December 11, 1997

Tennessee Valley Authority
ATTN: Mr. O. J. Zeringue
Chief Nuclear Officer and
Executive Vice President
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: MEETING SUMMARY - SEQUOYAH NUCLEAR PLANT, DOCKET NOS. 50-327 AND 50-328

Dear Mr. Zeringue:

On December 2, 1997, the NRC staff met at the Sequoyah Nuclear Plant Training Center with representatives of Tennessee Valley Authority Management. The purpose of this meeting was to discuss the operational performance of the Sequoyah Units, including performance improvement initiatives. Enclosure 1 is a list of the individuals who attended the meeting, and Enclosure 2 contains a copy of the material supplied by the licensee at the meeting.

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

Should you have any questions concerning this letter, please contact us.

Sincerely,

Original Signed by
M. S. Lesser

Mark S. Lesser, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos. 50-327, 50-328
License Nos. DPR-77, DPR-79

Enclosures: 1. List of Attendees
2. Handout Material

cc w/encls: (See page 2)

IE45

cc w/encls:
Senior Vice President
Nuclear Operations
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Vice President
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Mr. M. Bajestani
Site Vice President
Sequoyah Nuclear Plant
Tennessee Valley Authority
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Soddy Daisy, TN 37379

General Counsel
Tennessee Valley Authority
ET 10H
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Knoxville, TN 37902

Mr. R. R. Baron
General Manager Nuclear
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1101 Market Street
Chattanooga, TN 37402-2801

Mr. M. J. Burzynski, Manager
Nuclear Licensing
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Mr. P. Salas, Manager
Licensing and Industry
Sequoyah Nuclear Plant
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Mr. J. T. Herron
Plant Manager
Sequoyah Nuclear Plant
Tennessee Valley Authority
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Director
Division of Radiological Health
3rd Floor, L and C Annex
401 Church Street
Nashville, TN 37243-1253

County Executive
Hamilton County Courthouse
Chattanooga, TN 37402-2801

Distribution w/encls: (See page 3)

Distribution w/encls:
J. R. Johnson, RII
M. S. Lesser, RII
S. E. Sparks, RII
F. J. Hebdon, NRR
R. W. Hernan, NRR
W. C. Bearden, RII
C. F. Smith, RII
D. H. Thompson, RII
L. S. Mellen, RII
E. D. Testa, RII
PUBLIC

NRC Resident Inspector
U. S. Nuclear Regulatory Commission
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NRC Resident Inspector
U. S. Nuclear Regulatory Commission
1260 Nuclear Plant Road
Spring City, TN 37381

OFFICE	DRP/RII															
SIGNATURE																
NAME	S*parks:vyg															
DATE	12/ 4 /97		12/ /97		12/ /97		*2/ /97		12/ /97		12/ /97		12/ /97			
COPY?	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		

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LIST OF ATTENDEES

NRC

J. R. Johnson, Director, Division of Reactor Projects (DRP), Region II (RII)
F. J. Miraglia, Jr., Deputy Director, Office of Nuclear Reactor Regulation (NRR)
M. C. Shannon, Senior Resident Inspector, DRP, RII
F. J. Hebdon, Director, Project Directorate II-3, NRR
R. W. Hernan, Senior Licensing Project Manager, NRR

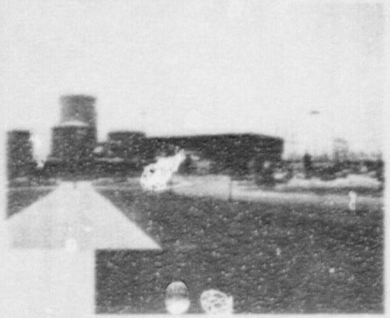
Licensee Attendees:

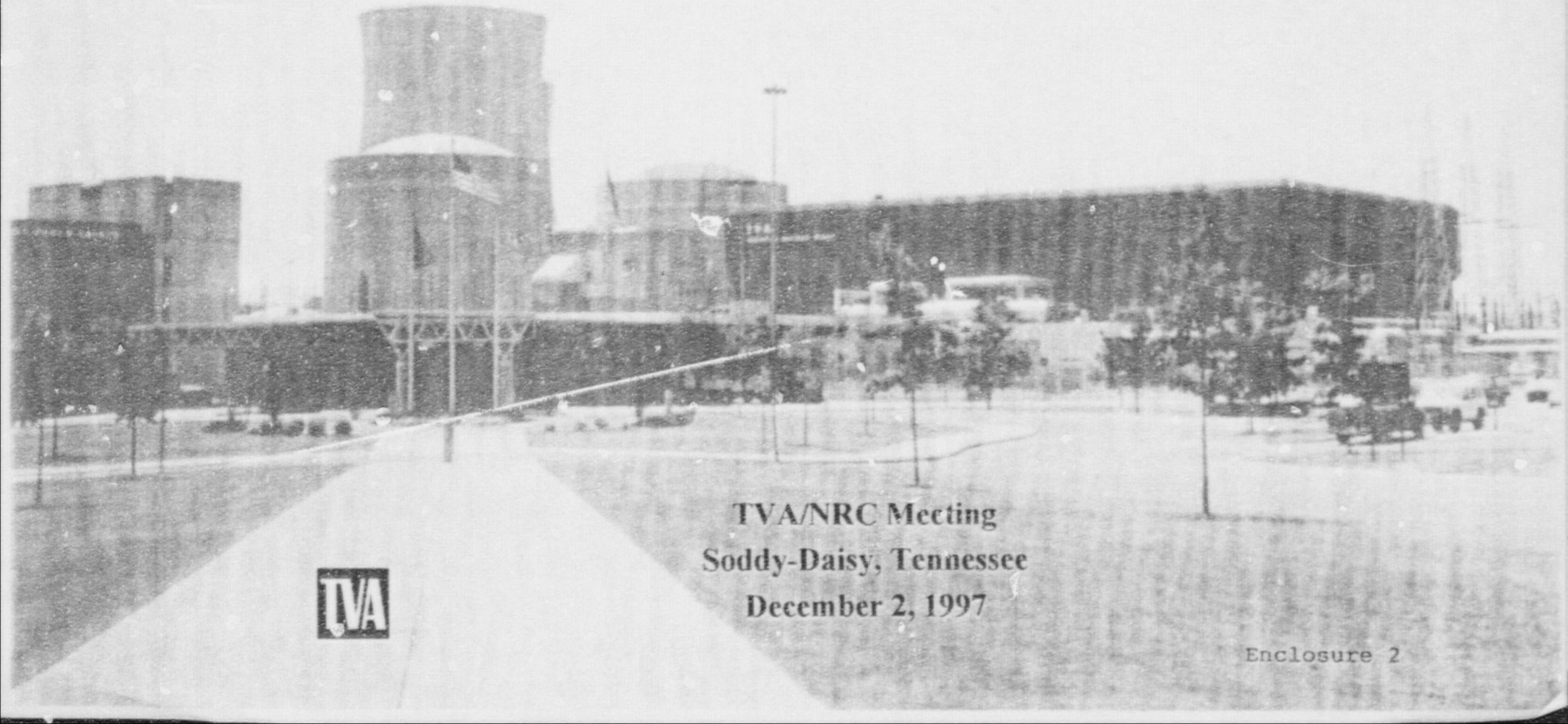
O. J. Zeringue, Senior Vice President, Nuclear Operations
M. Bajestani, Site Vice President
P. Salas, Manager, Licensing and Industry Affairs
J. T. Herron, Plant Manager
M. Fecht, Nuclear Assessment and Licensing Manager
J. Valente, Engineering and Materials Manager
L. Bryant, Outage Manager
D. L. Koehl, Assistant Plant Manager

Enclosure 1

Sequoyah Nuclear Plant

Plant Performance





TVA/NRC Meeting
Soddy-Daisy, Tennessee
December 2, 1997

Enclosure 2

Agenda

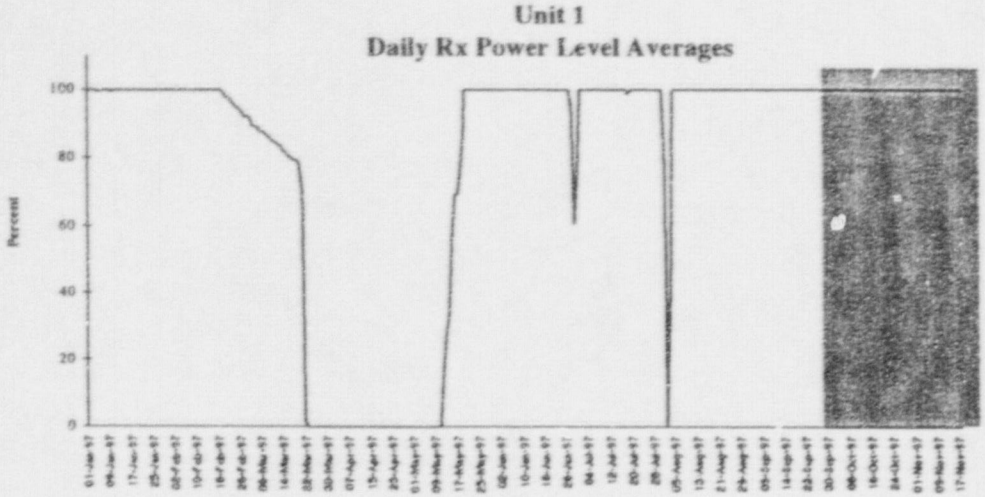
• Introduction	M. Bajestani
• Plant Performance	J. T. Herron
• Unit 2 Cycle 8 Refueling Outage	D. L. Koehl
• Department Performance	
Operations	H. H. Butterworth
Maintenance and Modifications	E. E. Freeman
Engineering	J. Valente
Plant Support (RadCon, Chemistry, Fire Ops)	C. E. Kent / J. H. Casey
• Material Condition	D. L. Koehl
System Health	
Diesel Generator	
Freeze Protection	
• QA Overview	R. M. Norton
• Conclusion	M. Bajestani

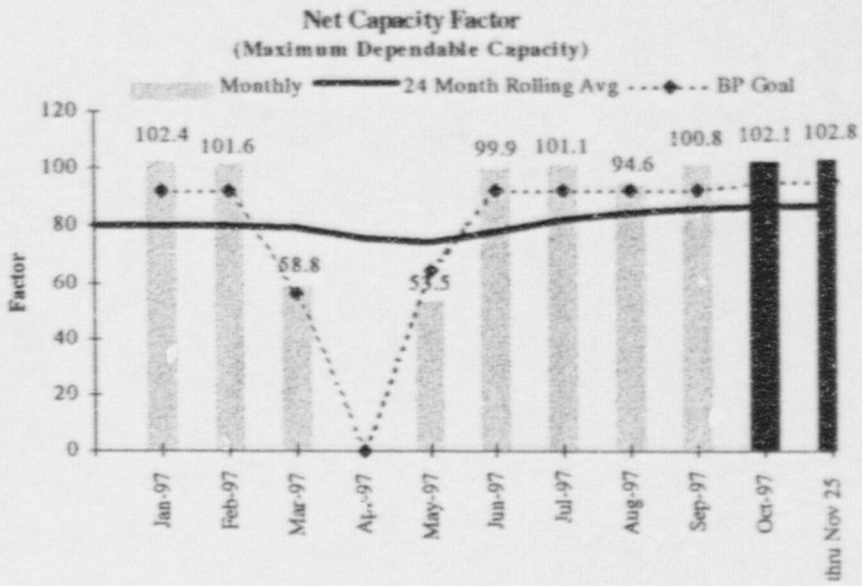
Introduction

- Successful U2C8 Refueling Outage Performance
  - Safe continued operation of Unit 1
  - Outage goals met
- Continuing Plant Performance Improvement
  - Material Condition
  - Human Performance

