July 6, 1999

South Carolina Electric & Gas Company
ATTN: Mr. Gary J. Taylor
Vice President, Nuclear Operations
Virgil C. Summer Nuclear Station
P. O. Box 88
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION REFUELING OUTAGE REVIEW MEETING

Dear Mr. Taylor:

This refers to the meeting conducted at your request at this office in Atlanta, Georgia on July 1, 1999. The purpose of the meeting was to discuss the recent Virgil C. Summer refueling outage and other items of interest. A list of attendees and presentation handouts are enclosed.

At the meeting, South Carolina Electric & Gas (SCE&G) personnel presented an informational overview of activities conducted during Refueling Outage 11. SCE&G also discussed the evaluation and corrective actions for issues associated with Magne-Blast breakers and fuel assembly top nozzle failures.

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

Should you have any questions concerning this meeting, please contact me at (404) 562-4500.

Sincerely,

Orig signed by Robert C. Haag

Robert C. Haag, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket No. 50-395
License No. NPF-12

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

cc w/encls: Continued see page 2

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cc w/encls:
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Nuclear Coordinator Mail Code 802
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OFFICIAL RECORD COPY DOCUMENT NAME: G:\summer mtg_0799.wpd

LIST OF MEETING ATTENDEES

Topic: VIRGIL C. SUMMER NUCLEAR STATION REFUELING OUTAGE REVIEW

Location: US Nuclear Regulatory Commission, Region II Office, Atlanta, Georgia

Date: July 1, 1999

NRC

Luis Reyes	Regional Administrator
Loren Plisco	Director, Division of Reactor Projects
Bruce Mallett	Director, Division of Reactor Safety
Robert Haag	Chief, Reactor Projects Branch 5
Kerry Landis	Chief, Reactor Safety Engineering Branch
Kevin Coyne	Project Engineer
Mark King	Resident Inspector
Paul Fillion	Reactor Inspector

South Carolina Electric & Gas

Steve Byrne	Plant Manager
Alan Torres	Outage Manager
Jim Proper	Supervisor, Nuclear Licensing and Operating Experience
Sam Skidmore	Engineer, Plant Support Engineering
Richard Slone	Engineer, Plant Support Engineering

Enclosure 1

SCE&G

Participants

- Steve Byrne — Plant Manager
- Alan Torres — Outage Manager
- Richard Slone — PSE Engineer
- Sam Skidmore — PSE Engineer
- Jim Proper — Supervisor, NL&OE

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Agenda

- Introduction and Overview
- Refueling Outage 11
- Magne-Blast Breakers
- Fuel Assembly Top Nozzle Issue
- Closing Comments

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Refueling Outage 11

Alan Torres
Outage Manager

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Outline

- RF-11 Goals
- Outage Comparison
- Outage Success
- Outage Challenges
- Major Activities Completed
- Summary

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Outage Summary

No Safety Significant Events	Goal Met
No Lost Time Accidents	1 LTA
Outage Dose less than 90 Rem	Actual Dose 115 Mr 2nd lowest in plant history
Planned Duration less than 30 days	Actual Duration 38 days, 10.5 hours 2nd lowest in plant history
Budget	Met Budget Goal Lowest in plant history

Enclosure 2

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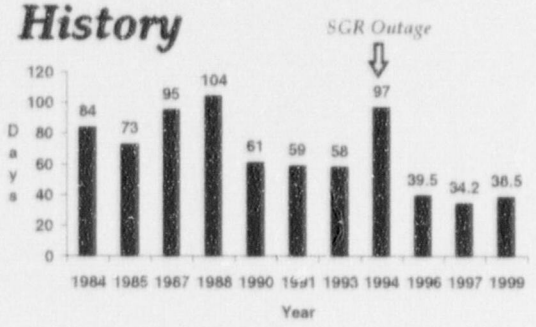
V. C. Summer Outage History



