



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

SEP - 8 1999

Randal K. Edington, Vice President - Operations
River Bend Station
Entergy Operations, Inc.
P.O. Box 220
St. Francisville, Louisiana 70775

SUBJECT: DISCUSSION REGARDING RECENT REFUELING/MAINTENANCE OUTAGE

Dear Mr. Edington:

This refers to the meeting conducted on August 30, 1999, in the Executive Conference Room of the Generation Support Building, located at the River Bend Station, St. Francisville, Louisiana. Due to the proprietary nature of some of the subject matter, this meeting was closed to attendance by members of the general public. The purpose of the meeting was to discuss overall performance issues during the April 3 through July 3, 1999, refueling/maintenance outage.

We found this meeting to be very useful. It provided a forum for a frank discussion of the successes, challenges, and lessons learned during the outage. Specific areas discussed included fuel handling, materiel condition, operations, radiation protection, and chemistry. You noted that, while this outage presented some unique challenges, some aspects of outage performance did not meet your standards. You also noted that outage critiques were still under review for potential process improvements and other lessons learned.

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 will be placed in the NRC's Public Document Room.

Should you have any questions, please contact me at 817/860-8148.

Sincerely,

A handwritten signature in dark ink, appearing to read "W.D. Johnson".

William D. Johnson, Chief
Project Branch B
Division of Reactor Projects

Docket No.: 50-458
License No.: NPF-47

Enclosure:

1. Attendance List
2. Licensee Presentation

9909150092 990908
PDR ADOCK 05000458
P PDR

Entergy Operations, Inc.

-2-

cc w/enclosure:

Executive Vice President and
Chief Operating Officer
Entergy Operations, Inc.
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Jackson, Mississippi 39286-1995

Vice President
Operations Support
Entergy Operations, Inc.
P.O. Box 31995
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General Manager
Plant Operations
River Bend Station
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Director - Nuclear Safety
River Bend Station
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Jackson, Mississippi 39205

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Winston & Strawn
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Manager - Licensing
River Bend Station
Entergy Operations, Inc.
P.O. Box 220
St. Francisville, Louisiana 70775

The Honorable Richard P. Ieyoub
Attorney General
Department of Justice
State of Louisiana
P.O. Box 94005
Baton Rouge, Louisiana 70804-9005

Entergy Operations, Inc.

-3-

H. Anne Plettinger
3456 Villa Rose Drive
Baton Rouge, Louisiana 70806

President
West Feliciana Parish Police Jury
P.O. Box 1921
St. Francisville, Louisiana 70775

Ronald Wascom, Administrator
and State Liaison Officer
Department of Environmental Quality
P.O. Box 82135
Baton Rouge, Louisiana 70884-2135

SEP - 8 1999

bcc to DCD (IE45)

bcc distrib. by RIV:

Regional Administrator

DRP Director

DRS Director

Branch Chief (DRP/B)

Project Engineer (DRP/B)

Branch Chief (DRP/TSS)

Resident Inspector

RIV File

RITS Coordinator

DOCUMENT NAME: R:_RB\RB8-30MS.RVA

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RIV:PE:DRP/B	E	C:DRP/B						
RVAzua;df		WDJohnson						
9/7/99		9/8/99						

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SEP - 8 1999

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9/7/99		9/8/99						

OFFICIAL RECORD COPY

ENCLOSURE 1

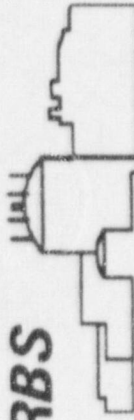
River Bend Station Outage Meeting

NRC/Entergy Operations, Inc. (EOI)