Plant Performance

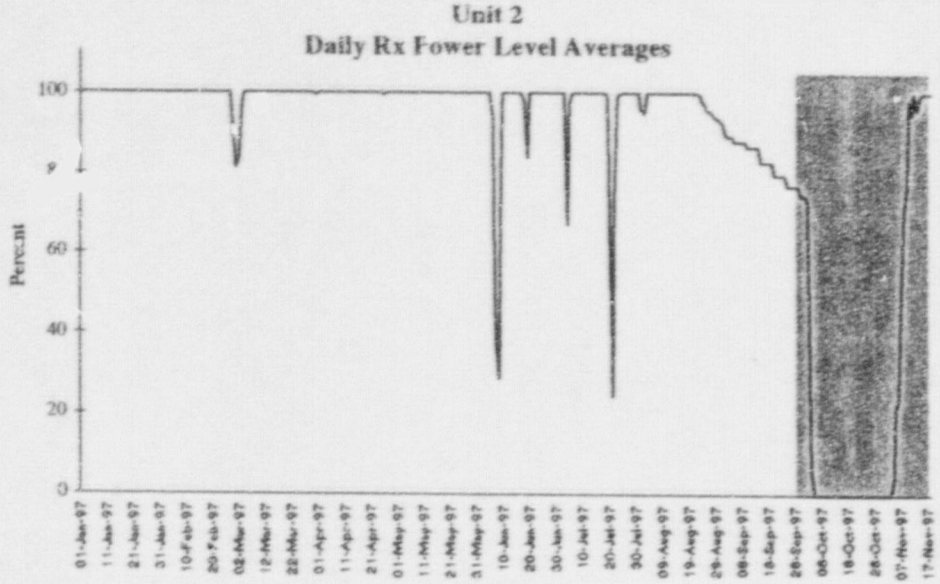
Unit 1

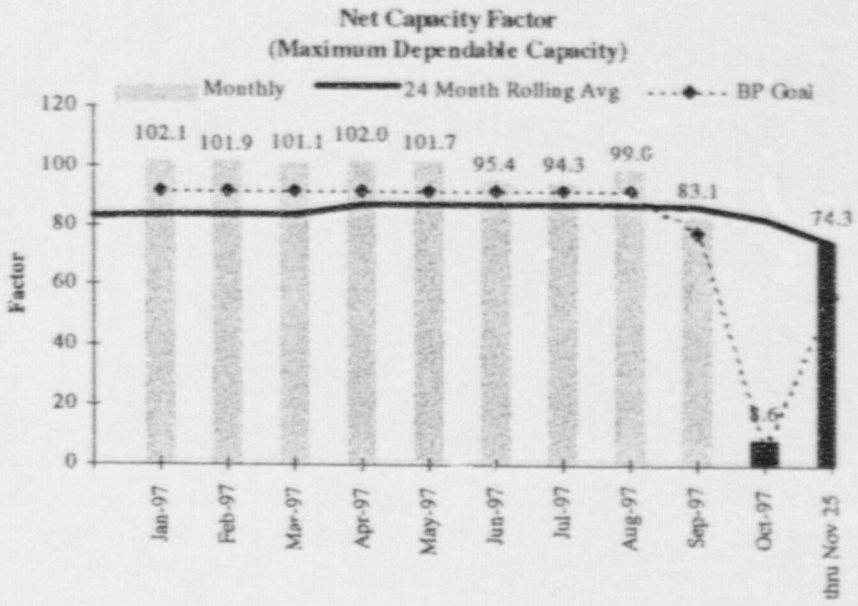




Herron

Plant Performance
Unit 2

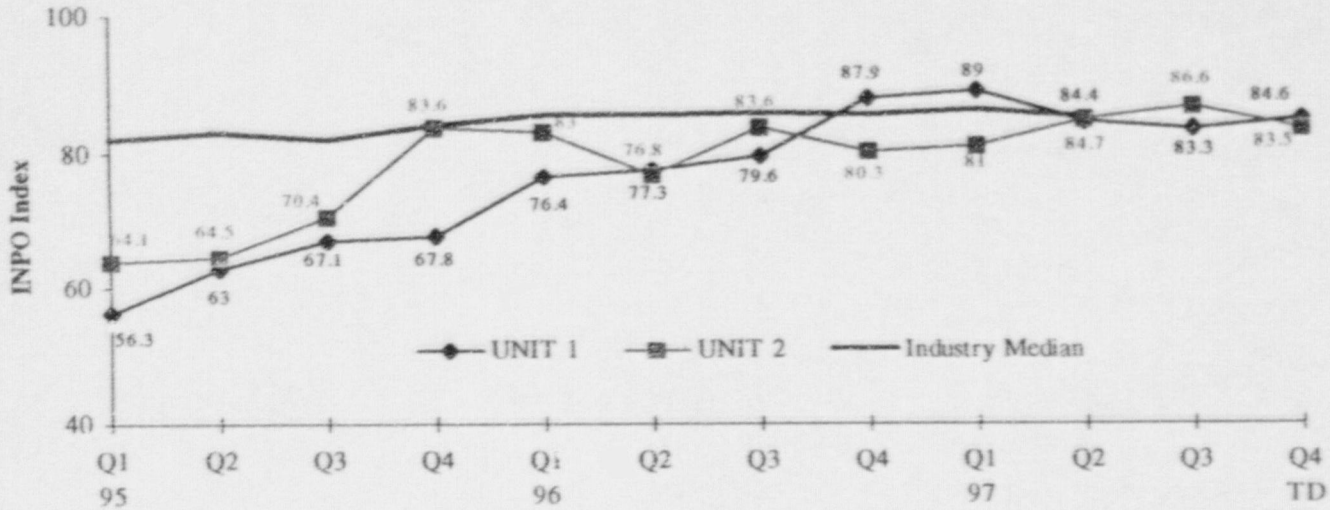




Herron

Plant Performance

INPO Performance Index

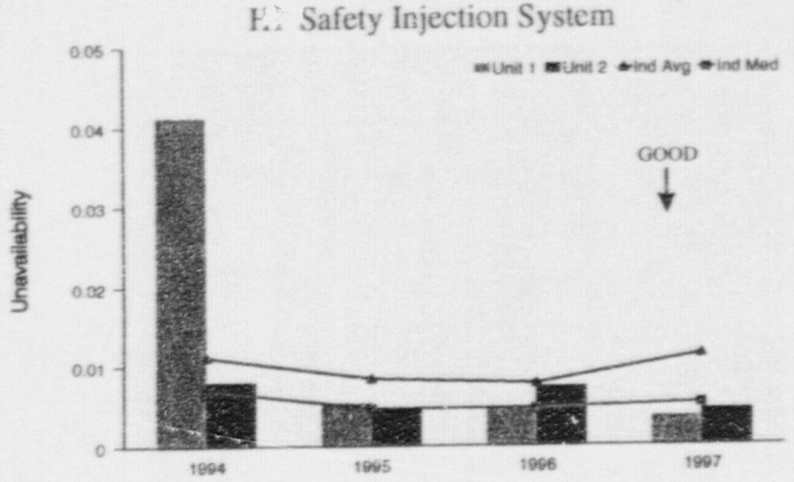


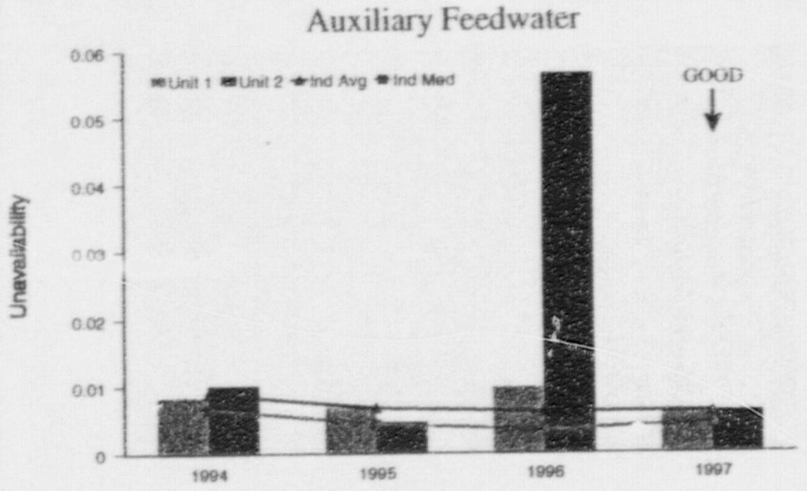
	SQN Unit 1				SQN Unit 2			
Performance Indicator	**Actual Value**	**Weight**	**% Max**	**Index**	**Actual Value**	**Weight**	**% Max**	**Index**
Unit Capability Factor (1)	84.72	16	89.5	14.3	83.83	16	87.6	14.0
Unplanned Capability Loss Factor (1)	5.17	12	64.2	7.7	5.24	12	65.1	7.8
Unplanned Automatic Scrams (1)	0.450	8	100.0	8.0	0.464	8	100.0	8.0
High Pressure Safety Injection System (1)	0.006	10	100.0	10.0	0.008	10	100.0	10.0
Auxiliary Feedwater System (1)	0.007	10	100.0	10.0	0.029	10	38.3	3.8
Emergency AC Power (Site) (1)	0.011	10	97.5	9.8	0.011	10	97.5	9.8
Collective Radiation Exposure/Unit (1)	144.43	8	85.2	6.8	197.39	8	67.5	5.4
Fuel Reliability (3)	0.0048	8	24.5	2.0	0.0004	8	100.0	8.0
Thermal Performance (2)	99.96	6	98.0	5.8	99.55	6	77.3	4.7
Chemistry Indicator (2)	1.33	7	74.4	5.2	1.07	7	100.0	7.0
Industrial Safety Accident Rate (Site) (2)	0.09	5	100.0	5.0	0.09	5	100.0	5.0
INPO Performance Index - October 1997		**100**		**84.6**		**100**		**83.5**

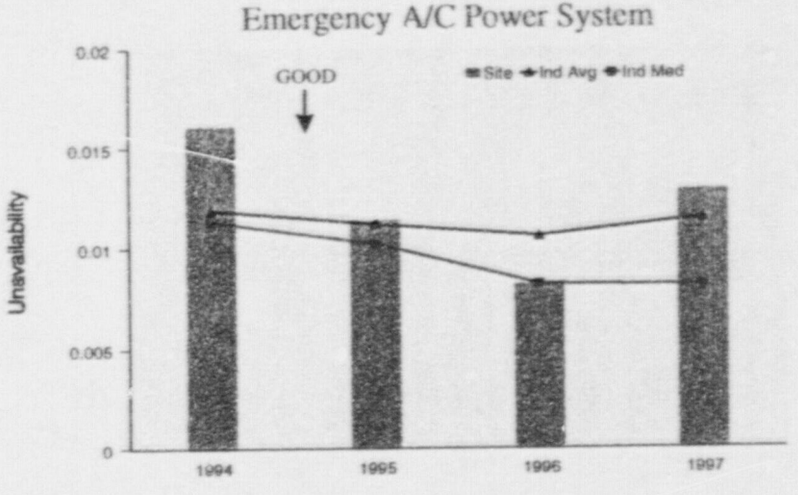
(1) based on 24 month average
(2) based on 12 month average
(3) based on 3 month average

Herron

Plant Performance
INPO Indicators



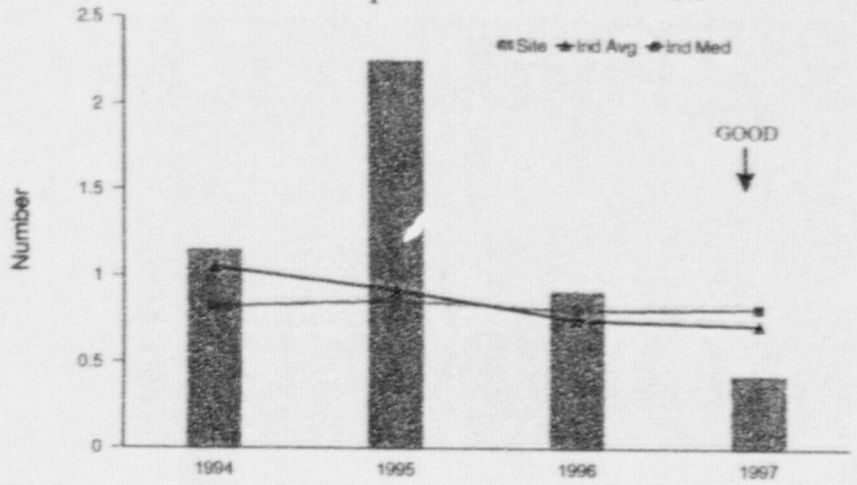




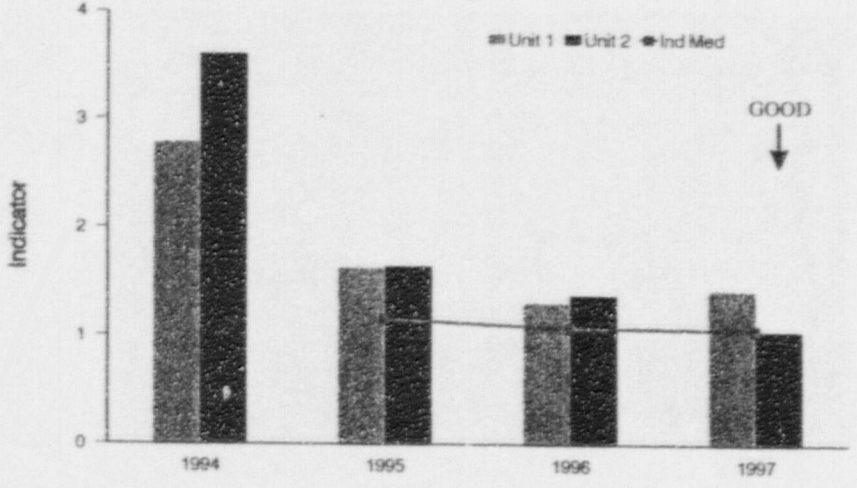
Herron

Plant Performance
INPO Indicators

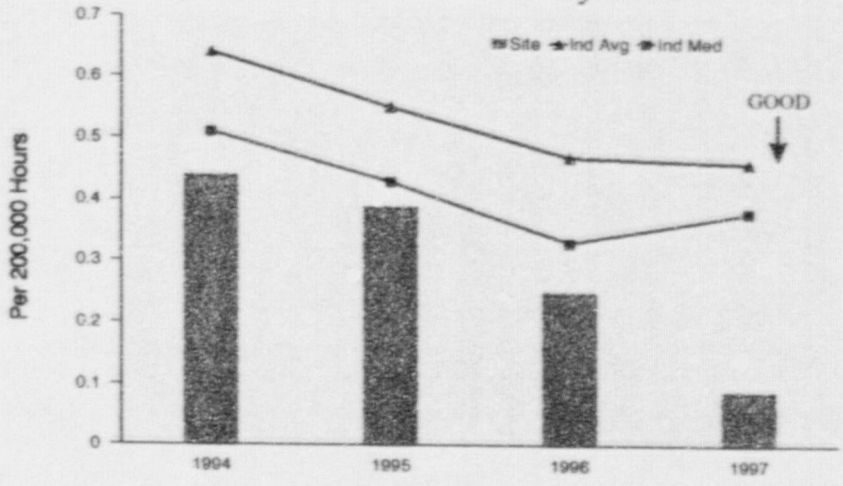
Scrams per 7000 Critical Hours



Chemistry Indicator



Industrial Safety



Herron

Refueling Outage

- U2C8 Goal Status

  - ✓ Safe and reliable Unit 1 operation - *Unit 1 operated at 100% power for outage duration*
  - ✓ No events - *No significant events (e.g., ESF, loss of shut down cooling, reactivity management, etc.)*
  - ✓ Strong Unit 2 performance after startup- *Unit 2 is performing well*
  - • No LERs or violations - *One LER on missed pressurizer PORV surveillance requirement*
  - ✓ No more than 1 recordable injury - *Zero recordable injuries*
  - ✓ No lost-time accidents - *Zero lost time accidents in 408,000 man-hours worked*
  - ✓ Less than 230 REM exposure and no high rad violations - *Actual exposure was 140 rem exposure and no high rad violations*
  - ✓ Clear outage TACFs - *14 cleared*
  - ✓ Clear temporary leak repairs - *23 cleared*
  - ✓ Clear outage control room deficiencies - *34 cleared*
  - ✓ Total completion of baseline outage scope - *2,155 completed*
  - ✓ Outage completed within schedule and budget - *On schedule and within budget*