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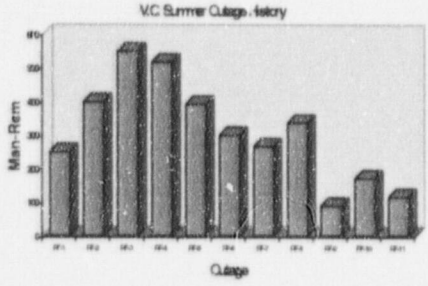

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Outage Summary

- Outage Successes
  - Use of Administrative Group for Safety, Fire Watches, Confine Space, and FME Watches
  - Use of Training Staffs in Shop and Specific Project Tasks
  - Use of Other Groups Such as Licensing, Chemistry, HR, EP, CDSV to Supplement Craft and HP Activities

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Outage Summary

- Outage Successes
  - Response to Challenges
  - Control of Dose and Use of ALARA Plan
    - RHR Single Train Cool Down
    - Use of Equipment Locators, ISI, Snubbers
    - RCS Drain Down Plan
  - Outage Work Scope Control

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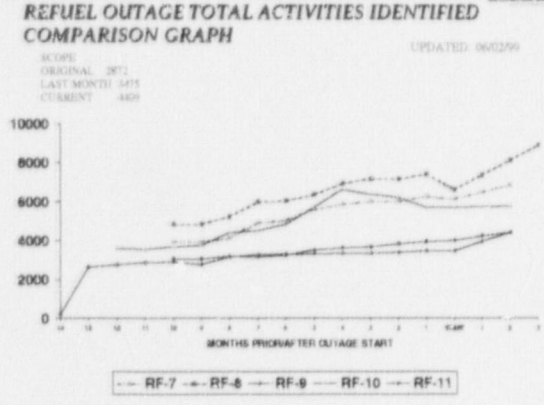

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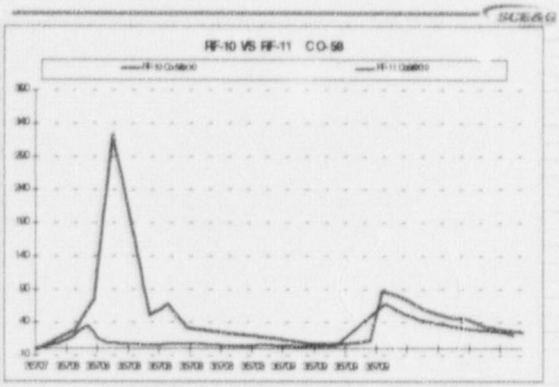
Outage Summary

- Outage Successes
  - Control of RCS Crud Burst
    - Chemistry Controls
      - Change RCS pH
      - Hold Hydrogen Concentration Higher Longer for Increased Solubility
      - Followed EPRI Guidelines
      - Pump Operation Following Hydrogen Peroxide Add



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Outage Summary

- Major Issues and Emergent Work
  - Fuel Transfer System Modifications - 60 hrs delay
  - Fuel Top Nozzle Issues - 68 hrs delays
  - 7.2 kV Breaker Issue - 18 hrs delay

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Outage Summary

- Major Work Activities
  - 40% Eddy Current of 2 S/G's
  - 'A' RCP Seal Replacement and Motor Swap
  - Replacement of both 1E Batteries
  - Inspection and Testing of 116 Snubbers
  - 49 LLRTs and 29 Movats Tests
  - 154 ISI Examinations and 39 Erosion /Corrosion Inspections

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Outage Summary

- Modifications Completed
  - HP Rotor Replacement
  - 10th Stage Extraction Check Valve Replacement
  - Removal of S/G Snubbers
  - 'A' D/G Heat Exchanger Replacement
  - Fuel Transfer System

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Outage Summary

- Modifications Completed
  - Amertap Upgrade
  - Gate Valve Pressure Locking
  - MSR Digital Controls
  - Main Transformer Supplemental Cooling System