August 30, 1999

NAME	TITLE	ORGANIZATION
David N. Lorfing	Supervisor - Licensing	EOI/RBS
Arlie Davey Wells	Superintendent - Radiation Control	EOI/RBS
Michael W. Davis	Senior HP/Chemical Specialist	EOI/RBS
William J. Trudell	Manager, Corrective Action and Assessment	EOI/RBS
Rick J. King	Director, Nuclear Safety Assurance	EOI/RBS
R. Micheal Wyatt	Manager, Planning & Scheduling/Outage	EOI/RBS
Rickey L. Roberts	Manager - Project Outage	EOI/RBS
Don R. Derbonne	Refueling Project Manager	EOI/RBS
Russ Brian	Manager - Design Engineering	EOI/RBS
Thomas Hildebrandt	Manager - Maintenance	EOI/RBS
Jerome Holmes	Manager - Technical Support	EOI/RBS
Randy Edington	Vice President - RBS	EOI/RBS
Dwight Mims	General Manager - Operations	EOI/RBS
James McGhee	Manager - Operations, Acting	EOI/RBS
Robert L. Biggs	Coordinator - Nuclear Safety Assessment	EOI/RBS
Norman Garrett	Resident Inspector	NRC/RIV/DRP/RBS
William D. Johnson	Chief, Project Branch B	NRC/RIV/DRP
Ken E. Brockman	Director, Division of Reactor Projects	NRC/RIV/DRP
Troy Pruett	Senior Resident Inspector	NRC/RIV/DRP/RBS
Dale A. Powers	Chief, Engineering and Maintenance Branch	NRC/RIV/DRS

RBS



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RECOGNIZE
Where we have been
EMPHASIZE
Where we are and where we are going

ENCLOSURE 2

River Bend Station Outage Meeting

August 30, 1999

Agenda

RECOGNIZE
Where we have been
EMPHASIZE
Where we are and where we are going

- | | |
|--------------------------|-----------------|
| • Introduction | Mike Wyatt |
| • Management Perspective | Dwight Mims |
| • Outage Overview | Rickey Roberts |
| • Fuel Handling | Don Derbonne |
| • Materiel Condition | Russ Brian |
| | Tom Hildebrandt |
| • Operations | James McGhee |
| • RP & Chemistry | Jerome Holmes |
| • Closing Remarks | Randy Edington |
| • Adjourn | |

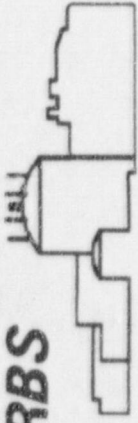
Management Perspective

Dwight Mims

General Manager Plant Operations

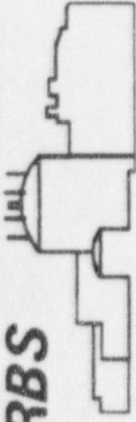
Outage Overview

Rickey Roberts
Manager Outage



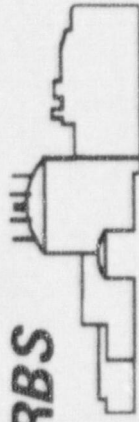
Outage Overview

- Safety focused approach
- Scope
- Challenges
- Critique summary
- Plans



Safety Focused Approach

- Safety through scheduling
 - Nuclear, industrial, and radiological
 - Defense-in-depth/protected trains philosophy
- Detailed outage plan/schedule
 - Real-time risk assessment
- Outage Risk Assessment Team (ORAT)
 - Established early
 - Team leader from operations



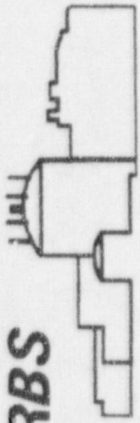
Safety Focused Approach (cont.)

• ORAT Team Members

- Operations - Team Leader
- Safety Analysis Engineering
- Operating Experience
- Quality Programs
- Scheduling supervisor
- Workweek manager
- EOOS Coordinator
- Senior manager oversight

Safety Focused Approach (Cont.)

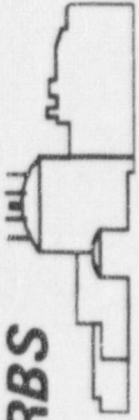
- Implemented Shutdown Operations Protection Plan (SOPP)
- Emphasized Risk Assessment Guidelines
- Reviewed mode change corrective actions
- Reviewed procedures
- Established Prevent Events Team
- Implemented schedule enhancements
- Improved training



Outage Scope

• Modifications

- High pressure (HP) rotor replacement
- Reactor Core Isolation Cooling (RCIC) injection
- Hydrogen water chemistry modification
- Revise safety relief valve (SRV) logic
- Div III battery replacement/upgrade
- Main Steam Isolation Valve (MSIV) SOVs
- Reactor Protection System (RPS) MG set field flash

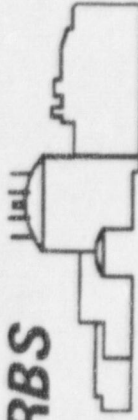


Outage Scope (cont.)

