

FEB 22 1994

official

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

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

Gentlemen:

SUBJECT: MEETING SUMMARY - V. C. SUMMER

This refers to the meeting conducted at your request in the Region II Office in Atlanta, Georgia on February 17, 1994. The purpose of the meeting was to discuss current plant issues at your Summer facility. A list of attendees and a copy of your slides are enclosed.

It is our opinion that this meeting was beneficial in that it provided us with a better understanding of the cause, impact and corrective actions you have planned to handle these issues. We look forward to being updated on the conclusions drawn from the independent evaluation you have scheduled to address these program concerns.

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 matter, please contact us.

Sincerely,

original signed by
J. R. Johnson for

Ellis W. Merschoff, Director
Division of Reactor Projects

Enclosures:

1. List of Attendees
2. Licensee Slides

cc w/encls: (See page 2)

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South Carolina Electric &
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ENCLOSURE 1

List of Attendees

Nuclear Regulatory Commission:

L. A. Reyes, Deputy Regional Administrator, Region II (RII)
A. F. Gibson, Director, Division of Reactor Safety, RII
J. R. Johnson, Deputy Director, Division of Reactor Projects (DRP), RII
F. S. Cantrell, Reactor Projects Section 1B, DRP, RII
R. W. Wright, Project Engineer, DRP, RII
R. C. Haag, Senior Resident Inspector - Summer, DRP, RII

Licensee Attendees:

D. Lavigne, General Manager, Nuclear Safety
M. Quinton, General Manager, Nuclear Engineering Services
M. Fowlkes, Manager, Nuclear Licensing and Operating Experience

**PRESENTATION TO
NRC REGION II
ON RECENT EVENTS
AT THE
VIRGIL C. SUMMER NUCLEAR STATION
(VCSNS)**

FEBRUARY 17, 1994

David Lavigne - General Manager, Nuclear Safety

Mike Quinton - General Manager, Engineering Services

Mike Fowlkes - Manager, Nuclear Licensing & Operating
Experience

INTRODUCTION

PURPOSE OF VISIT

- COMMUNICATE THE CIRCUMSTANCES OF THREE RECENT EVENTS AT VCSNS.
- DISCUSS OUR EVALUATION OF THESE EVENTS.
- SHARE INSIGHTS AS RELATED TO CAUSE AND CORRECTIVE ACTIONS.
- OBTAIN FEEDBACK AND OBSERVATIONS FROM NRC STAFF'S PERSPECTIVE.

THREE RECENT EVENTS TO BE DISCUSSED

- **NORMAL OPERATING CONDITIONS FOR CHARGING/SAFETY INJECTION SYSTEM EXCEEDING DESIGN SPECIFICATION. (DAVE LAVIGNE)**
- **FIRE SERVICE SPRINKLER SYSTEM DEGRADATION BELOW DESIGN FLOW REQUIREMENTS. (MIKE QUINTON)**
- **CONDITION OUTSIDE OF APPENDIX "R" ANALYSIS FOR IMPROPER ROUTING OF SAFETY RELATED CONTROL CIRCUITS. (MIKE FOWLKES)**

CHARGING/SAFETY INJECTION SYSTEM PRESSURE IN EXCESS OF DESIGN SPECIFICATION

CONDITION

- ENGINEERING REVIEW IDENTIFIED A POTENTIAL DISCREPANCY BETWEEN DESIGN SPECIFICATION PRESSURE AND SYSTEM NORMAL OPERATING PRESSURE.
- FURTHER REVIEW IDENTIFIED A CONDITION WHERE THE SYSTEM PRESSURE DURING RECIRCULATION FLOW ALIGNMENT FOR SURVEILLANCE TESTING WAS GREATER THAN THE SPECIFIED SYSTEM UPSET PRESSURE.

- A DETERMINATION WAS MADE THAT ACTUAL SYSTEM OPERATING PRESSURES WERE IN EXCESS OF THOSE ASSUMED IN THE DESIGN SPECIFICATION FOR THE SYSTEM.
- FURTHER REVIEW OF SYSTEM COMPONENTS AND PIPING LEAD TO THE DETERMINATION THAT ALL WERE DESIGNED TO PRESSURES BOUNDING THE ACTUAL SYSTEM OPERATING PRESSURES.

