SEPTEMBER 28, 1999

Florida Power and Light Company
ATTN: Mr. T. F. Plunkett
President - Nuclear Division
P. O. Box 14000
Juno Beach, FL 33408-0420

SUBJECT: MEETING SUMMARY - ST. LUCIE AND TURKEY POINT NUCLEAR PLANTS

Dear Mr. Plunkett:

This refers to the engineering meeting that was conducted at the NRC Region II Office at 1:00 p.m. on September 8, 1999, to discuss engineering issues at your St. Lucie and Turkey Point facilities. A list of attendees and a copy of your presentation handout are enclosed.

It is our opinion that this meeting was beneficial. We appreciate your update on the plant status and engineering issues at your facilities.

In accordance with Section 2.790(a) 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 meeting, please contact us.

Sincerely,

ORIGINAL SIGNED BY
ROBERT SCHIN FOR:

Kerry D. Landis, Chief
Engineering Branch
Division of Reactor Safety

Docket Nos. 50-335, 50-389, 50-250,
50-251
License Nos. DPR-67, NPF-16, DPR-31,
DPR-41

Enclosures: 1. List of Attendees
2. Licensee Presentation Handouts

cc w/encls: See Page 2

080011

IE45

cc w/encls:
J. A. Stall
Vice President
St. Lucie Nuclear Plant
6351 South Ocean Drive
Jensen Beach, FL 34957

R. G. West
Plant General Manager
St. Lucie Nuclear Plant
Electronic Mail Distribution

E. J. Weinkam
Licensing Manager
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John Gianfrancesco, Manager
Administrative Support & Special Projects
Florida Power & Light Company
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Mark Dryden
Administrative Support & Special Projects
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Rajiv S. Kundalkar
Vice President - Nuclear Engineering
Florida Power & Light Company
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M. S. Ross, Attorney
Florida Power & Light Company
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William A. Passetti
Bureau of Radiation Control
Department of Health
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Joe Myers, Director
Division of Emergency Preparedness
Department of Community Affairs
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(cc w/encls cont'd - See page 3)

(cc w/encls cont'd)
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Radiological Emergency
Planning Administrator
Department of Public Safety
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Metropolitan Dade County
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Distribution w/encls:
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K. Jabbour, NRR
PUBLIC

Distribution w/encls cont'd - See page 4:

Distribution w/encl w/encls cont'd:
U.S. Nuclear Regulatory Commission
ATTN: T. Ross
P. O. Box 6090
Jensen Beach, FL 34957-2010

U.S. Nuclear Regulatory Commission
ATTN: C. Patterson
9762 Southwest 344th Street
Florida City, FL 33035

OFFICE	RII:DRS	RII:DRP	RII:DRS				
SIGNATURE							
NAME	LANDIS	WERT					
DATE	9/24/99	9/27/99	9/ /99	9/ /99	9/ /99	9/ /99	9/ /99
COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: S:\DRS\STLTURSFUMMARY.WPD

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Florida Power and Light
Nuclear Engineering / NRC Interface Meeting

September 8, 1999

Region II

Atlanta, Georgia

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Agenda

• **Opening**	R. S. Kundalkar
• **Engineering Performance**	
– St. Lucie	C. R. Bible
– Turkey Point	D. J. Tomaszewski
• **Problem Solving / Root Cause Analysis**	
– St. Lucie Unit 1 Manual Reactor Trip on Low Condenser Vacuum	B. K. Dunn
– St. Lucie Unit 2 Rod Control Event	C. R. Bible
– Turkey Point HHSI System Gas Venting	A. T. Zielonka
– St. Lucie ECCS Piping	B. K. Dunn
– St. Lucie AFW Equipment Qualification	R. Noble
• **Self Assessment**	
– Fire Protection Assessment / Inspection	A. T. Zielonka
– St. Lucie System/Component Engineering	C. R. Bible
– Turkey Point Outage	D. J. Tomaszewski
• **Initiatives**	
– Steam Generator Program	R. D. Gil
– Turkey Point License Renewal	E. A. Thompson

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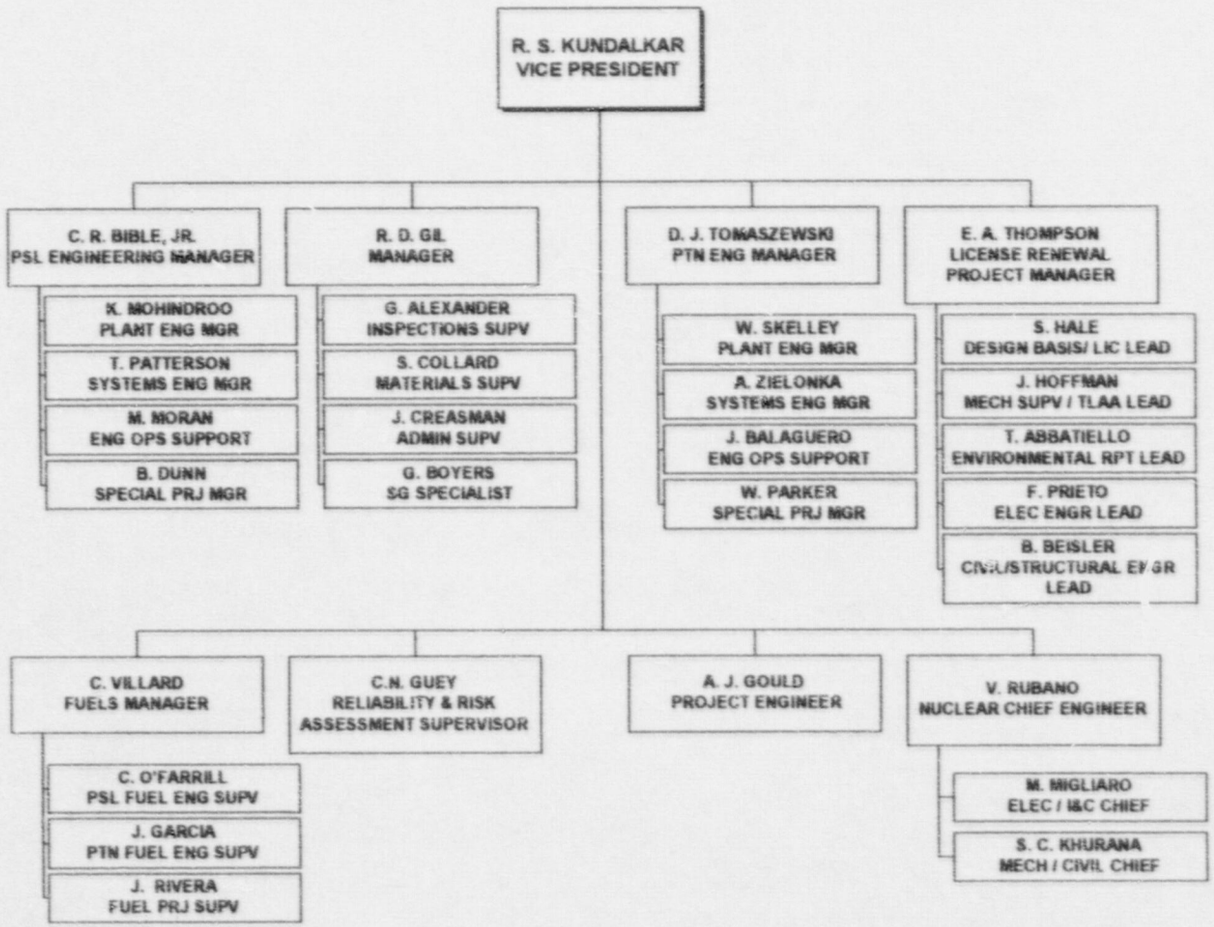
- Organization
- Corrective Action Program
- Cornerstones
- Self Assessments
- Y2K

R. S. Kundalkar

Vice President, Nuclear Engineering

Nuclear Engineering



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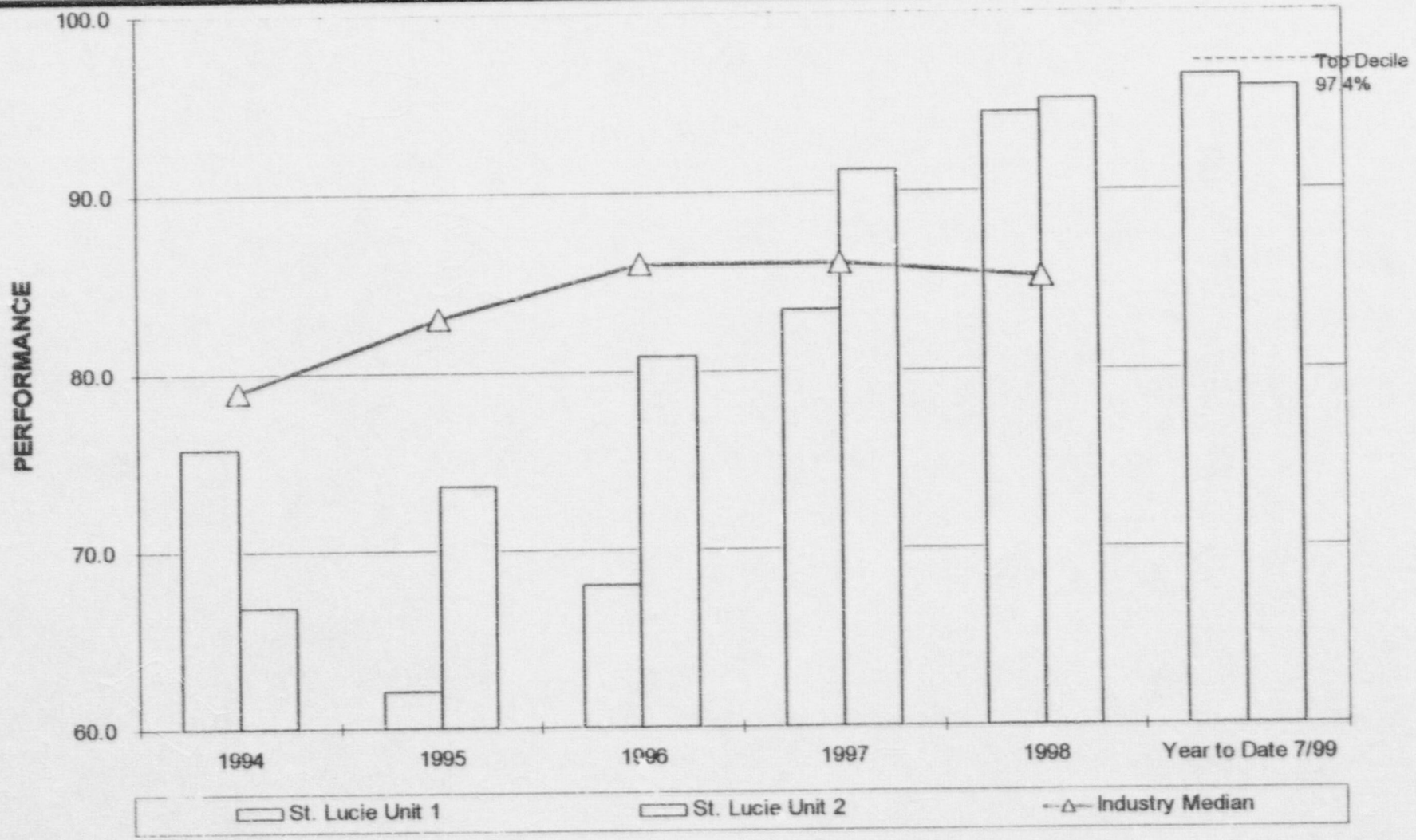
Engineering Performance

St. Lucie
Engineering

C. R. Bible
Engineering Manager

WANO Weighted Overall Performance

FPL



Engineering
FPL Department Indicators and Goals

Safety Focus				
Indicators		Goals		St. Lucie Actuals
		Green		
A.	Cited Violations	0	>2	0
B.	Non-Cited Violations	4	>12	1
C.	Quality Assurance Findings	0	2	0
D.	Reactivity Events	No Reactivity Events Due To Engineering	ECC >200 pcm or Engineering Error Reactivity Event	0
E.	Fire Impairments	On Schedule	Behind Schedule	Ahead of Schedule
F.	WANO Fuel Performance	≤ 5.0 E - 4	>5.0 E - 4	Unit 1 – 1.1 E-04 Unit 2 – 4.0 E-05
G.	OSHA Recordables	0	1	0
H.	Minor Injuries	≤2	>2	0
I.	Lost Time Accidents	0	>0	0

Engineering
FPL Department Indicators and Goals

Problem Identification and Correction				
Indicators		Goals		St. Lucie Actuals
		Green	Red	
A.	Self Assessment	1 Per Quarter	<1 Per 6 Months	2 Self Assessments
B.	Unplanned Plant Change Revisions	0 Revisions	≥2 Revisions	0 Revisions
C.	Drawing /Vendor Technical Manual / Total Equipment DataBase Changes	0 Late	≥6 Late	0 late
D.	Outage Plant Changes Issued on Time	Major Modfication Issued 6 Months Prior To Outage	Otherwise	0 late
E.	System Walkdown Program	>90% Walkdowns Complete	<70%	~80%
F.	Condition Reports	0 Late	>5 Late	0
G.	Condition Report Corrective Actions	< 450 By Year End	>500 By Year End	Trending to <450
		0 Late	>10 Late	41 Late

Engineering
FPL Department Indicators and Goals

Workforce Quality				
Indicators		**Goals**		**St. Lucie Actuals**
		Green	**Red**	
A.	Engineering Training Program	100%	<90%	100%
B.	Training Effectiveness	100% Attendance >95 % Pass Rate	<100% ≤95% Pass Rate	100% >95% Pass Rate
C.	Significant Human Performance Issues	0	>2	0
D.	Maintenance Rule Administration	Zero Untimely (a)(1) Classifications	>1	0
E.	System Engineer Qualification	100% Qualified	<80% Qualified	100%
		Qualify 5 System Experts	Off Plan	Behind But Recoverable
F.	ALARA	>5% Under Budget	>5% Over Budget	167 Mr
G.	Quality of Real Time Support	0 Perceived Deficiencies	>2 Deficiencies	1 Deficiency

Engineering
FPL Department Indicators and Goals

Cost Performance

Indicators		Goals		St. Lucie Actuals
		Green	Red	
A.	Unit Availability	Unit 1 >85.81% Unit 2 >94.97%	>1.0% Off Target	Both Units On Target To Meet Goal
B.	Budget Performance	-2% Deviation	≥0% Deviation	-3.0%
C.	Thermal Performance Indicator	>99.7%	<99.5%	99.8%
D.	Fuel Cost	≤0.45¢/kw	>0.47¢/kw	0.43¢/kw
E.	Refueling Outage	< 30 Days	>30 Days	U1 Outage September '99
F.	Procurement Engineering Cost Avoidance	>$5M	<$4M	
G.	Preventive Maintenance Change Requests	Acceptable Trend	Unacceptable Trend	Backlog Decreasing