- Refuel
- Current transformer (CT) replacement
- Div. I Emergency Diesel Generator inspections
- Safety relief valve (SRV) replacement
- Battery testing
- Bulk work

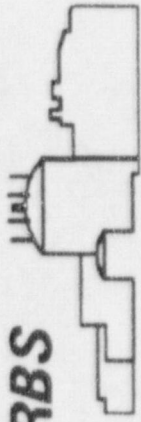
Outage Challenges

- Refuel issues
- Residual Heat Removal (RHR) heat exchanger testing
- Current transformers
- Main Steam Isolation Valves
- Refuel equipment
- Safety-related inverter testing



Outage Challenges (cont.)

- Extraction steam non-return valve (NRV) repairs
- Relief valves & snubbers
- Radiological controls
- Human performance



Outage Critique Summary

- Outage preparations
- Coordination between bus outage/MOV/LLRT
- Scheduling
- Manpower
- Process enhancements

Plans

- Organization
- Outage conduct
- Oversight

Organization

- Manager - P&S/Outage
- Outage Manager
- Additional project managers in outage
- Matrixed outage coordinator organization
- IST/MOV/LLRT Coordinator
- Dedicated/focused refueling equipment reliability team

Outage Conduct

- Preparation

Milestones

Criteria

- Scope

Fix the plant

- Communications

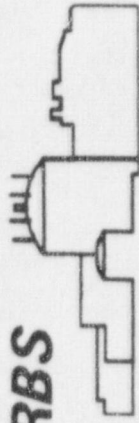
Up-front

During

Oversight

- Provide management sponsors for major activities
- Ensure Event Prevention Team - look ahead
- Provide additional assessment of schedule methods - tools
- Increase management presence on refueling floor
- Conduct additional QA assessment of refueling activities

RBS

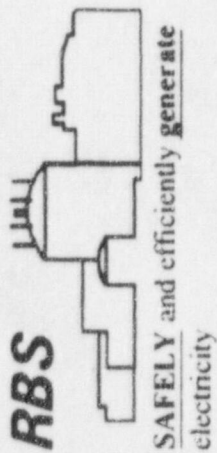


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RECOGNIZE
Where we have been
EMPHASIZE
Where we are and where we are going

Fuel Handling

Don Derbonne
Refueling Manager



RECOGNIZE
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Fuel Handling

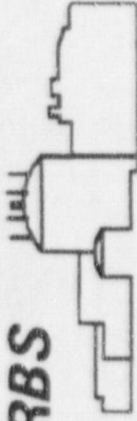
- RF06
- RF07

Fuel Handling (cont.)

- RF08
 - EOI fuel movement team
 - Fuel movement scope
 - Began 4/15/99 and finished 6/15/99
 - 4532 movement plan moves (expected: 1500)
 - 380 new bundles & previously burned (expected: 200)
 - 37 fuel assembly inspections

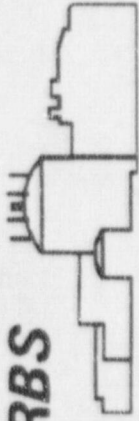
Fuel Handling (cont.)

- Results
 - Loaded core with no positioning or orientation errors
 - Fuel movement issues
 - Bent bail handle
 - Bent lower bridge mast
 - IFTS load error
 - Cattle chute



Fuel Handling (cont.)

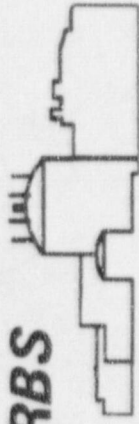
- **Corrective actions**
 - Identified critical steps in roles/responsibilities
 - Reviewed crews for qualifications, experience, and composition
 - Strengthened event review process
 - Improved the team building process
 - Developed guidelines to help crews with communications, observation and details of fuel movement
 - Reinforce executive management expectations with crews on error reduction techniques



Fuel Handling (cont.)

