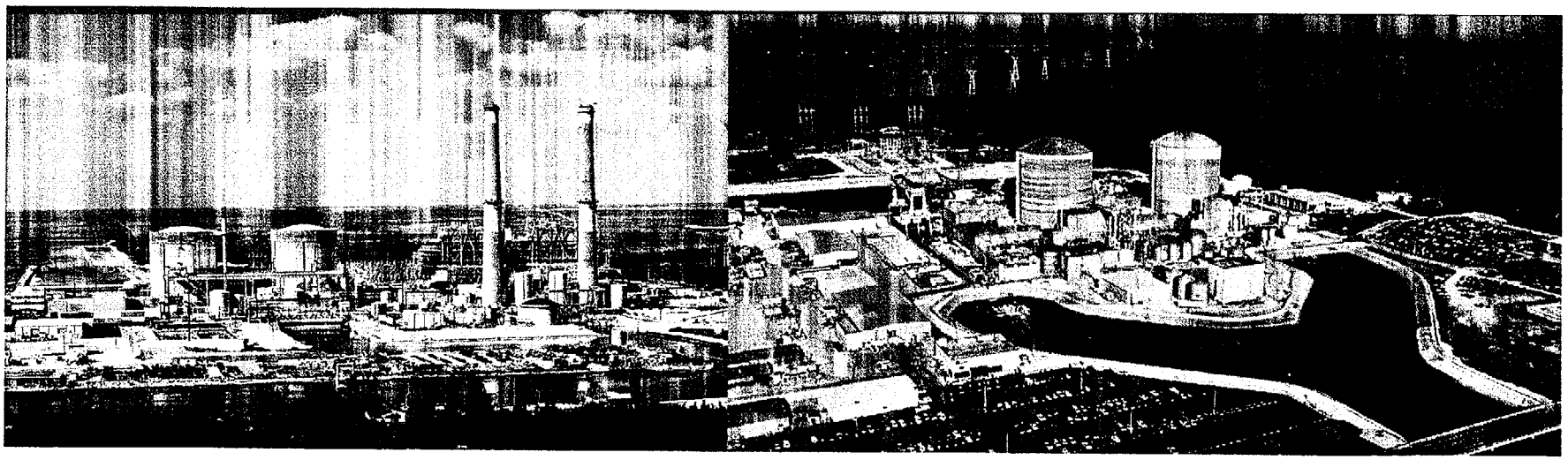
FPL

Nuclear Engineering
NRC / FPL Interface Meeting

August 14, 2000

Region II

Atlanta, Georgia



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Agenda

• **Opening**	J. A. Stall
• **Engineering Performance**	
– St. Lucie	B. K. Dunn
– Turkey Point	D. J. Tomaszewski
• **Corrective Action / Self Assessment**	
– Reactor Oversight Process	V. Rubano
– Corrective Action Program Self Assessment	D. J. Tomaszewski
– RCCA Event at Turkey Point	D. J. Tomaszewski
– Main Steam Line Break Analysis for St. Lucie Unit 1	B. K. Dunn
• **Initiatives**	
– Steam Generator Program	G. L. Boyers
– License Renewal Project	E. A. Thompson

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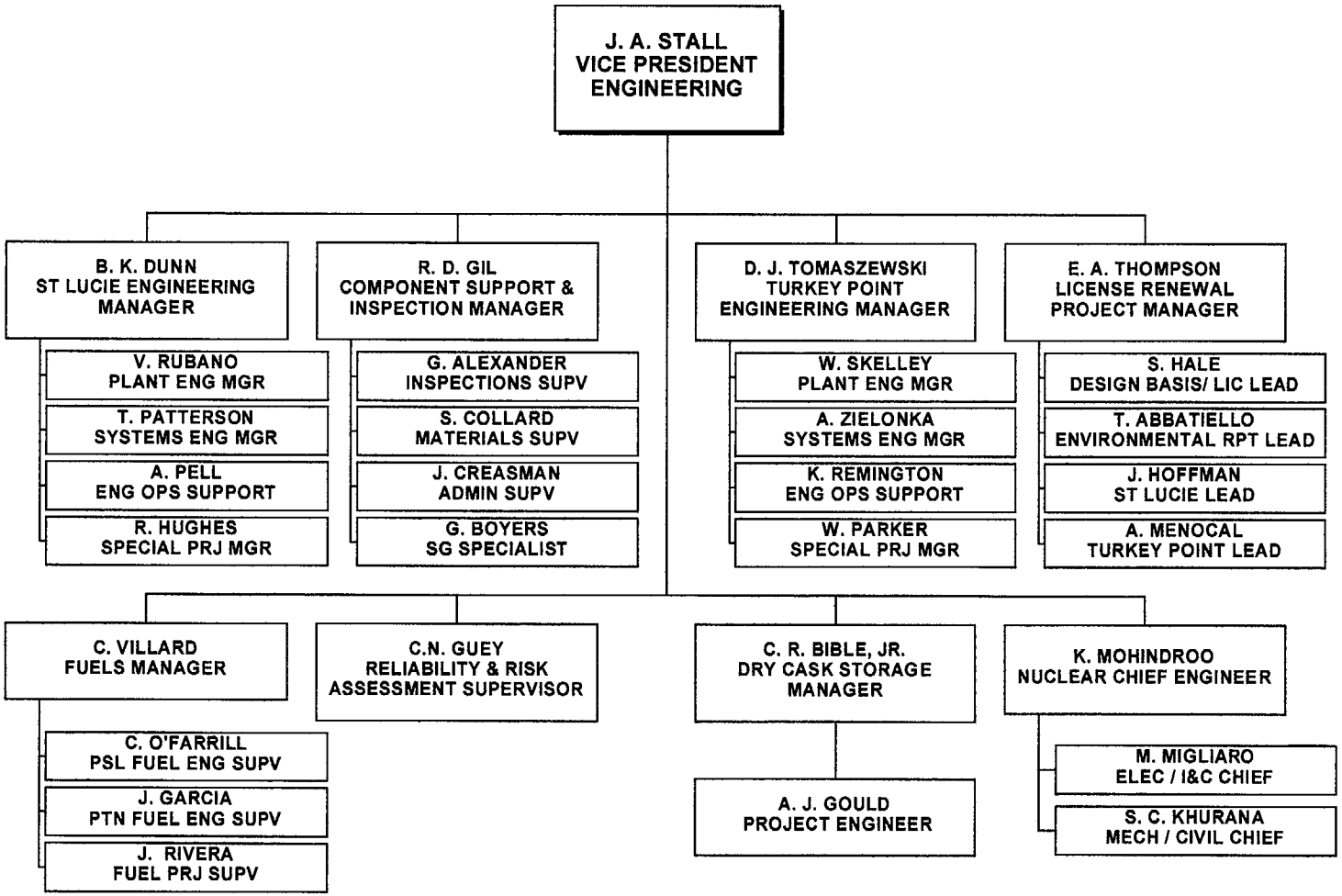
Nuclear Engineering