Refueling Outage

- Material Condition Improvements
  - Reliability
    - ✓ "A" LP rotor replacement - *Completed*
    - ✓ Rod control diagnostics - *Completed by Westinghouse - included cleaning and refurbishing control cards and performing diagnostic testing of rod control components*
    - ✓ 6.9kV breakers - *11 completed*
    - ✓ ASCO SOVs on BOP - *70 completed*
    - ✓ Rebuild primary and BOP pumps/motors - *14 completed, including installation of a new motor-driven auxiliary feedwater pump*
    - ✓ RCP motor and seal replacement (1 each) - *Replaced No. 1 RCP seal package and inspected No. 3 seal springs on other 3 RCPs. Installed refurbished spare motor/coolers in No. 4 position*
    - ✓ Main bank transformer inspections - *Completed inspection and modified core grounds on main bank transformers*

Refueling Outage

- Material Condition Improvements (Continued)

  - Man-machine interface

    - ✓ Install redundant channel Mansell RCS level monitoring - *Complete; used for back end mid-loop*
    - ✓ New main feed pump recirculation valves/controllers - *Complete*
    - ✓ Modify turbine steam seal system - *Complete; installed new gland seal steam spillover pressure control valves and steam supply valves*
    - ✓ Install new pressurizer safety valves and modify tailpipe - *Complete*
    - ✓ Resolve reset wind-up issues - *Complete; installed new pressurizer pressure master controller*
    - ✓ Continue 480v motor starter (Arrow Hart) replacements in BOP - *Continued with 70 buckets replaced*
    - ✓ New No. 2 feedwater heater bypass to condenser - *Complete; reduces startup transients*
    - ✓ Upgrade RCP seal leakoff flow indicating loops - *Complete; more reliable seal leakoff flow indication; cleared a TACF*
    - • Install RHR piping new high point vents - *Not completed due to craft availability and relative priority*
    - ✓ Clear control room deficiencies *34 cleared*
    - ✓ MSR and FWH Sightglasses - *Complete; installed 28 new level indicators with integral level switches*

Refueling Outage

- Material Condition Improvements (Continued)
  - Equipment performance
    - ✓ Install new electrical containment penetrations - *Replaced 3 canister type penetrations with modular type due to high resistance and high leakage*
    - ✓ Vital instrument power board maintenance - *Completed*
    - ✓ Temporary leak repairs cleared - *Cleared 23 Unit 2 temporary repairs*
    - ✓ Flow-accelerated corrosion inspection/repairs - *Completed 143 inspections - 6 feet large bore, 240 feet small bore, weld buildups on condensate booster piping*
    - ✓ Ice condenser subfloor dewatering - *Installed 35 well points in 5 bays, heated the floor, and removed 424 gallons of water. Chipped under selected doors to gain additional clearance*
    - ✓ Steam dump system improvements - *Rebuilt 12 steam dump valves and completed mods to the drain system to improve water removal ability*
    - ✓ Steam generator - *Sludge lanced the 4 generators (110 pounds removed) and completed approximately 28,000 eddy current tests. Plugged 23 tubes and performed 3 in situ pressure tests*
    - ✓ Main turbine oil tank demister - *Installed new demister to reduce oil vapors discharged to the atmosphere*

Refueling Outage

U2C8 Modifications

- Addition of T-drains to 17 motor-operated valves
- Stator cooling water pump isolation valves
- No. 7 heater drain tank flow to MCR
- Tell-tale drain hard pipe
- BOP runback circuit armed indication
- Flow modifier FM-3-142A
- Replace reactor coolant pump No. 1 leakoff FIT-62-10, -11, -23, -24, -36, -49, & -50
- Component cooling water bearing lube water
- No. 2 feedwater heater bypass to condenser
- No. 1 feedwater bypass sparger relocation
- Enlarge No. 3 heater drain tank sparger holes
- Component cooling system operable modes/pipe support modifications
- Removal of Thermo-Lag over the reactor trip breakers
- Arrow Hart and Allis Chalmers replacement
- Main feed pump miniflow valve, orifice and controller
- Pressurizer safety valves tailpipe modifications
- Tailpipe temperature setpoint alarm
- Obsolete recorders (only two in the outage)
- Replace electrical penetration X-169, -142, -134
- Delete neutron monitoring recorders
- Steam dump drain modifications
- Replace valves on turbine seal steam system
- Ice condenser floor dewatering
- Moisture separator reheater and feedwater heater level control system
- Main steam drain trap vibration
- Feedwater flow sense line heat trace
- Mansell level monitoring system
- In-mast fuel sipping
- ASEA transformer cooling fans/pump contactors
- Electrical separation on 2-M-6
- Delete drains VLV-3-1101, -1102, -1103, -1104

- Replace air pack circuit breaker 2-R-14 thru 2-R-24 (11 each)
- Articulated arm for RCP seals
- Motor-driven auxiliary feedwater pump replacement
- Modify mirror insulation on reactor head
- Replace obsolete Westinghouse relays

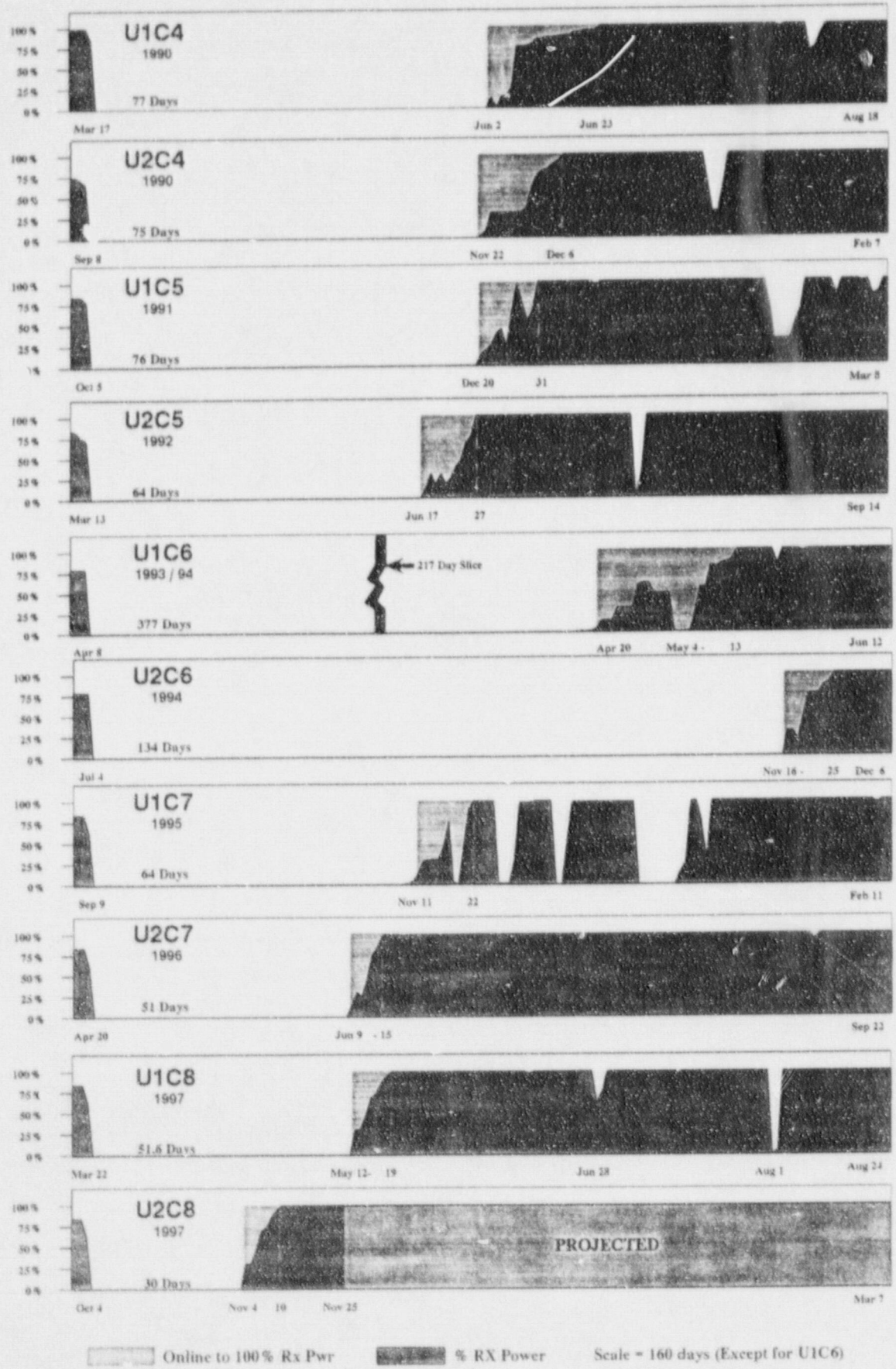
- Main turbine oil tank and main feed pump turbine turbotoc tie-ins
- Pressurizer manway bolting
- Reactor coolant pump No. 1 seal insert support machining
- Centrifugal charging pump speed increaser oil pump cooling
- Remove manual lift on main steam safeties
- B&W fuel electrical calculation/setpoint and scaling document
- Remove manual lift on pressurizer safeties
- DP test connections - System 063
- Eliminate solid state relays on containment isolation valve
- Rework/repair cable No. 4 - accumulator room
- Install auxiliary feedwater injection boric acid pump
- Replace LT-3-148 and LT-3-171

Koehl

Note: Highlighted items are considered significant outage activities

Sequoyah Nuclear Plant

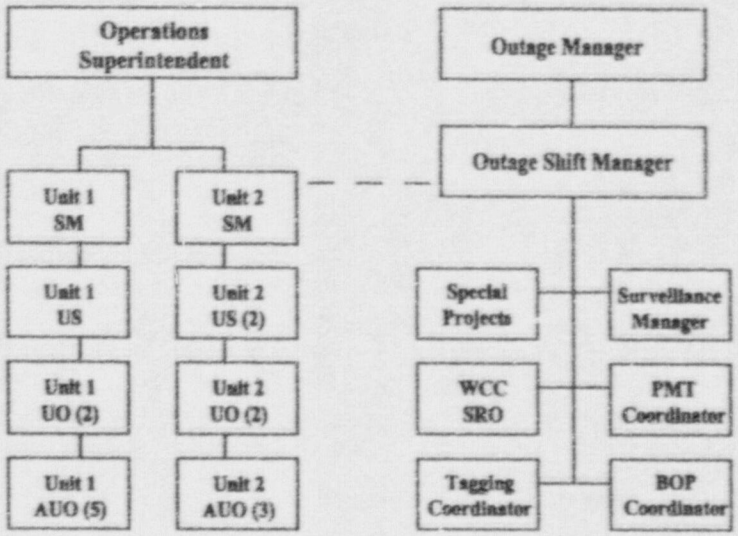
Refueling Outage Comparison



Operations

- Unit 2 Cycle 8 Outage Performance
  - Organization Changes
    - Three Shift Managers per crew
    - Specific coordinators and managers in the Work Control Center (WCC)
    - Realignment of resources for bulk work activities

Operations Outage Organization



Operations

- Unit 2 Cycle 8 Outage Performance
  - Personnel Changes
    - Determination of position attributes
    - Selection of key personnel in critical roles
    - Providing training/overview of outage schedule and activities
    - Development of work schedule that provided the resources
  - Leadership and Ownership
    - Unit 2 Shift Managers and supervisors
    - Outage Shift Managers
    - Tagging coordinators
    - "Out of the box" thinking

