



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

December 18, 2009

John Herron, Senior Vice President
Entergy Operations, Inc
P.O. Box 31995
Jackson, Mississippi 39286-1995

SUBJECT: NRC/ENTERGY OPERATIONS, INC. MANAGEMENT MEETING

Dear Mr. Herron:

This refers to our meeting conducted at the Entergy Power House Conference Center located in Jackson, Mississippi on December 10, 2009. At this meeting, NRC and Entergy management discussed the performance of Arkansas Nuclear One, Grand Gulf Nuclear Station, River Bend Station, and the Waterford Steam Electric Station, Unit 3. Recent Entergy organizational changes and current regulatory issues were also discussed, as indicated in the enclosed slide presentations.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html> (The Public Electronic Reading Room).

Should you have any questions concerning this matter, we will be pleased to discuss them with you.

Sincerely,

/RA/

Jeff Clark, P.E., Chief
Project Branch E
Division of Reactor Projects

Dockets: 50-313; 50-368,
50-416,
50-458, and
50-382, respectively

Licenses: DPR-51, NPF-6
NPF-29
NPF-47
NPF-38

Enclosures:

1. Attendance List
2. Presentation Slides

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 Linda Dufrene, Site Administrative Assistant, WAT
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NRC Senior Management Meeting
December 10, 2009

- | | |
|--------------------------------------|--------------------------------------|
| 1. <u>Bryan Ford - Entergy</u> | 21. <u>James Dorsey - Entergy</u> |
| 2. <u>Dale James - Entergy</u> | 22. <u>Scott Anders Entergy</u> |
| 3. <u>Alfred SANCHEZ - NRC</u> | 23. <u>JEFF HECKENBERGER ENTERGY</u> |
| 4. <u>Kenn Wurst (Entergy)</u> | 24. <u>JERRY BURFORD - ENTERGY</u> |
| 5. <u>Jeff Clark - NRC</u> | 25. <u>Richard L. Smith (NRC)</u> |
| 6. <u>Joe Kowalewski - Entergy</u> | 26. <u>RANDY DOUET - ENTERGY</u> |
| 7. <u>Dean Overland - NRC</u> | 27. <u>RC Hagan - NRC</u> |
| 8. <u>WILLIAM MCKINNEY</u> (ENTERGY) | 28. <u>MIKE PERITO - ENTERGY</u> |
| 9. <u>John McCann (Entergy)</u> | 29. <u>Grant Larkin NRC</u> |
| 10. <u>Tony Vigil (NRC)</u> | 30. <u>Serry C Roberts Entergy</u> |
| 11. <u>Jeff Forbes (ETR)</u> | 31. <u>MICHAEL P. SHANNON NRC</u> |
| 12. <u>F Collins NRC</u> | 32. <u>A. DAVID HUTTIE - ENTERGY</u> |
| 13. <u>Tim Mitchell Entergy</u> | 33. <u>Bill DEAN, NRC</u> |
| 14. <u>TROY PRUETT NRC</u> | 34. _____ |
| 15. <u>Greg Werner NRC</u> | 35. _____ |
| 16. <u>W.R. BRIAN Entergy</u> | 36. _____ |
| 17. <u>Alan EHlgut Entergy</u> | 37. _____ |
| 18. <u>John Dent, Entergy</u> | 38. _____ |
| 19. <u>FRED MARCUSSE Entergy</u> | 39. _____ |
| 20. <u>Andre James Entergy</u> | 40. _____ |

EOI/NRC Senior Management Meeting

December 10, 2009



Entergy

ENS-NRC/RIV
Senior Management Meeting

Jackson, MS

December 10, 2009



Morning Session

December 10, 2009

8:00	Introductions	NRC/Entergy
8:30	ANO Top Issues	A. Sanchez/K. Walsh
8:50	GGN Top Issues	R. Smith/R. Douet
9:10	RBS Top Issues	G. Larkin/M. Perito
9:30	WF3 Top Issues	D. Overland/J. Kowalewski
9:50	Break	
10:05	CAP Effectiveness	R. Brian
10:35	Open Discussion	NRC/Entergy
10:55	Break	
11:00	Equipment Reliability	T. Trask
11:30	Open Discussion	NRC/Entergy
11:50	Lunch	

Afternoon Session

12:35	Outage Control/Perf.	J. Heckenberger
1:05	Open Discussion	NRC/Entergy
1:25	Break	
1:40	Discuss Understanding	NRC/Entergy
	• SDP	
	• Cross Cutting Process	
	• MD 8.3 [NRC Decision for AIT]	
2:10	Break	
2:25	NSIR Presentation (Closed)	B. Dean
3:00	Security (Closed)	R. Brian
3:30	Open Discussion	NRC/Entergy
3:50	Closing Remarks	NRC/Entergy
4:10	Adjourn	

ARKANSAS NUCLEAR ONE PERFORMANCE INSIGHTS

**Alfred Sanchez
Senior Resident Inspector
Arkansas Nuclear One**



RECENT CHALLENGES

- **Operator Performance/Knowledge**
- **Procedure Adherence (Ops/Maint)**
- **Corrective Action Program Effectiveness**



ANO Discussion

Kevin Walsh

December 10, 2009



Arkansas Nuclear One Challenges / Highlights

- **Challenges**
 - ◆ **Operational Focus**
 - ◆ **Human Performance**
 - **Plant Status Control**
 - **Procedure / Work Document Quality Adherence**
 - ◆ **Identifying and Correcting Problems with Resolve**
- **Highlights**
 - ◆ **Operations Training Accreditation Renewal**
 - ◆ **Unit 2 Refueling Outage (2R20)**
 - **Equipment Reliability Enhancements**
 - **Next Generation Fuel**
 - ◆ **Hostile Action Drill**

GRAND GULF NUCLEAR STATION PERFORMANCE INSIGHTS

**Richard Smith
Senior Resident Inspector
Grand Gulf Nuclear Station**



RECENT CHALLENGES

- **Engineering Rigor and Staffing**
- **Human Performance/Plant Culture**
- **Operation Focus and
Interdepartmental Communications**