- FPL / Entergy Merger Announcement
- Elements of a Strong Engineering Organization
  - Corrective Action Program
  - Self Assessments
  - Initiatives

Nuclear Engineering

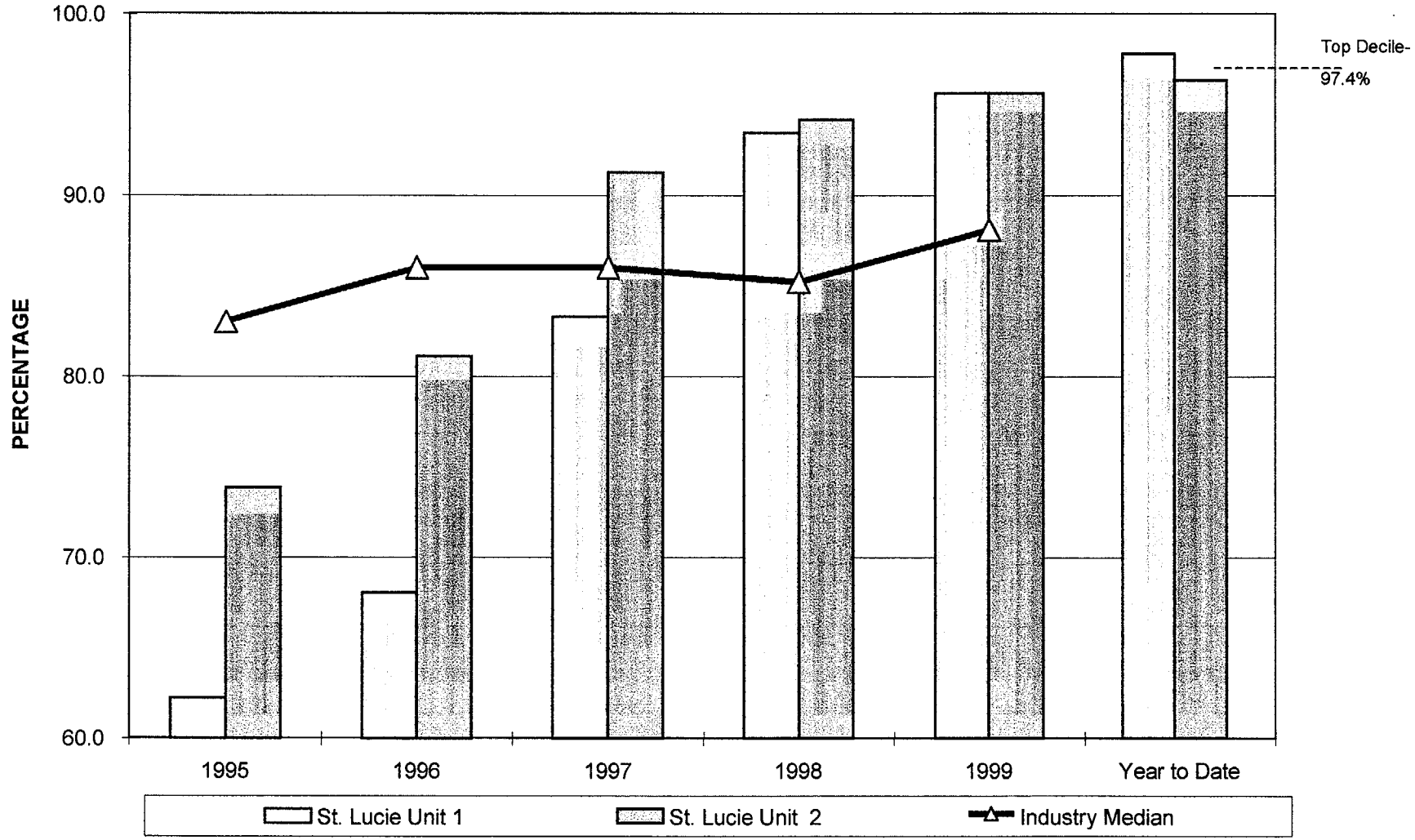


Engineering Performance

St. Lucie
Engineering

B. K. Dunn

WANO Weighted Overall Performance



Engineering
FPL Department Indicators and Goals

Nuclear Safety Focus				
Indicators		Goals		St. Lucie Actuals
		Green		
A.	Unplanned Scrams Per 7000 Hours	<1	>6	Unit 1 - 2.7 Unit 2 - 0
B.	Safety System Unavailibility - EDG	<1.25%	>5%	Unit 1 - 0.3% Unit 2 - 0.2%
C.	Safety System Unavailibility - HPSI	<0.75%	>5%	Unit 1 - 0.3% Unit 2 - 0.7%
D.	Safety System Unavailibility - AFW	<1.0%	>6%	Unit 1 - 0.8% Unit 2 - 0.3%
E.	Safety System Unavailibility - RHR	<0.75	>5%	Unit 1 - 0.5% Unit 2 - 0.3%
F.	NRC Violations due to Engineering	<2	>8	0
G.	QA Findings	<2	>6	0
H.	WANO Fuel Reliability Indicator	≤5 E4	>2.0E-2	Unit 1 - 8.2E-5 Unit 2 - 4.0E-5
I.	OSHA Recordable Injuries	0	>1	0
J.	ALARA	10% <Budget	5% Over Budget	10%<

Engineering
FPL Department Indicators and Goals

Problem Identification and Correction				
Indicators		Goals		St. Lucie Actuals
		Green	Red	
A.	Condition Reports	0 Late	>4 Late	0 Late
B.	Condition Report Action Items (PMAI's)	<200 by YE	≥250 at YE	Trending to <200
C.	Condition Report Action Items (Late)	0 Late/Qtr	>4 Late	23 Late 2Q00
D.	Self Assessments	1 per Qtr	<3/Yr Trend	3
E.	System Walkdowns	90%-100% W/D Complete	<70% W/D Complete	100%
F.	Drawing/VTM/TEDB Changes	0-2 Late	≥10 Late	0 Late

Engineering Department Indicators and Goals

Quality of Engineering				
Indicators		Goals		St. Lucie Actuals
		Green	Red	
A.	Engineer Initial Training Started within 12 Months of Hire	100%	<90%	100%
B.	Training Effectiveness	>90%	<70%	90%
C.	System Expert Qualifications	1 per System Engr	<1 per System Engr	On Plan
D.	Plant Modification Revisions due to Engineering Error	0	≥4	2
E.	Quality of Real Time Support	0 Deficiencies/Qtr	>2 Deficiencies/Qtr	0
F.	Significant Human Performance Issues	0/Qtr	>2/Qtr	0
G.	Operator Workarounds (Awaiting Eng)	≤2	>6	3

