



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA ST., N.W., SUITE 3100
 ATLANTA, GEORGIA 30303

Report No. 50-395/82-06

Licensee: South Carolina Electric and Gas Company
 Columbia, SC 29218

Facility Name: V. C. Summer

Docket No. 50-395

License No. CPPR-94

Inspection at V. C. Summer

Inspectors:	<u>Vergil H Brownlee for</u>	<u>2/24/81</u>
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	Division of Project and Resident Programs	

SUMMARY

Inspection on January 5-31, 1982

Areas Inspected

This routine unannounced inspection involved 296 inspector-hours onsite in the areas of TMI Action Plan followup, licensee identified item followup, open item followup, on site design control, and review of as built drawings.

Results

Of the 5 areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

- O. S. Bradham, Station Manager
- *J. G. Connelly, Deputy Manager
- *L. F. Storz, Assistant Manager, Operations
- *B. G. Croley Assistant Manager, Technical Support
- *S. J. Smith, Assistant Manger, Maintenance
- *P. J. Fant, Director, Station Quality Control
- *A. R. Koon, Jr., Technical Services Coordinator
- W. A. Williams, Jr., General Manager, Nuclear Operations
- M. B. Whitaker, Group Manager, Nuclear Engineering and Licensing

Other licensee employees contacted included technician operators, mechanic, and office personnel.

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on February 5, 1982, with those indicated in Paragraph 1 above. The inspector also attended the exit interviews of the following personnel: M. Hunt, W. Peery, T. Gibbons and D. Andrews on January 15, 1982, P. Burnett and E. Girard on January 29, 1982, V. Brownlee, T. Peebles, W. Miller and C. Evans on January 22, 1982, D. Moore and J. Lenahan on January 28, 1982, E. Girard and A. Belisle on January 8, 1982 and W. Kleinsorge on Janaury 14, 1982.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. TMI Action Plan Followup

(Closed) I.A.2.1. Immediate Upgrading of RO and SRO Training & Qualifications

This item deals with the qualifications and training of reactor operators as well as the content of training programs. The applicant has recently completed NRC examinations (written and oral) for the cold license candidates. The qualifications of these individuals were described in cor-

responsiveness between the applicant and NRR (OLB). The inspector discussed the experience and training requirements in NUREG 0737 for Reactor Operators (RO) and Senior Reactor Operators (SRO) with the applicant. The applicant is aware of the requirements in NUREG 0737 concerning this item. The inspector also reviewed the content of the training program for the hot license candidates. The program does include training in heat transfer, fluid flow, thermodynamics and plant transients. Since the hot license classes have not yet begun, closeout of this item is based on conversations with the applicant to ensure they are aware of the requirements in NUREG 07737. The V.C. Summer Safety Evaluation Report (SER) NUREG 0717, indicated the applicant has satisfied the requirements of I.A.2.1

(Closed) I.A.2.3 Administration of Training Programs for Licensed Operators

This item deals with instructors who teach systems, integrated responses, transient and simulator courses. Instructors who teach the above subjects are required to demonstrate their competence to the NRC by successful completion of a senior operator examination and also be in appropriate requalification programs. The instructors scheduled to teach the above subjects have been given unofficial notification that they have successfully completed the SRO examination. It is believed that prior to the commencement of the hot license class, formal notification will be received. Discussion with the applicant indicated that they were aware of the requirements of this item and that measures are being taken to ensure that only qualified personnel act as instructors for the above mentioned subjects. The V.C. Summer SER, NUREG 0717, indicates that the applicant has complied with the requirements of I.A.2.3.

(Open) I.B.1.2. Evaluation of Organization and Management Improvement of NTOL Applicants.