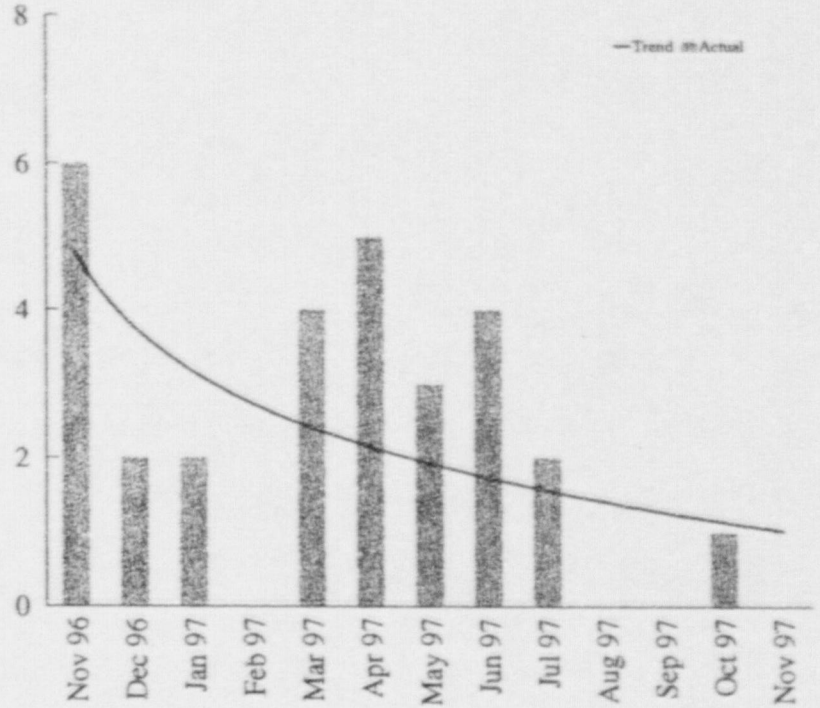
Operations

- Unit 2 Cycle 8 Outage Performance
  - Command and Control
    - Schedule discipline
    - Critical evolution control
  - Management Oversight
    - Additional shift management and senior management in the control room (Assistant Plant Manager, Operations Manager, and Operations Superintendent)
    - Additional WCC supervision in the field (BOP Coordinator, Surveillance Manager, Special Projects)
    - Continuous reinforcement of expectations on "doing things right"

Operations

- Performance Indicators
  - Status Control
    - Identified by PER program, reviewed by MRC, statused and discussed weekly in the POD meetings
    - Manipulated and verified over 18,000 components through clearances and over 3,900 through lineups
    - Independent third-party review of approximately 7,500 safety and technical specification components and identified no issues
    - Significant improvement from the previous outage

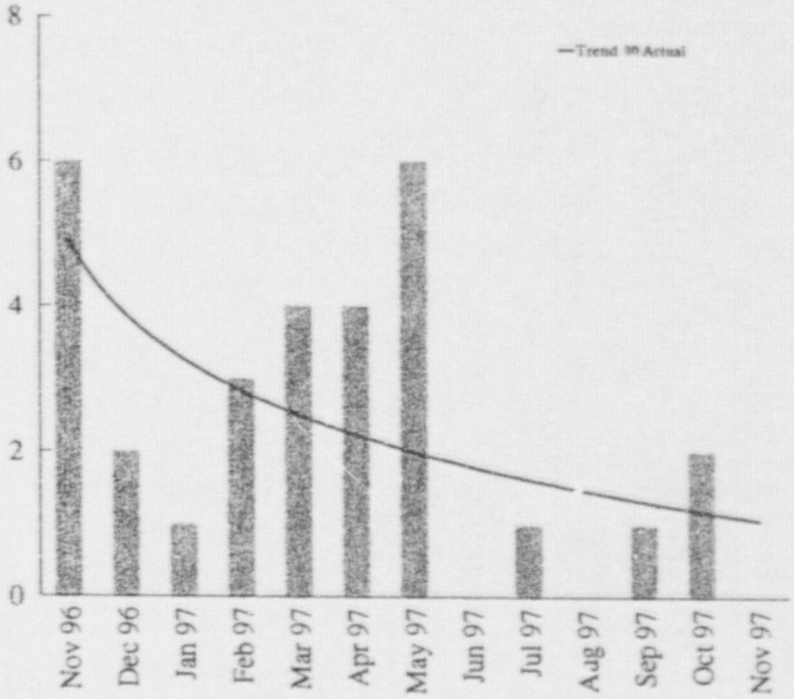
Past Trend of Status Control Errors



Operations

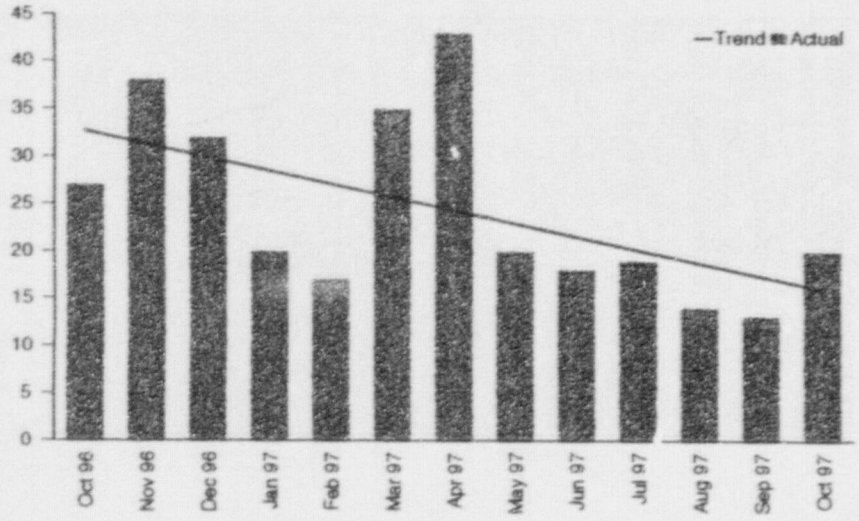
- Performance Indicators
  - Procedure Adherence
    - Identified by PER program, reviewed by MRC, statused and discussed weekly in the POD meetings
    - Significant increase in activity during an outage with 37,000 opportunities on Unit 2 and 35,000 on Unit 1
    - Significant improvement from the previous outage
    - Three errors tied to
      - Tools left in ice condenser without notifying the control room
      - Clearance released before all clearance holders off the clearance
      - Discharge valve not opened before the 2B-B CCS pump started

Past Trend of Procedure Adherence Errors

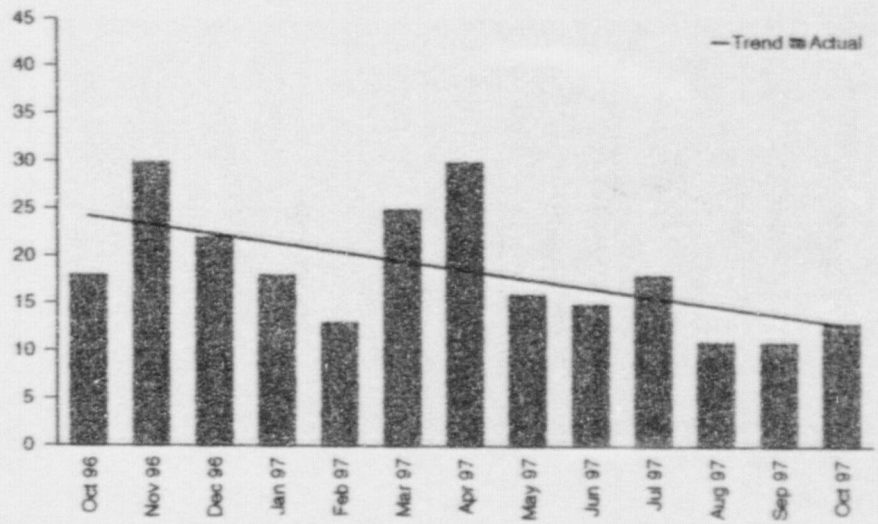


Operations

Operations Caused PERs



Operations PERs
Human Performance Related



Operations

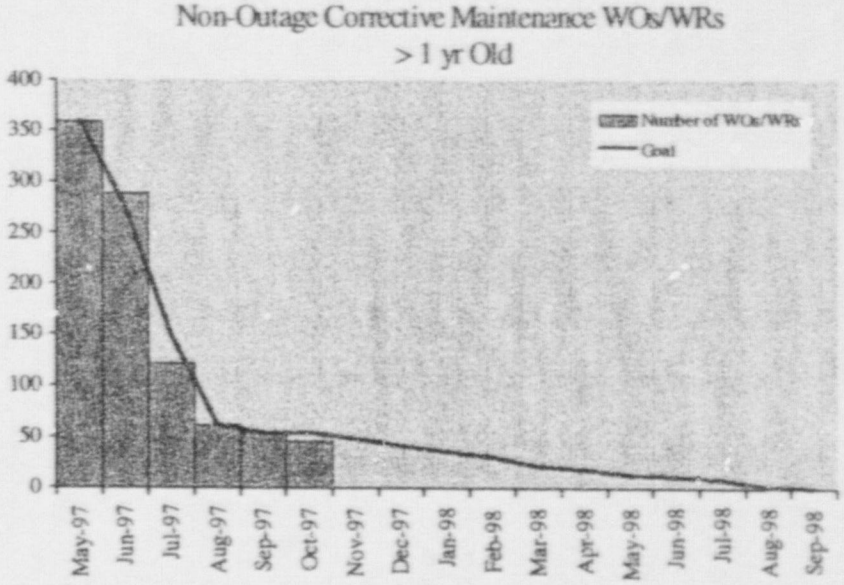
- Conclusions
  - Success Factors
    - Increased management involvement
      - Number of management observations from July 97 through November 97 (Use of Procedures 237; Clearance Process 127; AUO Watch Stations 71)
    - Communication and reinforcement of expectations
    - Self-critical culture with open lines of communication
    - Aggressive approach to resolving issues
    - AUO increased ownership of plant
  - Continual Focus Areas
    - Improvements in human performance (status control, procedural adherence, clearances)
    - Improvement in AUO performance - conduct and quality of rounds
    - Improvements in the ownership and execution of the daily work schedule

Maintenance and Modifications

- Outage Performance
  - Human Performance
    - No lost time or recordable injuries
    - QC inspection acceptance rate >98%
    - Fewer Maintenance-caused PERs - U2C8 (74), U1C8 (203)
    - No events
  - Material Condition
    - Total outage WOs completed was approximately 2,200
    - Non-outage corrective maintenance backlog was reduced
    - Overall backlog is approximately 3,000 after U2C8 vs. 3,600 after U1C8

Maintenance and Modifications

- Continuing Backlog Reduction & Material Condition Improvements
  - Non-outage corrective maintenance (CM) backlog reduction is on track to meet goal of 250 by end of year
  - Work off of CM greater than 1 year old is better than goal
  - Freeze protection upgrade completed
  - Switchyard status is now "white"
- Continuing Focus Areas
  - Human Performance Improvements
    - Results are being realized
    - Management remains focused
  - Troubleshooting techniques
  - Preventive maintenance effectiveness study



Freeman

Engineering

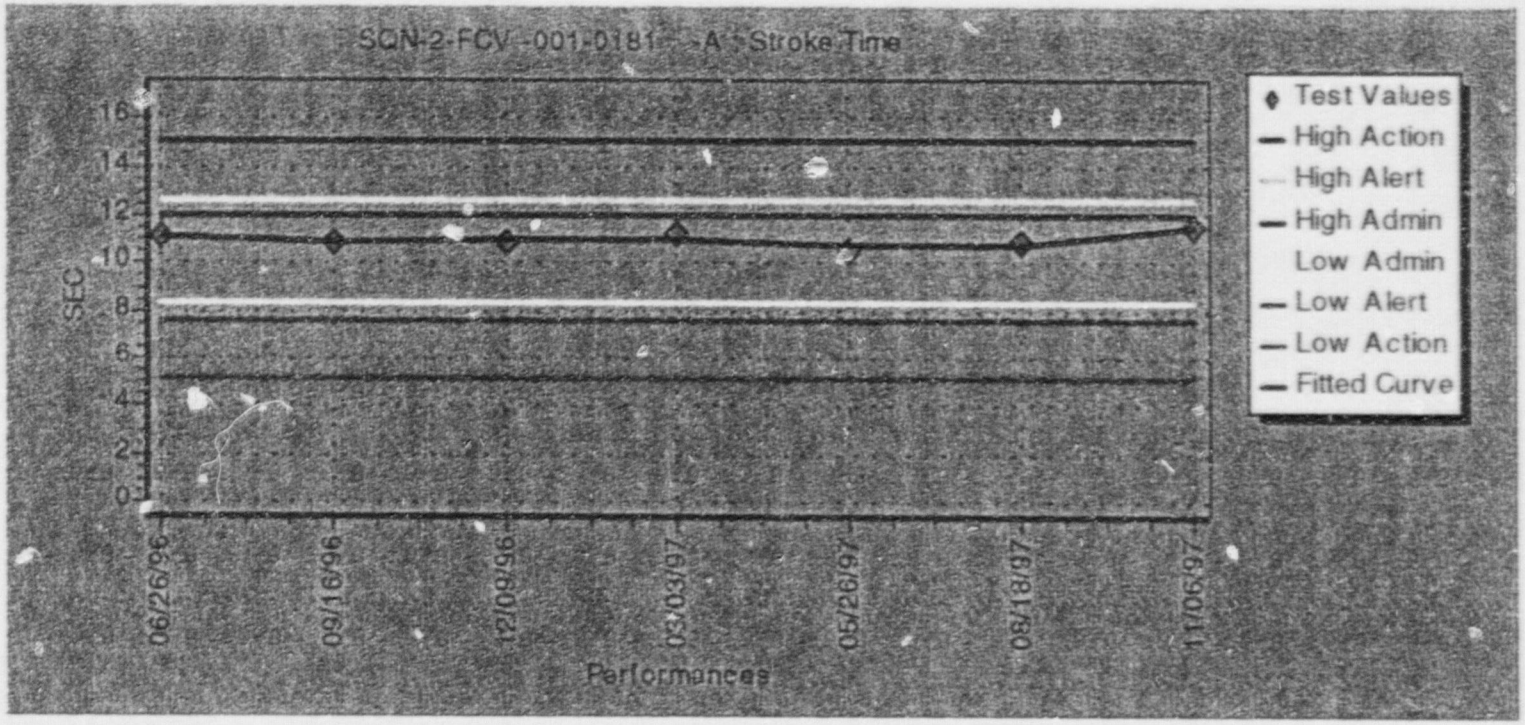
- Outage Performance
  - Timely outage support
    - Real-time engineering inspection and evaluation in field
    - Design changes are responsive to plant needs
  - Unit 2 Cycle 8 steam generator (S/G) status
    - Unit 2 steam generators in good condition for full cycle of operation
    - Less than 2% of the tubes plugged to date
    - Small volume of sludge (110 pounds) removed during U2C8 RFO
    - No detectable primary to secondary leakage