Engineering
FPL Department Indicators and Goals

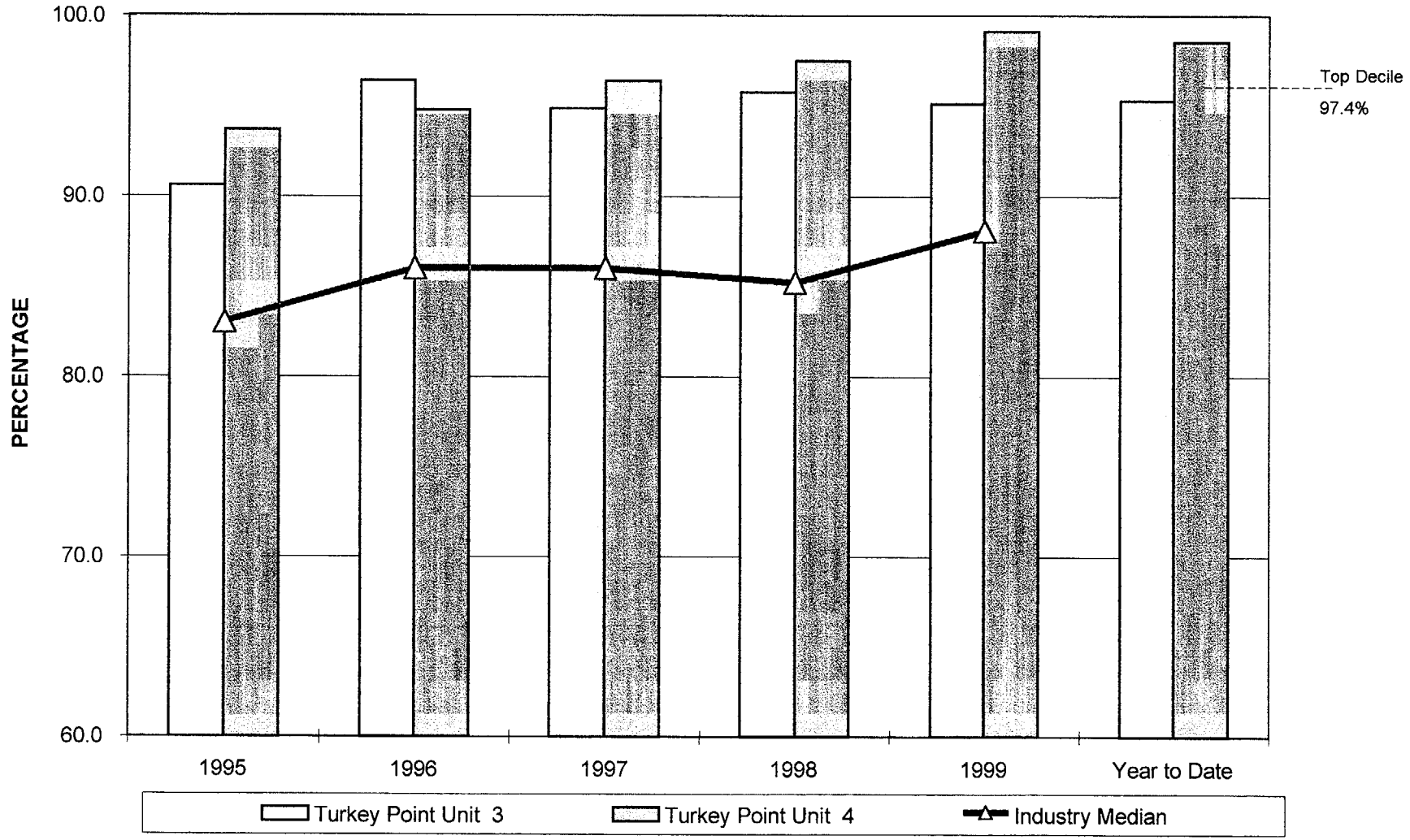
Cost Performance				
Indicators		Goals		St. Lucie Actuals
		Green	Red	
A.	Unit Capability Factor (3 Year Distribution)	>90%	<85%	Unit 1 - 87.5% Unit 2 - 92.3%
B.	Thermal Performance Indicator	>99.90%	<99.5%	Unit 1 - 100.0% Unit 2 - 99.8%
C.	Refueling Outage Duration	<30 Days	>35 Days	Unit 2 - 30 Days
D.	Budget Performance	>2% Under	Over Budget	Budget
E.	Unplanned Capability Loss Factor (3 Year Average)	0% - 1%	>2.0%	Unit 1 - 1.5% Unit 2 - 1.4%

Engineering Performance

Turkey Point Engineering

D. J. Tomaszewski

WANO Weighted Overall Performance



Engineering
FPL Department Indicators and Goals

Nuclear Safety Focus				
Indicators		Goals		Turkey Point Actuals
		Green	RED	
A.	Unplanned Scrams Per 7000 Hours	<1	>6	Unit 4 - 0.8
B.	Safety System Unavailibility - EDG	<1.25%	>5%	Unit 3 - 1.7% Unit 4 - 0.5%
C.	Safety System Unavailibility - HPSI	<0.75%	>5%	Unit 3 - 0.1% Unit 4 - 0.5%
D.	Safety System Unavailibility -AFW	<1.0%	>6%	Unit 3 - 0.6% Unit 4 - 0.6%
E.	Safety System Unavailibility - RHR	<0.75	>5%	Unit 3 - 0.1% Unit 4 - 0.3%
F.	NRC Violations due to Engineering	<2	>6	1
G.	QA Findings	<2	>6	0
H.	WANO Fuel Reliability Indicator	≤5 E-4	>2.0E-2	Unit 3 - 2.06E-6 Unit 4 - 3.44E-5
I.	OSHA Recordable Injuries	0	2	1
J.	ALARA	10% <Budget	>5% Over Budget	0.515-Non Outage 3.925 - Outage

Engineering Department Indicators and Goals

Problem Identification and Correction				
Indicators		Goals		Turkey Point Actuals
		Green	Red	
A.	Condition Reports	0 Late	>4 Late	0 Late
B.	Condition Report Action Items (PMAI's)	0-150	>200 at YE	200
C.	Condition Report Action Items (Late)	0 Late	>4 Late	0 Late
D.	Self Assessments	2 In 1 Qtr	<3 per Year	2
E.	System Walkdowns	90%-100% W/D Complete	<70% W/D Complete	100%
F.	Drawing/VTM/TEDB Changes	0-2 Late	≥10 Late	0 Late

Engineering Department Indicators and Goals

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Quality of Engineering				
Indicators		Goals		Turkey Point Actuals
		Green	Red	
A.	Turnovers	0 - 3 T/O	≥10	4 Turnovers
B.	Vacancies	0 - 2 Vac.	>5	1 Vacancy
C.	Engineer Initial Training Started Within 12 Months of Hire	100%	<90%	100%
D.	Training Effectiveness	>90%	<70%	ETP -98% STA - 98%
E.	Backup Shift Technical Advisor Qualification	≥10	<2	
F.	Plant Modification Revisions due to Engineering Error	0	≥5	1
G.	Procurement Engineering Backlog (>4 Weeks Old)	0-2	>11	0
H.	Operator Workarounds (Awaiting Eng)	≤2	>6	1