This item deals with the capabilities and qualifications of corporate and plant staffs. The requirement to establish an Independent Safety Engineering Group (ISEG) is also included in this item. The inspector reviewed the following references:

- (a) NUREG 0694 TMI-Related Requirements for New Operating Licenses
- (b) NUREG 0737 Clarification of TMI Action Plan Requirements
- (c) Safety Evaluation Report (SER), Through Supplement No.1, V.C. Summer Nuclear Station, NUREG 0717
- (d) SCE&G letter dated March 4, 1981 to NRC
- (e) SCE&G letter dated January 15, 1982 to NRC

Reference (c) indicates that the applicant contracted the services of two individuals (one full time, one part time) to augment the corporate staff. Reference (e) indicates that the creation of a corporate organization responsible for the development, implementation and evaluation of operating

and technical training programs negates the need to retain one of the individuals on a contractual basis. Reference (c) also indicates that the individuals hired to augment the corporate staff would be non-voting members of the NSRC. Reference (e) changed this commitment to a voting member.

Reference (c) indicates that the applicant committed to recruit and hire permanent staff members to augment its management capabilities from the standpoint of operating experience. The inspector found that some progress was made in this area and that efforts in this area are continuing.

Reference (c) indicates that the applicant is negotiating long term contracts for continued engineering support in important areas. These contracts would be with its nuclear steam supply system vendor and the architect-engineer. The inspector found the negotiations on the final stages. The applicant committed to have the continued engineering support available by fuel load.

Reference (c) indicates that the applicant committed to develop a plan to rotate corporate and plant engineers and shift technical advisors to provide the valuable hands-on experience to the technical staff. This commitment is included in reference (d). The inspector found that the details of the plan have not been developed but that the applicant is aware of the commitment and intends to implement the plan at some time after the commencement of commercial operations.

Reference (c) indicates that the applicant is negotiating with a personnel contractor for PWR experienced SRO personnel to serve in an advisory capacity in the plant's control room until full power operation is achieved. The inspector found the negotiations complete and SRO personnel have been contracted.

Reference (c) indicates that the ISEG will consist of five full-time engineers on site. At present, only three personnel are assigned to the ISEG. Efforts to hire the additional personnel have been made. The applicant committed to have five personnel assigned to the ISEG prior to fuel load. The inspector reviewed the resumes of the three ISEG members and found that they possess the qualifications called for in the Draft Technical Specifications and reference (c). This item (TMI I.B.1.2) will remain open until 5 personnel are permanently assigned to the ISEG.

6. Licensee Identified Item Followup

(Open) 82-06-01. On December 22, 1981, Region II was notified of a potential significant deficiency concerning the seating capability of Westinghouse containment isolation valves. In a letter dated January 20, 1982 the applicant indicated that a determination whether this item was a substantial safety hazard was not complete and that the letter was an interim report. Until a final report has been made and evaluated, this item will remain open.

(Closed) 81-14-02. VCT Level Transmitter. This item was addressed in inspection report 81-32. The basis for the 10 minutes of operator response time is based on a conservative estimate of 120 gpm letdown flow and an initial level in the VCT of 50%. If the transient starts at 20% the operator would have 6.5 minutes to respond. The failure of a level transmitter will be addressed in an annunciator response procedure which will be reviewed at a later date during a procedure review inspection.

(Closed) 81-28-04. BATH Bend Radius. In a letter dated September 15, 1981, the licensee reported a potential significant deficiency concerning cable termination in the connection box of Boric Acid Transfer Pump 1A. It was found that cable termination could not be made without exceeding the minimum bend radius. In a letter dated December 11, 1981 the licensee reported that nine different pumps had a similar problem. In the letter, the Chemical Drain Tank Pump is listed as XPP131. The Chemical Drain Tank Pump is actually XPP35. The disposition of the problem was to replace the connection box with a larger box. Specifically, the Crouse Hinds Connection Box (GUAM 47) was replaced with a GUAM 69.

The licensee indicated that none of the nine pumps are electrically safety-related and therefore was not reportable under 10CFR50.55(e). The inspector verified that the pumps are not electrically safety-related but a number of pumps are mechanically safety-related and all but the Spent Resin Sluice Pump are designed to meet seismic conditions. The inspector determined that an improper termination was never made but rather the applicant's QC program identified the fact that it was extremely difficult to make a proper connection and that corrective action was taken to make it easier. The inspector agreed that this item was not reportable.