GGNS Discussion

Randy Douet

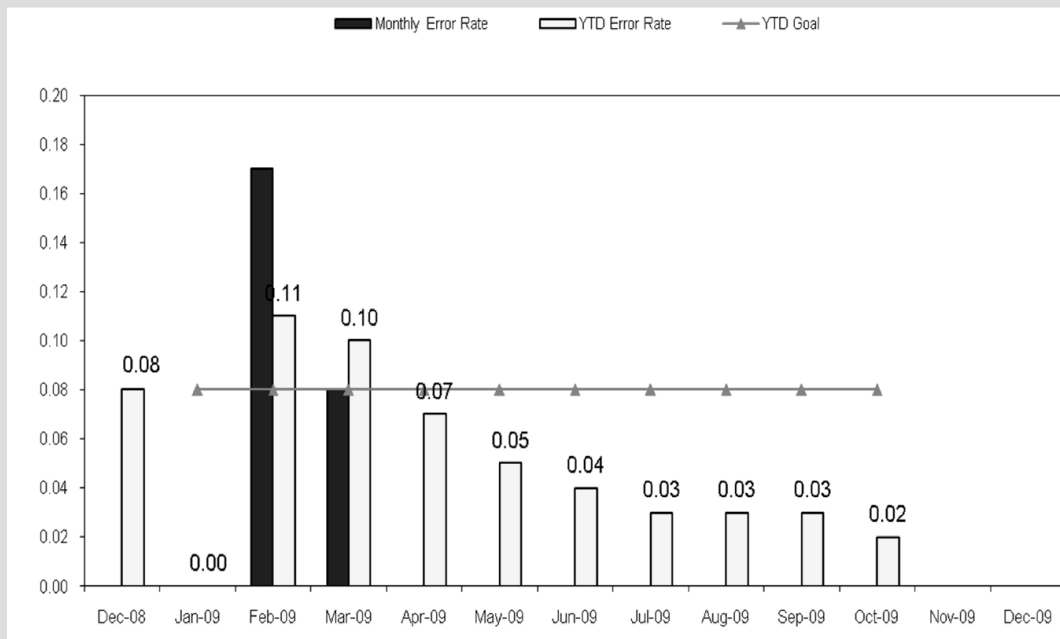
December 10, 2009



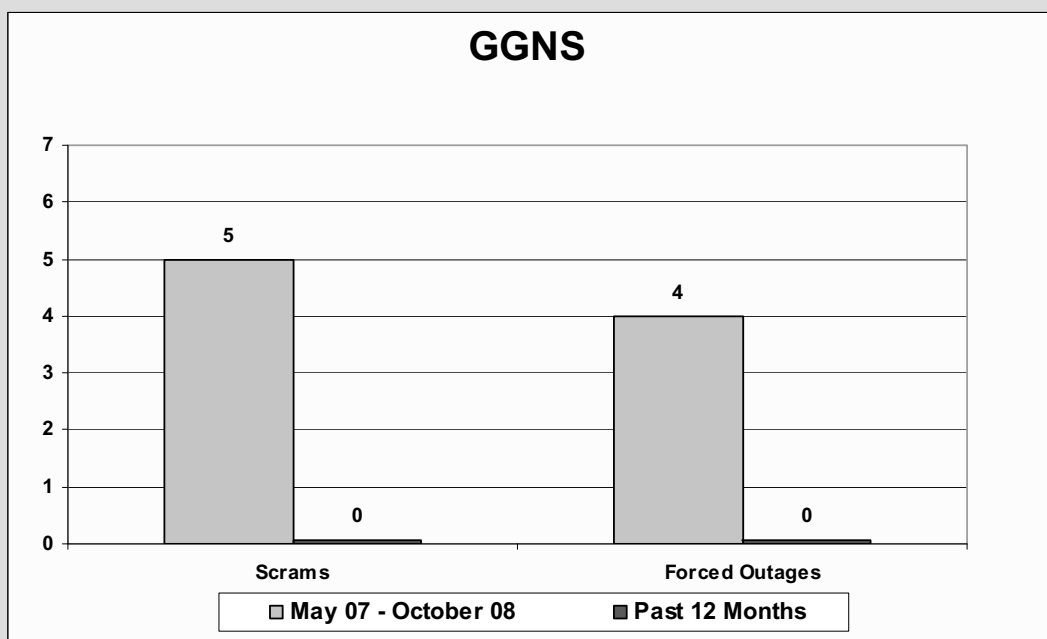
Grand Gulf Challenges / Highlights

- **Challenges**
 - ◆ Continued Performance Improvement
 - ◆ Engineering Staff Expertise
 - ◆ Operability Evaluation Focus
- **Highlights**
 - ◆ Human Performance Error Rate
 - ◆ Operations Training Accreditation Renewal
 - ◆ Emergency Preparedness Exercise