APPARENT CAUSE OF IDENTIFIED DISCREPANCY

- **CONDITION WAS IDENTIFIED IN 1983 IN A NONCONFORMANCE NOTICE (NCN).**
- **DISPOSITION ACCEPTED THE CONDITION AS BEING WITHIN CODE ALLOWABLES.**
- **NCN DID NOT RECOGNIZE THE NEED TO CHANGE THE DESIGN SPECIFICATION.**
- **IN 1993, SCE&G PERFORMED A CHANGE OF THE ROTATING ASSEMBLY FOR THE "B" CHARGING/SAFETY INJECTION PUMP.**
- **THE DESIGN PRESSURE FROM THE DESIGN BASIS DOCUMENT OF 3100 PSIG WAS UTILIZED FOR THE SUPPORTING ANALYSIS.**
- **ENGINEERING REVIEW OF THE FINAL REPORT ON THE CHARGING PUMP RUNOUT TESTING LEAD TO THE DISCOVERY OF THE DISCREPANCY IN THE DESIGN BASIS PRESSURES.**

FURTHER ACTION TAKEN TO RESOLVE ISSUE

- ENGINEER VERIFIED THAT ACTUAL CONDITIONS ARE WITHIN CODE ALLOWABLES FOR SYSTEM DESIGN.
- FURTHER EVALUATIONS AND ANALYSIS HAVE BEEN PERFORMED WHICH WILL ALLOW A CHANGE TO THE DESIGN SPECIFICATION TO BOUND ALL NORMAL AND UPSET SYSTEM PRESSURES.
- NO CREDIT WAS REQUIRED TO BE TAKEN FOR CODE ALLOWANCES UNDER THE CRITERIA OF APPENDIX F OF ASME SECTION III.
- CURRENTLY PERFORMING A LESSONS LEARNED EVALUATION TO BETTER UNDERSTAND "HOW WE GOT HERE."
- CURRENTLY EVALUATING DIFFERENCES IN DESIGN DOCUMENTATION.

FIRE SERVICE SPRINKLER SYSTEM ISSUE

- **HISTORICAL BACKGROUND**
 - ▶ **SYSTEM DESIGNED, PROCURED, AND INSTALLED
NON-NUCLEAR SAFETY RELATED.**
 - ▶ **EXPECTATION AND STANDARDS HAVE CHANGED
SINCE THE LATE 1970s.**
 - ▶ **LICENSEE HAS UPGRADED AND MAINTAINED
THE SYSTEM AS QUALITY RELATED.**

- ORIGINAL SYSTEM FLOW TESTING WAS A SURVEILLANCE REQUIRED TO BE PERFORMED ONCE EVERY THREE YEARS.
 - ▶ TEST WAS A QUALITATIVE ASSESSMENT OF TOTAL SYSTEM FLOW UNTIL 1990.
 - ▶ ANI COMMENTS PROMPTED A CHANGE OF FREQUENCY TO ANNUALLY AND A QUANTITATIVE ASSESSMENT OF SYSTEM BRANCH FLOW FOR TRENDING PURPOSES.
 - ▶ TEST PERFORMED IN 1990-1991 TIME FRAME WAS INTENDED TO ESTABLISH BASELINE FOR TRENDING OF ANNUAL TEST AND ALSO MEET THE REQUIRED THREE YEAR SURVEILLANCE FOR THE QUALITATIVE ASSESSMENT OF SYSTEM FLOW.
 - ▶ TEST WAS ACCOMPLISHED SATISFACTORILY AND TREND DATA WAS FORWARDED TO DESIGN ENGINEERING FOR EVALUATION.
 - ▶ DESIGN ENGINEERING'S PRELIMINARY EVALUATION WAS INCONCLUSIVE WITH RESPECT TO THE ACCEPTABILITY OF THE DATA AS A TRENDING BASELINE.

- APPARENT DISCREPANCIES EXISTED BETWEEN DESIGN CALCULATIONS AND DATA COLLECTED FROM TESTING; HOWEVER, THE ENGINEER REQUIRED ADDITIONAL DATA TO DETERMINE IF AN ACTUAL PROBLEM EXISTED.
- ENGINEERING REQUESTED ADDITIONAL TESTING AND ADDITIONAL DATA POINTS TO BE ADDED TO ALLOW FURTHER EVALUATION.
- ANNUAL TEST WAS PERFORMED IN 1992 TO VALIDATE THE INITIAL DATA AND TO MEET THE ANI COMMITMENT FOR AN ANNUAL TEST. ADDITIONAL TESTING DATA WAS NOT GATHERED.
- PROCEDURE STILL CONTAINED A REQUIREMENT FOR TRENDING BUT AN ACCEPTABLE BASELINE WAS YET TO BE ESTABLISHED...SURVEILLANCE TASK SHEET REMAINED OPEN PENDING RESOLUTION WITH DESIGN ENGINEERING.
- DESIGN ENGINEERING BEGAN AN EFFORT TO REVISE AND PROVIDE A MORE DETAILED MODEL TO ALLOW FOR A BETTER PERFORMANCE OF THE EVALUATION OF THE TEST DATA.