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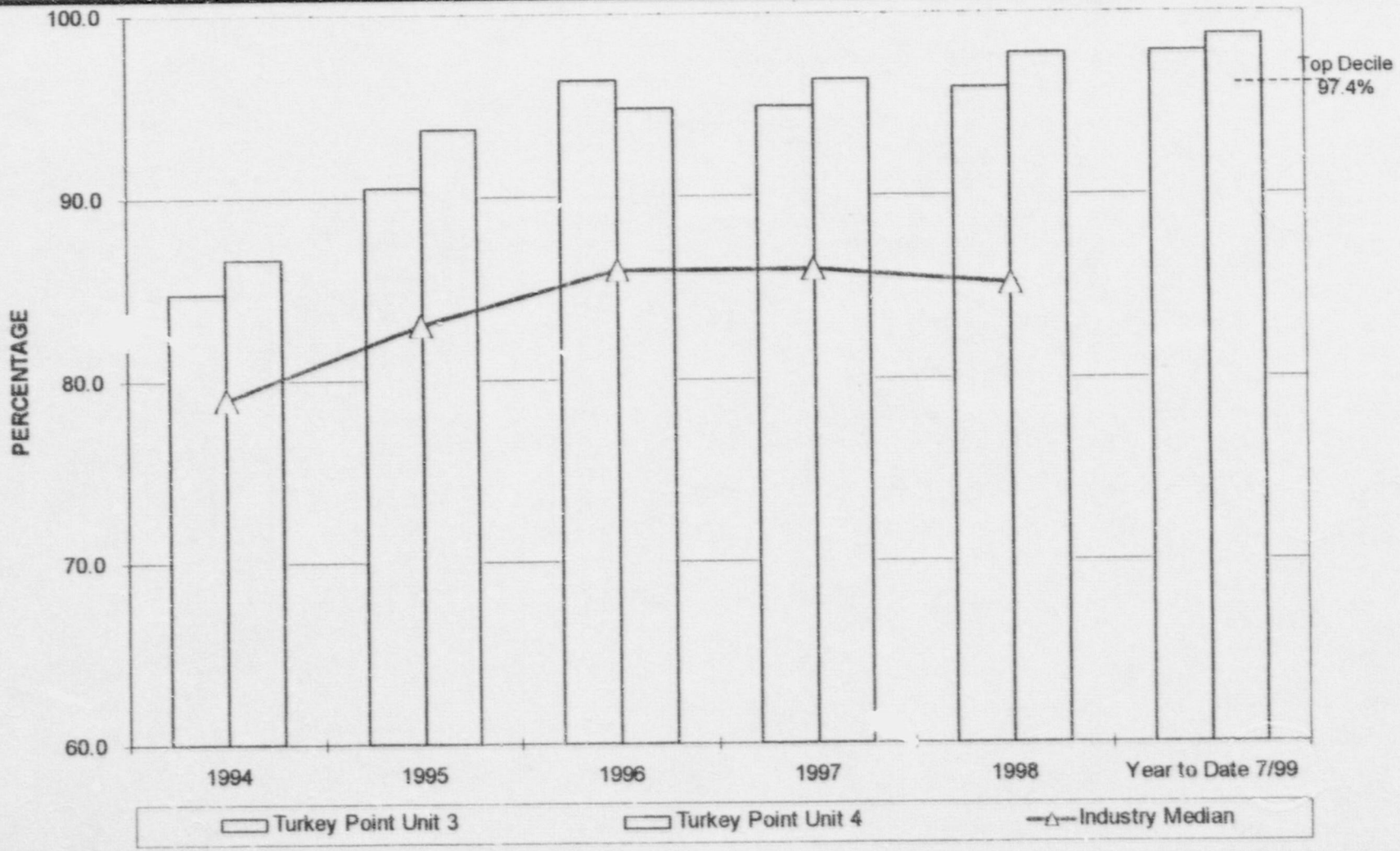
Engineering Performance

Turkey Point
Engineering

D. J. Tomaszewski
Engineering Manager

WANO Weighted Overall Performance



Engineering
FPL Department Indicators and Goals

Safety Focus				
Indicators		**Goals**		**Turkey Point Actuals**
		Green	[illegible]	
A.	Cited Violations	0	>2	0
B.	Non-Cited Violations	4	>12	1
C.	Quality Assurance Findings	0	2	0
D.	Reactivity Events	No Reactivity Events Due To Engineering	ECC >200 pcm or Engineering Error Reactivity Event	0
E.	WANO Fuel Performance	≤ 5.0 E -4	>5.0 E -4	Unit 3 – 4.91 E-04 Unit 4 – 5.97 E-05
F.	OSHA Recordables	0	1	0
G.	Minor Injuries	≤2	>2	1
H.	Lost Time Accidents	0	>0	0
I.	ALARA	<3.75 Rem	>4.5 Rem	[illegible]

Engineering Department Indicators and Goals

Problem Identification and Correction				
Indicators		Goals		Turkey Point Actuals
		Green	[illegible]	
A.	Self Assessment	1 Per Quarter	<1 Per 6 Months	2 Self Assessments
B.	Unplanned Plant Change Revisions	0 Revisions	≥2 Revisions	0 Revisions
C.	Drawing/Vendor Technical Manual / Total Equipment DataBase Changes	0 Late	≥6 Late	0 Late
D.	Outage Plant Change Issued on Time	Major Modifications issued 6 Months Prior To Outage	Otherwise	0 Late
E.	System Walkdown Program	>90% Walkdowns Complete	<70%	75%
F.	Condition Reports	0 Late	>5 Late	0
G.	Condition Report Corrective Actions	<200 Total	>300 Total	279 Total
		0 Late	>10 Late	[illegible]

Engineering
FPL Department Indicators and Goals

Workforce Quality				
Indicators		Goals		Turkey Point Actuals
		Green	[illegible]	
A.	Turnovers/Vacancies	≤3	>11	4 Turnovers
B.	Engineering Training Program People Not Started Initial Training Within 12 Months Of Hire Date	≤1	>5	3
C.	SRO Training For Supervisor	≥80% Certified	<50% Certified	66%
D.	System Engineer Qualification	100% Qualified	<80% Qualified	95%
		50% Qualified On Backup System	<25%	58%
E.	Backup STA Availability	≥3 Qualified	0 Qualified	2 At Year's End

Engineering
FPL Department Indicators and Goals

Cost Performance				
Indicators		Goals		Turkey Point Actuals
		Green		
A.	Unit Availability	Unit 3 ≤95% Unit 4 ≤85%	Unit 3 <95% Unit 4 <85%	Unit 3 – 98.6 Unit 4 – 88.2
B.	Thermal Performance Indicator	>99.70%	<99.4%	Unit 3 – 99.9% Unit 4 – 99.9%
C.	Fuel Cost	≤0.45¢/kw	>0.47¢/kw	.43¢/kw
D.	Refueling Outage	On time/under budget	Over budget or over scheduie	23 days/ 20:57 Hrs:Min Under Budget
E.	Procurement Engineering Cost Avoidance	>$5M	<$4M	$2.9M to date

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Problem Solving
Root Cause Analysis

St. Lucie Unit 1 Manual Reactor Trip on Low Condenser Vacuum

B. K. Dunn

Special Projects Manager

St. Lucie

St. Lucie Unit 1
Manual Reactor Trip

- Unit 1 on line for 545 Days
- On 8/23/99, Unit 1 was manually tripped

  1234: D-24 Alarm received "Gland Steam Hi/Lo Pressure"

  1236: D-13 Alarm received "Turbine Vacuum Low"

  Vacuum was 5.0" Hg and rapidly increasing

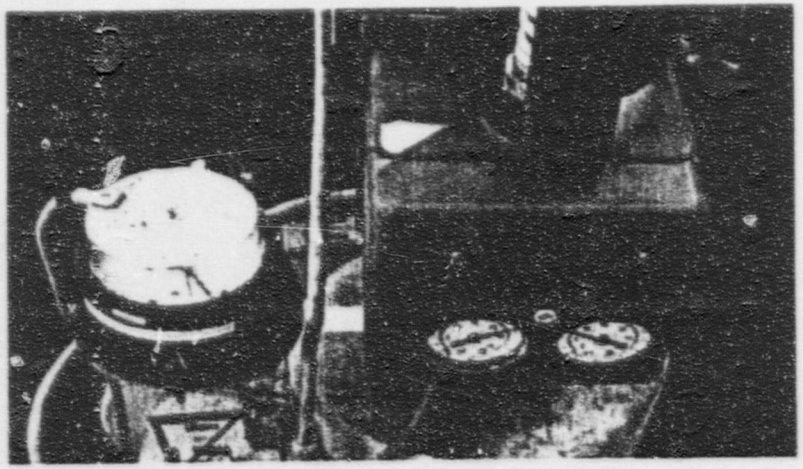
  1236: Manual Reactor Trip at 5.5" Hg condenser vacuum
- All safety systems performed as expected
- Two (2) non safety related anomalies

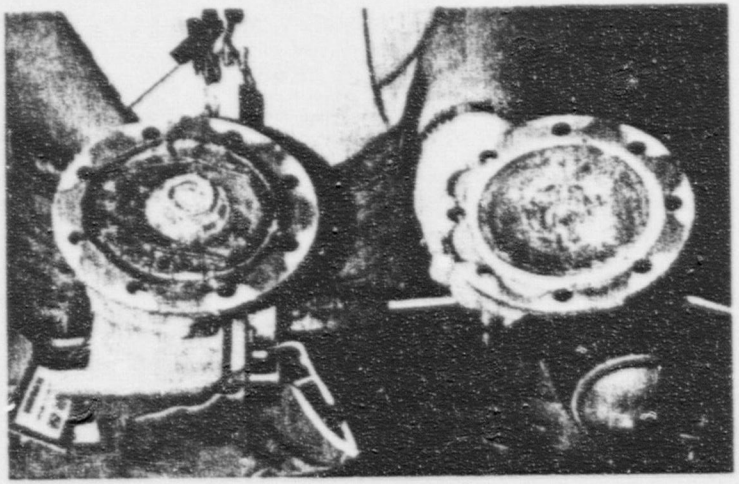
  Condensate recirculation valve did not open as expected

  6.9kV bus did not transfer from auxiliary to start up transformer

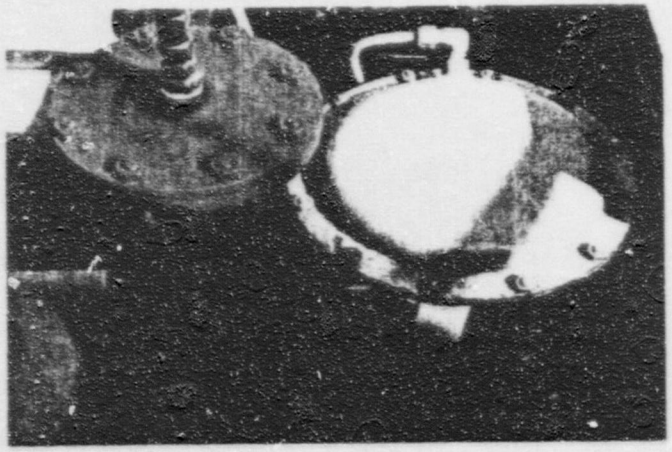
St. Lucie Unit 1
Manual Reactor Trip

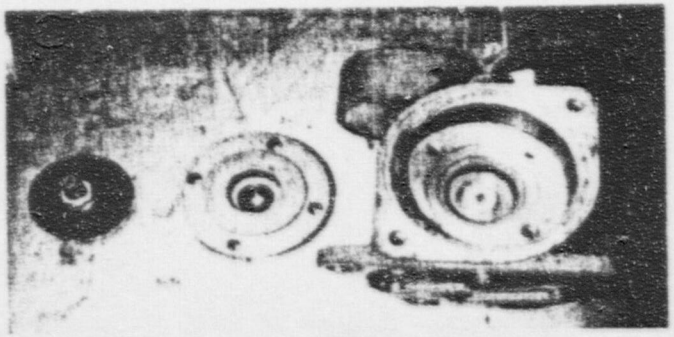
Gland Steam Regulator





Actuator: Dirt and corrosion byproducts present





Pilot Regulator Nozzle : Powdery dirt found in supply port. Vent nozzle found binding due to dirt.

St. Lucie Unit 1
Manual Reactor Trip

Low Condenser Vacuum

- Gland steam regulator failed, causing loss of low pressure turbine gland steam
- Pilot regulator malfunctioned due to plugged port
- Root cause is inadequate preventive maintenance (PM) on pilot regulators.
- Corrective Actions:
  - Replaced the failed pilot assembly (complete)
  - Inspected/tested all other Unit 1 gland steam regulators (complete)
  - Inspect/test Unit 2 gland steam regulators
  - Develop PM program for gland steam regulators for both units

St. Lucie Unit 1
Manual Reactor Trip

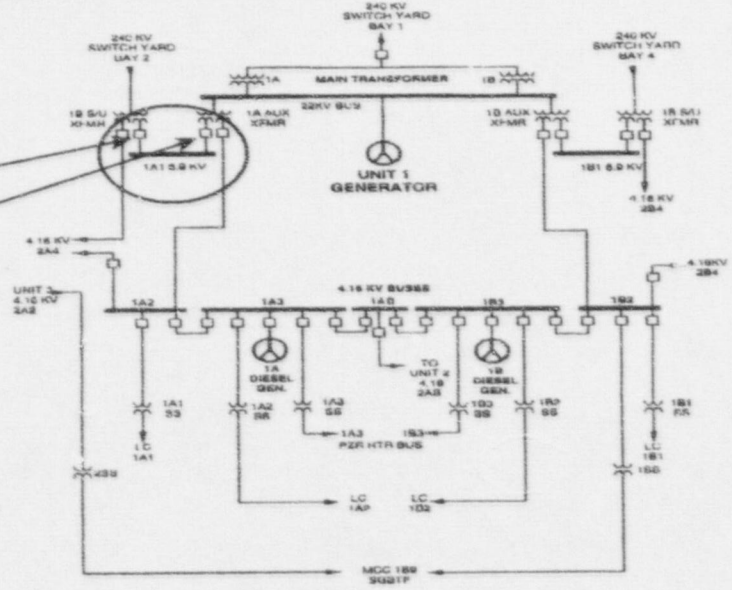
Condensate Recirculation Valve

- Valve failed to open causing a minor secondary side transient
- Results of troubleshooting:
  - Regulator providing 27 psig (50 psig required for proper operation)
  - Regulator was found to be in good condition - 1995 manufacture date
  - Cause of the inadequate pressure setting is not known, however vibration affecting the setting is a potential cause
- Corrective Actions
  - Replaced air regulator (complete)
  - Adjusted valve per plant procedure; no problems noted (complete)
  - Performed static and dynamic diagnostic checks (complete)
  - System Engineer will monitor air regulator setting for drift

St. Lucie Unit 1
Manual Reactor Trip

Loss of Non Safety 6.9KV BUS

- Sequence of Events
  - 3 of 4 busses transferred as required after trip
  - Startup feeder breaker to 1A1 bus closed
  - Auxilary feeder breaker to 1A1 bus failed to open
  - Generator remained connected to grid through 1A1 bus
  - At 4-1/2 seconds, startup feeder breaker to 1A1 bus tripped on over current (expected due to generator connection)
  - Power lost to 1A Feedwater Pump and the 1A1 and 1B2 Reactor Coolant Pumps



- No equipment damage as a result of the trip
- Apparent cause was control circuit discontinuity (two loose connections found at relay termination)
- Corrective Actions
  - Verified all terminations on associated relays to be tight (complete)
  - Performed multiple tests to simulate transfer functions and verify opening of the aux feeder breaker (complete)
  - Replaced the aux feeder breaker with spare breaker (complete)
  - Currently evaluating inspection program for relay connections

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Problem Solving
Root Cause Analysis

Rod Control Events at St. Lucie

Manual Reactor Trip due to CEDMCS

C. R. Bible

Engineering Manager

St. Lucie Unit 2 - Manual Reactor Trip due to CEDMCS

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Time Line

May 25:

- 5 Control Element Drive Mechanisms (CEDMs) transferred to lower grippers, trouble alarms received in the control room
- Root Cause Team formed. Troubleshooting plan developed

June 1:

- CEA 40 spuriously dropped into core, power reduced as required by license, CEA retrieved following troubleshooting
- Event Response Team (ERT) formed, involves all Plant Departments
- Coil traces indicated anomalies at several coils

June 3:

- ERT specified replacement of Subgroup 21 power switch

June 4:

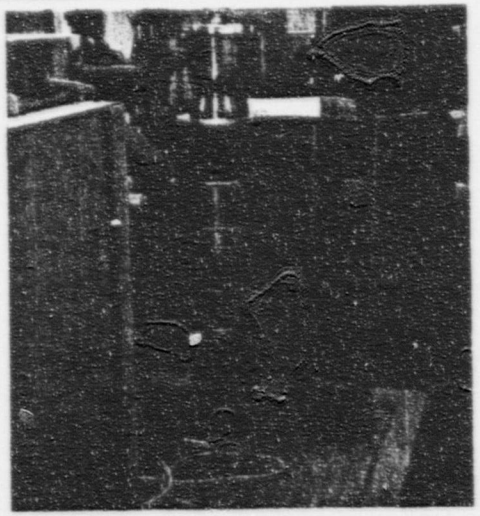
- Power Switch 21 (PS) replacement and troubleshooting - two successful transfers from control rod hold bus - rods dropped on third transfer.
- Operations performed a ***manual trip*** of the reactor.