Grand Gulf Personnel Error Rate

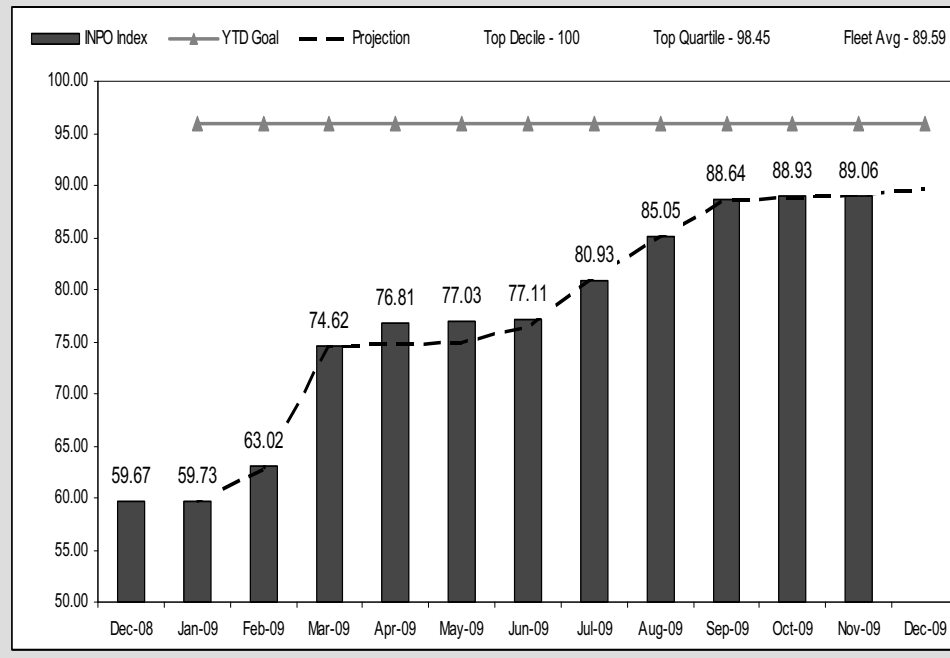


Scrams & Forced Outages



Grand Gulf INPO Index

Grand Gulf INPO Index



November 2009 projection – 89.06

RIVER BEND STATION PERFORMANCE INSIGHTS

Grant Larkin
Senior Resident Inspector
River Bend Station



RECENT CHALLENGES

- **Reactivity Control Issues**
- **Equipment Reliability**
- **Corrective Action Program Effectiveness**



RBS Discussion

Mike Perito

December 10, 2009



River Bend Station Challenges / Highlights

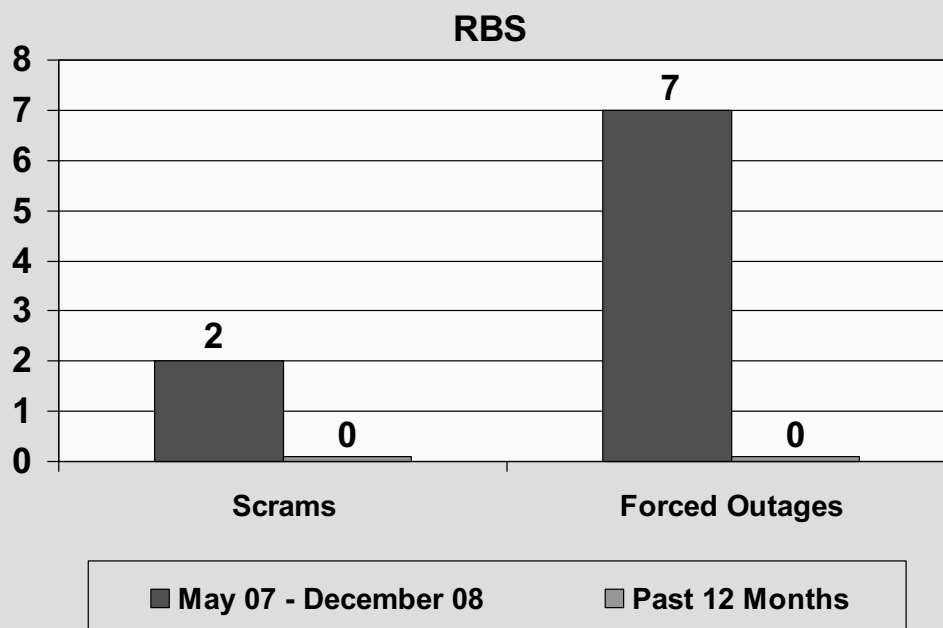
- **Challenges**

- ◆ Continuous Performance Improvement
- ◆ Long Term Asset Management
- ◆ Source Term / Collective Radiation Exposure

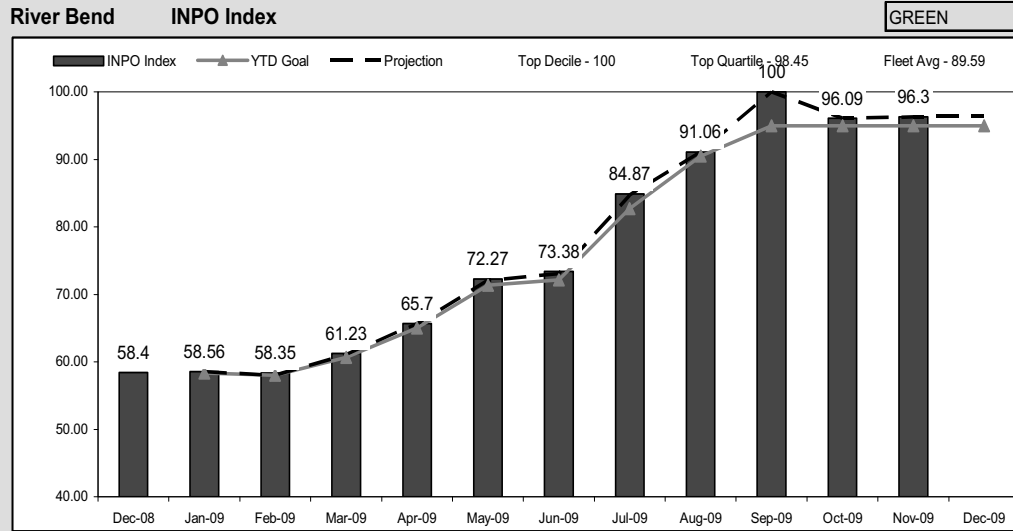
- **Highlights**

- ◆ Maintenance/Technical Programs Accreditation Renewal
- ◆ 363 Continuous days on-line, Hurricane Gustav to RF-15
- ◆ INPO Index of 100 in September