(Closed) 81-05-07 NaOH Tank Vacuum. On March 4, 1981, Region II was notified of a potentially significant deficiency involving the NaOH tank. In an interim report dated March 30, 1981 the applicant indicated that the NaOH tank was not procured to operate under a vacuum, yet a vacuum could exist in the tank. In a final report dated May 20, 1981 the applicant indicated that the tank would be qualified under vacuum conditions. The inspector reviewed correspondence from Gilbert Associates which indicates that the tank will maintain integrity down to 3 psig vacuum. According to the applicant, the worst case vacuum expected is 0.5 psig vacuum, therefore making the tank acceptable.

7. Open Item Followup

(Closed) 81-20-01 ED-1. The original concern was whether the battery charger was capable of supplying 288 amps of system loads plus recharge the battery in less than 12 hours. The original FSAR description indicated that the system loads were 216 amps. Preoperational test ED-1 "DC Distribution" verified that the battery charger was capable of supplying 216 amps plus

recharge the battery from a fully discharged condition to a fully charged condition in less than 12 hours. After this test was completed the FSAR was amended to indicate that calculated system demand was changed to 288 amps. The inspector questioned whether or not the charger could supply 288 amps system load plus recharge the battery.

The electrical distribution system provides backup power to the Vital 120 volt busses in the event the inverter is not able to provide power. This source of power is the same as the A.C. power supply for the battery charger. Therefore, if power is available to operate the charge, it is reasonable to assume the vital busses could be powered from the same source and reduce the D.C. load demand on the battery charger. Also, the licensee performed test EDO1-E04 "ESF Batteries Loading Status" and found that the total actual load on each DC bus (1HA and 1HB) was 195 amps and 203 amps, respectively. Therefore, even under conditions where the battery charger A.C. source could not supply backup power to the vital A.C. busses, but could provide power to the charger, the battery charger could supply the bus loads plus recharge the battery. Since the actual load is less than the 216 amps, and the probability is high that backup A.C. power will be available, the battery chargers are not likely to see 288 amps. Therefore, this item is closed.

(Open) 81-05-18. Inservice Valve Program. This item deals with numerous technical problems with the inservice valve program. The inspector reviewed the valve list in the inservice valve program submitted to the NRC on January 21, 1982.

This list has the following discrepancies:

- a. Valves 8480A,B,C,8440,1027,1023A,B, and 1024 are not included in the program.
- b. The normal position for valves 6050A, B, 6051A,B, 6052A, 6053 A, B and 6054 is not correct.
- c. The valve description for valves 8997 and 8990 is incorrect.
- d. Main Stream Safety Valve 2806L is listed as normally open.
- e. The basis for relief for E1 and J12 is incorrect.

(Closed) 81-23-04. This item dealt with a confusing statement in Section 4.5.2 of the Operational QA Plan. The Plan has been revised and is clearer in its intent.

(Closed) 80-40-03. D/G Vibration Measurements. In a letter to NRR dated 1/13/82 the applicant stated that vibration measurements were taken on the

control relay panel and the engine guage board. Colt Industries considers the vibration levels to be normal and that modifications are not warranted. This item is closed.

(Closed) 80-18-03. Review of HR-3. This item consisted of having a procedure to conduct Reactor Building Post Accident Atmospheric Sampling. Preoperational Test HR-3 indicated that HPP-137 would be used. Due to administrative changes, HPP-137 no longer covers this topic. HPP-920 does cover this topic and has been approved by the applicant.

(Closed) 81-03-07. RH-1 Retest. This item involved the retest of the RHR system to ensure maximum allowable flow was not exceeded. The first test run resulted in flow rates greater than 5000 gpm. New orifices were installed to reduce flow. The retest resulted in flow rates less than 5000 gpm, which was acceptable.

8. On-site Design Control

a. General

The overall design and design verification responsibility has been delegated to Gilbert Associates Incorporated (GAI) except for the NSSS scope of work. SCE&G has contracted with other design agencies (EDS, Teledyne, Ebasco, other GAI offices, etc.) which administratively interface with GAI, Reading, Pennsylvania. Daniel Construction Company (DCC) performs no original design. DCC's on-site engineering staff performs engineering services in accordance with GAI engineering documents. On-site design control is administered by the SC&EG Resident Engineers office. A portion of this office is staffed by representatives of the design agencies who provide field liaison for their respective scope of work. All on-site design work is approved or verified by GAI, Reading.