Engineering Department Indicators and Goals

FPL

Cost Performance				
Indicators		Goals		Turkey Point Actuals
		Green	Red	
A.	Unit Capability Factor (3 Year Distribution)	>90%	<85%	Unit 4 - 93.6%
B.	Thermal Performance Indicator	>99.70%	<99.5%	Unit 3 - 99.8% Unit 4 - 99.9%
C.	Refueling Outage	<30 Days	>35 Days	Unit 3 28 Days
D.	Budget Performance	>2% Under	Over Budget	>2% Under
E.	Unplanned Capability Loss Factor (3 Year Average)	0% - 1%	>2.0%	Unit 3 - 1.4%

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Reactor Oversight Process

V. Rubano

Reactor Oversight Process

- Positive Development for the Industry
- Staff Has Done a Good Job Focusing on Risk Significance
- FPL Uses ½ the NRC Threshold for Internal Indicators

Reactor Oversight Process

- Oversight Process Relies Upon the Corrective Action Program
- FPL Currently Assessing Safety Significance for Transient Conditions / Events
- Further Work Needed Between FPL and the Staff on Significance Determination Process (SDP)

Reactor Oversight Process

- Current Significance Assessments
  - PSA Group Notified for Reactor Trips or Any Significant Transient / Event
  - PSA Group Performs Assessment for Conditions Requiring Phase 2 Screening
  - Procedures are being Revised to Formalize the Involvement of the PSA Group
  - PSA Group Consulted on a Regular Basis

Reactor Oversight Process

- Significance Determination Process
  - Issues which Cannot be Assessed as Minor are Screened in the SDP
  - Need Common Understanding of the SDP
  - Met with the NRC in June
  - Standardized Plant Analysis Risk (SPAR) Model
    - Identify Differences with St. Lucie PSA Model
    - Reconcile Significant Differences

Reactor Oversight Process

- New Oversight Process is an Improvement
- Need to Continue the Dialog on SDP
- Continuous Improvement Emphasis in the Corrective Action Program

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Corrective Action Program Self Assessment

D.J. Tomaszewski

Corrective Action Self Assessment

Assessment Focus Areas

- Root Cause Analysis
- Corrective Action Closeout
- Program Changes
  - Significance Levels
  - Repeat Conditions

Corrective Action Self Assessment

Root Cause Analysis

- Some Corrective Actions were not Effective in Preventing Recurrence
  - Gas in HHSI System
  - Human Performance Near Misses
- Improved Compliance with Procedure
  - Corrective Action for Previous QA Finding Effective
  - PNSC Review of Root Cause Analysis Effective at Improving Quality
- Corrective Actions Completed as Stated

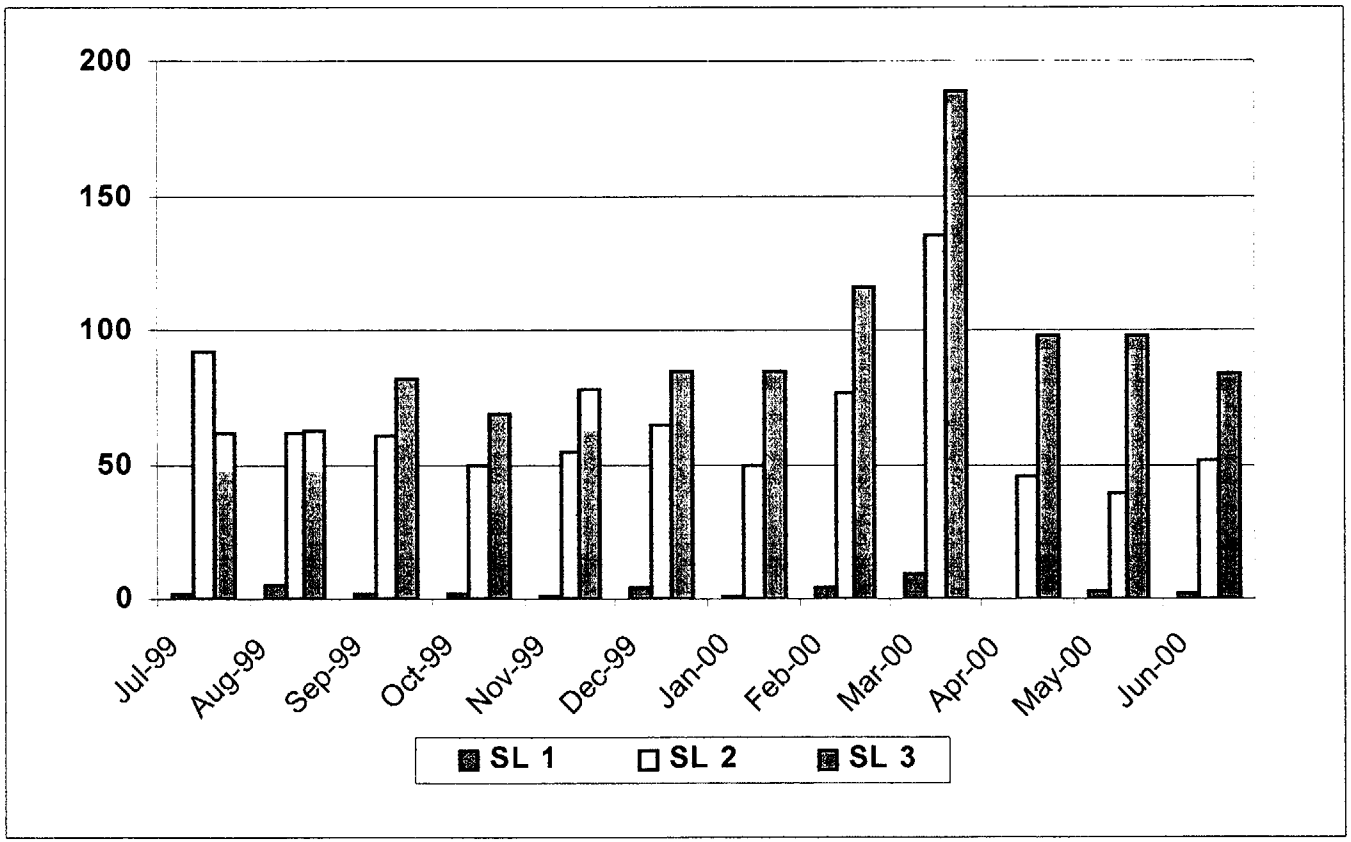
Corrective Action Self Assessment

Corrective Action Closeout

- Backlog of Action Items Reduced Substantially
- Corrective Actions Completed as Stated
- Corrective Actions Generally Completed in a Timely Manner

Corrective Action Self Assessment

Significance Levels



Corrective Action Self Assessment

Program Changes

- Significance Levels Appropriate
- Expectations for Significance Level 2 and Repeat Condition not always met
  - Expectations for Repeat Condition Not Defined
  - Expectations Not Understood by Personnel

Corrective Action Self Assessment

Additional Conclusions

- Condition Reports (CR) have been Issued for each Cited and Non Cited Violation
- Improvement needed in Human Performance Trending

Corrective Action Self Assessment

Improvement Actions

- Qualification Matrix for Root Cause Training
- Reviewer Checklist for Condition Report (CR) Closeout
- Departmental Human Performance Assessments being Performed
- Procedure Revision and Training to Improve Expectations for Repeat Conditions