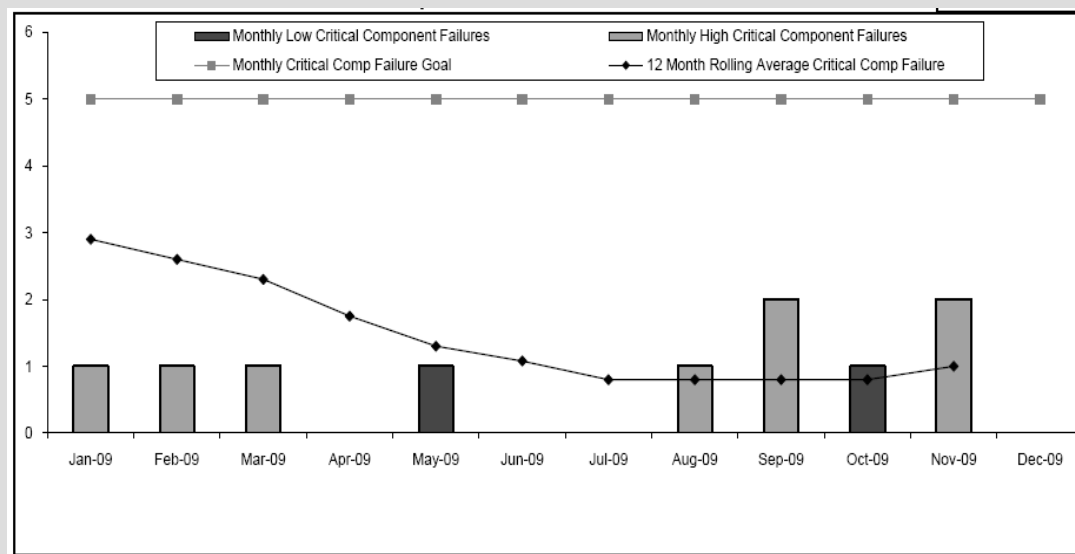
Scrams & Forced Outages



River Bend INPO Index



Failure of Critical Components



WATERFORD STEAM ELECTRIC STATION, UNIT 3 PERFORMANCE INSIGHTS

**Dean Overland
Resident Inspector
Waterford Steam Electric
Station, Unit 3**



RECENT CHALLENGES

- **Equipment Reliability Issues**
- **Corrective Action Program Effectiveness**
- **Plant Physical Security**



W3 Discussion

Joe Kowalewski

December 10, 2009



Waterford 3 Challenges / Highlights

- **Challenges**
 - ◆ Continued Performance Improvement
 - ◆ CAP; improvements in rigor and cause analysis
 - ◆ Collective Radiation Exposure
- **Highlights**
 - ◆ Refuel 16 / Fixing Problems
 - Equipment Reliability Enhancements
 - Next Generation Fuel
 - ◆ SGRP and DFS in progress
 - ◆ Hostile Action Drill

BREAK

*Corrective Action Program
Effectiveness*

Russ Brian

December 10, 2009



Fleet Functional Area Managers

- **Problem Identification...**

- ◆ **Training**

- Standard training is provided for all badged employees working at Entergy facilities regarding expectations of problem Identification.

- ◆ **Standard Performance Indicators**

- Industry accepted performance indicators routinely maintained, reviewed and challenged.

- ◆ **Entergy Fleet Learning Process**

- Immediate Sharing of condition reports
 - Sharing of Causal Analysis

- ◆ **Additional Improvements to Prevent Repeat Events**

- Piloting Fleet-wide tool to easily identify repeat events

Fleet Functional Area Managers

- **...& Resolution**

- ◆ **Condition Review Group (CRG)** assigns CR priority based on established criteria

- ◆ **Standard Performance Measures**

- Annual fleet assessments conducted to ensure condition reports are prioritized consistently across the fleet.
 - Monitor Effectiveness of CRG
 - Standard set of Fleet Indicators to monitor performance
 - CRG oversight is conducted through routine monitoring by Fleet OE &CA Manager

Fleet Functional Area Managers

- **Causal Analysis and Corrective Actions**

- ◆ **Root Cause Evaluations**

- 2008 Business Plan to address a gap in performance related to Root Cause Analysis and associated corrective actions.

Results of Industry Survey, Benchmark and Best of Practices resulted in the following:

- The more significant actions to improve performance:
 - Implement significant procedural enhancements simplifying roles and responsibilities and process for performing RCA
 - A fleet standard Training module was developed and implemented for all Root Cause Evaluators
 - A fleet Qualification card was implemented with a biennial re qualification requirement.

Fleet Functional Area Managers

- **Causal Analysis and Corrective Actions**

(Cont.)

- ◆ **Root Cause Evaluations (Cont.)**

- The more significant actions to improve performance (Cont.):
 - To ensure consistent quality is maintained the following parameters are **monitored**:
 - » Root Cause Analyses are graded against a consistent fleet standard
 - » Effectiveness of corrective actions are monitored through Identification of reoccurring events
 - » Effectiveness reviews procedurally required for all CAPRs
 - » (January) 2010 Business Plan action to perform self assessment to ensure effectiveness of actions from 2008 BP
 - » 2010 Business Plan action to perform benchmark

Fleet Functional Area Managers

- **Causal Analysis and Corrective Actions** *(Cont.)*
 - ◆ **Apparent Cause Analysis**
 - 2009 Business Plan has similar actions to address quality of Apparent Cause Analysis as was taken in 2008 for Root Cause Analysis
 - ◆ To ensure consistent **Corrective Action Review Board standards are implemented across the fleet** a Job Familiarization Guide was developed to ensure an adequate knowledge level.

