June 28, 1995

Duke Power Company ATTN: Mr. J. W. Hampton Vice President Oconee Site P. O. Box 1439 Seneca, SC 29679

SUBJECT: MEETING SUMMARY - OCONEE NUCLEAR STATION - JUNE 20, 1995

Gentlemen:

On June 20, 1995, representatives from the Oconee Engineering Department met with members of the Region II staff in Atlanta. Mr. Davis led the discussion for Duke Power. Mr. Davis provided the staff with an overview of engineering activities at the site. Enclosed is a copy of the handout provided during this meeting. Also enclosed is a list of attendees at the meeting.

Mr. Gibson expressed the staff's appreciation for this update. The meeting was beneficial in providing the staff with your management perspective of ongoing engineering activities.

Sincerely,

Original signed by Jerome J. Blake for Charles A. Casto

Charles A. Casto, Chief Engineering Branch Division of Reactor Safety

Docket Nos. 50-269, 50-270, 50-287 License Nos. DPR-38, DPR-47, DPR-55

11002:

Enclosures: As stated (2)

cc w/encls: (See page 2)

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DUKE POWER COMPANY OCONEE ENGINEERING UPDATE JUNE 20, 1995



Agenda

- Plant Status
- Engineering Interfaces
- Self Assessment
- Work Processes
- Design Basis
- Major System/Equipment Issues

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Open Discussion/Feedback



### **Plant Status**

- U1 & U2 at 100%, U3 in EOC15 RFO (35 Days)
- One Unit Trip (U2) in last 6 months, Two in last 10 months
- INPO Indicators
  - » INPO 1 Rating for 6th consecutive time
  - » HPI unavailability, YTD upper quartile
  - » EFW unavailability, YTD upper quartile
  - » EAC unavailability, YTD just below upper quartile
  - » Failed fuel, U1 and U2 zero, U3 zero on restart
- 1995 YTD Capacity Factor, U1 92%, U2 85%, U3 101%
  - » U1 CRDM Thermal Barrier Replacement (12 Days)
  - » U2 Expansion Joints/CRDM (19 days)

### **Engineering Interfaces**

- Plan-of-the-Day (POD) Meetings
- <u>Nuclear Excellence Quality Steering Team</u> (NEQST) Meetings
- Outage Meetings
- Regulatory Review Meetings
- Plant Operational Review Committee (PORC)
- <u>N</u>uclear <u>Safety Review Board</u> (NSRB)
- <u>Business</u> <u>Excellence</u> <u>Steering</u> <u>Teams</u> (BEST)

### Self Assessment Process

### Background

- » Utilized INPO Criteria
- » Performed with Duke Personnel
- » October 10, 1994 October 20, 1994

#### Progress to Date

- » Correlated the findings with ongoing initiatives
  - Group Manager assigned for each initiative
  - Total Findings 46
  - Findings Closed to-date 12
  - Findings to be Completed in 1995 14
  - In progress 20

## Self Assessment Process

- Continuing Initiatives
  - » Self Assessment to be Performed in 1995
  - » Plan to use outside assistance

### Work Processes

- Planning and Work Management Process
- Backlog Management
- Operations and Maintenance Support
- Calculation Process
- Training and Qualification Process

## Planning and Work Management Process

### • Background

- » Limited integration of Work Management (WM) processes
- » WM identified as an area for improvement

### Planning and Work Management Process

- Progress to Date
  - » WM application in place PLAN
  - » Engineering has been trained on the application
  - » Currently entering work activities

### Planning and Work Management Process

- Continuing Initiatives
  - » Development of a resource loading application
  - » Development of a long range operational plan for engineering

# **Backlog Management**

### Background

- » Backlog of Work Orders (WO) on-hold for Engineering
- » 13,000 documents out-of-date
- » Large backlog of overdue Problem Investigation Process (PIP) actions

#### Progress to Date

- » Clear ownership and expectations for WO's on-hold
- » Eliminated document backlog (cost: 20 person years)
- » Accurate as-built drawings available
- » Overdue PIP Actions at zero
- » Increased awareness of problems that backlogs create