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Rod Control Cluster Assembly (RCCA) Event

Cycle 18 Refueling Outage

Turkey Point Unit 3

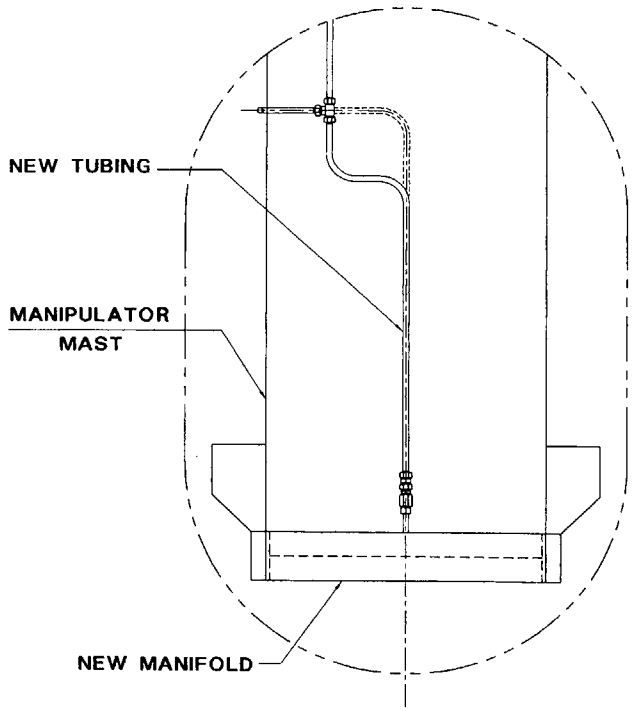
D.J. Tomaszewski

RCCA Event

- Background
  - Minor Fuel Leak in Unit 3 Cycle 17 Core
  - First Time Use Of In-Mast Sipping at Turkey Point
- Manipulator Mast Modification
  - Added Tubing and Manifold to Bottom of Fixed Mast
- Dimensional Stackup
  - Post-incident Review
- Root Cause and Corrective Action