BREAK

Equipment Reliability

Tim Trask

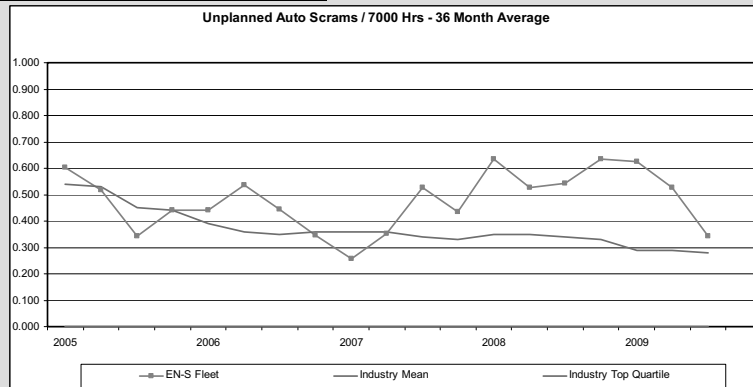
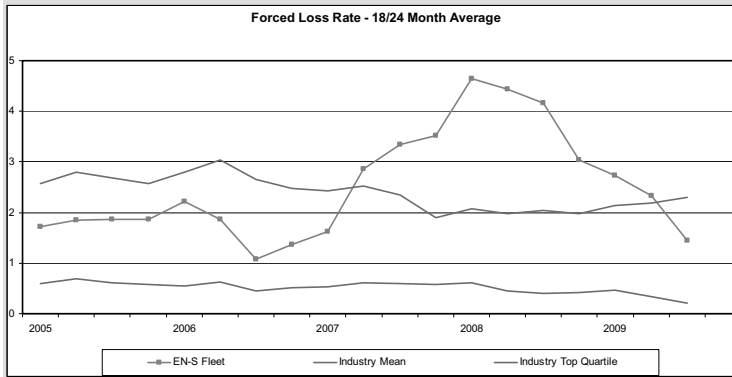
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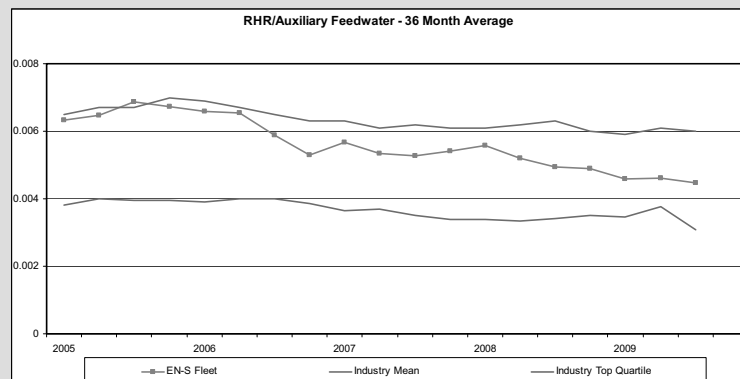
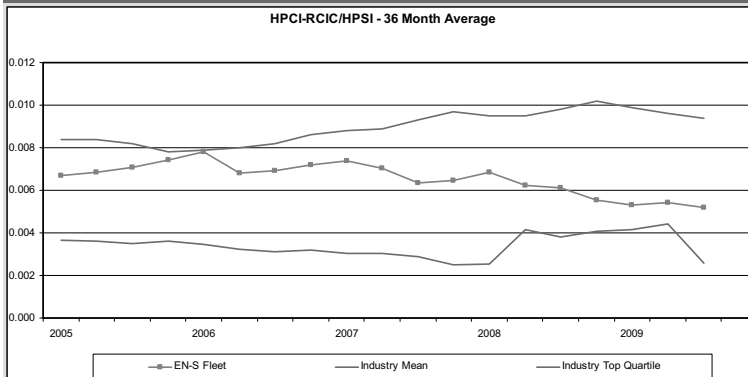
Entergy Nuclear Fleet Equipment Reliability

- **Equipment Reliability is a Key Cornerstone of the Entergy Nuclear Operational Philosophy.**
- **Fleet Key Performance Indicators for 2006 and 2007 showed mixed results and need for improvement.**
- **Fleet Equipment Reliability Assessment performed in 2007 identified gaps to industry excellence.**
- **Corrective Actions established and performed.**
- **Follow-up Assessments performed in 2009 and planned for 2010.**
- **Key Performance Indicator Trends are improving.**

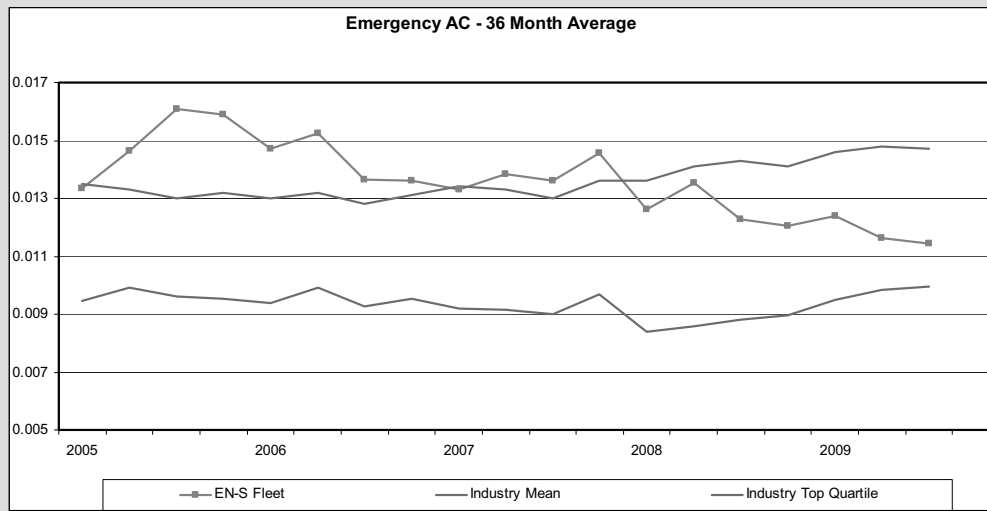
Key Performance Indicators



Key Performance Indicators



Key Performance Indicators



Key 2007 Assessment Findings & Results

- **Unit Reliability Team Effectiveness**
 - ◆ URT fully implemented at each EN Site.
 - ◆ Site Integrated Database loaded, functional and provides input to the Asset Management Plans.
 - ◆ URT functioning as the “One Stop Shop” to identify, prioritize, and drive resolution of EqR issues.
 - ◆ Ongoing Focus on Aging, Obsolescence and Life Cycle Management
- **Depth & Rigor of Critical Component Failure Analysis**
 - ◆ EN Corrective Action Program revised to include a graded approach to cause evaluation based on component classification.
 - Apparent Cause Evaluation (ACE) and Equipment Failure Evaluation (EFE) for Critical Component Failures
 - ◆ Quarterly Critical Component Failure Analyses performed at each site.
 - ◆ Equipment Reliability Clock established.

Key 2007 Assessment Findings & Results

- **Component Classification**

- ◆ Industry benchmark identified conservative criteria, beyond guidance in INPO AP-913.
- ◆ Entergy Component Classification Procedure revised to provide proper focus on nuclear safety and power production.
- ◆ Component Reclassification completed.

- **Single Point Failure Vulnerabilities**

- ◆ Evaluations completed at all EN Sites.
- ◆ Mitigation of the identified SPVs, either through enhanced PMs or Modifications, are being performed at each Site during refueling outages.