- Conclusion
 - Not satisfied with our performance
 - Ongoing improvement efforts

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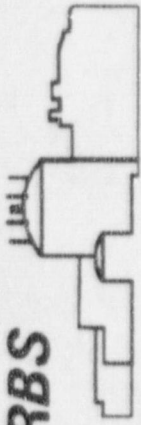
Matériel Condition

Russ Brian

Manager Design Engineering

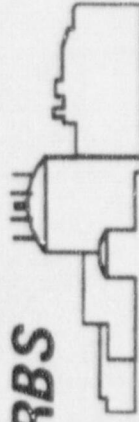
Tom Hildebrandt

Manager Maintenance



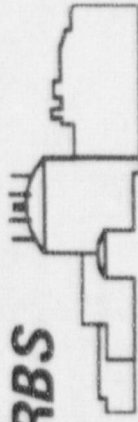
Engineering

- Planned activities
- Emergent outage challenges
- Extended outage opportunities



Planned Activities

- Hydrogen water chemistry installation
- RCIC injection point re-route
- HP turbine rotor replacement
- Div. III battery replacement/upgrade
- SRV logic modification
- SRM availability improvement
- RPS MG set field flash modification
- Recirc pump seal root cause



Emergent Scope Challenges

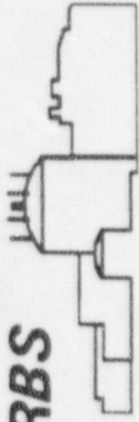
- Fuel recovery
- RHR heat exchanger
- MSIV pilot poppet
- Non-return valves
- Relief valves and snubbers
- Feedwater heater inspection

Extended Outage Opportunities

- Accomplished feedwater min-flow valve controller modifications
- Installed
 - MOV torque switch bypass modifications
 - Recirc pump axial motion monitor
- Completed diesel air modification
- Implemented instrument air reliability improvements

Maintenance

- Focus issues
 - Radworker practices
 - Turbine generator
 - Diesel generator maintenance plan

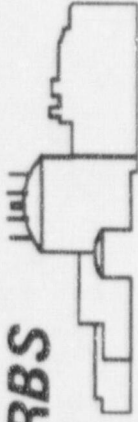


Improvement Initiatives

- Reduction in the dependence on contractors
- Mock-up training--recirc flow control valve
- Human performance awareness

Areas of Success

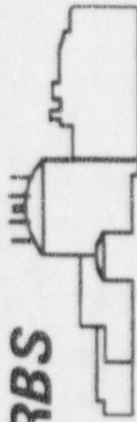
- Main Steam Isolation Valve problem identification and resolution
 - Good teamwork with Engineering
 - All 8 valves inspected and modified
 - Industry OE provided



Areas of Success (cont.)

- Recirc pump seals
 - Improved performance Cycle 8
 - Replaced upper motor guide bearing
 - Implemented modification to add axial shaft movement indicator
 - Installed new seals in both pumps
- Current transformer replacement
 - Implemented conservative response to OE (GGNS)
 - Replaced 131 transformers
 - Worked in both safety-related divisions during RF08

RBS

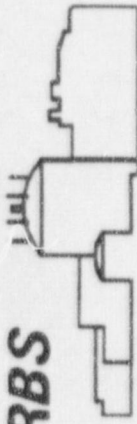


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Plant Operations

James McGhee
Manager Operations



Plant Operations

- Outage operating philosophy
- Implemented improvements
- Successes
- Challenges
- Lessons learned
- Conclusion

Operations Outage Philosophy

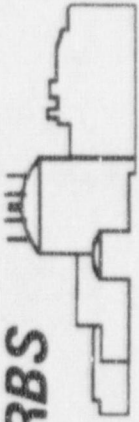
- Defense-in-depth
 - Maintain maximum equipment availability
 - Understand and communicate risk
- Detailed outage plan/schedule with on-going risk assessment
- Conservative decision making

Implemented Improvements

- Shutdown training
- Protected division status
- 24 hour safety/risk assessment
- Risk assessment communication
- Schedule reviews

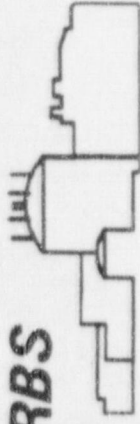
Successes

- Controlled, well executed shutdown
- Safely performed significant clearance scope changes due to SRV and CT
- Effective corrective actions prevented any loss of shutdown cooling
- Startup incorporated conservative limits for chemistry parameters



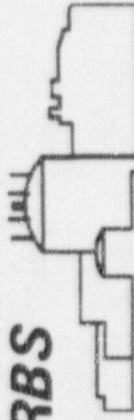
Challenges

- Four ESF actuations
 - One incorrect clearance order
 - One incorrect procedure
 - One I&C technician error
 - One newly installed equipment failure
- Two Technical Specification implementation errors
 - One identified through good questioning attitude
 - One caused by ineffective communication