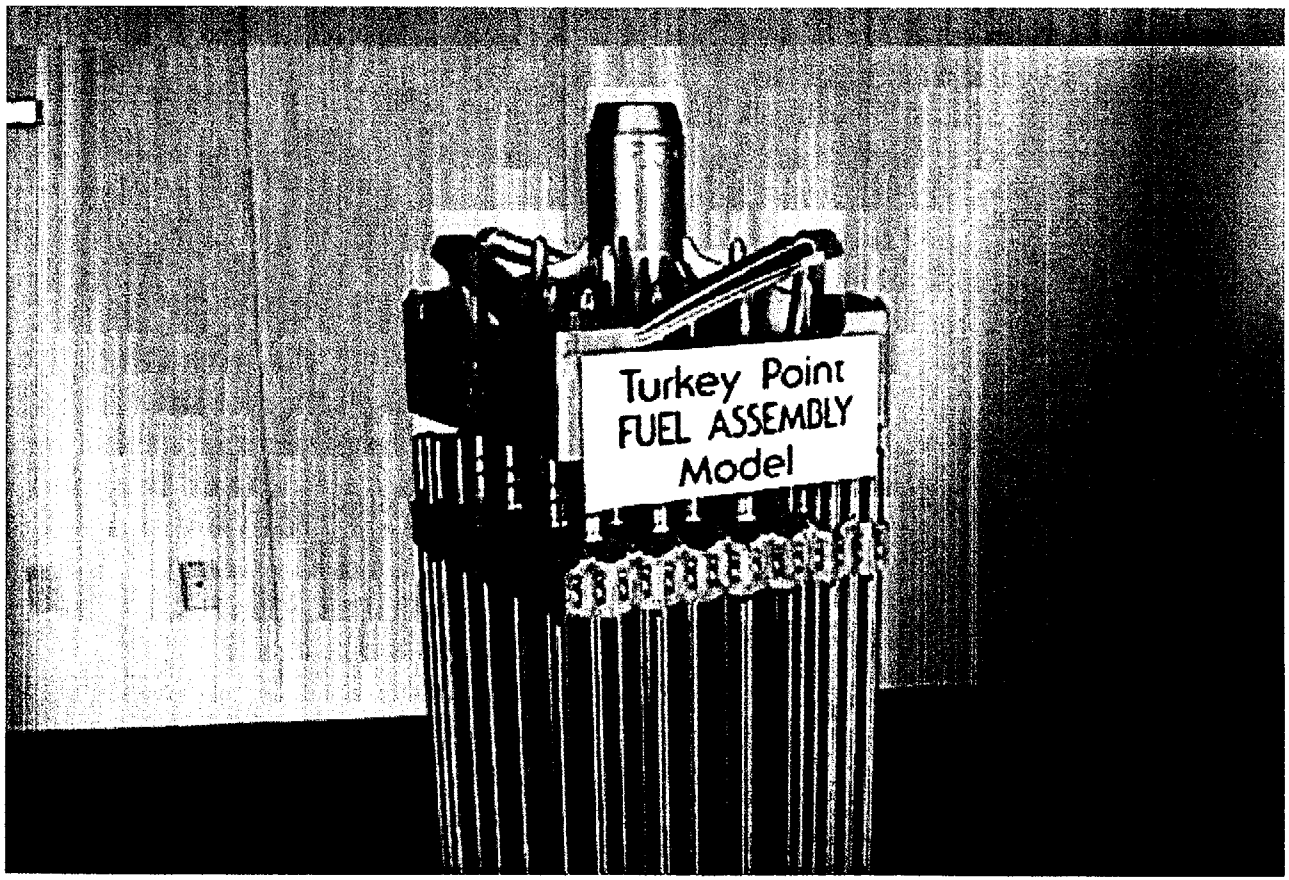
RCCA Event

Mast Modification



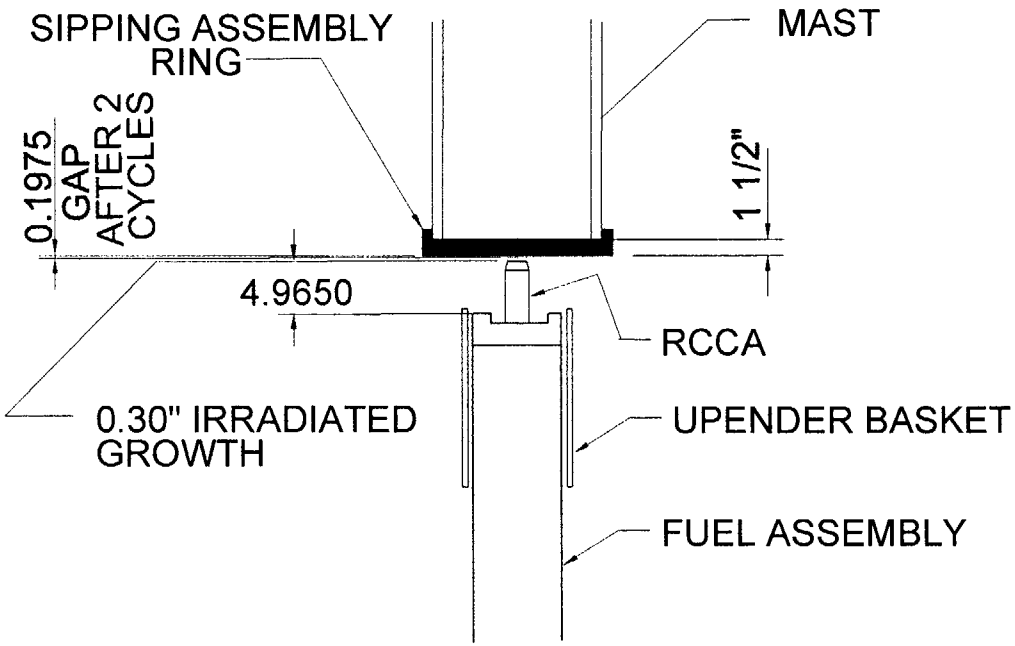
RCCA Event

Fuel Assembly With RCCA Inserted



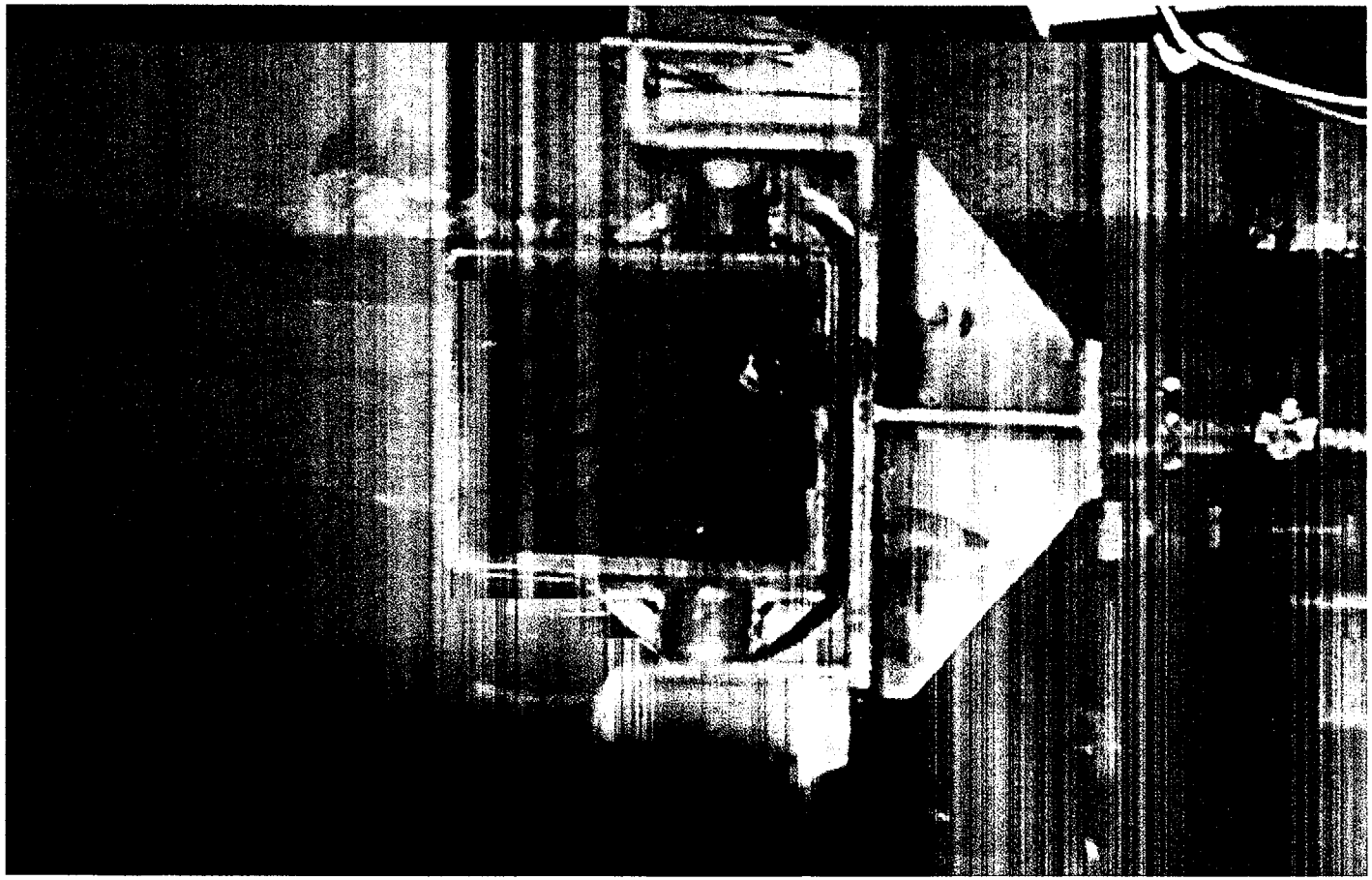
RCCA Event

Dimensional Stackup



RCCA Event

Bent RCCA in Reactor Cavity Side Upender



RCCA Event

- Root Cause
  - FPL - Human Performance; Insufficient Verification by Design Engineering
  - CONTRACTOR - Human Performance; Insufficient Self-Checking and Independent Review
- Corrective Actions
  - Review of Contractor Design Control
  - FPL Training on Contractor Oversight and Verification of Critical Design Attributes