June 11:

- Unit returned to service following repairs to CEDMCS.

Control Element Drive Mechanism

(Training mock-up)



Unit 2 CEDMCS Room

St. Lucie Unit 2 - Manual Reactor Trip due to CEDMCS

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Root Causes

Reactor Trip:

- Replacement PS not seated into back plate
- Inadequate PS installation procedure.
- Blind transfer from hold bus was contributing factor.

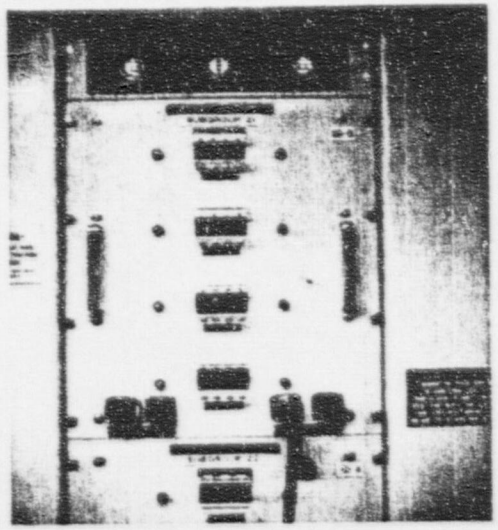
CEDMCS Alarms and Rod Drops:

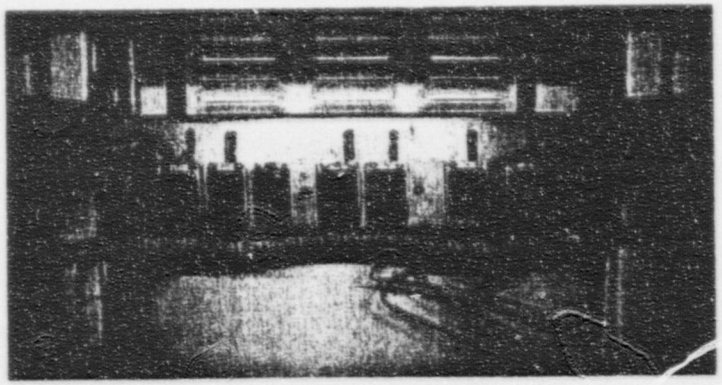
- Phase-to-ground shorts found in PS 9, 21.
- Failed Mylar washer (PS-21).
- Anomalies (PS-9).

Corrective Actions prior to Unit Restart

- Replaced PS-9, 21.
- Successful Megger test of CEDMCS.
- All coil traces verified to be acceptable.

Power Switch 21 Panel





Power Switch back plate - view looking into cabinet with power switch removed

St. Lucie Unit 2 - Manual Reactor Trip due to CEDMCS

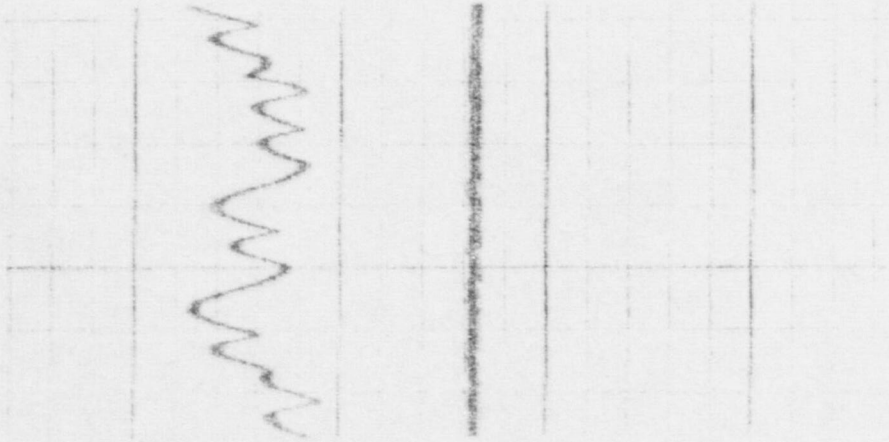
Key Corrective Actions:

1. Enhanced procedure for installing power switches

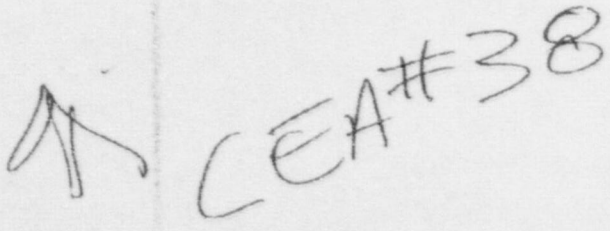
2. Megger test CEDMCS to detect grounds during Refueling Outages

3. Perform Coil checks of 25% of CEA's during quarterly FLCEA tests

St. Lucie Unit 2 - CEDMCS - Comparison of Coil Traces



CEA #38 As-found condition shows an erratic upper gripper coil waveform caused by a missing phase in the power switch.



CEA #38 After repairs. Upper gripper coil trace shows a waveform balanced between the three phases. There are no indications of noise superimposed on the signal.

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Problem Solving
Root Cause Analysis

Turkey Point
HHSI System Gas Venting

A. T. Zielonka

Systems Engineering Manager

Turkey Point

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Turkey Point HHSI System Gas Venting

- HHSI Pump Gas Intrusion
  - On 1/5/99, the 4B HHSI Pump failed to develop normal discharge pressure.
  - Root cause analysis performed. Potential causes evaluated:
    - Suction obstruction
    - Mechanical/Motor/Valve failures
    - Gas Intrusion Paths

Turkey Point HHSI System Gas Venting

- Root Cause: Minor leakage through multiple valves over a long period of time

- Corrective Actions
  - Vented pumps weekly
  - Cut/cap test line during spring refueling outage

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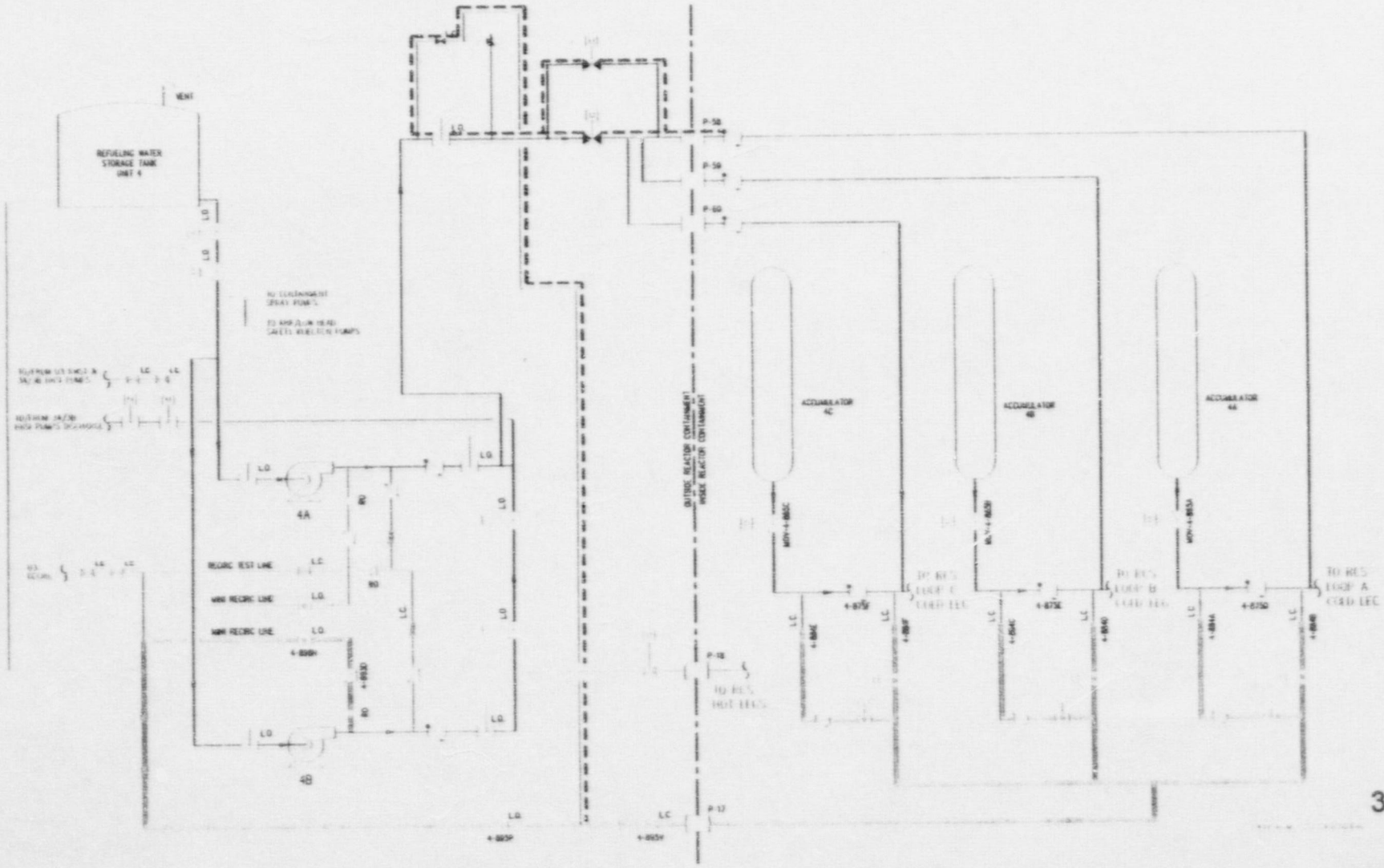
Turkey Point HHSI System Gas Venting

- After spring refueling outage
  - Operator detects warm pipe on one cold leg injection line
  - Checked for gas - Increased sensitivity due to previous experience
  - Venting header daily - Minor gas being detected
  - Overhaul suspect valves during outage of sufficient duration

Turkey Point HHSI System Gas Venting



Problem Solving
Root Cause Analysis

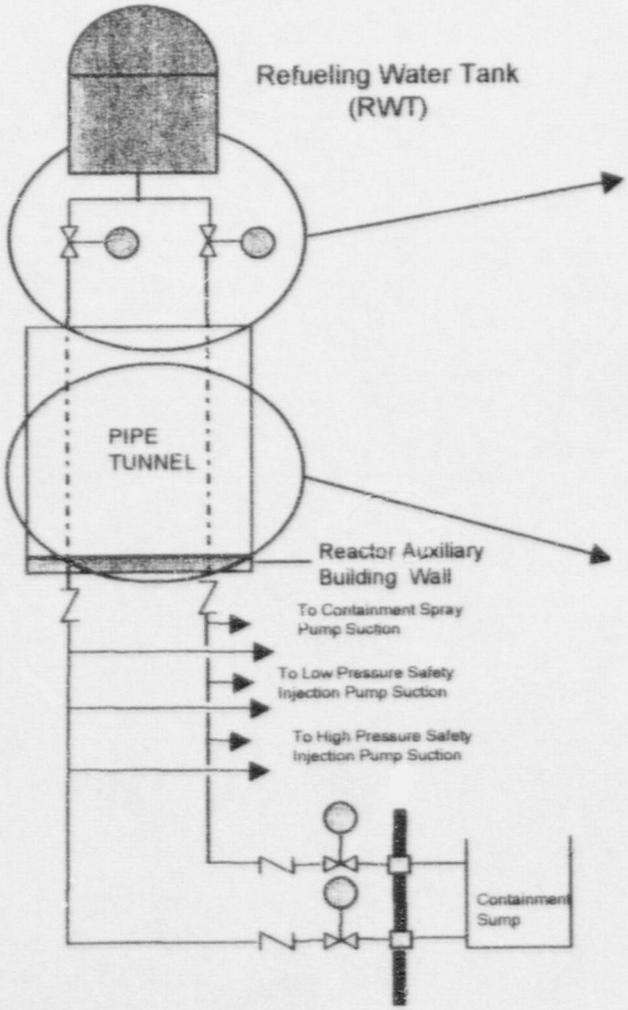
St. Lucie - ECCS Piping

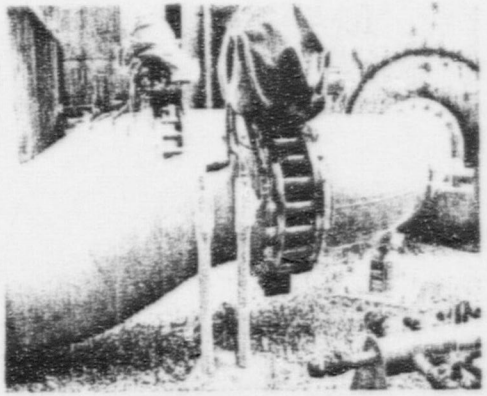
B. K. Dunn

Special Projects Manager

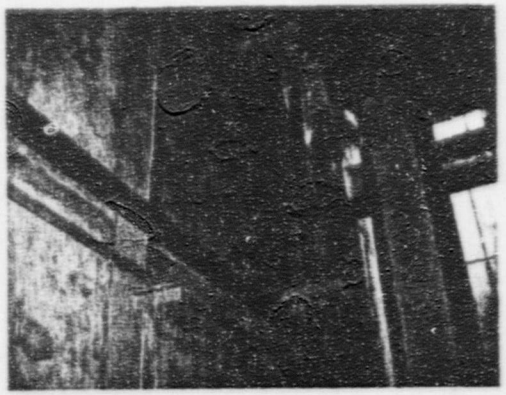
St. Lucie

St. Lucie ECCS Piping

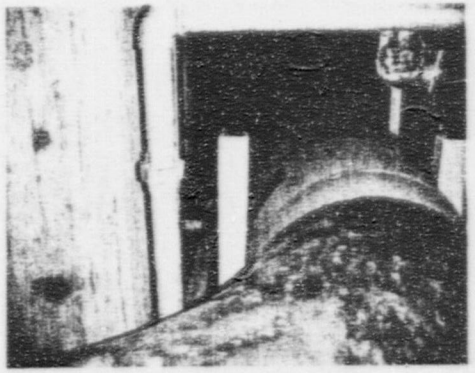




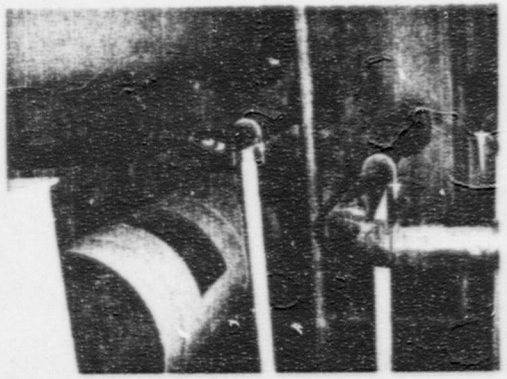
24" ECCS PIPE FROM RWT TO PIPE TUNNEL



24" ECCS PIPE ENTERING PIPE TUNNEL



24" ECCS PIPE IN PIPE TUNNEL



24" ECCS PIPE EXITING PIPE TUNNEL
AT RAB EAST WALL

St. Lucie ECCS Piping

- **Unit 1 (1996)**
  - Indication of "through wall leak" on 24" line at circumferential weld
  - Minor leakage, NO SAFETY SIGNIFICANCE
  - Defect removed and branch connection installed to arrest leak
  - Failure mechanism - stress corrosion cracking
  - Expanded inspection to include applicable circumferential welds
  - Applied protective coating to circumferential welds