Engineering

- Continuing Focus Areas
  - Generic Letter 89-10 Program Completion
    - Nine activities were identified for program closure
    - Identified activities are complete except one modification on containment spray valves for Units 1 and 2
    - Maintenance of Unit 1 PORV block valves scheduled for U1C9 RFO
  - Quarterly System Reviews
    - Review of control air compressors completed
    - Review performed by TVA multi-site team of design and system engineers
    - The team concluded that the Centac Compressor design was sound with long-term reliability expected

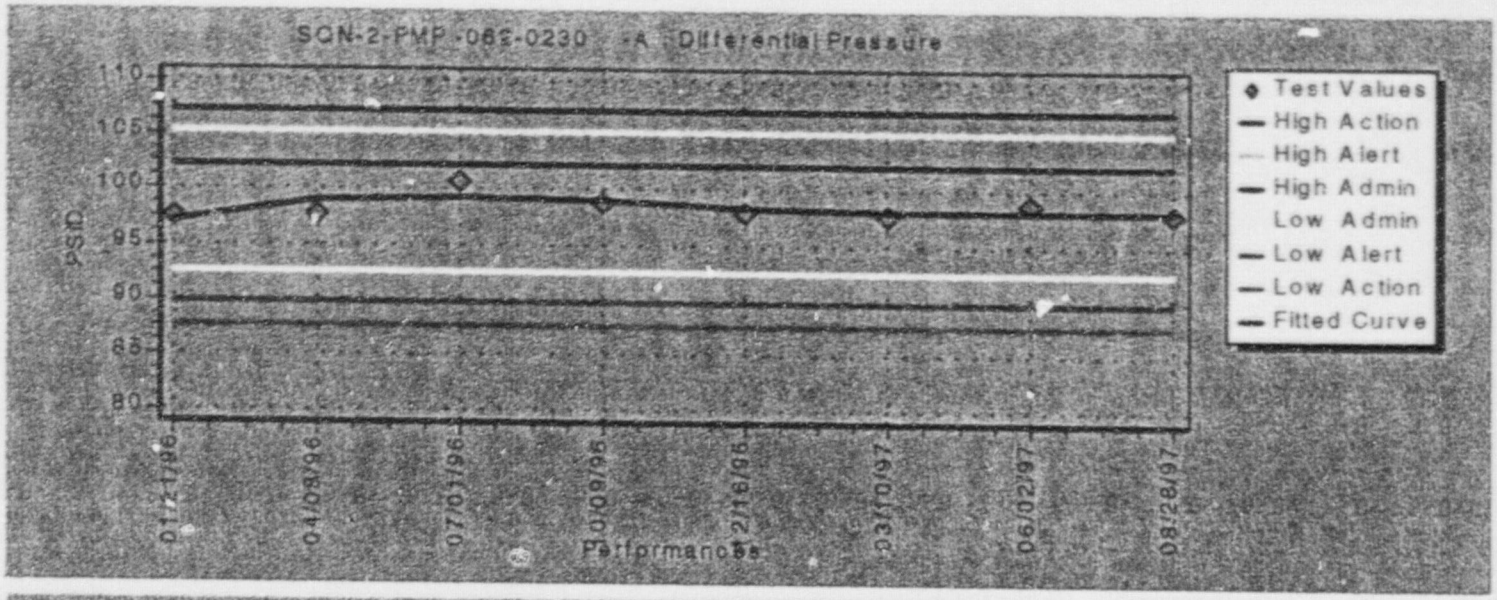
Engineering

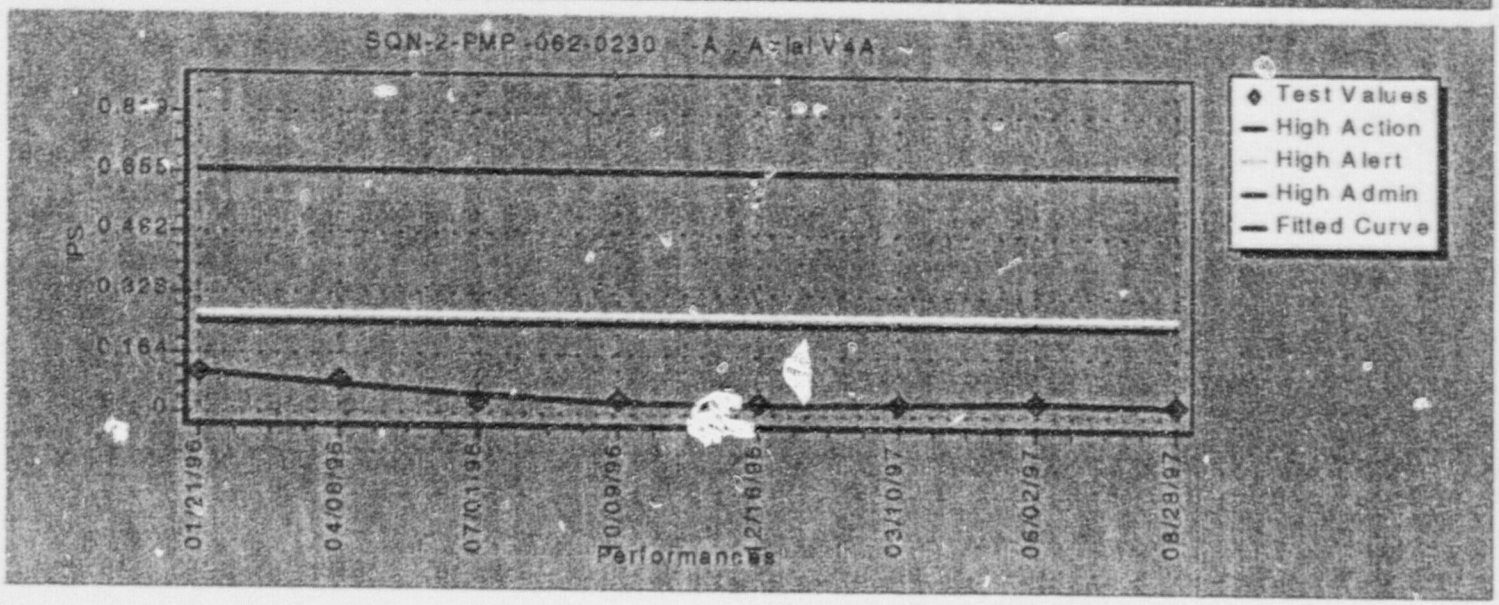
- Continuing Focus Areas (Continued)
  - ASME Section XI IST Program
    - Tracking and trending software developed
    - Operations personnel task qualification training
    - Procedure peer review



Engineering

- ASME Section XI IST Program (Continued)

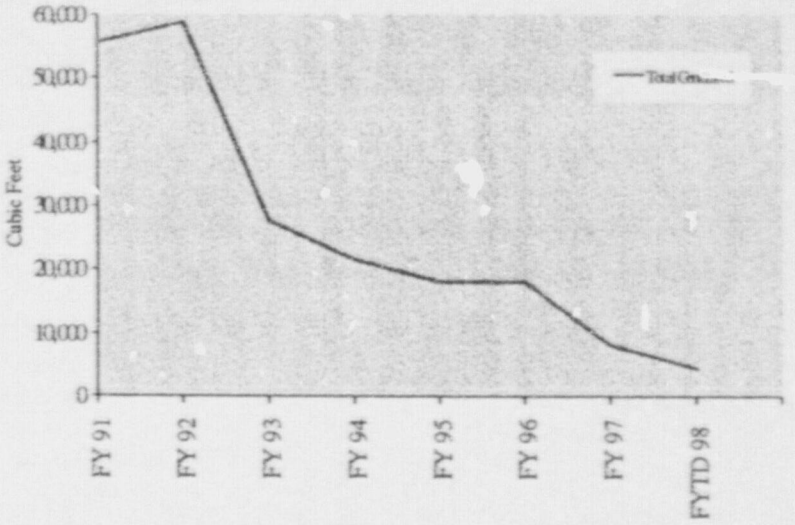




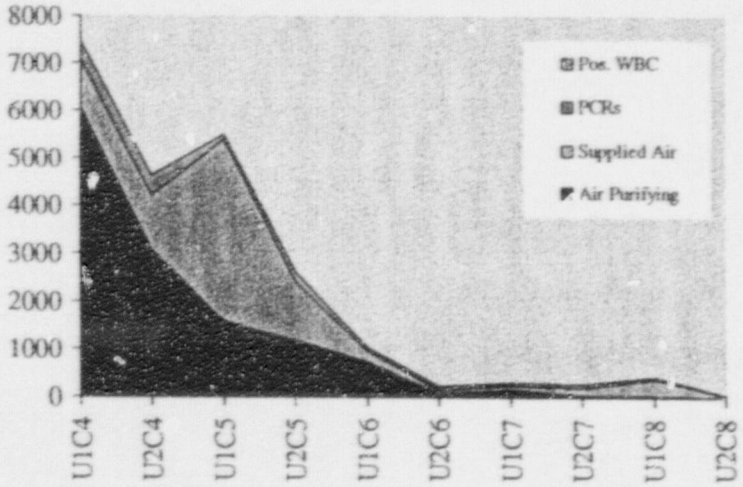
Plant Support

- RadCon Performance
  - Respiratory protection
  - Radwaste generation
  - U2C8 exposure goal reduced from 230 REM to 173
    - Actual accumulated dose was 140 REM