- **PM Optimization**

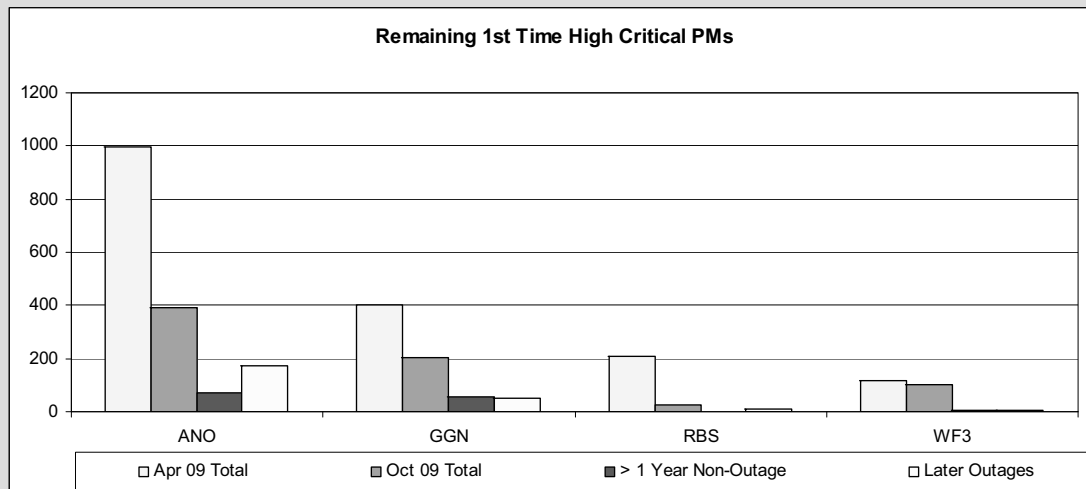
- ◆ PM Evaluations of High Critical Components completed at each Site.
- ◆ PM Evaluations of Low Critical Components in progress.

Key 2007 Assessment Findings & Results

- **Implementation**

- ◆ **Performance of First Time High Critical PMs.**
 - Evaluations performed at each Site to ensure appropriate reliability to risk balance is maintained
 - Completion is a Fleet Focus Area.
- ◆ **Work Management and Implementation.**
 - Analyses completed or in progress to identify inefficiencies in implementation of Work Management Process.
 - Focus placed on First Line Supervisor In-Field Time and Effectiveness.
 - Focus placed on Supplemental Personnel performance.
 - Corrective and Elective Maintenance Backlogs show positive trends.

First Time High Critical PMs

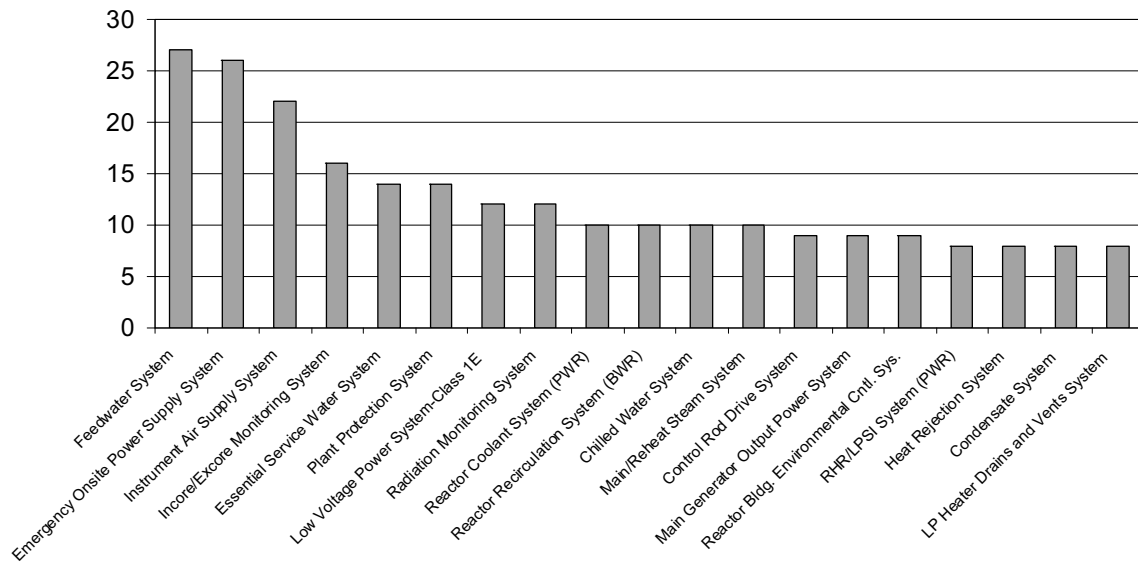


Critical Component Failure Analysis Results

- **System, Component and Causal Factor Distributions are consistent with Industry Data.**
- **Dominant Areas:**
 - ◆ Feedwater System
 - ◆ Emergency Diesel Generators
 - ◆ Balance of Plant Air-Operated Valves
 - ◆ I&C Obsolescence
 - ◆ Equipment Performance Monitoring and Trending
 - ◆ Causal Analysis and Corrective Action
 - ◆ Work Practices