- **Unit 2 - Refueling Outage (1998)**
  - Inspected numerous welds on 24" line
  - One minor indications removed (buffed out) and two branch connections installed
  - ASME Flaw evaluation completed for continued operation

- **Unit 2 Cycle 11 Operation (1999)**
  - Leak identified in March, branch connection installed
  - In April leaks discovered on both 24" lines
  - Relief request submitted to NRC for continued operation to prepare for repairs
  - Branch connections installed on both ECCS lines
  - Applied protective coating to all circumferential welds

St. Lucie ECCS Piping

- **Unit 2 Replacement Plan**
  - Replace piping during Spring 2000 refueling outage
  - Install more corrosion resistant material
  - Installation duration of 26 days at a cost of approximately $1.7 million
- **Unit 1 Inspection Plan / Contingencies**
  - No new leaks identified since 1996
  - Continue enhanced inspection frequency
  - Fall 1999 Refueling Action Plan
    - Inspect 2 circumferential welds and compare results to initial inspection
    - Remove 2 supports and inspect piping surface
    - Materials for pipe repairs are available, if required

FPL

Self Assessment

Fire Protection Assessment/Inspection

A. T. Zielonka

Systems Engineering Manager

Turkey Point

Fire Protection Status
St. Lucie Plant

- 1999 Targeted to Complete
  - Unit 1 & 2 Emergency Lighting Upgrades
  - Unit 1 & 2 Hose Station Additions
  - Unit 1 SSA Circuit Modifications (Outside Containment)
  - Fire Impairment Reductions
  - Detection/Suppression System Engineering Reviews

Fire Protection Status
St. Lucie Plant

- 2000/2001 Scope of Work
  - Unit 1 Containment SSA Circuit Modification
  - Unit 2 SSA Circuit Modifications
  - Detection/Suppression System Reviews and Modifications
  - Fire Impairment Reductions

Fire Protection Status
Turkey Point Plant

- Thermo-Lag Upgrades Proceeding as scheduled. Completion in 2001.
- Fire Protection Self Assessment
  - Following NRC TI Format
  - 85% complete
  - 85 Potential Discrepancies Identified
    - 48 Minor Procedure and/or Drawing Errors
    - 18 Program Discrepancies
    - 19 Enhancements/Not Discrepant Conditions

Fire Protection Status
Turkey Point Plant

- Fire Protection Self Assessment (Cont'd)
  - No Safe Shutdown/Operability Issues
  - Condition Reports to Address Discrepancies
  - Final Report due September 30, 1999

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Self Assessment

St. Lucie System / Component Engineering (SCE)

C. R. Bible

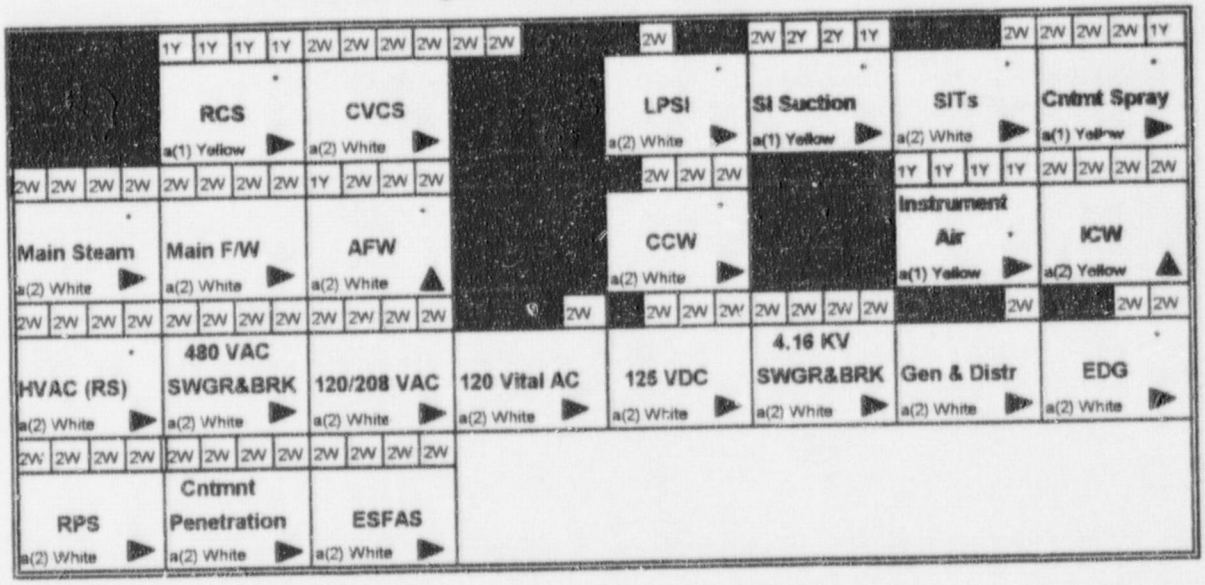
Engineering Manager

St. Lucie
SCE Performance

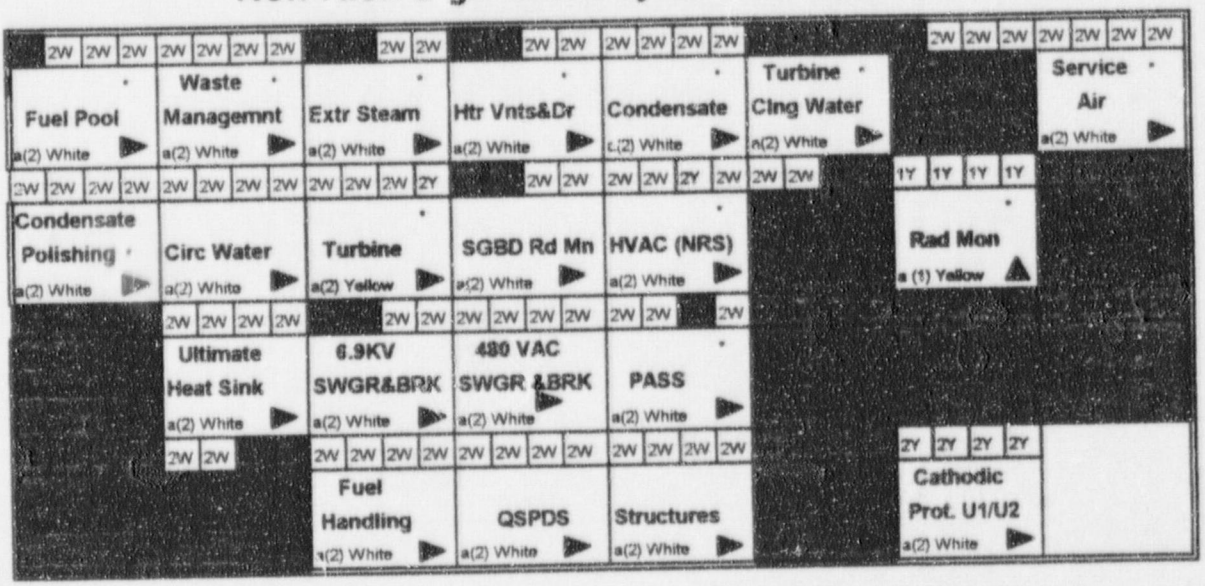
- Prior to 1996, System Engineering Group was small
- Since then have implemented a number of enhancements:
  - Upgraded System Engineering Procedures, incorporating INPO recommended practices
  - Preventative maintenance review process enhanced
  - SCE Hot Items database in Lotus Notes
  - Upgraded training program for System and Component Engineers. Progressive process from plant introduction to system expert
  - Developed System Health Window report which has played a key role in improved system reliability

UNIT 1 SYSTEM STATUS 2nd QUARTER 1999

Risk Significant Systems Status



Non-Risk Significant Systems Status



ABBREVIATIONS

G: Green Rating
W: White Rating
Y: Yellow Rating
R: Red Rating

▲ Up Trend
▶ Neutral Trend
▼ Down Trend

*Classification under review by Expert Panel

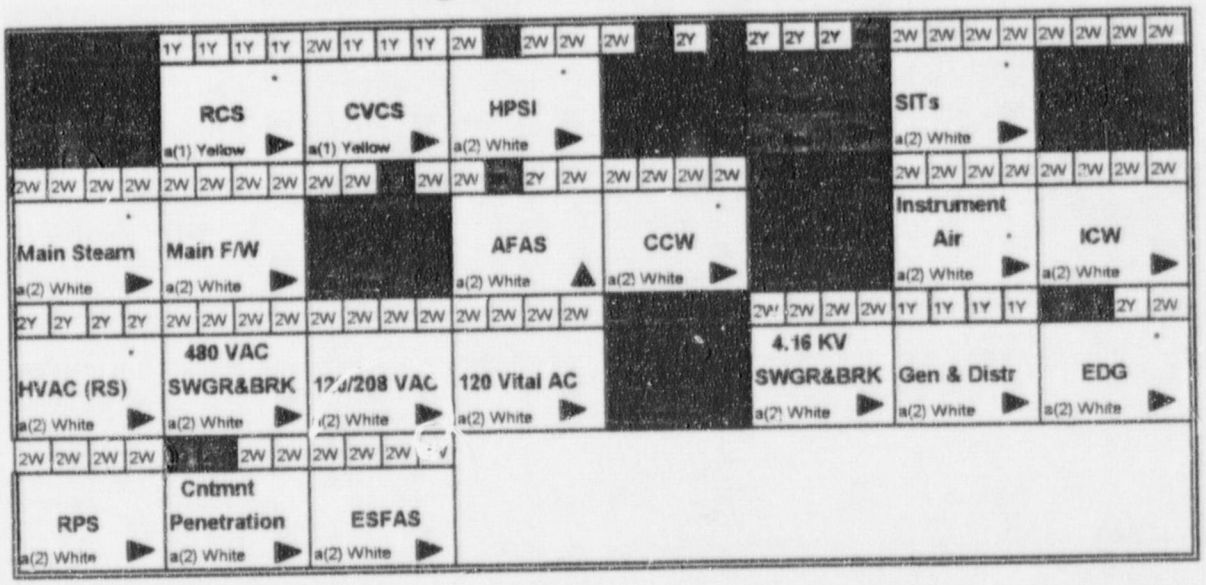
MAINTENANCE RULE

RS: Risk Significant
NRS: Non Risk Significant
a(2): MR Rating Acceptable
a(1): MR Rating Unacceptable

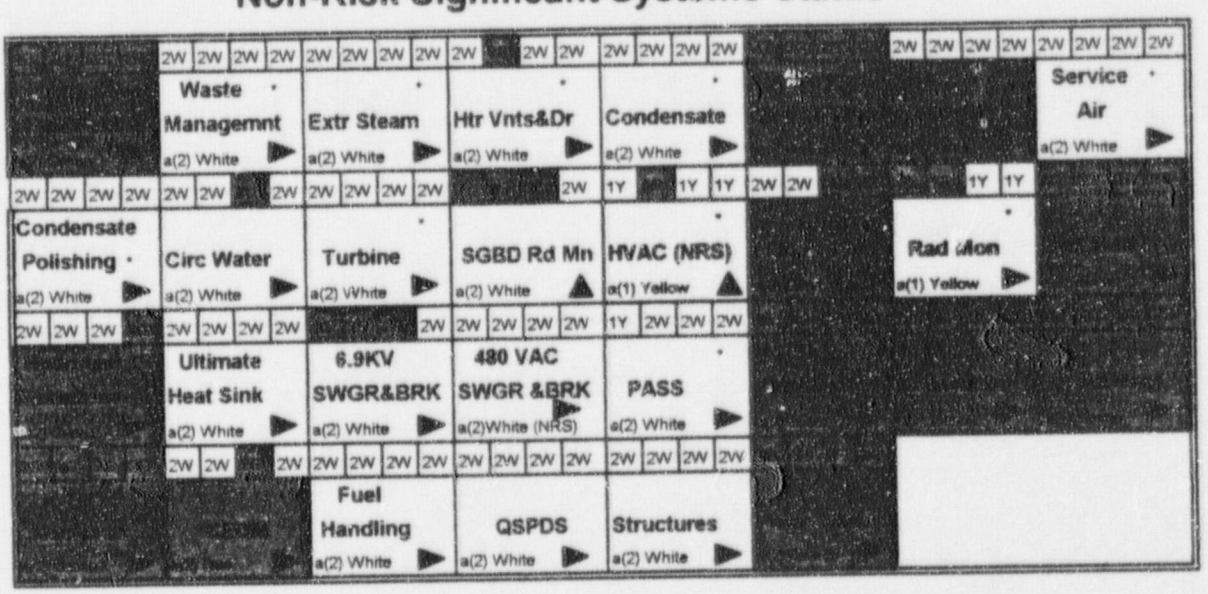
2W 1Y
SYS NAME
MR Rating/Color

UNIT 2 SYSTEM STATUS 2nd QUARTER 1999

Risk Significant Systems Status



Non-Risk Significant Systems Status



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MAINTENANCE RULE

RS: Risk Significant
NRS: Non Risk Significant
a(2): MR Rating Acceptable
a(1): MR Rating Unacceptable

St. Lucie
SCE Performance

- Self Assessments related to SCE activities include:
  - INPO Assist visits
  - Preventative Maintenance program
  - Event Response Team (ERT) effectiveness
  - SCE effectiveness in meeting expectations
- SCE has matured as evidenced by improved equipment reliability
- Additional process enhancements needed to ensure focus on the highest priority activities
- Communications is an area for further improvement

Turkey Point Outage Performance

D. J. Tomaszewski

Engineering Manager

Turkey Point

FPL

Turkey Point Unit 4 Outage Self Assessment

- Engineering Performance
  - Safety
  - Work Quality
- Future Improvements

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Outage Safety

- Pre-Outage Risk Review
  - Two Trains of Shutdown Cooling
  - Delayed start of Emergency Diesel Inspections
  - No reduced inventory
  - Active PSA Review
- Increased Awareness Tools
  - Second Item in Plan of the Day after Industrial Safety

FPL

Outage Safety

- Full Core Off-Load
  - Insert Shuffle in Spent Fuel Pit
  - Shutdown Cooling Work performed when no fuel was in the Reactor

Work Quality

- Modifications - 18 Modifications
  - 12 Regulatory/Corrective Action items
  - 6 Economic/Reliability Upgrades
  - No Unplanned Revisions
  - Minimum number of minor changes
- Improved Processes
  - ALARA Focus
    - Lift Rig
    - Risk Informed ISI

Work Quality

- Improved Processes (Cont'd)
  - Cross Under Repairs
  - Computerized Radiography
  - Low Power Physics Testing
  - Core Mapping
  - Power Ascension