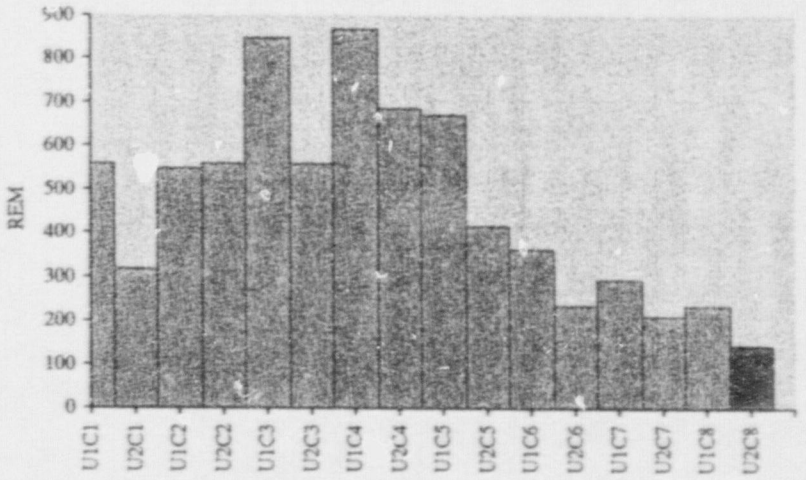
Waste Generation



Respiratory Protection



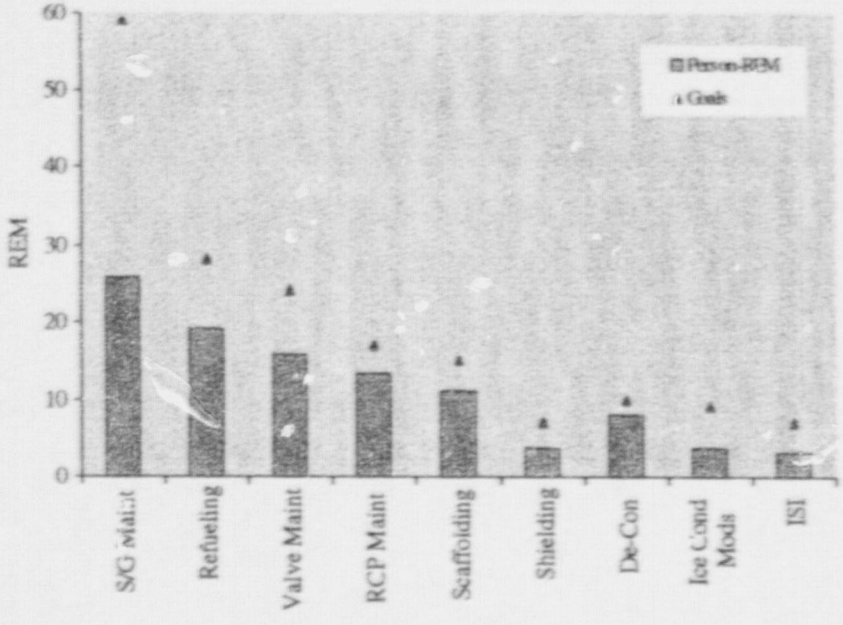
Refueling Outage Dose History

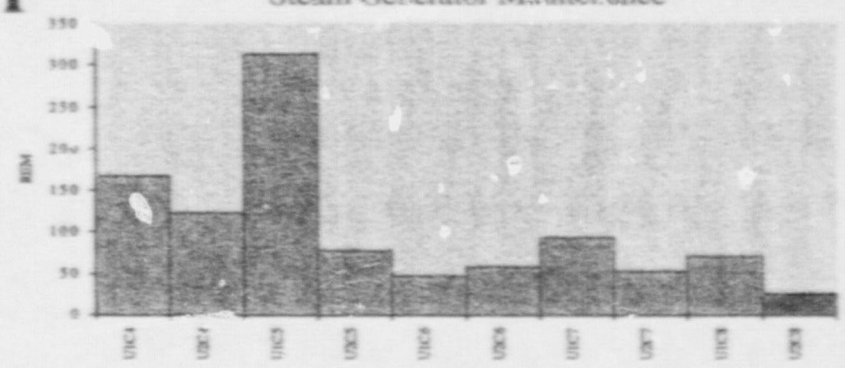


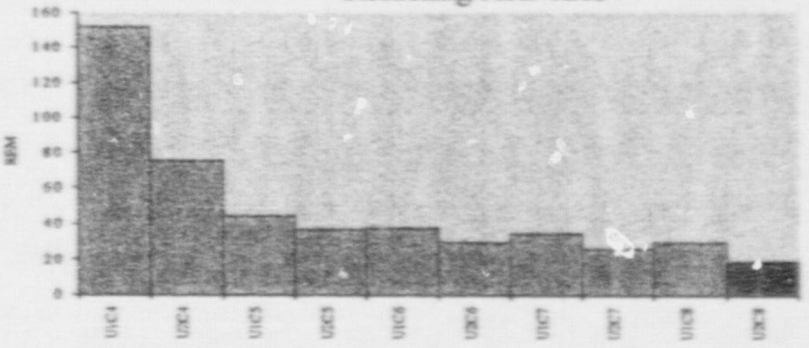
Kent

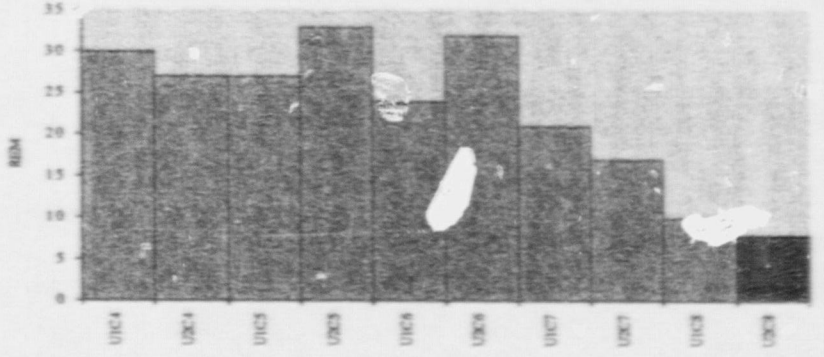
Plant Support

- RadCon U2C8 Performance (Continued)
  - U2C8 Dose Accrual







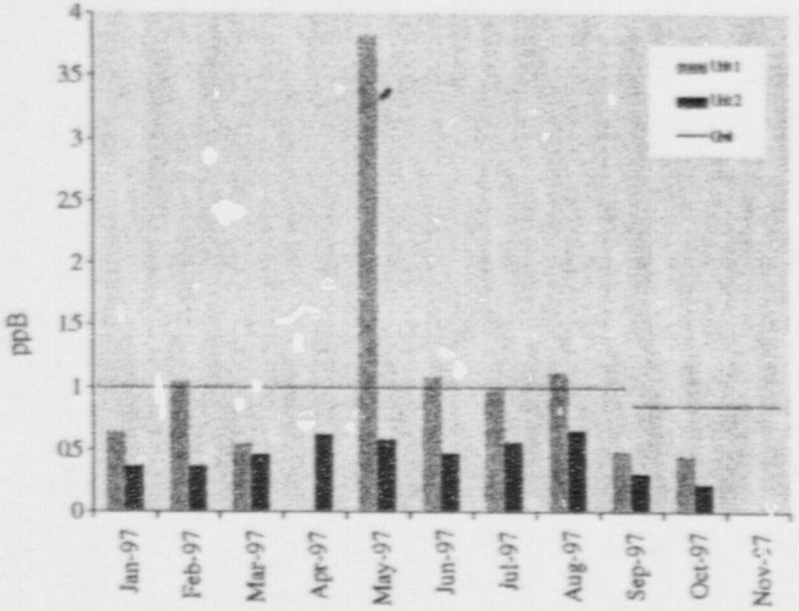


Kent

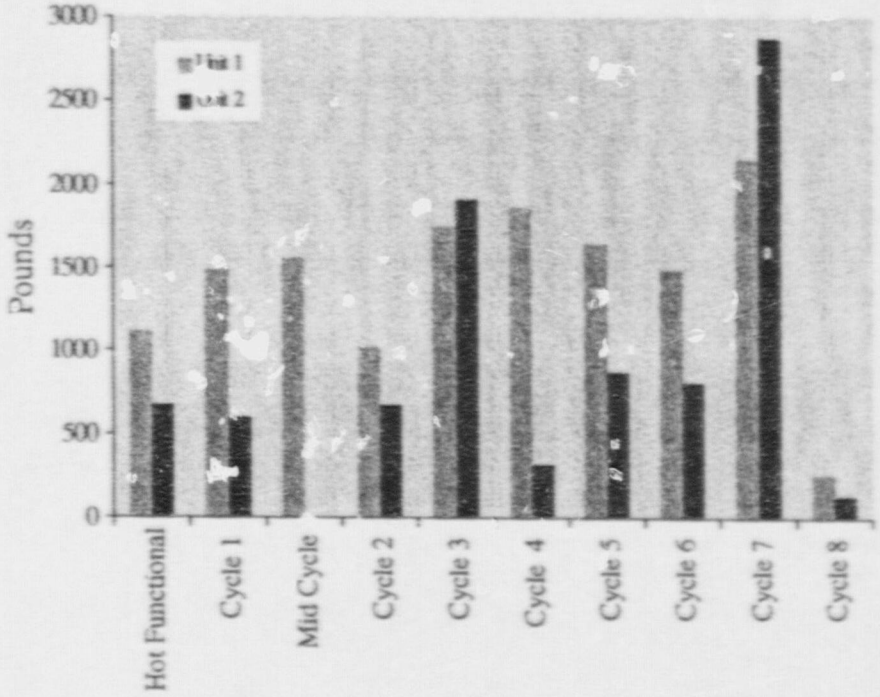
Plant Support

- Chemistry Performance
  - Steam Generator Chemistry

SGB Sodium



SG Sludge Removal



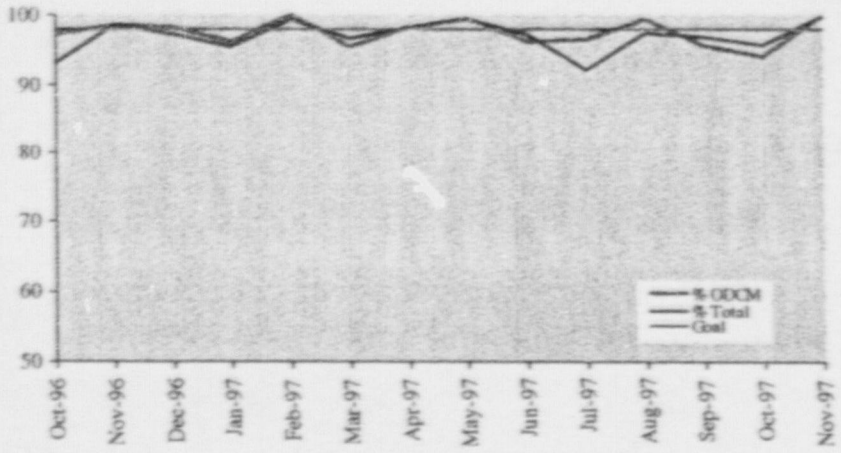
Kent

Plant Support

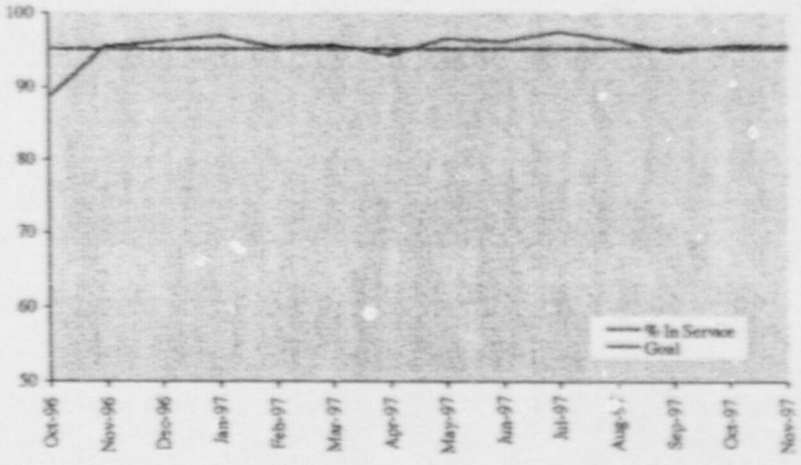
- Chemistry Performance (Continued)
  - Radmonitor operability
  - Chemistry on-line instrument availability
  - Material Condition improvements
    - Make-up water
    - ERCW chemical treatment

Rad Monitor Operability

(Compliance required)



Chemistry On-Line Instruments



Kent

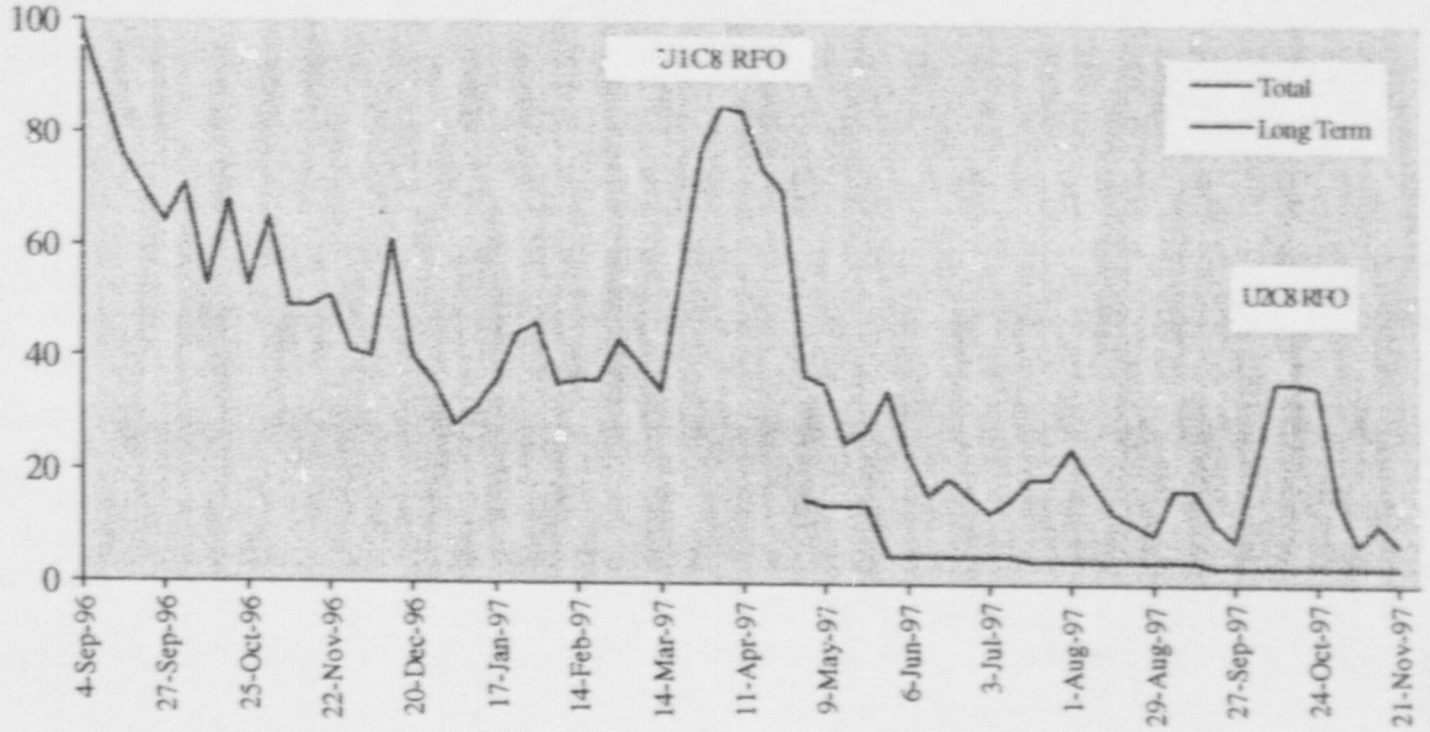
Plant Support

- Fire Operations Performance
  - Fire Suppression System Modification
    - On target for new pumps to be operable in December
  - Resolution of Thermo-Lag
    - Removal (Reduction Plan) - *Unit 2 was completed as planned*
    - Upgrade Plan - *Design issued and field work to start in December*
    - Kaowool Replacement - *Design issued*