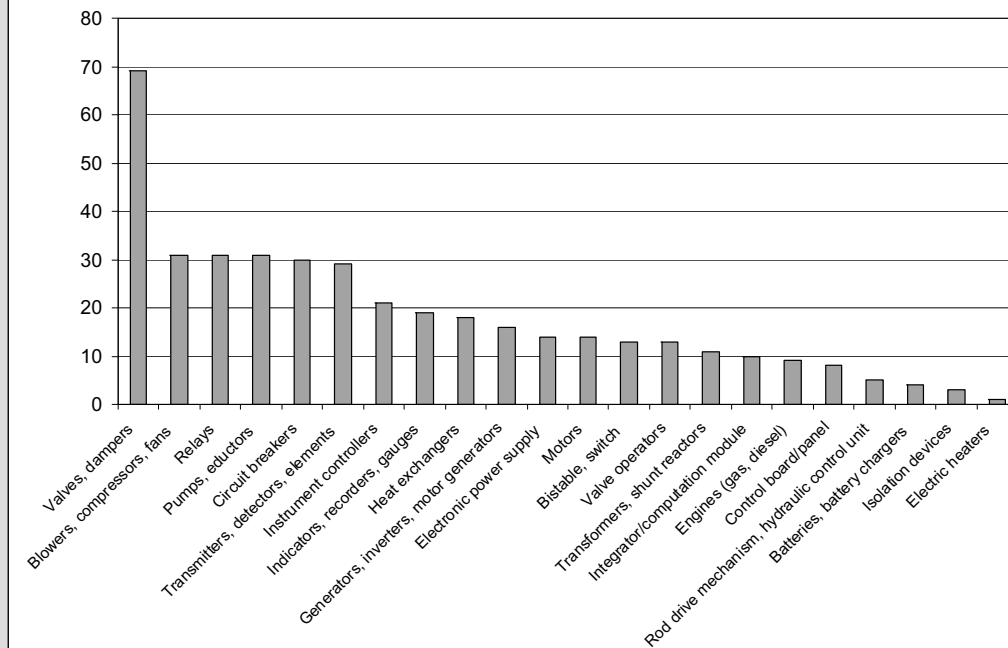
System Distribution

Entergy Fleet HCCFs 7/1/07 to 6/30/09

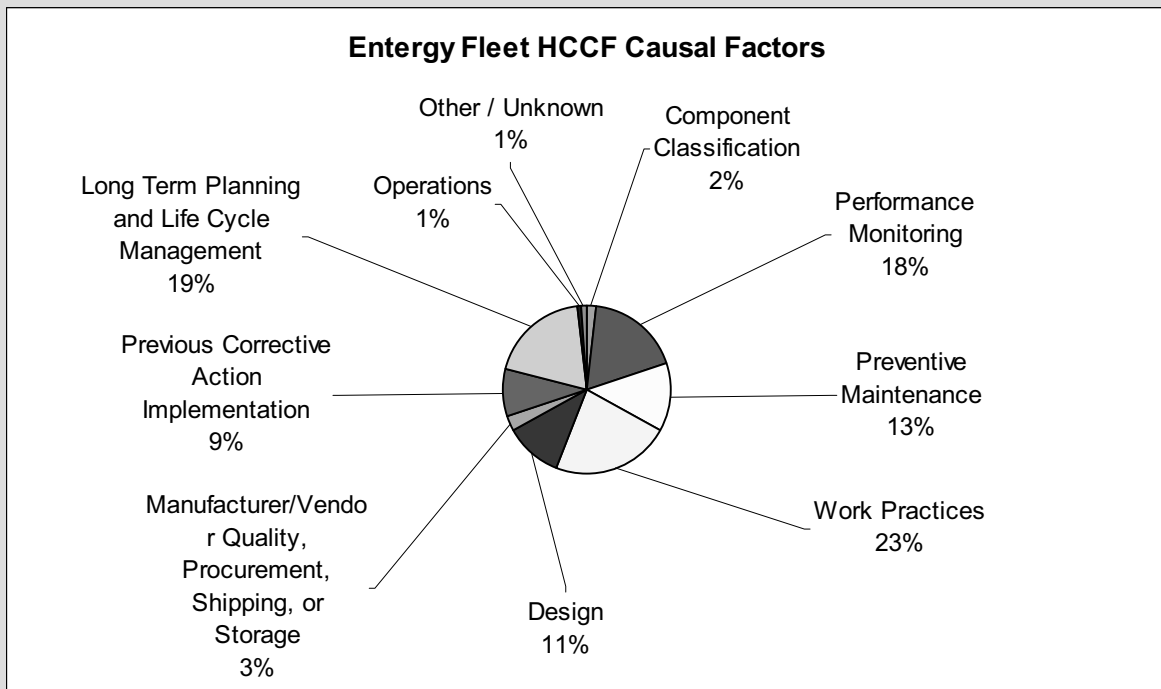


Component Distribution

Entergy Fleet HCCFs 7/1/07 to 6/30/09



Causal Factor Distribution



2010 Key Focus Areas

- **System Vulnerability Reviews**
- **I&C Aging & Obsolescence**
- **Emergency Diesel Generators**
- **Balance of Plant Air-Operated Valves**
- **Buried Piping**
- **Wetted Cable**
- **Switchyard and Transformer Reliability Improvements**
- **Equipment Performance Monitoring and Trending**
- **Troubleshooting, Causal Analysis and Corrective Action**
- **Work Practices**

Backup Slides

LUNCH

Outage Control/Performance

J. Heckenberger

December 10, 2009



Entergy Nuclear Fleet Refueling Outage Vision

- **Focus on Completing all the “Right Maintenance and Testing” with Precision**
- **Precision Execution of the Outage =**
 - ◆ **Reduced Risk of Errors or Events**
 - ◆ **A Lever to Continuously Drive Improvement of Organizational Effectiveness**
 - ◆ **Improved Quality of Work and Testing**
 - ◆ **Improved Predictability of Generation**

2009 Outage Improvement Fleet Business Plan

- **Outage Safety**
- **Major Vendor Performance**
- **Supplemental Worker Performance**
- **Refueling Equipment Performance**
- **Outage Execution Mechanics**

2009 Outage Improvement Fleet Business Plan

Outage Safety

- **Issued Fleet Outage Safety Procedure**
 - ◆ **Best Practices from Industry and INPO**
 - ◆ **Improved Outage Risk Assessment Team**
 - ◆ **Implemented an Oversight Review**
 - ◆ **Improved Schedule Change Review and Approval Process during Outage**
- **SOER 9-01 (Shutdown Safety) Review/Response**
 - ◆ **Senior Manager Outages on SOER Development Team**
 - ◆ **All Site Responses Completed by February**

2009 Outage Improvement Fleet Business Plan

Major Vendor Performance

- Major Vendors Developed Improvement Plans
- Initial Plan Reviewed with Entergy Senior Leadership
- Living Plan/ Results Reviewed Bi annually with Senior Leadership
- All Outage CR's now coded to appropriate vendor for trending/ improvement