### Backlog Management

#### Continuing Initiatives

- » Reducing numbers of WO's on-hold for Engineering
- » Vital-to-Operations (VTO) Drawings updated before systems are returned to service
- » Updating documents within 60 days of outage
- » Maintain overdue PIP's at zero
- » Holding managers/supervisors accountable for backlogs
- » Measuring and trending program

# Operations and Maintenance Support

- Background
  - » Lacked focus on operator workarounds
  - » Reliability of some equipment not adequately addressed
  - » Engineering Support Program (ESP) for Systems/Equipment not clearly defined
- Progress to Date
  - » Operator workaround list formalized
  - » Weekly management focus on workarounds
  - » Site focus on top equipment reliability issues
  - » Maintenance Procedure Upgrade on Emergency Power Project (EPP)
  - » ESP clearly defined in directive

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## Operations and Maintenance Support

#### • Continuing Initiatives

- » Management focus on minimizing operator workarounds
- » PM Optimization
- » Implementation of ESP for Maintenance Rule Systems/Equipment

### **Calculation Process**

- Background
  - » Audits & inspections (e.g., SWSOPI) identified concerns with accuracy, thoroughness of calculations
  - » Similar concerns identified at all 3 Duke nuclear sites
- Progress to Date

» Placed greater emphasis on timely update of calculations affected by modifications - now done within 60 days of field completion

- » Revised directive to clarify expectations and responsibilities
- » Communicated expectations

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### **Calculation Process**

#### • Continuing Initiatives

- » Developing calculation database that allows searching, sorting & cross-referencing
- » Training on Instrument Setpoint/Uncertainty Calculations directive planned
- » Enhanced work management process will allow more effective resource allocation
- » Human performance improvement training for supervisors/engineers doing analytical work

### **Training & Qualification Process**

- Background
  - » 1994 Engineering Reorganization -
  - » Job Functions Redefined
  - » Position Specific Guides (PSGs) Developed
  - » Program Based on INPO's "Guidelines for Training and Qualification of Engineering Support Personnel"

### Training and Qualification Process

### • Progress to Date

- » Program Re-Accredited by INPO Fall '94
- » Incumbents assessed to PSG's, needs identified
- » Individual Training Plans Developed
- » Engineering Training and Job Enrichment Team Developed
- » Incumbents not on special assignment have completed the Initial Training Program
- » Engineering Continuing Training Program

### Training and Qualification Process

- Continuing Initiatives
  - » PSG's are Living Documents
  - » Needs Assessment On-Going
  - » Teammates Actively Involved

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# Design Basis Issues

- Emergency Power Project
- Design Basis Documentation
- Oconee Safety Related Designation Clarification (OSRDC)
- Service Water
- Testing

## **Emergency Power Project**

- Background
  - » Many open issues and commitments
  - » Progress toward completing work not satisfactory
  - » Some commitments missed, dates extended
  - » Project team formed in October 1994 with dedicated Project Manager

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## **Emergency Power Project**

#### Progress to Date

- » Project team divided work into four categories:
  - Category 1: 72 tasks--potential operability issuescompleted June 1, 1995
  - Category 2: 41 tasks--operations and maintenance programs
  - Category 3: 71 tasks--modifications
  - Category 4: 5 tasks--configuration control
- » Budgeted project work hours 40 person years
- » Project hours expended to-date 24 person years
- » NRC inspection June 5 16, 1995

## **Emergency Power Project**

#### Continuing Initiatives

- » Complete remaining project commitments
- » Implement Category 3 Modifications

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## **Design Basis Documentation**

#### Background

- » Project originated as result of 1986 EFW SSFI & 1987 Low Pressure Service Water (LPSW) SITA
- » Project started in 1989
- » Not a reconstitution, unless design basis missing
- Progress to Date
  - » \$2.5 Million spent to-date
  - » 64 of 89 complete
  - » All remaining DBD's in progress

# **Design Basis Documentation**

### Continuing Initiatives

- » Project to complete 12-31-95
- » Ensure appropriate tests exist for design basis functions

### Oconee Safety-Related Designation Clarification Project (OSRDC)

#### Background

- » 1993 EDSFI/SWSOPI identified QA classification issues
- » Internal/external questions on basis for QA classification
- » 83-28 response not clear
- » Duke committed to increase testing and maintenance requirements for SSCs important to safety.