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Outage Summary

- Challenges for the Future
  - Control Cost Through Increased Use of Plant Staff and CDSV
  - Contractor Resources
  - Continue to Improve Schedule Review Process
  - Continue Improvements Such as HP ALARA Plan, Drain Down Plan

Outage Summary

- Our Measuring Stick of Success
  - Safety Conscience Primary Focus
  - No Nuclear Safety Fvents
  - Conservative Decision Making
    - Fuel Top Nozzle Issue
    - 7.2 kV Breaker Issue
  - ALARA Awareness

Magne-Blast Breakers

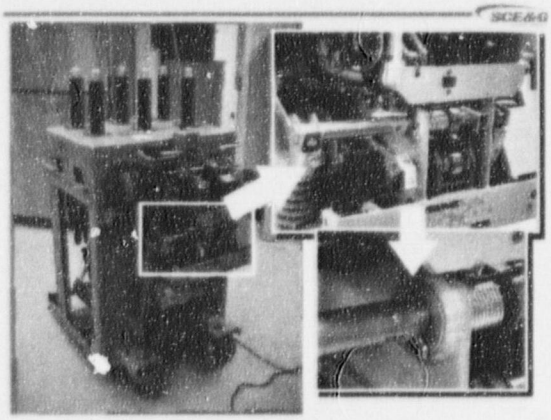
Richard Slone
PSE Engineer

Overview

- Breakers recently overhauled by GE
- "Tripped free" on close attempt
- Cotter pin not properly bent
- Latch check switch bracket hit by pin
- Bracket interfered with switch paddle on trip shaft

VCS Medium Voltage Breakers

- General Electric Magne-Blast
- Air Circuit Breakers
- Vertical Lift
- 7.2 kV
- 500 MVA



Charging Pump Breaker

- Overhauled in May/June '98
- Site Tested and Installed June '98
- Failed to close - February '99
- Various factory attempts to fix failed
- Back to Atlanta Service Shop

Second Breaker Failure

- Post overhaul testing April 99
- Same failure to close symptom
- Latch Check Switch paddle interference found

Second Breaker Failure

- Root cause of interference not clear
- High speed photography
- Cotter pin observed striking back of latch check switch plate

Re-inspection of 1st Breaker

- Gap was also changing
- Cotter pin also not properly bent
- Ding marks where pin tabs hit bracket

Root Cause

- Cotter pin on trip shaft not bent fully
- Tab strikes back of switch, moving it forward
- Closes required gap between switch plate and trip shaft paddle

Root Cause (cont.)

- Result of no gap:
  - Switch bracket bounces against paddle when attempting to close
  - Paddle movement rotates trip shaft
  - Trip latch bounces off trip latch roller when breaker attempts to close
  - Breaker "trips free"

Root Cause (cont.)

- Breakers operated properly every time with:
  - Paddle removed
  - Switch bracket removed

Corrective Actions

- Latch Check Switches, brackets, and paddles removed from VCS breakers
  - In-service as well as spare breakers
    - NNS 480 Volt substation feeders remain
  - LCS function not required for VCS design
    - Resolves cotter pin problem
    - Removes an unnecessary component from closing circuit - increased reliability

Corrective Actions

- Electrical Maintenance procedures revised to re-verify switch removal
- Procurement documents/databases will be revised to address LCS
- Part 21 notification sent to NRC by VCS on 5-5-99

Summary

- All NSR breakers reworked to a safer, more reliable condition
- In-depth root cause
- Conservative decision making
  - protected both trains
- Shared industry experience

Fuel Assembly Top Nozzle Issue

Sam Skidmore
PSE Engineer

Outline

- Problem Discovery
- Actions (Core Offload)
- Actions (Core Load)
- Safety Assessment
- Vendor Root Cause
- Summary

Problem Discovery

- Simultaneously, on Offload Steps 23A and 24 (4-13-99/2309):
  - Difficulty Latching in Fuel Handling Bldg.
  - Unusual Fuel Orientation in Reactor Bldg.
  - Visual Inspection in RB
    - One or More Gripper Fingers Disengaged
    - Non-essential Personnel Leave RB
    - Recovery Efforts Begin
    - Suspend Attempts to Latch Fuel in FHB