FPL

Main Steam Line Break (MSLB) Analysis

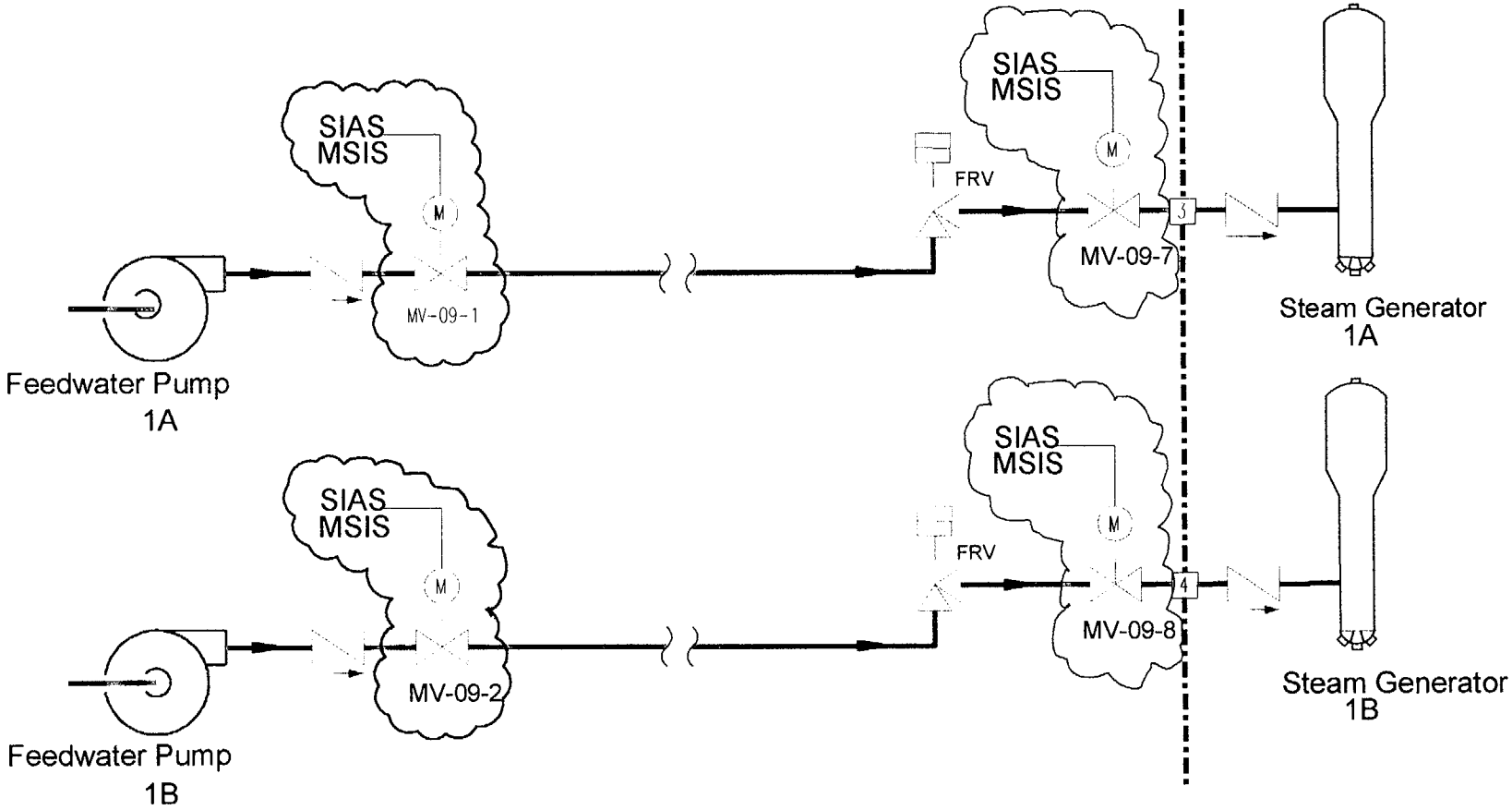
St. Lucie Unit 1

B.K. Dunn

Main Steam Line Break Analysis

- Background
  - FPL Initiated Re-analysis of Main Steam Line Break
    - Main Feedwater Isolation Valve (MFIV) Closure Characteristics
    - Resulted in Peak Containment Pressure Above Design
  - Operability Evaluation per GL 91-18
    - Unit 1 Containment Remains Operable
    - Issue is of Low Safety Significance
  - LER Submitted in Late 1998

Main Steam Line Break Analysis



EXISTING CONFIGURATION

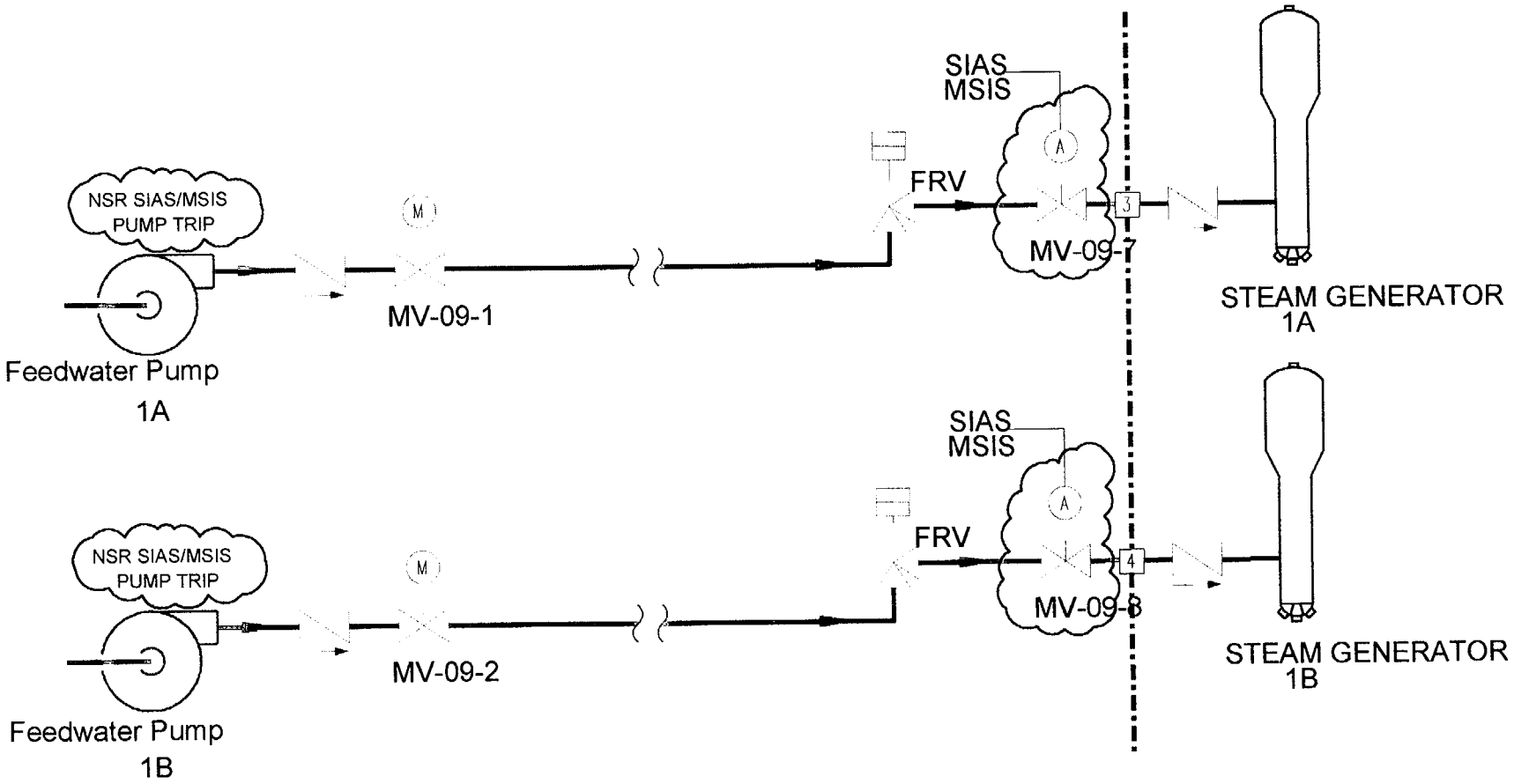
Main Steam Line Break Analysis

- Corrective Actions
  - Main Feed Pump Trip
    - Implemented Fall 1999 Outage
  - Valve Modification
    - Stroke Time Must Be Reduced From 60 Seconds to approximately 15 Seconds
    - Closing Torque to Meet GL 89-10 Margins
    - MFIVs Already Utilize Largest Available Motors