Lessons Learned

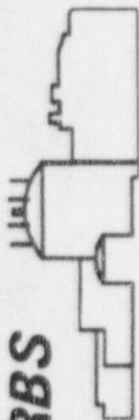
- Events are generally caused by failures of multiple barriers
 - Human performance improvement and error reduction initiatives are critical to maintaining barrier strength
 - EOI initiatives must strengthen barriers and address organizational weaknesses
 - Aggressive corrective action program will be a cornerstone of human performance excellence program



Conclusion

- More effective communication of pre-outage decisions is key to consistency & better performance
- Operations can/must contribute more to initial schedule preparation and sequencing of key activities
- RBS Operations is an integral part of the human performance initiative for EOI

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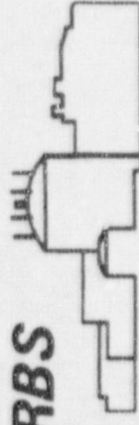
RP and Chemistry

Jerome Holmes

Manager Technical Support

Site RP Improvement Plan Status

- Site's radworker guidelines
- RBS's supervisor expectations
- Necessary resources have been committed
- Implementation schedule
- RBS site inter-discipline team is developing the practical factors training program

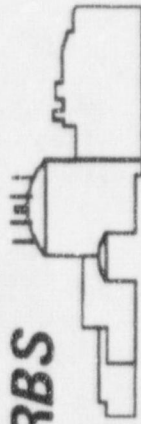


Start-up Chemistry

- Reduce metals transport to the reactor
- Improve site chemistry performance monitoring
- Increase start-up chemistry monitoring
- Improve site-wide communications of the chemistry action plan
- Baseline characterization of the plant's water system

Site's Chemistry Action Guideline Matrix

Monitored Parameter	Actions		
	Convene FILM Team	Normal Power Reduction to ~80 % based on Verified Sample	Plant Shutdown
Reactor Water		NA	NA
Conductivity @ 25 °C $\mu\text{S/cm}$	= 0.25 $\mu\text{S/cm}$ or $\Delta = +0.05 \mu\text{S/cm}$	= 0.5 $\mu\text{S/cm}$	As required by Technical Specifications
(ppb) Chlorine	= 20 ppb	NA	As required by Technical Specifications
(ppb) Sulfate	= 20 ppb	NA	NA
Final Feedwater			
Copper (Total)	= 0.3 ppb	NA	NA
Fe (Total)	= 3.5 ppb	NA	NA
Conductivity @ 25 °C $\mu\text{S/cm}$	= 0.065 $\mu\text{S/cm}$	NA	NA
Condensate Hotwell			
Conductivity @ 25 °C $\mu\text{S/cm}$	= 0.1 $\mu\text{S/cm}$	NA	NA



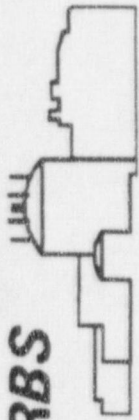
Site's Chemistry Monitoring

3. Chemistry requirements prior to injecting feedwater into the reactor vessel (Chemistry Hold Point #1)

<i>Required Action</i>	<i>Results</i>
A. FWS conductivity	< 0.08 uS/cm
B. FWS dissolved oxygen	< 200 ppb
C. FWS particulate iron oxide (PIO)	< 100 ppb
D. FWS copper	
E. RCS conductivity	< 0.3 uS/cm
F. RCS chlorides	< 20.0 ppb
G. RCS sulfates	< 20.0 ppb