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Problem Discovery

- Fuel Recovery:
  - Consult Manipulator Vendor Rep
  - Consult Additional Refueling Contractor resources
  - Develop "Troubleshooting" Plan
  - Plant Safety Review Committee Approval
  - Implement Plan. Fuel Safe (4-14-99/0810)

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Problem Discovery

- Springs Held Down With Inc-600 Screws
- Clamp (cover) Attached by Separate Screw and Single Tack Weld

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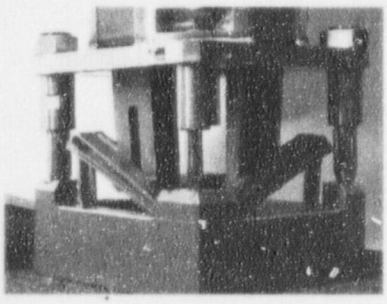

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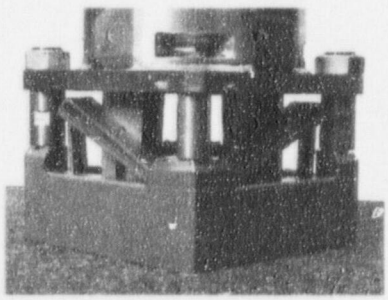

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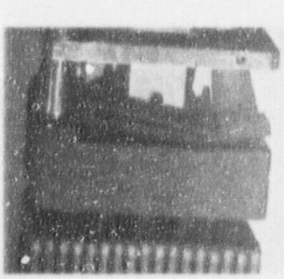
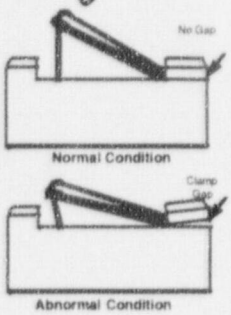
Problem Discovery





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Actions: Core Offload

- Notifications:
  - NRC Resident (On site during discovery)
  - Other Affected Utilities
  - Fuel Vendor
  - Refueling Services Vendor
  - Manipulator Crane Vendor
  - INPO Network
  - LER

Actions: Core Offload

- Manipulator Crane
  - Verify Proper engagement function
    - Adjust Engage Limit Switch setting
    - Verify Cam Travel
    - Test with Dummy Assembly
  - Visually Verify Engagement (UW camera)

Actions: Core Offload

- Spent Fuel Handling Tool
  - Remove Reference and Dummy Pins
  - Visually Verify Latching (UW Camera)
- Fuel Vendor Video Inspection
- Crew Briefing
- Resume Offload 4-16-99/0351

Actions: Core Offload

- Step 65 Partial Engagement
- Visual Inspection Results
  - Problem Limited to Region M ("Mikes")
- 35 "Mikes" out. 29 Remaining
- Lower Slack Cable Setting
- Brief Crew
- Offload Complete 4-18-99/0722

Actions: Core Load

- Replace Top Nozzle on 28 Assemblies
  - Standard Vendor Tooling, Parts and Procedures
- Verify No Loose Parts
- Verify No Damage to 'S' Holes

Actions: Core Load

- Replace Manipulator Crane Gripper Assembly
- Restore SFHT Pins
- Core Load Uneventful

Safety Assessment

- All Parts Remain on Top Nozzle
- Assembly Remains Engaged in Alignment Pins
- RCCA Movement Unaffected
- Accident Conditions Acceptable

Vendor Root Cause

- Ongoing:
  - Data Collection
  - Materials Investigation
  - Manufacturing Investigation

Summary

- Deliberate and Conservative Decision Making for Safe Offload
- Thorough Assessment and Reconstitution Effort to Ensure Safety of Cycle 12 Core
- Notifications to Industry

Closing Comments

Steve Byrne
Plant Manager