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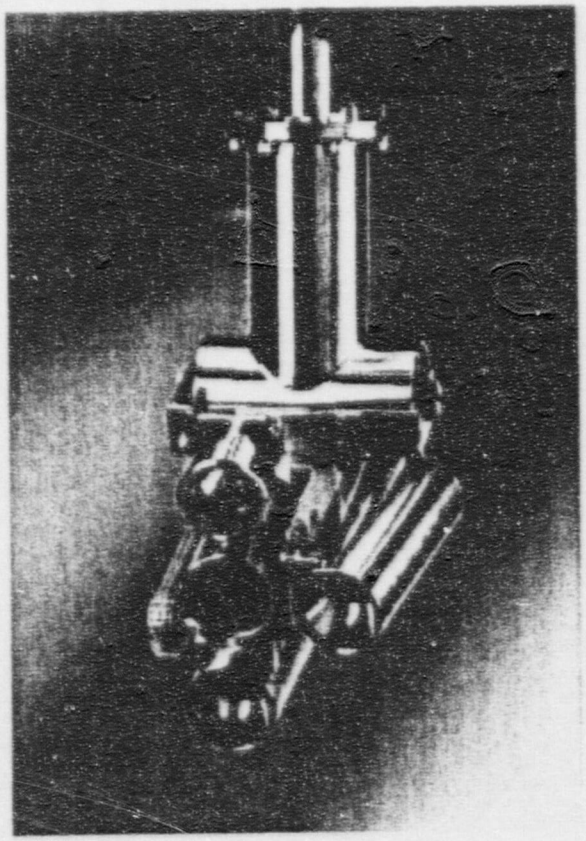
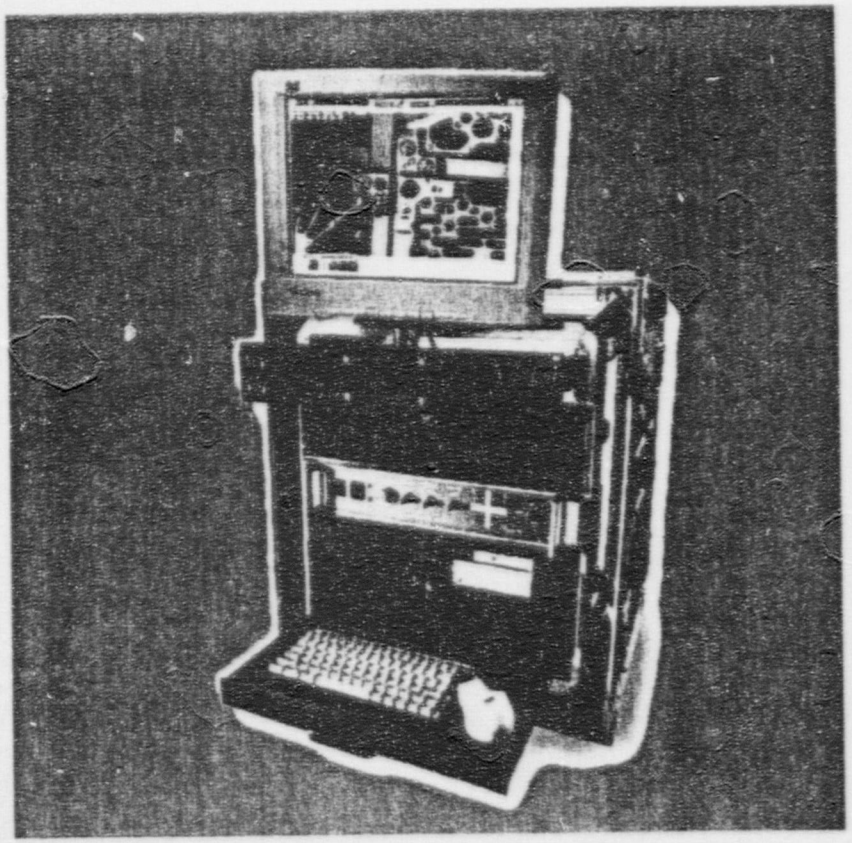
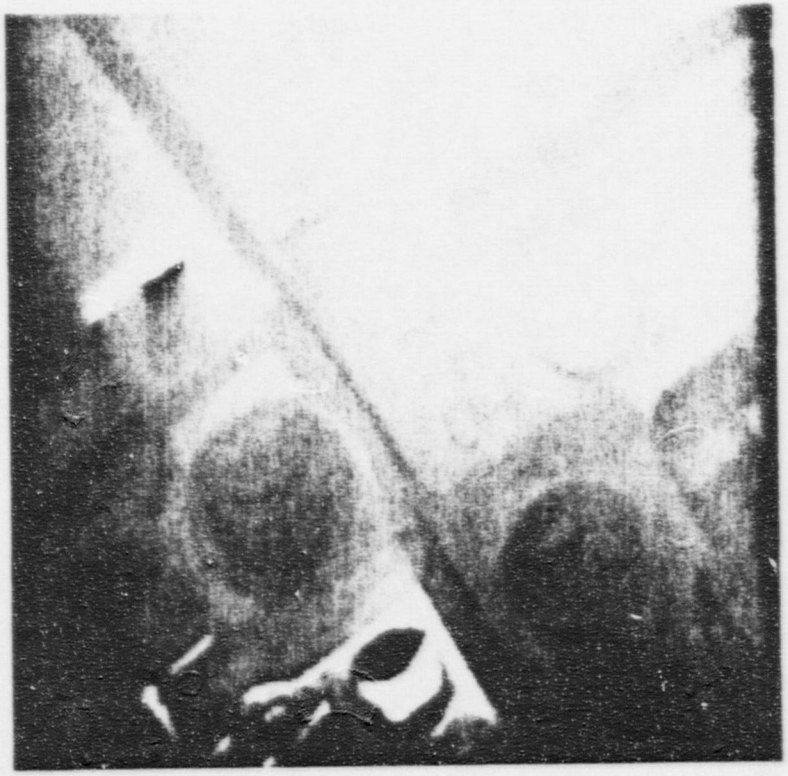
Fuel Identification System

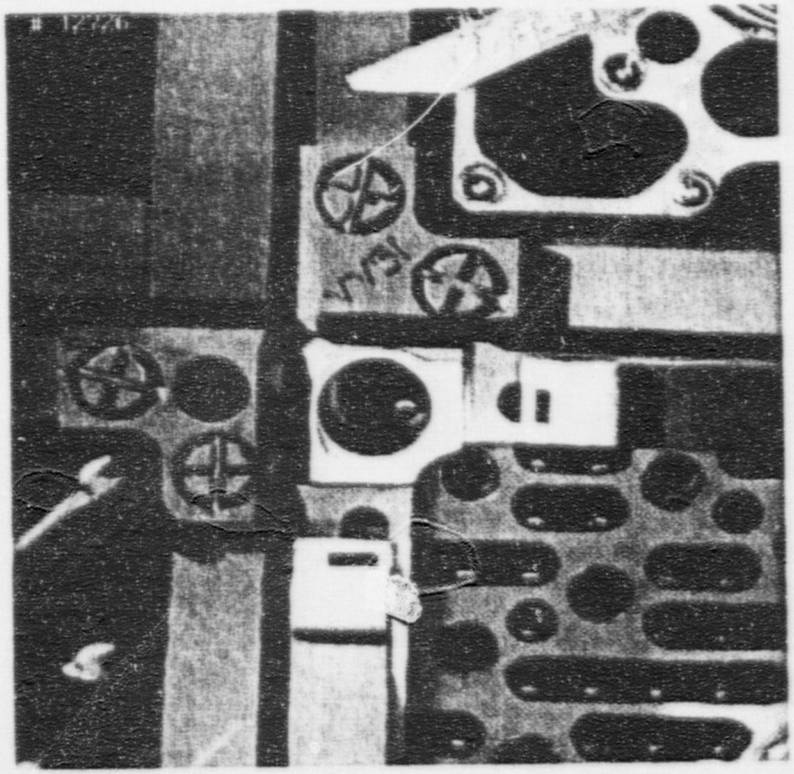




FPL

What does it look like?





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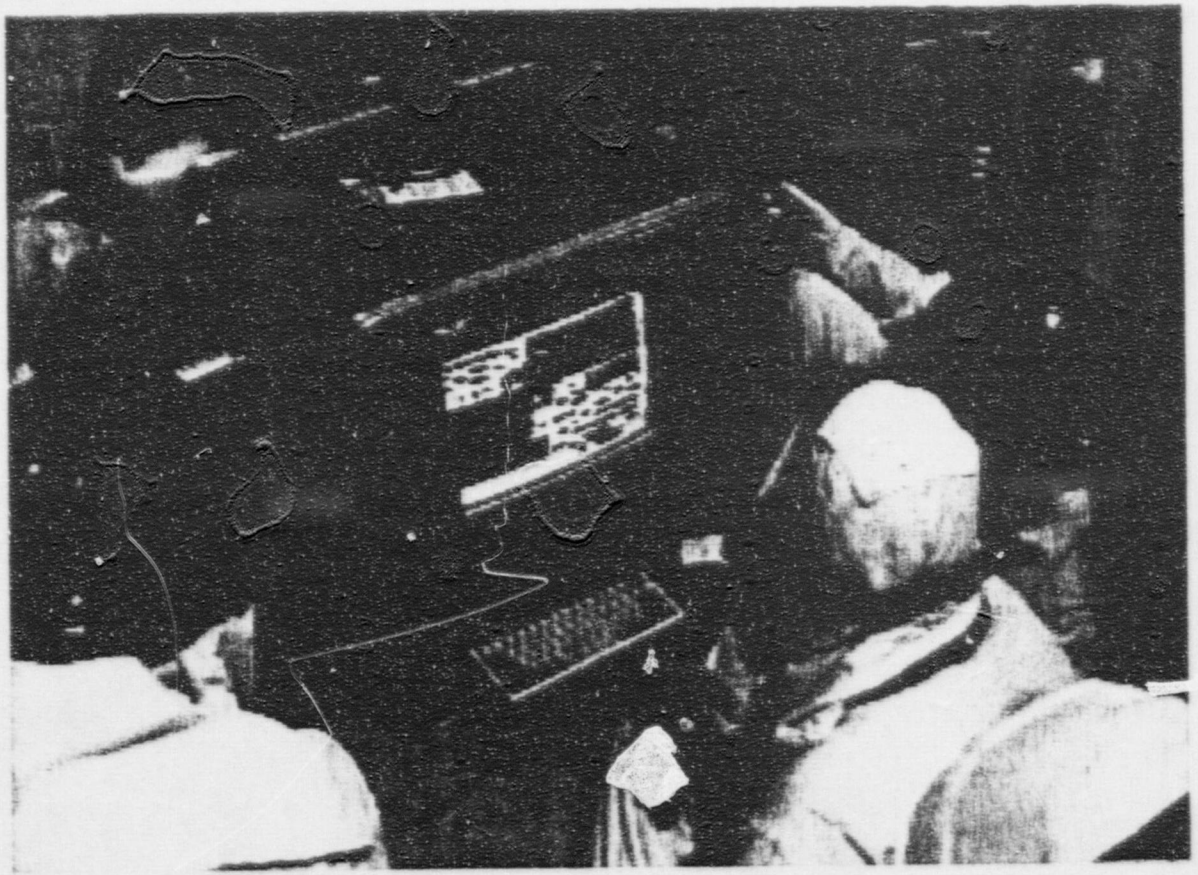
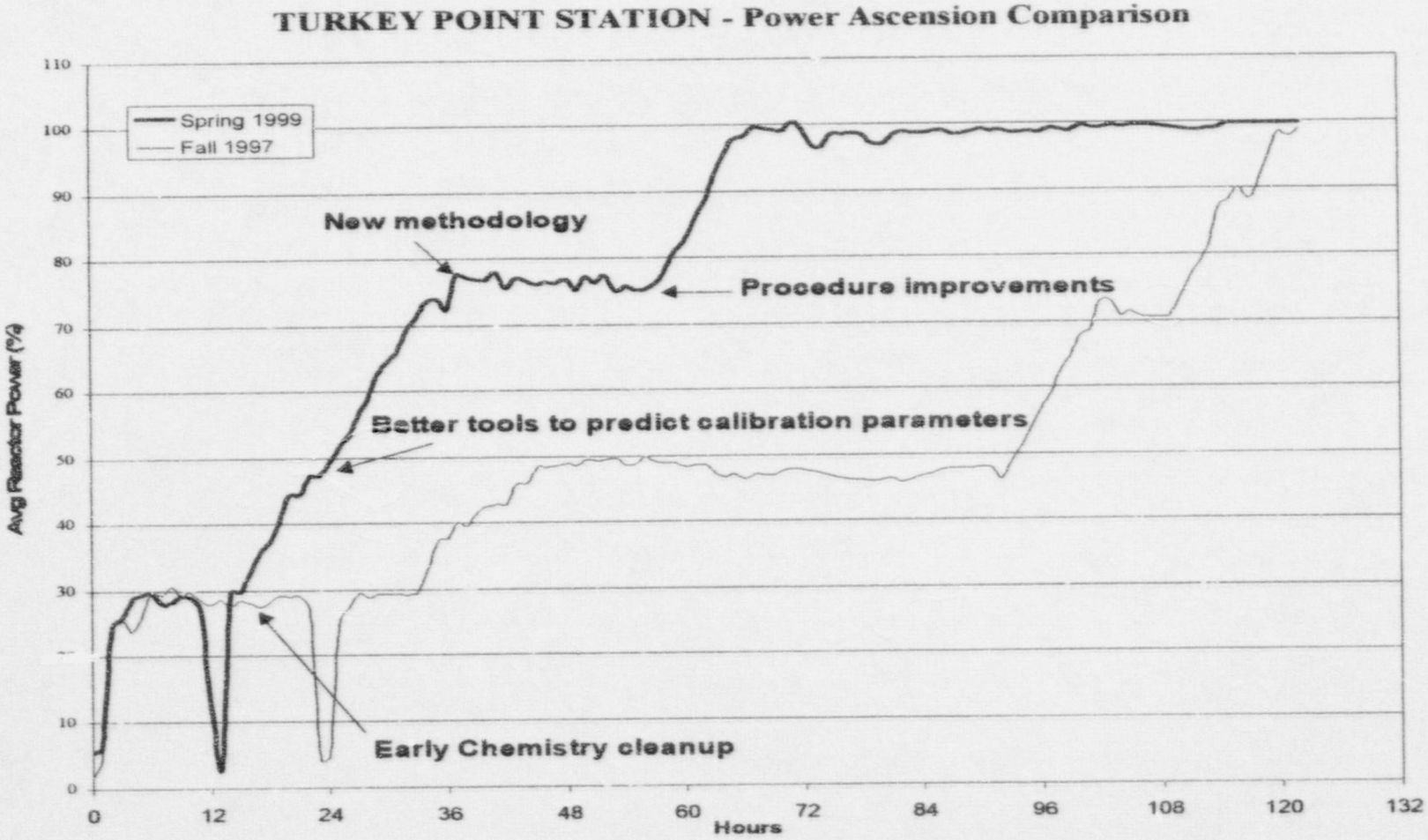
In Use at Turkey Point



Power Ascension Improvements



Future Improvements

- ALARA
  - Risk Based ISI - Class I only
  - Reactor Coolant System Cleanup/Shutdown Chemistry Improvements
- On-Line Inspection/Maintenance
- Risk Awareness Improvements