#### • Progress to Date

- » Formed OSRDC team to clarify licensing basis and develop QA-5 program
- » Submittal to NRC 4/12/95
- » NRC meetings held

### Oconee Safety-Related Designation Clarification Project (OSRDC)

#### Continuing Initiatives

- » Verify QA-1 SSC's Categorized Properly
  - Design document review is complete, verification begun
  - Documents reviewed for post-licensing commitments, tabulation begun
  - Tabulation due to NRC 7/10/95
  - Final repository for QA classification will be Equipment Data Base (EDB)
- » Identify non QA-1 SSCs that mitigate accidents

- Contractors hired; pilot accident review has begun

» Develop augmented quality standards program (QA-5) for non QA-1 SSCs - to begin 4th quarter 1995

### Service Water

### Background

- » Duke LPSW SITA (1987)
- » NRC SWSOPI (Fall 1993)
- » NRC SWSOPI follow-up inspections (Fall 1994)

Progress to Date

- » Plan for resolution presented during Duke/NRC meeting on Feb. 24, 1995.
- » Majority of issues resolved/closed

### **Service Water**

- Continuing Initiatives
  - » Complete 8 of 9 remaining SWSOPI issues by end of 1995
  - » Complete GL 89-13 (9th issue) in 1996.
  - » CCW upgrade modification
    - upgrade portions to QA1
    - LPSW supply to CCW pumps
    - auto restart CCW pump
    - complete by end of 1997

# Testing

#### Background

- » Inconsistent testing philosophies and programs
- » Several events during testing

#### Progress to Date

- » Formed Testing Quality Improvement Team
- » Developed testing directive
- » Formed IST and Appendix J working groups

### Continuing Initiatives

- » Implement testing directive
- » Develop on-line Post Maintenance/Post Modification Testing database

## Major System/Equipment Issues

- CRDM Slow Trip Times
- Valves
- SSF Design Margins
- Emergency Feedwater Overpressure
- DC Ground Detection/Location
- Batteries
- Trip Reduction
- Major Modifications
- Maintenance Rule

## CRDM Slow Trip Times

#### Background

- » NEQST Top Site Issue
- » Detected slow drives during outages
- » Type A drives on Unit 1 and Unit 2
- » Apparent root cause crud build-up
- » BWOG Project

# **CRDM Slow Trip Times**

#### Progress to Date

- » Automatic trip time recording feature
- » Scheduled outages on Unit 1 and Unit 2 for testing
- » Installed modified thermal barriers

#### Continuing Inititatives

- » Unit 1 Refueling Outage Replace or refurbish slow drives (14 presently identified)
- » Unit 2 Refueling Outage Replace or refurbish slow drives (1 presently identified)
- » Complete BWOG Project
- » Continue trip time testing during shutdowns
- » Monthly 10% rod movement on Units 1 and 2

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### Valves

#### Background

- » NEQST Top Site Issue
- » \$5.7 million station valve budget
- » INPO SOER
- » Regulatory Bulletins
- Progress to Date
  - » Established Valve Working Group
  - » Developed Obsolete and Problem Valve List
  - » Expanded Valve Diagnostics Program
- Continuing Initiatives
  - » Continued emphasis on regulatory and equipment issues relative to valves
  - » Generic letter on Pressure Locking/ Thermal Binding

### SSF Design Margins

### Background

- » NEQST Top Site Issue
- » DBD effort identified restrictive U1 seal leakage limits
- » Annual SSF drill identified weakness in meeting 10 minute activation time

#### Progress to Date

- » Completed detailed margin evaluation
- » Enhanced procedures to shorten activation times
- » Additional focus on training