Plant Support

- Fire Operations Performance (Continued)
  - Impairments
    - Number of impairments being kept low

Impairment Permits



Casey

Material Condition

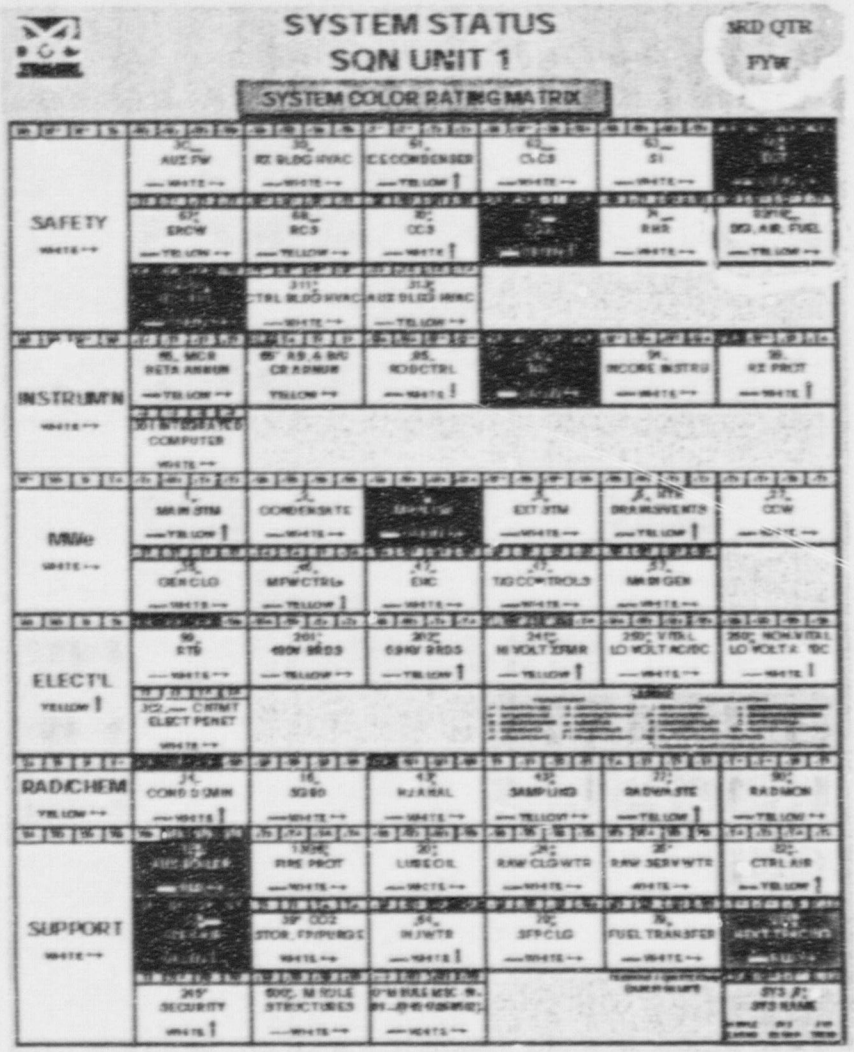
- Overall Plant Health
  - Unit 2 Outage Results
    - Targeted six "yellow" systems to be improved to "white" based on U2C8 outage results
      - Main Steam - steam dump drain system improvement
      - ✓ Heater Drains and Vents - No. 2 feedwater bypass to main condenser
      - ✓ Diesel Generator - governor actuator replacement
      - ✓ Main bank transformers and switchyard modifications
      - ✓ Chemical Volume Control System
      - ✓ 6.9kV boards
    - Electrical functional area changed from "yellow" to "white" based on system health improvements
    - RadCon/Chemistry functional area changed from "yellow" to "white" based on system health improvements
    - Operator workarounds - Priority 1 workarounds closed on Unit 2
    - All scheduled temporary alterations and temporary leak repairs cleared

Material Condition (Continued)

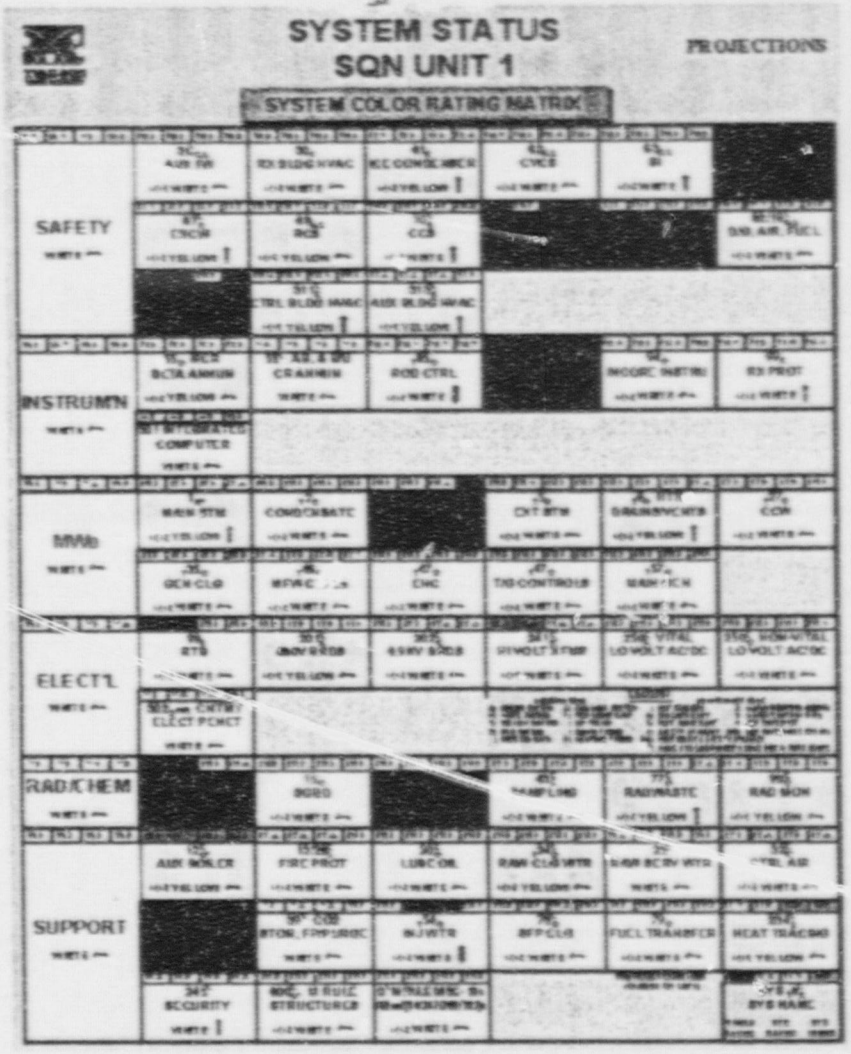
- Unit 1 and 2 Focus Areas
  - System health
  - Control room work requests
  - Corrective maintenance backlog
  - Operator workarounds/challenges
  - Catch containments
  - Temporary alterations
  - C-zone square footage