Initiatives

Steam Generator (SG) Program

R. D. Gil

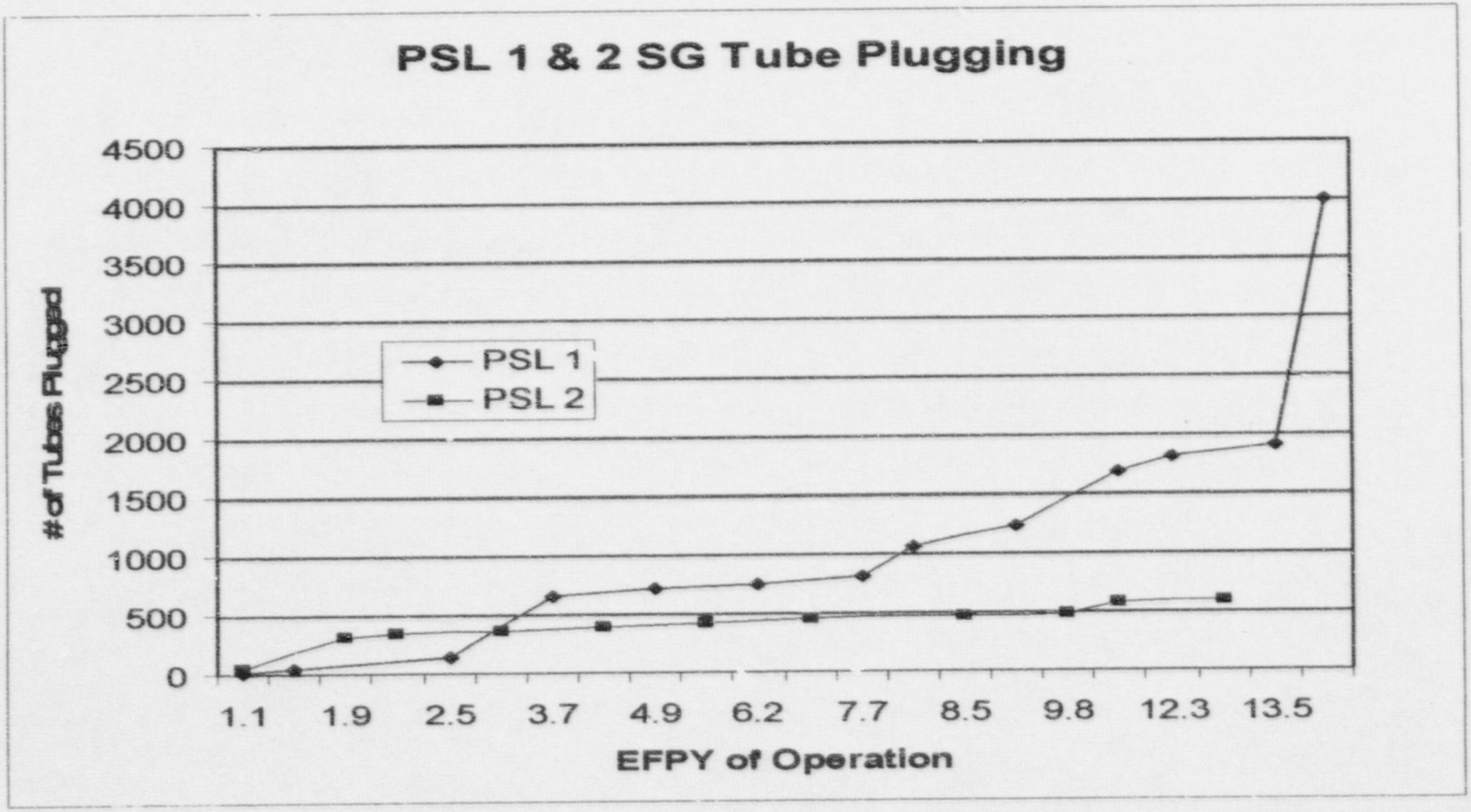
Component Support & Inspections Manager

FPL

SG Program

- Turkey Point SGs replaced in 1983 and 1984 (Unit 4 & Unit 3 respectively) - in good health
- St. Lucie Unit 1 SGs replaced in 1997
- St. Lucie Unit 2 SGs are in good health - closely monitored

SG Program
St. Lucie Unit Comparison



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SG Program

- Health of SGs is a high management priority
  - SG Management Team is in place
- Implementation of NEI 97-06 industry initiative being finalized this year

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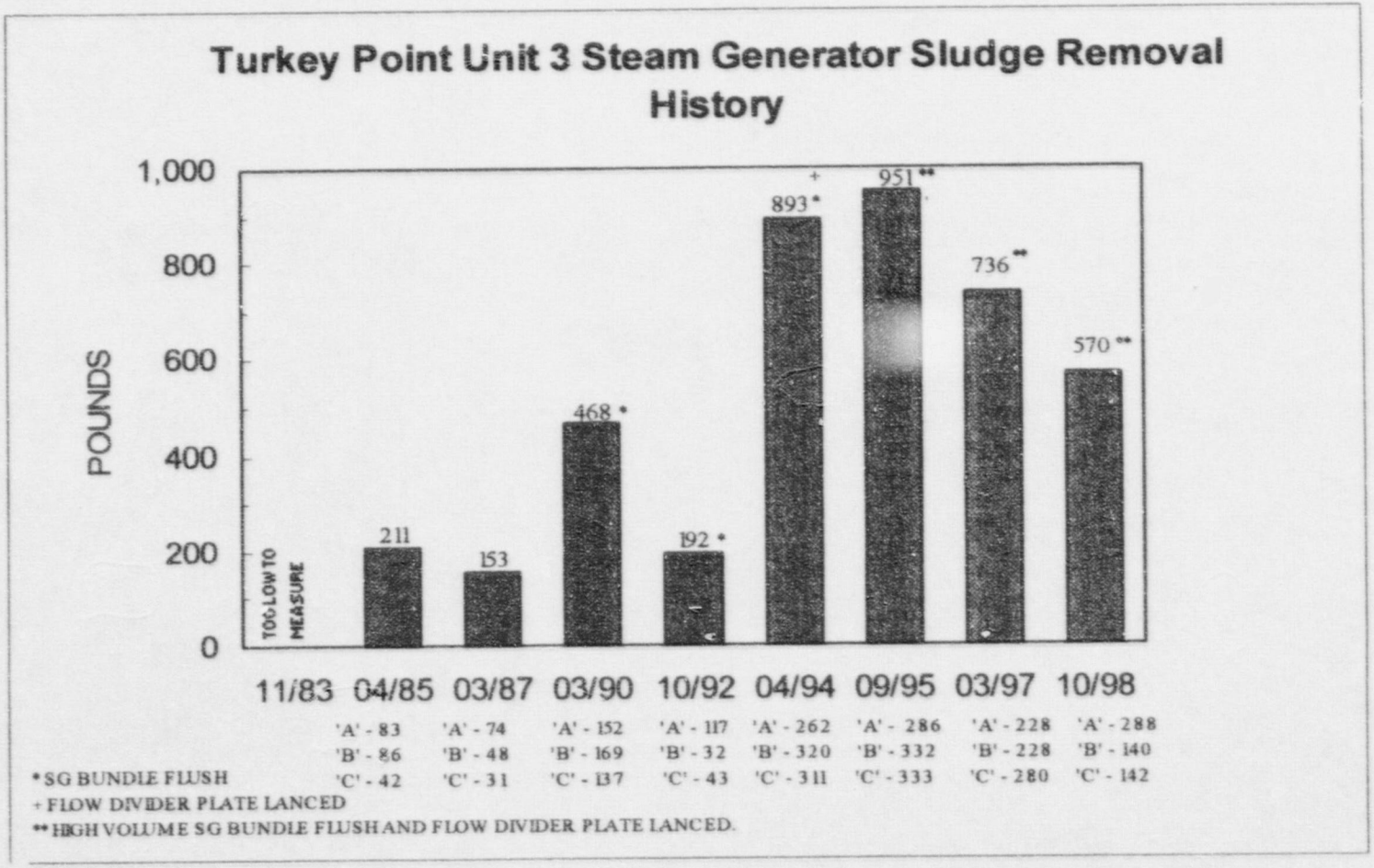
SG Program

- Robust Inspection Program
  - Exceeds regulatory minimums
  - Use best available technology
- Aggressive Maintenance Program
  - Sludge lancing performed each outage
  - Developed high volume bundle flush
  - Optimized chemistry program

SG Program


Turkey Point Unit 3 Steam Generator Sludge Removal History
POUNDS
1,000
800
600
400
200
0
TOO LOW TO MEASURE
211
153
468 *
192 *
893 * +
951 **
736 **
570 **
11/83
04/85
03/87
03/90
10/92
04/94
09/95
03/97
10/98
'A' - 83 'B' - 86 'C' - 42
'A' - 74 'B' - 48 'C' - 31
'A' - 152 'B' - 169 'C' - 137
'A' - 117 'B' - 32 'C' - 43
'A' - 262 'B' - 320 'C' - 311
'A' - 286 'B' - 332 'C' - 333
'A' - 228 'B' - 228 'C' - 280
'A' - 288 'B' - 140 'C' - 142
* SG BUNDLE FLUSH
+ FLOW DIVIDER PLATE LANCED
** HIGH VOLUME SG BUNDLE FLUSH AND FLOW DIVIDER PLATE LANCED.

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SG Program

- Recent NRC Notices and Generic Letters
  - No Impact on FPL Program
    - IN 97-88: Experiences During Recent SG Inspections
    - GL 97-05: Steam Generator Tube Inspection Techniques
    - GL 97-06: Degradation of Steam Generator Internals

FPL

Initiatives

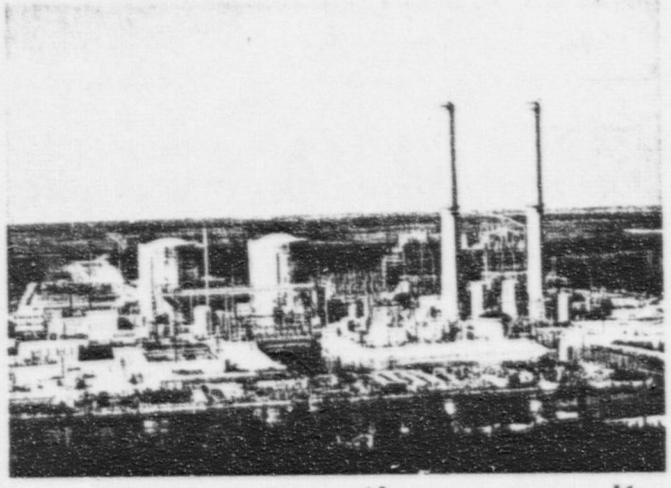
Turkey Point
License Renewal

E. A. Thompson
Project Manager

FPL

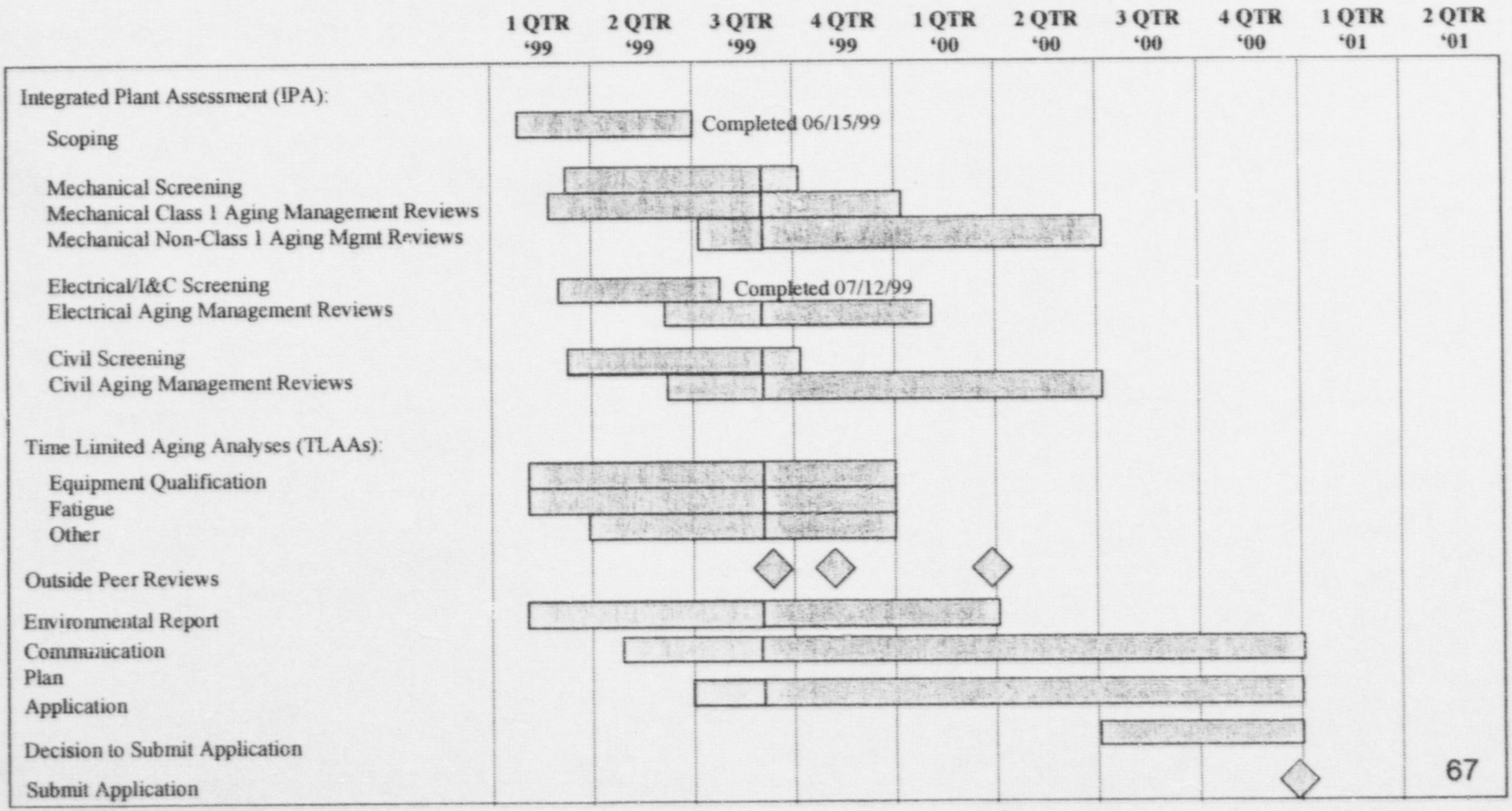
License Renewal Project

- Preparing an application for renewed license for Turkey Point
- Planning to submit application by end of 2000
- Benefits of license renewal include:
  - Low cost electricity producer
  - Excellent station performance
  - Key location--south of Miami
  - Environmental benefits - low greenhouse emissions
  - Precludes need for construction of alternate generating capacity