All design organizations are audited for conformance to the QA and Nuclear Engineering Procedures relative to their scope of work.

b. Procedures

On-site design control activities for the SCE&G Resident Engineer's Office are performed in accordance with SCE&G Procedures contained in the Nuclear Engineering Procedures Manual. The procedure manual contains procedures for the control of the design process relative to design input, specifications, calculations, interface activities, design verifications, drawings, document and drawing control, corrective actions on deficiencies, design change, etc. The on-site DCC engineering service functions are performed in accordance with the DCC Construction Procedures Manual procedures and to the requirements of GAI criteria.

c. Inspector Activities

The inspectors examined the on-site design process and reviewed the applicable engineering procedures for the SC&EG Resident Engineer's office. Additionally, the on-site DCC engineering service activities were reviewed. Discussions and walkdowns were held with SC&EG QA/QC and the Resident Engineer Office personnel. The inspectors reviewed the following design, field fabrication, design change work packages to assure that: adequate design controls were followed; criteria established by the home office were met; design review was performed; verification records were adequate; changes were justified, reviewed and approved; design drawings were updated and revised; final as-builts were being prepared and released back to the field; documents were controlled; applicable hot functional test data corresponded with as-built dimensions; and that work packages in process were being controlled.

(1) Rupture Restraint	RB-436 MS-C (GAI)
(2) Rupture Restraint	RB-436-FW-M (GAI)
Pipe Support	MK-FWH-340 (GAI)
(3) Hanger Mechanical Restraint	MSH-009 (GAI)
(4) Hanger Restraint	CSH-002 (EDS)
(5) Hanger Mechanical Restraint	SFH-4041 (EDS)
(6) Hanger Restraint	CSH-1496 (Teledyne)
(7) Hanger Restraint	CSH-122 (Teledyne)
(8) Rupture Restraint	RB-412-RC-M (W)

Additionally, the inspectors reviewed the FSAR program requirements for design and interface control. Previous NRC Inspection Reports 81-10 and 81-16 provide additional input to provide assurance that the on-site design control and the on-site/off-site design interface is functioning and effectively and in accordance with established QA program and project management documents.

The inspectors reviewed the following SC&EG Audits:

- (1) SCE&G Audit of GAI-Power Engineering Division, Reading, Penn., January 27-28, 1981 (Annual Audit)
- (2) SCE&G Audit of Westinghouse-Pittsburgh, Penn., March 9-11, 1981
- (3) SCE&G Type II Surveillance, Rpt. II-19-80, May 27 - June 30, 1980, "GAI/PER On-Site Pipe Support Design and DCC Instrument Support Design".
- (4) SCE&G Type II Surveillance Rpt. II-6-81, February 3-16, 1981, "Pipe Hanger As-Built Data", On-Site DCC.

- (5) SCE&G Type I Surveillance, Rpt. 18116, January 9-11, 1981, "Pipe Hangar FCR-B and Advice of Redesign Programs".
- (6) SCE&G Type I Surveillance, Rpt. 8813A, August 10-12, 1981, "As-Built Data for Piping and Pipe Hangers".
- (7) SCE&G Type I Surveillance, Rpt. 8814, August 27-31, 1981 "As-Built walkdown for Piping and Pipe hangars".

d. Conclusions

The inspectors concluded that the organizational/functional alignment for design control and interface activities is basically as described in the FSAR. Based on the above observations the inspectors conclude that the established QA/QC and Engineering Assurance Procedures were being implemented effectively. The QA/QC, engineering, crafts and management personnel interviewed during this inspection were

No violations or deviations were identified.