- ANNUAL TEST WAS PERFORMED AGAIN IN 1993 IN COMPLIANCE WITH THE ANI COMMITMENT, AGAIN THE ISSUE OF THE BASELINE TRENDING WAS NOT RESOLVED. ADDITIONAL TEST DATA WAS NOT GATHERED.
- LATER IN 1993, AN ADDITIONAL PROCEDURE WAS DEVELOPED WHICH INCLUDED CONSIDERATION OF THE ADDITIONAL DATA REQUESTED BY DESIGN ENGINEERING.
- FOLLOWING THE INITIAL PERFORMANCE OF THE NEW PROCEDURE, THE ENGINEER DETERMINED FROM THE DATA COLLECTED AND THE REVISED COMPUTER MODEL THAT ONE AREA OF THE AUXILIARY BUILDING DID NOT MEET THE DESIGN BASIS.
- THE ENGINEER IDENTIFIED THIS AS A POTENTIAL NONCONFORMANCE AND DISCUSSED THE GENERATION OF A NONCONFORMANCE NOTICE (NCN) WITH HIS MANAGEMENT.
- ENGINEERING MANAGEMENT DECIDED THAT ACTIONS NEEDED TO BE COMPLETED UNDER AN EXISTING NONCONFORMANCE DISPOSITION FOR THE FIRE SERVICE SYSTEM.

- IN NOVEMBER 1993, THE SYSTEM ENGINEER PROVIDED ADDITIONAL RECOMMENDATIONS TO CHANGE THE DATA COLLECTION PROCEDURE IN AN EFFORT TO RESOLVE THE PROBLEM AND TO EXPEDITE THE SYSTEM FLUSH.
- THE RESPONSIBILITY FOR TESTING THE FIRE SERVICE SYSTEM WAS TRANSFERRED TO THE TEST UNIT, AND FURTHER PROCEDURE DEVELOPMENT WAS INITIATED.
- ON JANUARY 19, 1994, THE TEST UNIT SUPERVISOR IDENTIFIED THE FACT THAT A NUMBER OF TASK SHEETS REMAINED OPEN FOR THE ANNUAL SURVEILLANCE, CONTRARY TO THE REQUIREMENTS OF THE PROGRAM.
- AN OFF-NORMAL OCCURRENCE REPORT AND A NONCONFORMANCE NOTICE WERE GENERATED AT THIS POINT TO PROGRAMMATICALLY IDENTIFY THE ISSUE.

ACTIONS TAKEN FOR FIRE SERVICE SPRINKLER SYSTEM ISSUE

- DESIGN ENGINEER PROVIDED DISPOSITION ADDRESSING THE AFFECTED AREA AS BEING THE 463 FT ELEVATION OF THE AUXILIARY BUILDING (AB-463).
- A CONTINUOUS FIRE WATCH WAS POSTED FOR THIS AREA IN ACCORDANCE WITH PROCEDURAL REQUIREMENTS.
- ACTIONS WERE TAKEN TO RADIOGRAPH CERTAIN AREAS OF THE PIPING HEADER WHICH FEED THE AB-463 SPRINKLER SYSTEM.
- DESIGN ENGINEERING IS EVALUATING A MODIFICATION TO PROVIDE AN ADDITIONAL SUPPLY HEADER FOR THE AFFECTED AREA.
- THE VENDOR FOR THE SPRINKLER SYSTEM HAS BEEN CONTRACTED TO ASSIST IN FURTHER EVALUATION OF THE SYSTEM MODEL AND DESIGN CALCULATIONS TO ENSURE COMPLETE RESOLUTION OF THE SYSTEM DESIGN ISSUES.