Main Steam Line Break Analysis

- Corrective Actions
  - Detailed Matrix of Options Was Evaluated
    - Standard Review Plan Option Selected
    - Two Safety Related Pneumatic Valves with Feed Pump Trip Backup
  - License Amendment Submittal Planned for October 2000
  - Valve Actuator Replacement in Spring 2001 Outage

Main Steam Line Break Analysis



AFTER MODIFICATION

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Steam Generator (SG) Program

G. L. Boyers

SG Program

- Program Update
- Review Recent Inspections
  - St. Lucie 1 September 1999
  - Turkey Point 3 March 2000
  - St. Lucie 2 April 2000
- Program Initiatives

SG Program

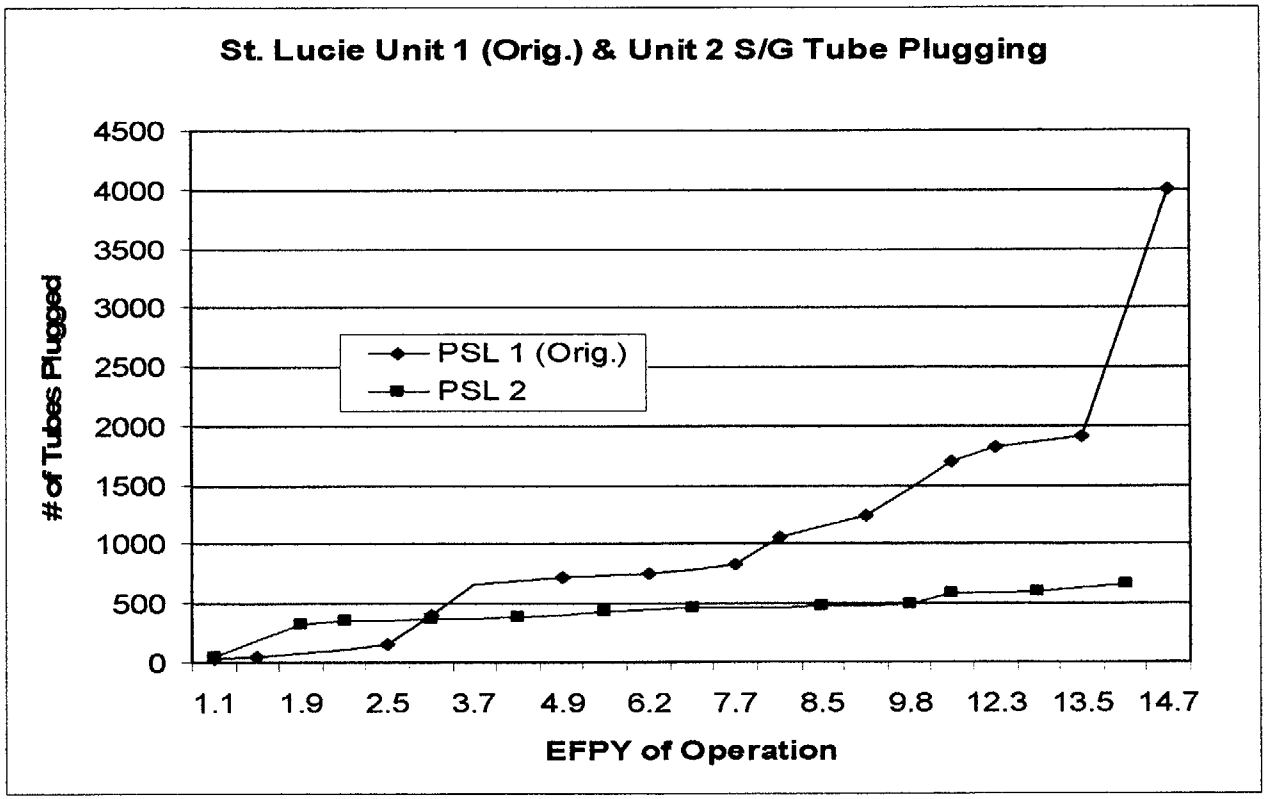
- St. Lucie Unit 1 EOC 15 - September 1999
  - 1st Inspection of Replacement SG's
  - Wear 'A' S/G - 17 Tubes (11 Plugged)
  - Manufacturer Root Cause Analysis
    - Localized Problem - Limited Extent
  - Monitor in Next Inspection
  - Tubes Plugged - Avg. 0.06% / 18% Limit

SG Program

- Turkey Point Unit 3 EOC 17 - March 2000
  - 10th Inspection of Replacement SG's
  - 1st Significant Top of Tubesheet Inspection
    - 69 Tubes Plugged (5 AVB Wear)
    - Circumferential & Volumetric Indications
  - Re-Analysis Concludes Circumferential Indications are Geometry Variations
  - Tubes Plugged - Avg. 1.6% / 20% Limit

SG Program
St. Lucie Unit Comparison

- St. Lucie Unit 2 EOC 11 - April 1999
  - Tubes Plugged - Avg. 3.9% / 15% Limit



SG Program

- Program Initiatives
  - SG Integrity is a Priority
  - Procedures Revised to Meet NEI 97-06
  - NEI SGTF Member (Generic PLA Efforts)
  - INPO Reviews at Both Sites
  - Strong Program Leadership
    - Effective SG Management Team

      Chairman - VP Nuclear Engineering

License Renewal Project

E. A. Thompson

License Renewal

- Application Preparation Status
- Turkey Point Application Content
- Turkey Point Application Schedule
- Turkey Point Community Outreach

License Renewal

- Application Preparation Status
  - Turkey Point Application Submittal Planned in Fall 2000
    - Draft Application Prepared
      - Peer and Management Review of Draft Completed
  - St. Lucie Application Submittal Planned in June 2002
    - Commenced Preparation of Technical Documents

License Renewal

- Turkey Point Application Content
  - Standard Table of Contents Used
  - Level of Detail Comparable to Duke/Entergy Submittals
  - RAIs from Other Submittals Considered
  - 26 Programs Credited
    - 12 Existing, 7 Enhanced, 7 New

License Renewal

- Turkey Point Application Schedule
  - Submittal in Fall 2000
  - Inspection Timeframes
    - Environmental Scoping Meeting - December 2000
    - Scoping/Screening - June/July 2001
    - Aging Management Review - August / Early September 2001
    - Closeout - February/Early March 2002
  - Actions to Facilitate Inspections

License Renewal

- Turkey Point Community Outreach
  - Performed Research of Community Impressions
    - Neighbors Think Positively of Turkey Point
    - License Renewal Recognized as Sound Business Decision
    - Emphasis Areas
      - Safe, Reliable Operation and Training of Personnel
      - Maintenance of Plant Equipment
      - Layers of Safety Protect Environment and Community
      - Strong Emergency Planning
      - Community Involvement

License Renewal

- Interface with Federal, State and Local Officials
- Community Outreach Team
  - Teacher Workshops for over 50 Area Teachers
  - Presentations / Dialog Through Community Organizations
    - Video, Brochure
    - Reception Center
  - Feedback is Supportive