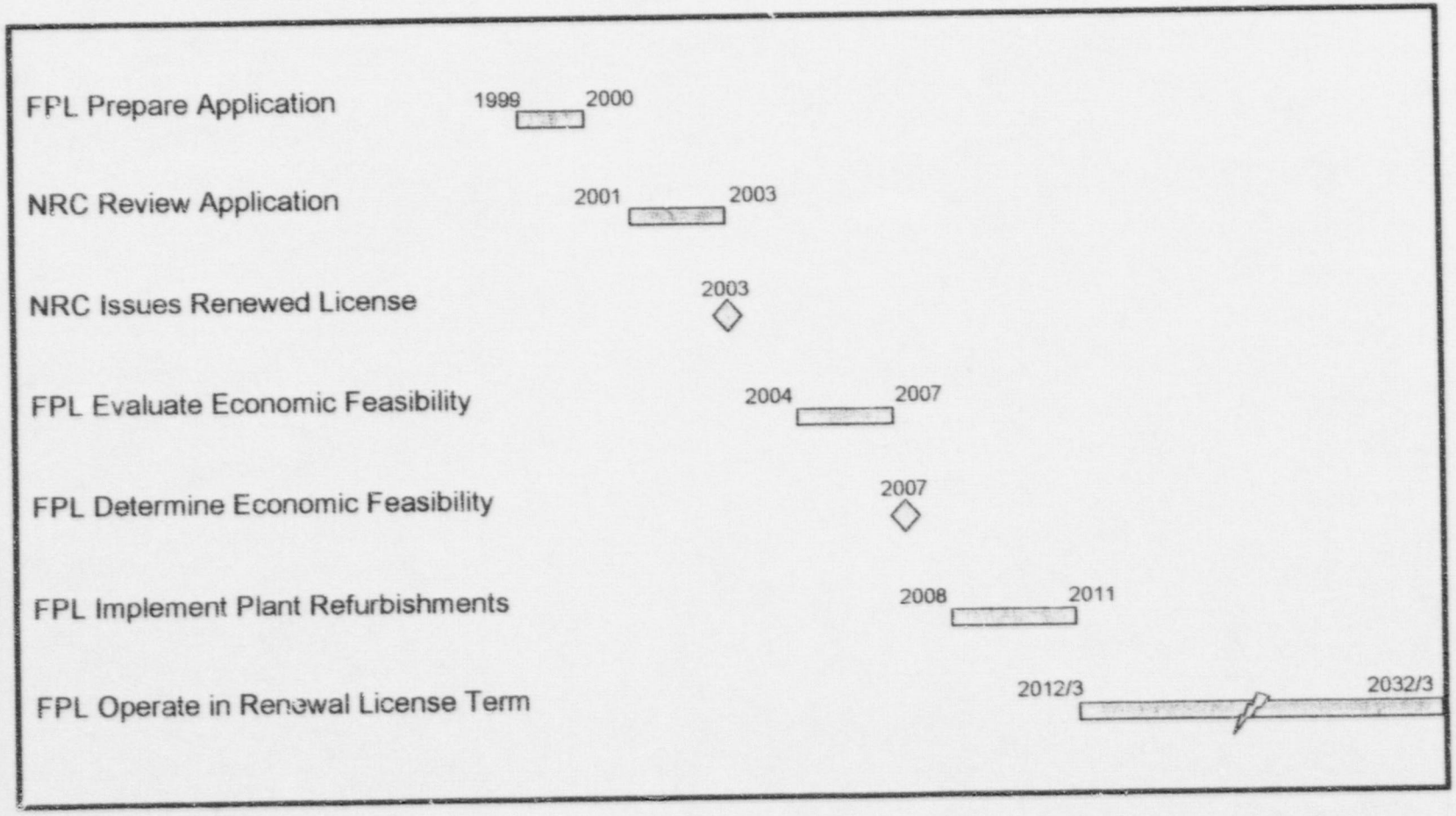


- Renewed license keeps option available to continue operating Turkey Point

Renewed License Application Preparation Timeline



License Renewal Timeline



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Project Progress

- Project is on target
  - Interfacing with other federal, state, and local agencies
    - Facilitate license application review period
    - Feedback is positive
- Following NRC inspections of other applicants

St Lucie
Unit 1 Steam Trestle HELBA

ISSUE

Review of the high energy line break analysis (HELBA) and qualification of equipment located in the steam trestle area

- Licensing basis for the steam trestle determined the area was not harsh due to a short event duration and "thermal lag" effects

- NRC Letter dated June 14, 1999 stated the steam trestle should be considered a "harsh environment" per 10 CFR 50.49

St Lucie
Unit 1 Steam Trestle HELBA

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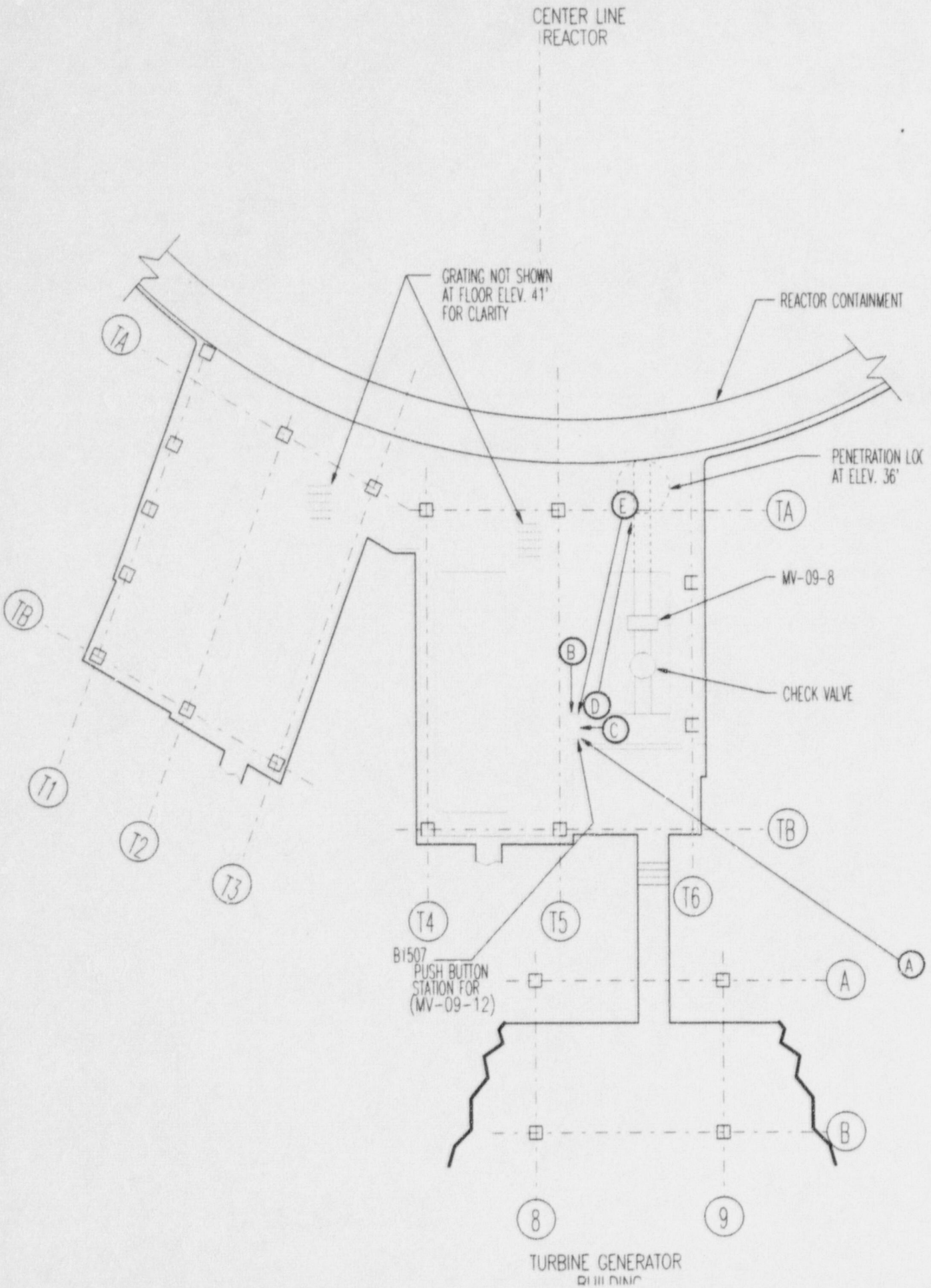
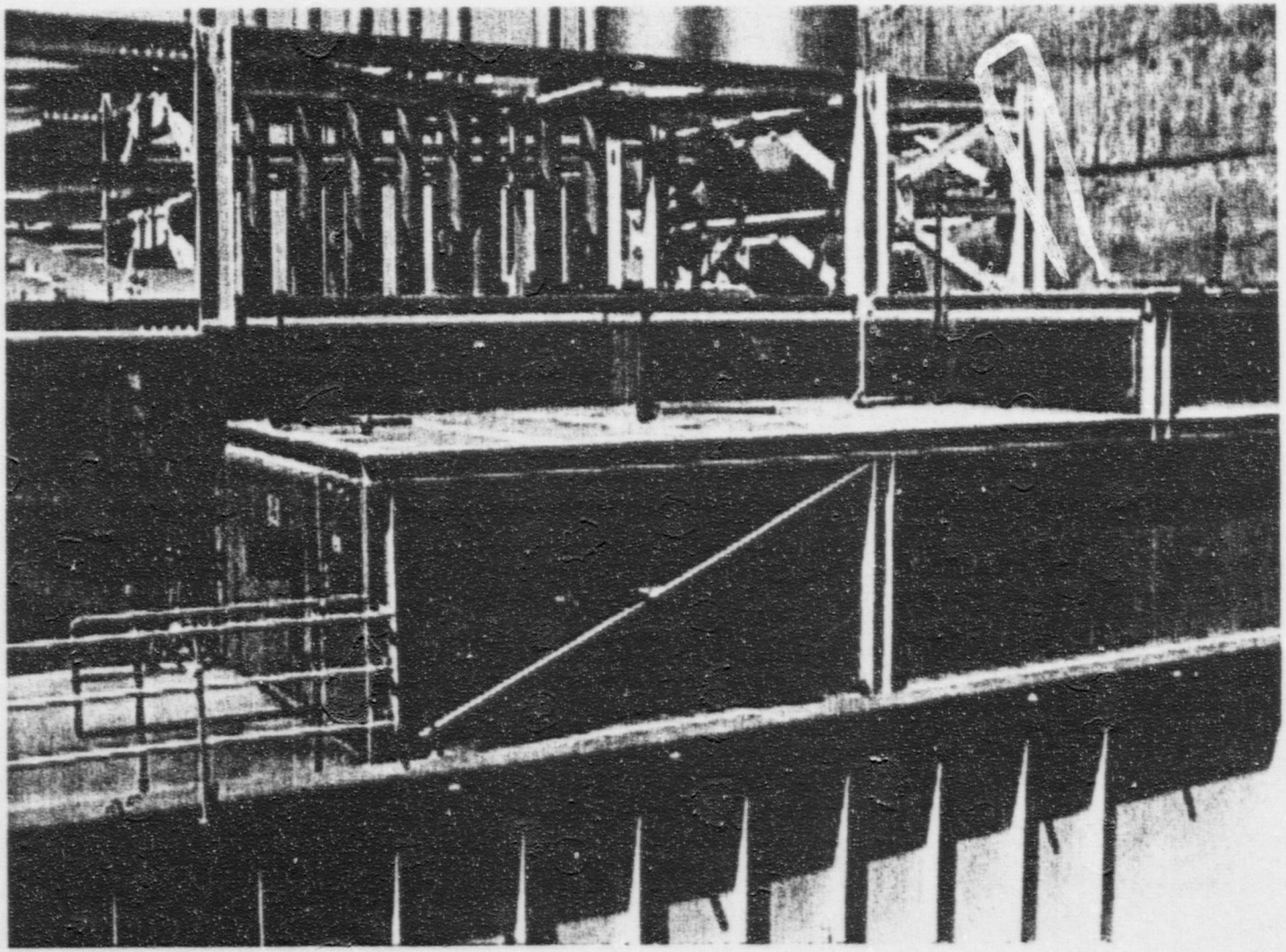
LICENSING BASIS (UFSAR Section 3.11)

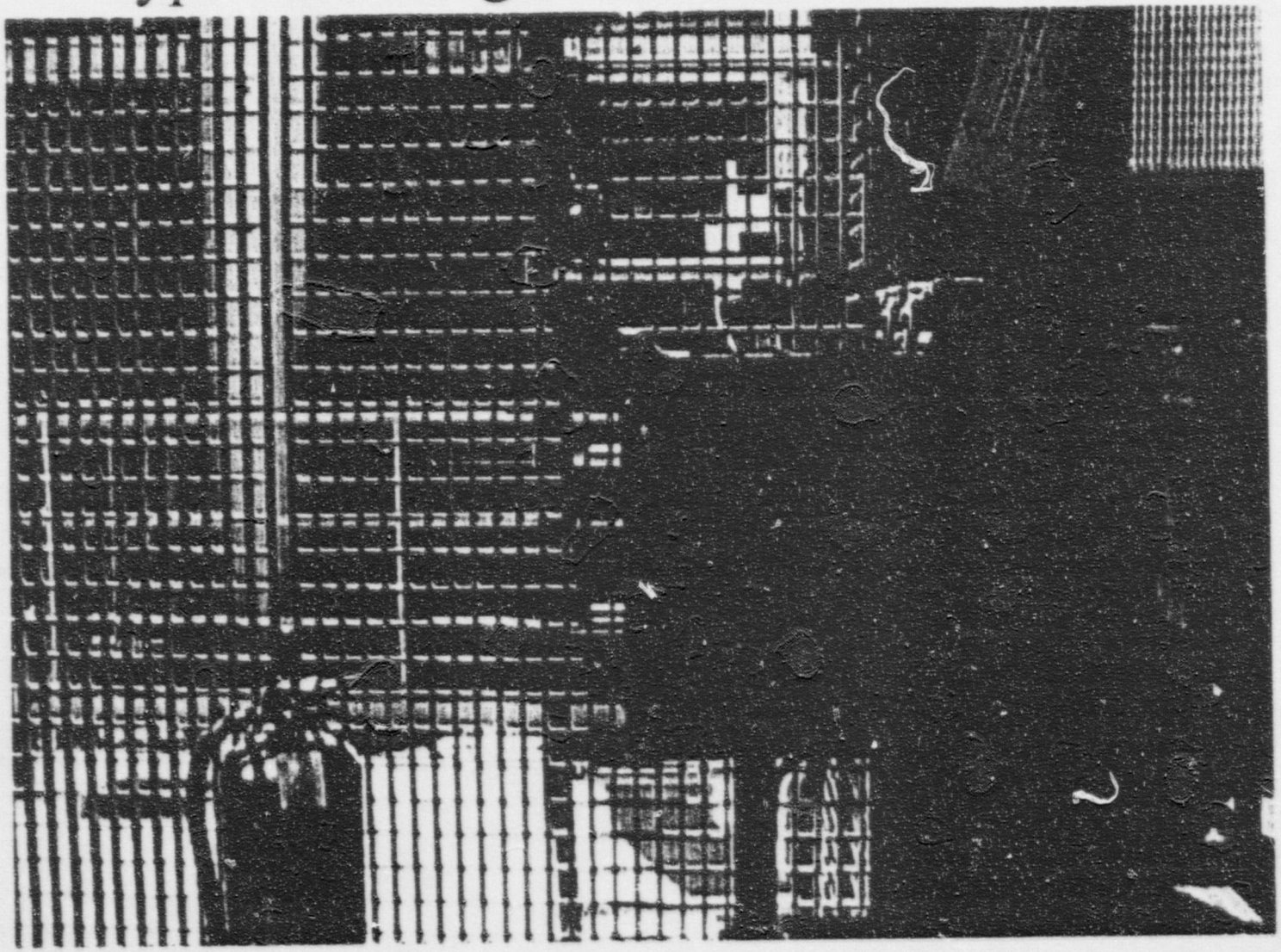
- Dept. of Operating Reactors (DOR) guidelines used for qualification of electrical components.
- Steam trestle components determined to be outside scope of DOR
  - Weathertight boxes
  - Short duration of HELB environment
- Licensed to main steam line break HELBA criteria (UFSAR Section 3.11):
  - Postulates full guillotine rupture of main steam header
  - Steam generator blows dry in 60-90 seconds (event terminated)
  - Conservatively assumes break at any location (not limited to high stress)
  - Results documented in FSAR
- Predates 10 CFR 50.49
  - The steam trestle areas are open to atmosphere