LONGER TERM ACTIONS TO ADDRESS PROGRAM CONCERNS

- MANAGEMENT REVIEW BOARD
- ROOT CAUSE EVALUATION: MARCH 18, 1994
- INDEPENDENT EVALUATION OF THE FOLLOWING
(MAY 1, 1994):
 - ▶ QUALITY RELATED PROGRAMS
 - ▶ SURVEILLANCE TEST TRACKING SYSTEM AND
ASSOCIATED AUDITS
 - ▶ REVIEW OF PAST EVENTS, ROOT CAUSES, AND
QA AND NSRC AUDITS
- ENGINEERING EVALUATION OF OPEN ITEMS:
JUNE 15, 1994
- ESTABLISH CLEAR EXPECTATION FOR THE
GENERATION OF NONCONFORMANCE NOTICES:
MAY 1, 1994

CONDITION OUTSIDE THE APPENDIX "R" ANALYSIS REQUIREMENTS FOR THE CHILLED WATER SUPPLY VALVES TO THE CHARGING/SI PUMPS

- ON JANUARY 13, 1994, THE LICENSEE IDENTIFIED A CONDITION FOR THE APPENDIX "R" ANALYSIS WHERE CONTROL CIRCUITS FOR CHILLED WATER SUPPLY ISOLATION VALVES TO THE CHARGING/SI PUMPS WERE ROUTED THROUGH "PROHIBITED" AREAS.
- THESE CIRCUITS ARE SUSCEPTIBLE TO "HOT SHORTS" WHICH COULD RESULT IN SPURIOUS CLOSURE OF THE ISOLATION VALVES AND CHARGING/SI PUMP DAMAGE.
- AN APPENDIX "R" REVIEW OF THE ROUTING OF THESE CIRCUITS IN 1986 BY THE LICENSEE'S ARCHITECT-ENGINEER FAILED TO IDENTIFY THIS SUSCEPTIBILITY.
- SUBSEQUENT REVIEW IN 1993 AND JANUARY 1994 FOR THE ROUTING OF THESE CIRCUITS WITH RESPECT TO A NEW MODIFICATION RESULTED IN THE IDENTIFICATION OF THIS CONDITION.

ACTIONS TAKEN IN RESPONSE TO THIS CONDITION

- ESTABLISHED HOURLY FIREWATCH PATROLS FOR THE AFFECTED ZONES.
- LIFTED LEADS FOR CONTROL POWER TO THE VALVE FOR THE PUMP BEING MAINTAINED IN OPERATION.
- THE FIRE EMERGENCY PROCEDURES HAVE BEEN REVISED AND ISSUED PROVIDING ACTION TO FAIL THE VALVES TO THE OPEN POSITION FOR FIRES IN THE AFFECTED ZONES.
- TRAINING AND TIME-LINE VALIDATION FOR THESE PROCEDURE REVISIONS HAVE BEEN COMPLETED.
- PROCEDURE REVISION RETURN THE PLANT TO WITHIN THE APPENDIX "R" ANALYSIS REQUIREMENTS AND ALLOW THE TERMINATION OF THE HOURLY FIRE WATCH PATROLS AND RESTORATION OF CONTROL POWER TO THE VALVE FOR THE PUMP IN OPERATION.

ADDITIONAL CORRECTIVE ACTIONS

- THE ARCHITECT-ENGINEER HAS COMPLETED A RE-EVALUATION OF THE REVIEWS CONDUCTED FOR MODIFICATIONS DURING THE TIME FRAME OF CONCERN.
- NO OTHER PROBLEMS WERE IDENTIFIED FOR THESE APPENDIX "R" EVALUATIONS.
- SCE&G IS PLANNING A MODIFICATION TO CHANGE THE COOLING SUPPLY TO THE LUBE OIL COOLERS FOR THE CHARGING/SI FROM CHILLED WATER TO COMPONENT COOLING WATER (CCW).
- THIS MODIFICATION WILL INCLUDE REROUTING OF CONTROL POWER CIRCUITS FOR THE NEW CCW SUPPLY VALVES TO ADDRESS APPENDIX "R" REQUIREMENTS.
- THIS WILL ALSO ALLOW THE ELIMINATION OF THE MANUAL ACTIONS PRESENTLY REQUIRED IN THE FIRE EMERGENCY PROCEDURES.

CLOSING REMARKS

- OUR GREATEST CHALLENGE IS TO MAINTAIN MANAGEMENT ATTENTION TO EMERGING ISSUES AND PROBLEMS.
- ISSUES DISCUSSED TODAY WERE IDENTIFIED BY LICENSEE AND WITH ONE EXCEPTION, WERE RESOLVED IN A TIMELY MANNER.
- ALL OF THE ISSUES HAD A MINIMAL IMPACT ON PLANT SAFETY.
- CONTINUE TO STRIVE FOR IMPROVED PERFORMANCE IN ALL AREAS AND COMMITTED TO TIMELY IDENTIFICATION AND RESOLUTION OF ISSUES IMPORTANT TO SAFE OPERATION OF PLANT.