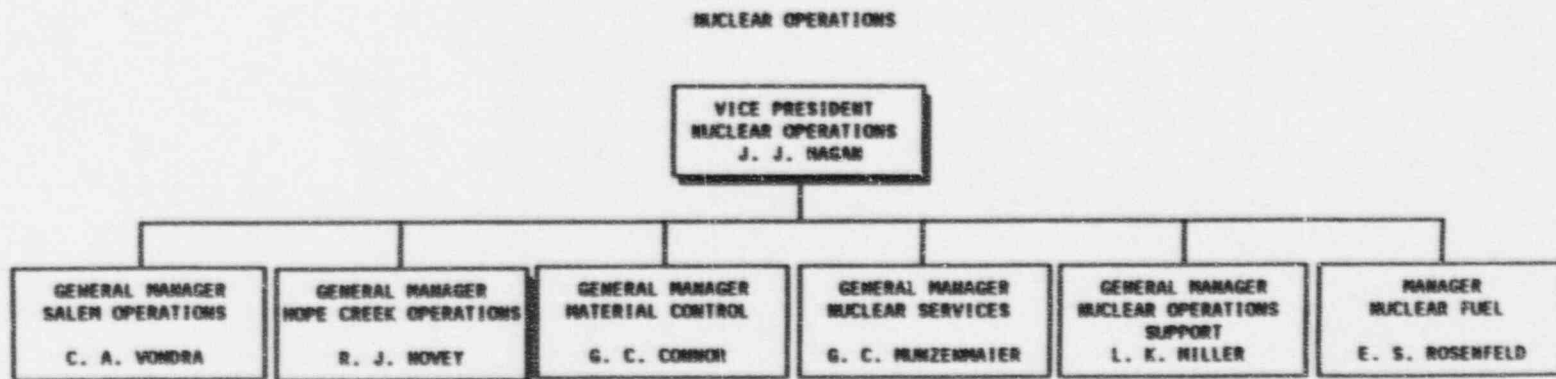
- I. ORGANIZATION CHARTS**
- II. PSE&G REDEPLOYMENT**
- III. NUCLEAR DEPARTMENT BUSINESS PLAN**
- IV. 1993 PERFORMANCE OBJECTIVES**
- V. SALEM IMPROVEMENT RESULTS**

NUCLEAR DEPARTMENT

NUCLEAR DEPARTMENT



NUCLEAR DEPARTMENT



93SEM03

Bob