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## SSF Design Margins

#### Continuing Initiatives

- » Upgrade seal leakage instrumentation
- » Activation Time
  - Develop technical basis for establishing SSF ASW at 14 minutes.
  - Reduce operator actions required

### Emergency Feedwater System Overpressure

- Background
  - » NEQST Top Site Issue
  - » Excessive pump discharge pressures at low flow rates
  - » Turbine Driven Emergency Feedwater (TDEFDW) pump turbine steam control valve
- Progress to Date
  - » Replacing Motor Driven EFW Pump Automatic Recirculation Control (ARC) Valves
- Continuing Initiatives
  - » Install Strainers in Steam Supply Lines
  - » Reduce overspeed trip setpoint for TDEFDW pump turbine

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## DC System Detection/Location

#### • Background

- » Policy for clearing grounds not clear
- » Limited ability to locate grounds
- » Effects of multiple grounds not well understood
- Progress to Date
  - » Established multi-site DC Task Force
  - » Issued criteria for ground detector settings
  - » Developed policy for locating grounds
  - » Completed design study on effects of multiple grounds
- Continuing Initiatives
  - » Develop Selected License Commitment (SLC) to control station response based on magnitude of ground

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» Search for optimum ground location equipment

### Batteries

- Background
  - » Performance tests indicated capacity of some Exide batteries less than original rating
- Progress to Date
  - » Manufacturer investigating root cause
  - » Currently operable due to capacity margin in battery sizing calculation
  - » Service tests demonstrated capacity adequate for design discharges
- Continuing Initiative
  - » Evaluate revised battery capacity curves to determine adequacy for application
  - » Investigate replacement options
  - » Take action based on root cause

## **Trip Reduction**

### Background

- » Increased Trend in Reactor Trip Frequency
- Progress to Date
  - » Reviewed Reactor Trip Reports
  - » Reviewed responses to selected SPIP recommendations
  - » Recommendations to station management
  - » Modifications selected for implementation
  - » Human Performance Program improvements highest priority
  - » Reviewed Feedwater/Condensate System trips

# **Trip Reduction**

- Continuing Initiatives
  - » Human Performance Improvement Plan
  - » Modifications beginning Unit 1 RFO

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# **Major Modifications**

### Completed

- » Upgraded Nuclear Instrumentation System
- » Deleted N16 Decay Tank
- » Replaced Reactor Building Cooling Unit Cooling Coils

# **Major Modifications**

### • Implementation in Progress

- » Replace Inverters and Chargers
- » Upgrade Nuclear Instrumentation System
- » Replace ARC Valves for MDEFWP's
- » Reroute RCS Highpoint Vent Piping
- » Fiber Optic Communication technology
- » Replace LPSW Piping for HPI Motor Cooler Discharge
- » 230KV Switchyard Degraded Grid Protection Upgrade
- » Vehicle Barrier System Addition

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# **Major Modifications**

#### • PLANNED

- » Automatic Feedwater Isolation for MSLB
- » CCW System Upgrade
- » OAC Replacement
- » Add 2/3 Logic for MSRH/MSRH Drain Tank Trip (SPIP)
- » ICS Upgrade
- » Keowee ACB Upgrades
- » Keowee Voltage Regulator Upgrades
- » Keowee Overspeed and Trip Protection
- » Phase 3 Dry Cask Storage

Maintenance Rule Implementation

#### Background

- » Multi-site team began implementation March 1, 1994
- » Coordinated with License Renewal
- » Followed NUMARC 93-01

• Progress to Date

- » Site implementation in progress
- » Performance monitoring is being transferred to the system engineers
- » Removal-from-Service Risk Assessment Matrix implemented

Continuing Initiatives

- » Implement directives and training
- » Implement Maintenance Rule June 1996

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## Summary

- Long standing issues being resolved
- Strong interface with station
- Sensitive to NRC feedback
- Work Management Process improving

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- Focusing on long range planning
- Engineering management team committed