9. Review of As-Built Drawings

a. Design Documents

The inspector reviewed and walked down the following final as-built drawings:

C-314-611R1	Component Cooling from RHR Heat Exchanger "A" to 24" header (EDS)
C-314-601R2	Reactor Coolant-Pressurizer Surge Line (W)
C-314-081R1	Feedwater-From Pen #206 to Steam Generator "B" (GAI)
C-314-671R1	Chemical Volume Control-Charging Pumps A, B and C suction (EDS)
C-314-651R1	Spent Fuel Cooling-From S. F. Pool Interior Wall to S. F. Cooling Pump A&B (EDS)
C-314-641R1	Residual Heat Removal-From RHR Heat Exchanger "B" to Charging/Safety Injection Pump "B" (Teledyne)
C-314-011R1	Main Steam-From Steam Generator "B" to Penetration #207 (GAI)
DE-SP-18RO	Reactor Building Spray System Nozzle Location and Documentation (DCC)

The inspector reviewed ten changes which were incorporated in the drawings and verified that the as-built condition agreed with the design change and that the changes were properly reviewed and approved by appropriate personnel. The review also verified that GAI or the appropriate design agents had verified that the as-built condition conformed to the original seismic criteria and was reflected on the drawing.

The inspector reviewed the procedures governing the generation and completion of design documents. There were no violations or deviations identified.

The status of the schedule for completion of as-built design documents was discussed with licensee management. A firm date for completion of the drawings was not available as changes were being worked which were impacting on the review cycle. The licensee representative acknowledged that the as-built design documents would be completely reviewed prior to operation and be available to site personnel.

b. Operational Flow Documentation

The inspector reviewed the status of system walkdowns for verification of flow diagrams. These walkdowns have been completed on safety-related systems and discrepancies are being resolved. The licensee agreed to provide a status of as-built flow diagram completion on a specific drawing basis on February 15, 1982 to the Resident Inspector. Also, it is understood that final as-built flow diagrams or appropriately controlled market-up drawings will be available for use by operations prior to fuel load. This is an inspector follow-up item (82-06-02).

10. Plant Operating and Emergency Procedure Review

A special inspection of the General Operating Procedures (GOP's), System Operating Procedures (SOP's) and Emergency Operating Procedures (EOP's) was conducted to determine the adequacy of these procedures for plant operation. This inspection was also conducted to determine the validity of the comments of Mr. M.S. Mediros in his trip report memorandum to Mr. Darrell G. Eisenhut dated December 29, 1981.

To accomplish this inspection, selected GOP's, SOP's and EOP's were reviewed. The review compared each GOP, SOP, and EOP with each other and with the referenced GAI and Westinghouse system diagrams and the plant's draft Technical Specifications. The plant was toured to observe system configurations and panel layouts and operators were interviewed to determine their knowledge and understanding of various procedures.

The following procedures were reviewed:

- GOP-1, Plant Start Up from Cold Shutdown to Hot Shutdown, Revision 2 dated 10/28/81;
- GOP-2, Plant Start Up from Hot Shutdown to Minimum Load, Revision 2 dated 2/28/80;
- GOP-5, Plant Shutdown from Minimum Load to Hot Standby, Revision 1 dated 9/14/81;
- GOP-6, Plant Shutdown from Hot Standby to Hot Shutdown, Revision 1 dated 10/28/81;
- GOP-7, Plant Shutdown from Hot Shutdown to Cold Shutdown, Revision 1 dated 2/25/80;
- GOP-102, Chemical and Volume Control, Revision 1, dated 3/16/81;
- GOP-112, Safety Injection, Revision 1 dated 10/15/81;
- GOP-115, Residual Heat Removal, Revision 0 dated 6/28/79;
- GOP-117, Service Water, Revision 2, dated 3/31/81;
- GOP-118, Component Cooling Water, Revision 0, dated 2/23/79;
- GOP-210, Feedwater, Revision 0, dated 8/22/79;
- GOP-211, Emergency Feedwater System, Revision 1 dated 8/2/79;
- EOP-1, Safety Injection Actuation, Revision 1 dated 10/14/80;
- EOP-2, Main Steam Line or Feedwater Line Break without Safety Injection, Revision 1, dated 11/4/80;
- EOP-3, Steam Generator Tube Leak without Safety Injection, Revision 0, dated 12/11/79
- EOP-5, Reactor Trip, Revision 3, dated 10/22/81;
- EOP-6, Emergency Boration, Revision 2, dated 10/15/81;
- EOP-13, Natural Circulation, Revision 1, dated 12/9/81;
- EOP-14, Inadequate Core Cooling, Revision 0, dated 11/10/81;