CENTER LINE
REACTOR
GRATING NOT SHOWN
AT FLOOR ELEV. 41'
FOR CLARITY
REACTOR CONTAINMENT
PENETRATION LOC
AT ELEV. 36'
MV-09-8
CHECK VALVE
B1507
PUSH BUTTON
STATION FOR
(MV-09-12)
TA
TB
T1
T2
T3
T4
T5
T6
E
B
D
C
A
8
9
TURBINE GENERATOR

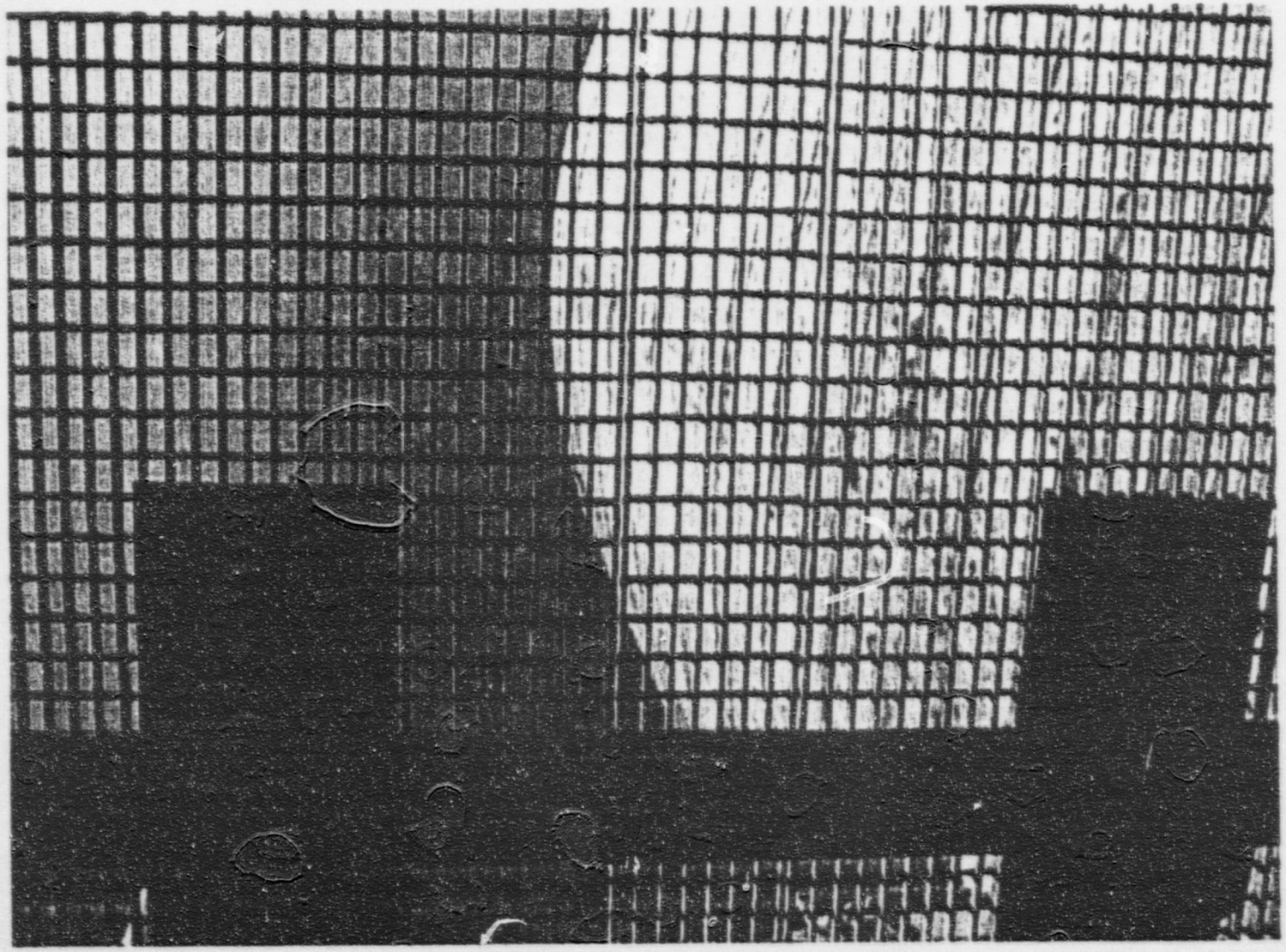
Steam Trestle Area (View A)



Typical Grating & Electrical Box (View B)



Steam Trestle Overhead Grating



St Lucie
Unit 1 Steam Trestle HELBA

TIMELINE

- 1976 - Operating License granted based on MSLB HELBA in UFSAR (Appendices 3C & 3D)
- January, 1980 - IEB 79-01 issued, accepts use of existing HELBA
- August, 1980 - PSL response to IEB documents use of existing HELBA
- September, 1980 - Suppl. 2 to IEB issued, requested consideration of a spectrum of breaks
- May, 1981 - NRC SER accepts use of FSAR HELBA
- February, 1983 - NRC TER accepts use of FSAR HELBA (Franklin Institute Report)
- April, 1983 - NRC SER accepts use of FSAR HELBA (agrees with TER)
- 1987 - GL 87-11 issued
  - PSL commits to comply for future modifications (added UFSAR Appendix 3J)
- NRC letter of June 14, 1999 states that steam trestle area needs to be considered harsh

St Lucie
Unit 1 Steam Trestle HELBA

FPL

IMMEDIATE ACTIONS

- Condition Report 99-0780 issued
- Plant operability verified to UFSAR criteria (licensing basis)
  - Identified Safety Related equipment installed in steam trestle
  - Safety Related equipment found to be in weatherproof boxes or qualified for harsh environment
  - Walkdowns performed to confirm configuration
  - Material condition of electrical boxes verified by walkdown

St Lucie
Unit 1 Steam Trestle HELBA

FPL

ADDITIONAL ACTIONS

The licensing basis HELB does not include analysis of a spectrum of break sizes. Engineering is reviewing these "beyond licensing basis" breaks. Actions include:

- Identification of high energy lines in steam trestle area (MFW, AFW, MS)
- Identification of break locations per UFSAR Appendix 3J (BTP MEB 3-1)
  - 33 potential break locations identified based on stress analysis criteria
  - Conservatively identified 12 potential leakage crack locations in addition to break locations
  - Independent verification completed
- Walkdowns for each break location to identify affected components
  - Developed matrix relating each potential break location with potentially affected equipment
  - 33 x 97 matrix also identifies distance to affected components (line-of-sight)
- Identification of bounding break scenarios
  - Grouped similar break locations and identified 6 bounding break locations
  - Only 2 of the bounding scenarios potentially impacted required redundant equipment
- Detailed review of affected equipment for bounding scenarios

St Lucie
Unit 1 Steam Trestle HELBA

FPL

ANALYSIS OF AFFECTED EQUIPMENT

- Limiting break locations potentially affect only two components:
  - MV-09-11 (AFW Pump 1C to S/G 1A)
  - Push button station for MV-09-12 (B1507)
- MV-09-11 is qualified to inside containment EQ criteria.
- B1507 will not be directly impacted
  - Distance from break to box is ~ 21 feet
  - Push button construction - an electrical box installed within a weathertight box
  - Line-of-sight to break location is severely limited due to several obstructions
  - Altran analysis shows that break influence is less than 11 feet
- Leakage Crack were also conservatively investigated.
  - 12 potential locations identified
  - Only 1 leak location potentially impacted redundant safety related equipment
  - closest equipment is ~ 13 feet
  - Altran analysis shows leakage crack influence is less than 3 feet

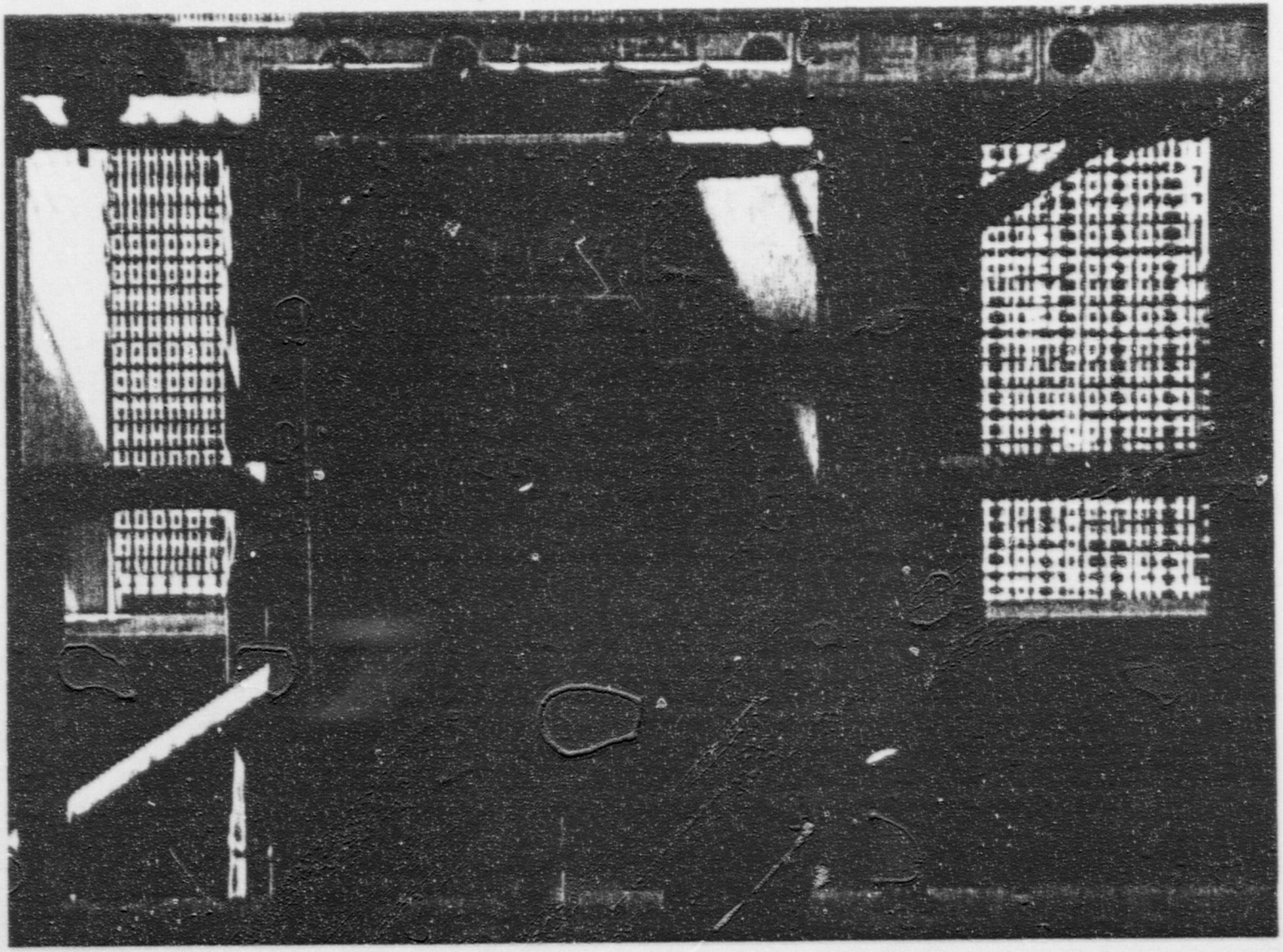
St Lucie
Unit 1 Steam Trestle HELBA

FPL

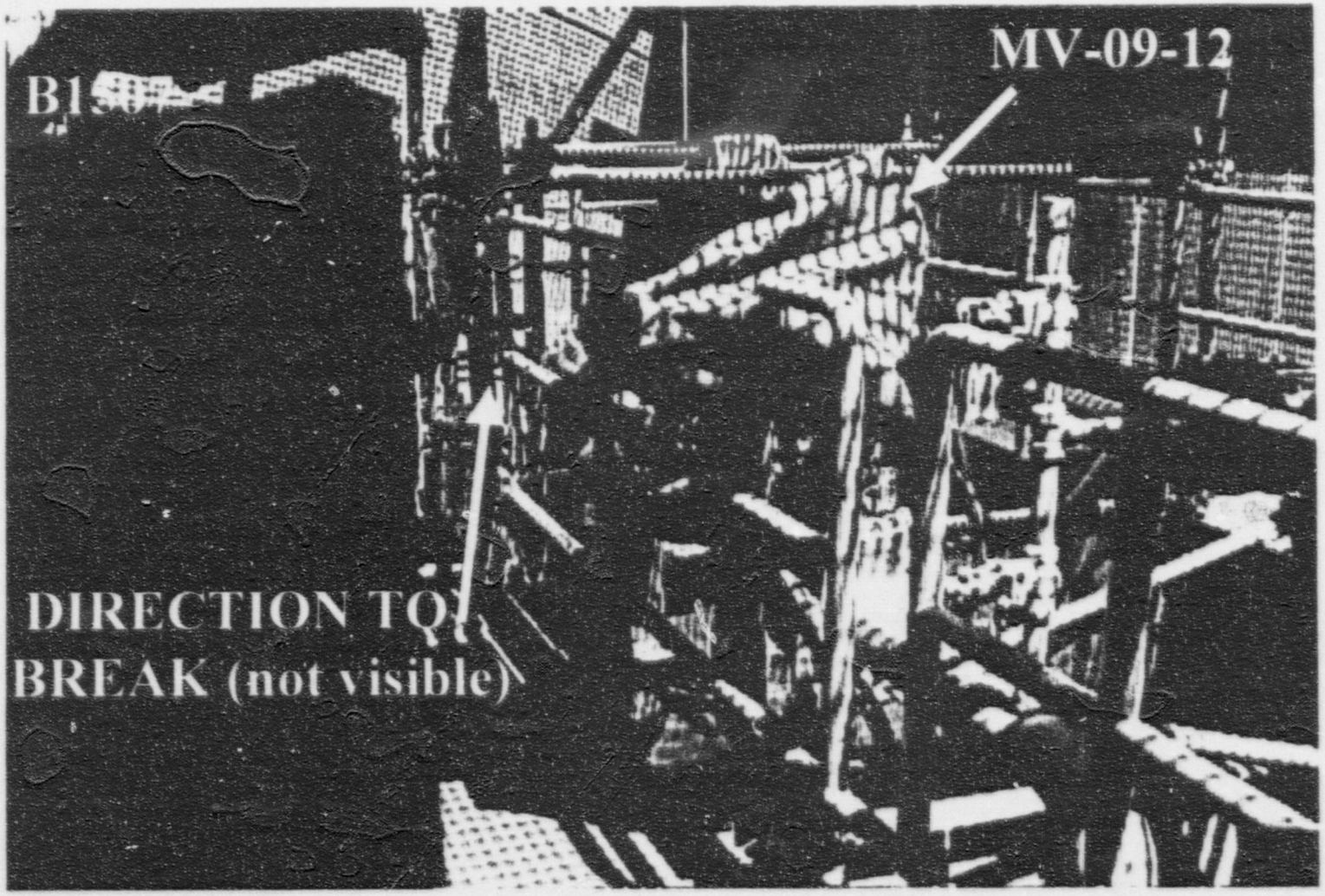
CONCLUSIONS

- Plant meets licensing basis requirements
- Walkdowns and reviews conducted demonstrate equipment operability
- Results from review of a spectrum of break locations indicate that Safety Related equipment would not be adversely impacted by postulated breaks

B1507 (NEMA-4) (View C)



Box 1507 Looking Toward Break (View D)



Break Looking Toward B1507 (View E)