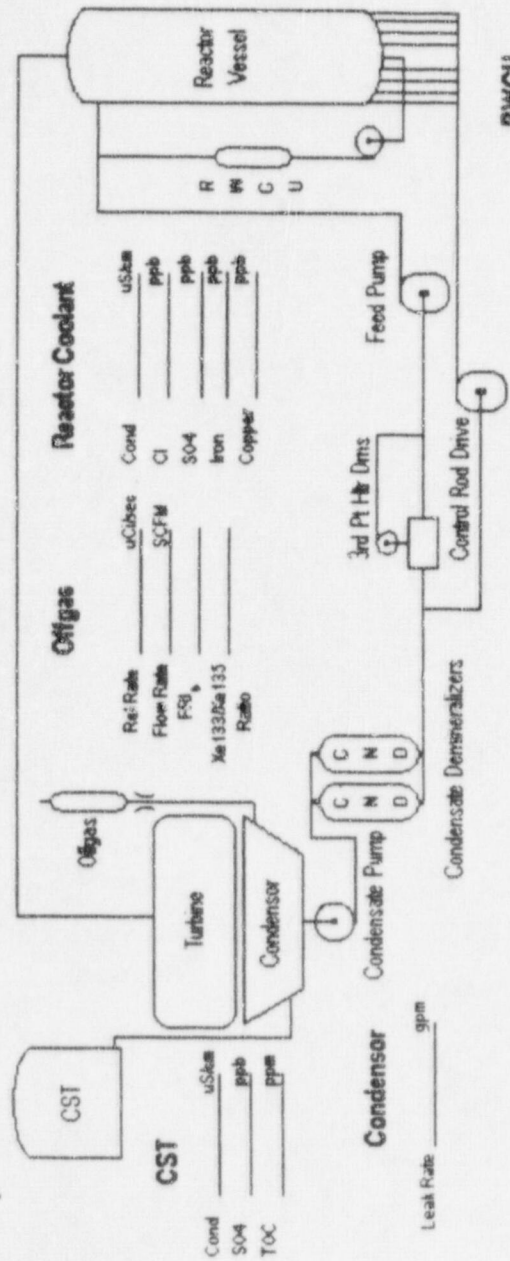
9. Chemistry requirements at 15 % power (Chemistry Hold Point #3)

<i>Required Action</i>	<i>Results</i>
A. FWS conductivity	< 0.065 uS/cm
B. FWS dissolved oxygen	15 - 200 ppb
C. FWS particulate iron oxide (PIO)	< 10 ppb
D. FWS copper	
E. RCS conductivity	< 0.3 uS/cm
F. RCS chlorides	< 5.0 ppb
G. RCS sulfates	< 5.0 ppb
** Check on outside system chemical feed rates. Coordinate with Nalco as needed.	



River Bend Station Chemistry

Date _____

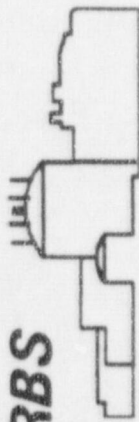


CDI	CDE	FWS	3rd PI H ₂ Dms	RWCU
Cond _____ uS/cm	Cond _____ uS/cm	Cond _____ uS/cm	Cond _____ uS/cm	Cond _____ uS/cm
D.O. _____ ppb	D.O. _____ ppb	D.O. _____ ppb	D.O. _____ ppb	D.O. _____ ppb
Iron _____ ppb	Iron _____ ppb	Iron _____ ppb	Iron _____ ppb	Iron _____ ppb
Copper _____ ppb	Copper _____ ppb	Copper _____ ppb	Copper _____ ppb	Copper _____ ppb

CRD
Cond _____ uS/cm
D.O. _____ ppb

Notes

RBS

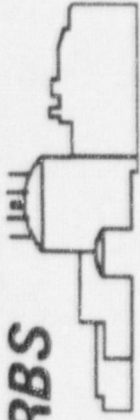


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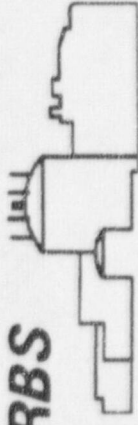
Site's Industrial Safety Performance

Year	1996	1997	1998	1999
LTAs	1	0	1	0
Res. Duty	6	0	0	0
OSHA	22	19	10	9
First Aid	157	130	73	80



Outage Achievements

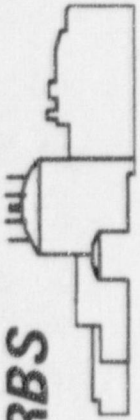
- No discrete particles or alpha concentration during the outage
- No individual approached the admin radiation limits
- Mitigated elevated levels of iodine and noble gases
- Demonstrated improving industrial safety culture
- Implemented comprehensive chemistry start-up plan



Site Focus

- River Bend Station must effectively implement the station's Radworker Improvement Plan
- The site must remain vigilant in monitoring and responsiveness to plant chemistry conditions
- RBS must continue to encourage a healthy industrial safety culture in order to improve

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Closing Remarks

Randy Edington