The following reference were utilized:

- (1) Inspection and Enforcement Manual (Chapters 42400, 42450 and 42452)
- (2) Regulatory Guide, 1.33, Quality Assurance Program Requirement (operation) Revision 2, February 1978.
- (3) ANSI EN 18.7, Administrative Control and Quality Assurance for the Operational Phase of Nuclear Power Plants, February 1976.
- (4) NUREG-799, Criteria for Preparing Emergency Operating Procedures, June 1981.
- (5) Inspection and Enforcement Procedure Check Lists.

Findings concerning the GOP's and SOP's are as follows:

- a. The GOP's and SOP's exhibited weaknesses in technical content that appear to be cause by insufficient procedure review. Examples of these weaknesses are:
 - (1) The procedures have excessive grammatical and typographical errors. The errors cause a lack of clarity in the steps in some cases actually change the intent of the step.
 - (2) The procedures do not interface properly, e.g.,
 - Initial conditions for one GOP may not reflect the final conditions of a preceding GOP;
 - A GOP may not refer an operator to an applicable SOP during a system start-up or shut-down though it would be necessary to refer to the SOP to accomplish the activity; and,
 - The instructions given an operator in a GOP may conflict with the instructions given the operator in an applicable SOP.
 - (3) The valve lineups included as attachments to SOP's are not correct, e.g.,
 - Valves are missing from the lineups;
 - Valves are incorrectly positioned for proper system operation;
 - Valve designations are incorrect and are not the same as those shown on system drawings; and,
 - Valve position designations do not specify the valve position.
 - (4) The procedures direct operators to perform operations that violate or will violate license conditions.

- (5) The procedures do not reflect the control board switch and labeling nomenclature, e.g.,
- A switch may have control board positions ON, OFF, AUTO. However, the procedure will refer to a normal position for the switch. (The capitalization of switch positions as discussed herein is consistent with procedure practice. The capitalization is intended to mean the actual switch labeling on a control board.)
- (6) The abnormal system operating procedures are included in the SOP's as section 6.0 and are entitled "Off-Normal Operating Conditions". The intent of section 6.0 is meet the requirement of Regulatory Guide 1.33, Appendix A, paragraph 6, "Procedures for Combating Emergencies and other Significant Events", with procedures for events that are not considered an emergency and therefore are not EOP's. These abnormal system operating procedures were not complete because they do not recognize the complete loss of a system nor do they cover all emergencies listed in Regulatory Guide 1.33, Appendix A.

These findings, in addition to the findings identified by the resident inspector in previous NRC inspection reports, indicate that the GOP's and SOP's are not suitable for plant operation. The licensee has committed to rewrite the SOP's and GOP's to provide suitable procedures for plant operation. This rewrite will include procedure/system walkthroughs as appropriate to assure that interface between systems/procedures is adequate, that valve lineups are correct, and that licensee conditions are not violated.

The above mentioned items will remain open (82-06-03) pending future NRC inspection of GOP's and SOP's.

Findings concerning the EOP's are as follows:

- a. All specific comments and concerns in the M. S. Medeiros trip report were inspected with the following results:

The majority of specific comments relative to procedures EOP-2 and EOP-5 were determined to be either very insignificant or not valid. The remaining comments determined to be valid were discussed with appropriate licensee personnel. Commitments were obtained from the licensee, to address these comments and revise the procedures as necessary.

- b. Although the conclusions in the M. S. Medeiros letter were not supported by this inspection, the EOP's are in general, poorly written.

Certain steps are difficult to understand or are confusing. Typographical and grammatical errors are found frequently. The inspection revealed minor discrepancies relative to technical adequacy.

- c. All specific comments concerning the EOP's were discussed with licensee representatives and commitments obtained to revise the procedures to correct the identified discrepancies.

The above mentioned items will remain open (82-06-04) pending future NRC inspection of EOP's.