2009 Outage Improvement Fleet Business Plan

Supplemental Worker Performance

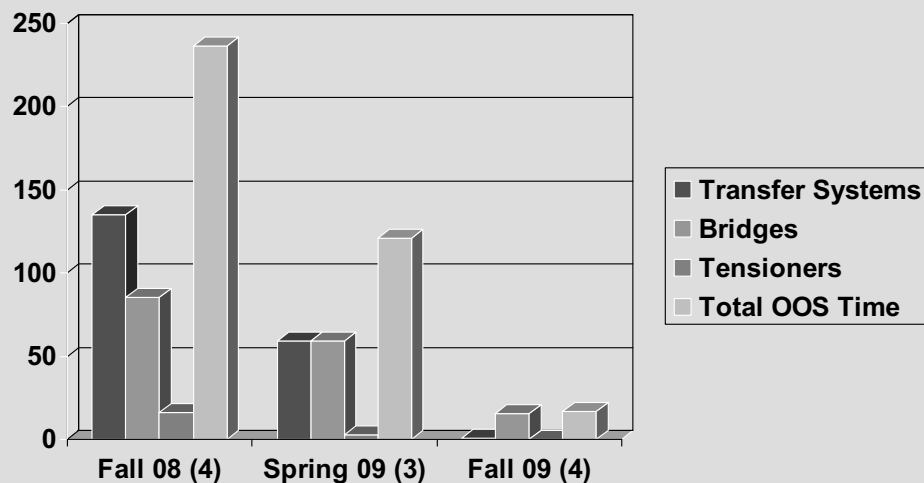
- Institution of Oral Boards for all Supplemental Supervision
- Development of “Critical Maintenance” process that identified Key Steps/ Right Oversight
- Developed and Implemented “New to Nuclear” actions for first time Nuclear Workers

2009 Outage Improvement Fleet Business Plan

Refueling Equipment Performance

- Immediate focus on Equipment that handles Irradiated Fuel/ Components
- Immediate Gap Identified and Closed for Fall Outage Season in Refueling and Transfer System PM Programs
- Refuel Equipment Fleet PM Templates in Development to complete by end of year
- Stations revise PM Work Orders based on Fleet Templates prior to next Outage (2010)
- Significant Improvement seen on Refuel Equipment Reliability in Fall Outage Season

Refueling Equipment Downtime By Outage Season



2009 Outage Improvement Fleet Business Plan

Outage Execution Mechanics

- **OCC/ WMC Improvements**
- **Increased Structure around System and Program Maintenance**
- **Increased Focus related to Critical Path and Outage Metrics**
- **Instituted Fleet Managers Assist at beginning of outage**
 - ◆ **4 days during first week of outage**
 - ◆ **Identify Gaps to Fleet and Industry Best Practices immediately and correct them**
 - ◆ **Rollup findings per outage season and make improvements within each functional area**

ANO Unit #2 2R20 Major Scope

- Alloy 600 Weld Inspections
 - 100% Steam Generator Eddy Current Testing and Sludge Lancing-
- Main Generator Exciter Major Inspection
- Motor Control Center Bus Bar and Stab Replacement and Modifications
- Reactor Vessel Head Bare Metal Visual & NDE Inspection
- Replace 2 Reactor Coolant Pump Seals
- Ultrasonic Fuel Cleaning
- Replace L/D Flow Control Valve (2CV-4817)
- Correct SPV in Alterrex System by Adding Parallel Diodes
- Modify Main Feed Water Recirculation Controller
- Circ Water Motor Cable Replacement
- Install Permanent Regen Heat Exchanger Shielding Package
- Replace CEDMCS Hall Effect Transducers with Improved Design
- Cooling Tower Bypass Line and Return Line Repairs
- Main Feedwater Pumps Bearing replacements & Oil Channel Mods
- Feedwater Heater ECT, Repairs, & Level Tree Upgrades

River Bend RF15 Major Scope

- Drywell Permanent Shielding – Recirc Pump B
- Condenser Access Mod and Bellows Replacement
- RS-8/9 Riser Clamp Installation
- Prep for Noble Metals Injection
- 9 Control Blade Exchanges
- 9 CRD Mechanism Exchanges
- 29 NI Replacements
- 5 Dry Tube Replacements & 1 Contingency
- RSS-1 and Generator Line Insulator Replacements
- Fancy Point Insulator Inspections
- 8 Transformer Clean & Inspections & 2 Internal Inspections
- Breakers Replacements: 36 Master Packs, 19-4160V, 1-13.8kV, 16-125VDC
- Main Transformer Online Monitoring Installation
- Standby Service Water Cooling Tower Inspection

Waterford #3 RF16 Major Scope

- Station Batteries A & AB
- RF Equipment Upgrade
- Feedwater Heater Divider Bolt Up Modification
- RCP-1A Motor and Pump Project
- Safety Injection Valve Work (SI-336A, SI-142A, SI-109B, SI-405 A&B)
- Incore Detector Thimble Replacement
- Alloy 600 Reactor Head Visual Inspection and Cold Leg Inspections
- S/G Primary and Secondary Inspection
- Pressurizer Heater Replacement
- SGR N-1 Work
- Condensate Pump/Motor Rebuild
- RCS Elevated Activity Mitigation

2010 Refueling Outage Initiative Summary

- **Outage Safety/ Risk Mitigation**
 - Protected Equipment Improvements
- **Outage Preparation**
 - Senior Leadership Challenge Boards for Milestones and Projects
- **Major Supplier/ Vendor Performance**
 - Lessons Learned/ Improvements from Fall Outage Season
- **Outage Execution Mechanics**
 - Focus on Improving mid Level Leadership Skills and Behaviors
- **Scheduling Improvements**
 - Challenging Rev "B" Schedule Logic and Durations to Industry Best
 - More Detailed Critical Path and Refueling Floor schedules
- **Refueling Floor Execution Initiatives**
 - Standardize Refueling Floor Organization Structure
- **Refuel Equipment Improvement**
 - Finish All PM Templates and Develop all Work Order instructions at sites
 - Expand Improvement areas to Polar/ Overhead Cranes and Specialized Tooling
- **Outage Cost Control**
 - Actions required to establish Top Quartile Performance at each site

Discussion of Processes

- **SDP**
- **Cross Cutting Process**
- **Management Directive 8.3**

December 10, 2009



BREAK

Closing Remarks



Entergy