Material Condition
Unit 1 System Health Report

FY 1997 - 3rd Qtr

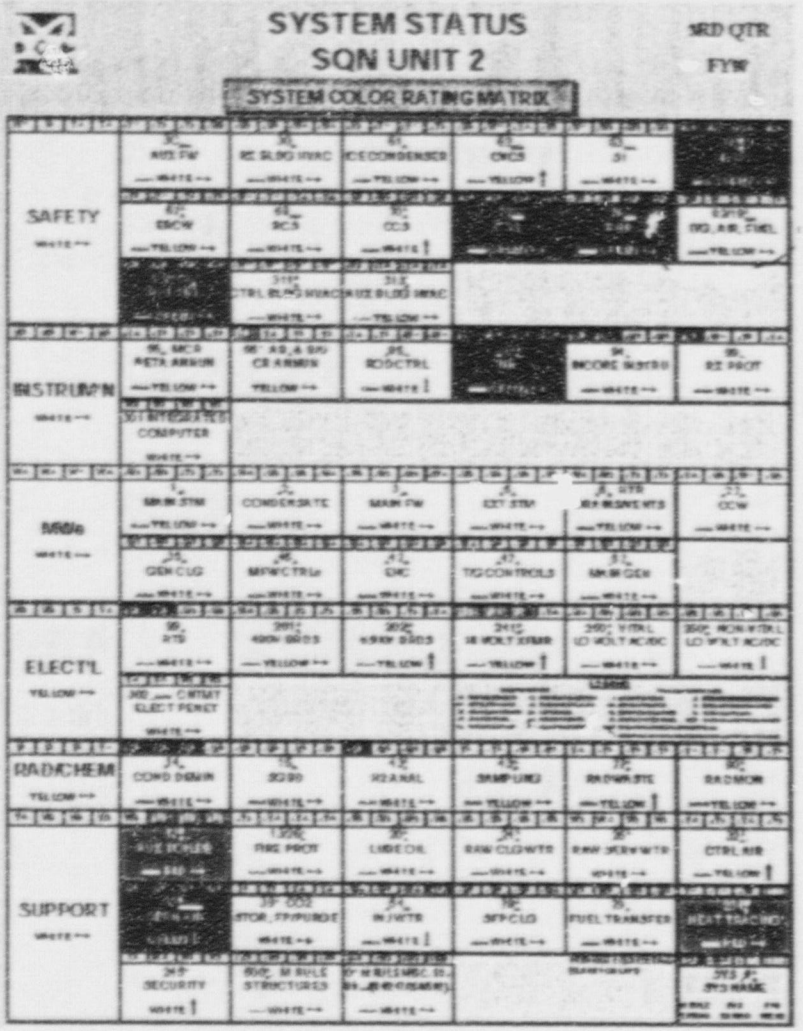


Projection

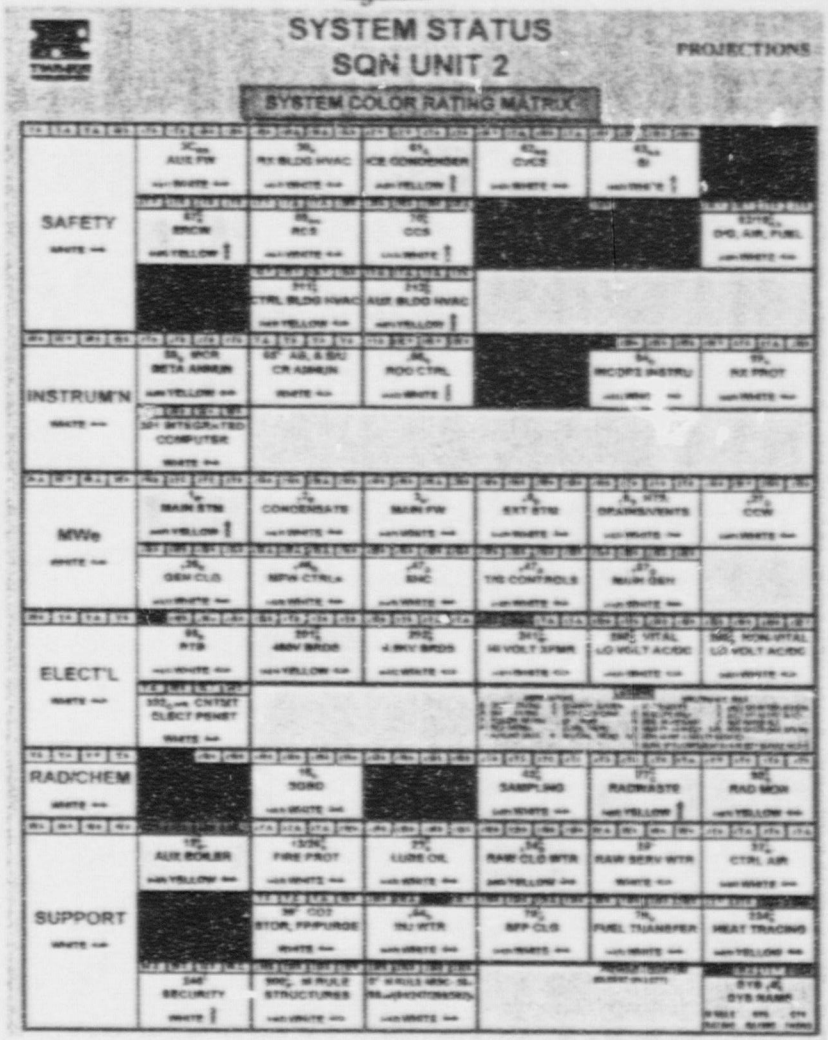


Material Condition
Unit 2 System Health Report

FY 1997 - 3rd Qtr

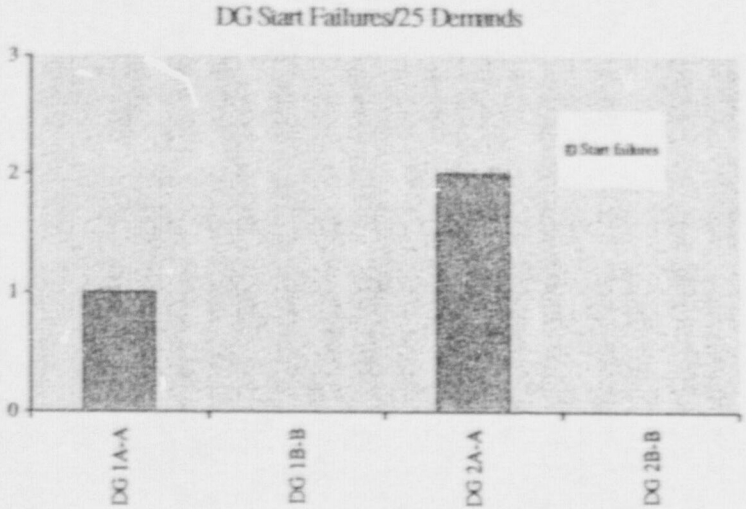


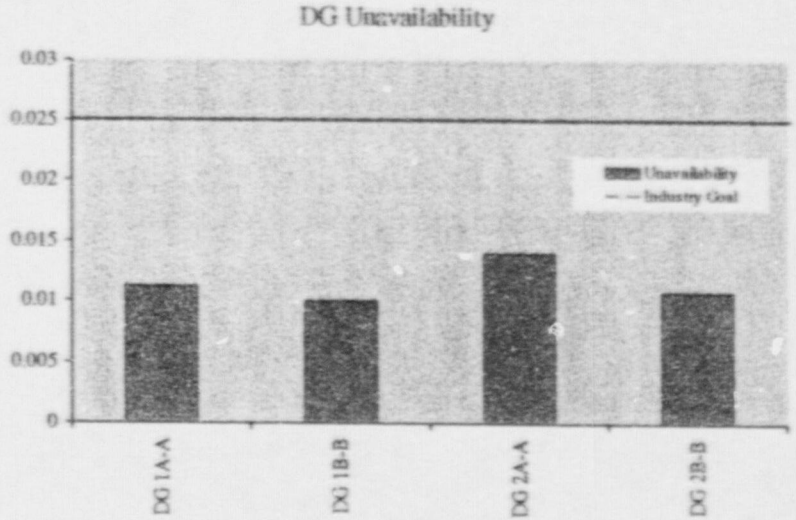
Projection



Material Condition
(Continued)

- Condition of Diesel Generator (D/G)
  - Unavailability is low
  - 2A-A D/G unavailability slightly above others, but well within industry goal
  - Low number of start failures per 25 demands
  - D/Gs considered strong performing system



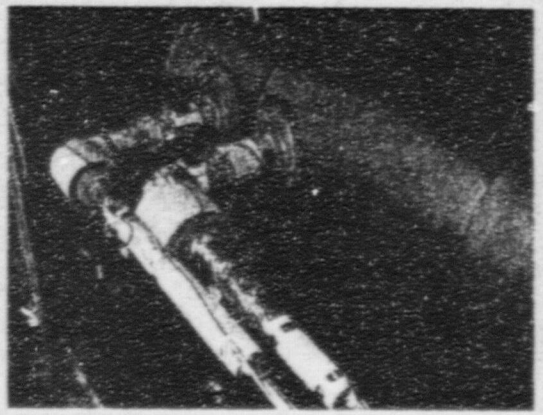


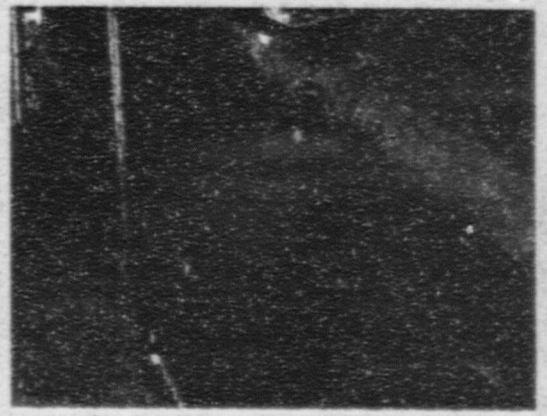
Koehl

Material Condition
(Continued)

- Freeze Protection Efforts
  - Modifications Completed
    - Four major DCNs implemented for heat trace, control circuits, and insulation resulting in approximately 4,500 feet of heat trace, 100 thermocouples, 320 splices, 1,500 feet of control wiring, 350 feet of conduit, and 1,500 feet of insulation. Implementation required approximately 11,000 man-hours to complete
      - Units 1 and 2 feedwater heat trace

Feedwater Flow Instrument Taps





Material Condition
(Continued)

- Freeze Protection Efforts (Continued)
  - Modifications Completed (Continued)
    - Fire Pumps No. 1A and 2B heat trace
    - Units 1 and 2 RWST heat trace
    - CCW screen heat trace
    - ERCW heat trace

Fire Pumps

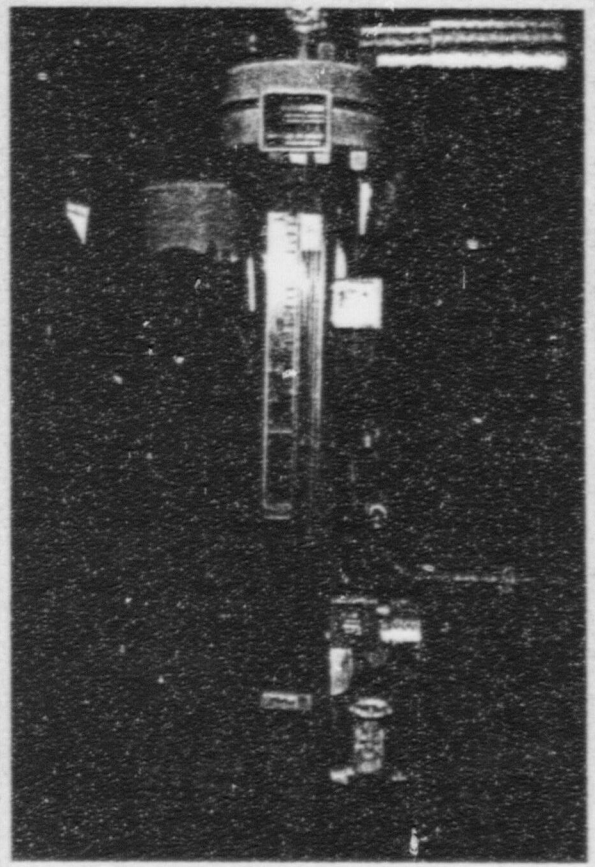
CCW Screen Wash Pumps

Material Condition (Continued)

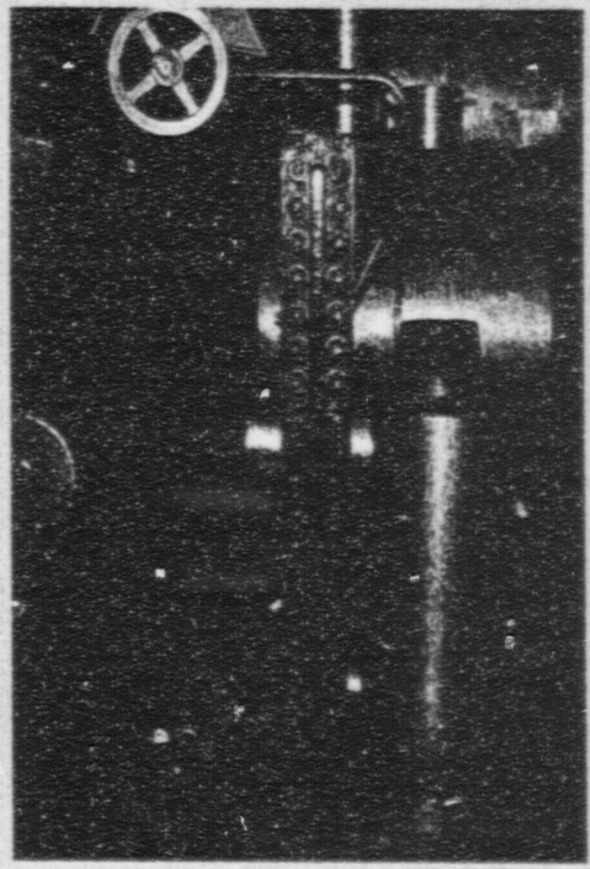
- Material Condition Improvements

MSR Level Gauge/Sight Glass

Unit 2



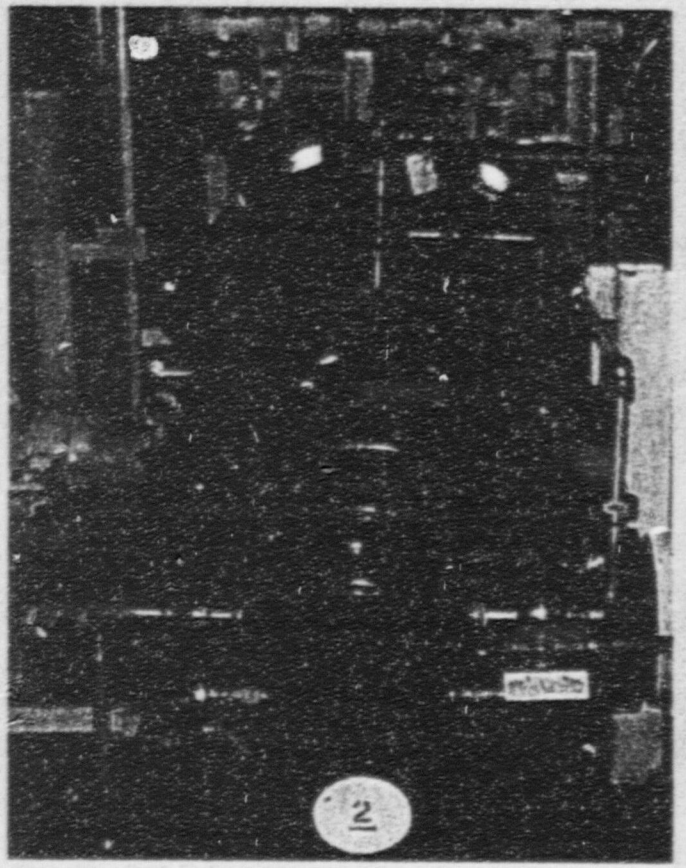
Unit 1



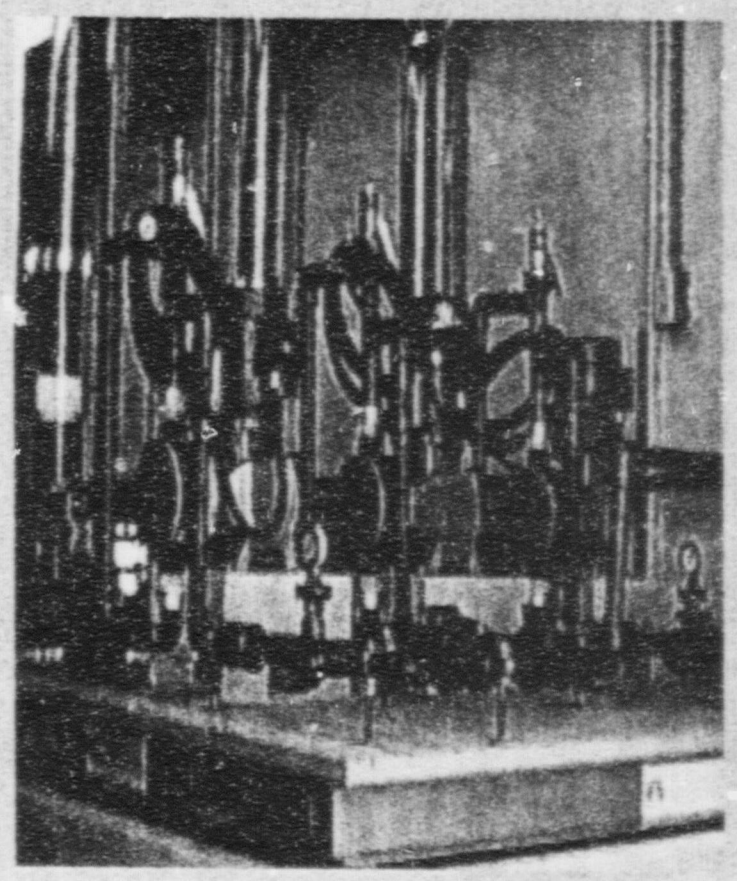
Material Condition (Continued)

- Material Condition Improvements

Unit 2 Motor Driven Auxiliary Feedwater Pump



ERCW Chemical Injection Pumps



Koehl

QA Overview

- Unit 2 Cycle 8 Outage Oversight Plan
  - Pre-outage coverage
  - Focused assessments
  - Dedicated activity owners (assessors)
  - Key projects, critical evolution, backshift activities
  - Defined methodologies
  - Separate outage report
  - Special status/clearance team
- Unit 2 Cycle 8 Outage Oversight Conclusions
  - Overall outage performance was very good
  - Positive management involvement
  - Outage planning was excellent
  - Maximum QA outage oversight time with only minor issues identified

Material Condition

- Overall Plant Health
  - Unit 2 Outage Results
    - Targeted six "yellow" systems to be improved to "white" based on U2C8 outage results
      - Main Steam - steam dump drain system improvement
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