TOLEDO EDISON

JOE WILLIAMS, JR.
Senior Vice President—Nuclear
(419) 249-2300
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Docket No. 50-346

License No. NPF-3

Serial No. 1-600

December 26, 1985

Mr. C. J. Paperiello, Director
Division of Reactor Safety
United States Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Mr. Paperiello:

Toledo Edison acknowledges receipt of your November 22, 1985 letter (log No. 1-1280), Notice of Violation, and Inspection Report No. 50-346/85028 (DRS). Following an examination of the item of concern, Toledo Edison herein offers information regarding this item:

Violation: 10 CFR 50, Appendix B, Criterion V states, in part, "Activities affecting quality shall be prescribed by documented instructions, procedures...of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures,..."

Contrary to the above, the licensee's procedures were inadequate for fabricating, installing, and inspecting the plant pressure retaining safety related flexible boot seals.

This is a Severity Level IV violation (Supplement I). (50-346/85028-04)

Response: (1) Corrective action taken and results achieved.

An NRC concern was identified as a result of an investigation regarding the acceptance criteria for the overlap axial seam utilized in the fabrication and installation of BISCO flexible boots. Toledo Edison (TED) has contacted BISCO to provide the minimum allowable overlap axial seam required, and to provide documentation which supports this criteria. BISCO has provided this documentation and concludes that a minimum overlap axial seam width of one inch is acceptable regardless of pipe diameter. BISCO Test

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Report 748-109 supports this conclusion and is available for your review. This report, which was conducted in part to determine the weakest pressure retaining section of the boot assembly, demonstrates that the clamp assembly will fail before the one inch overlap axial seam will fail. In any event, both the axial seal and the clamp retained pressure greater than that required for its intended purpose. The test assembly was fabricated and installed using materials and procedures very similar to those utilized at Davis-Besse and provide TED with a high degree of confidence that the one inch overlap axial seam criteria is acceptable.

In further discussions, BISCO noted that specifying two and three inch overlaps existed for ease of installation only. A one inch overlap, as indicated in the previous discussions, is more than sufficient from a pressure retention perspective. However, with larger diameter boot seals, it is difficult to work with only a one inch overlap, and specifying two and three inch overlaps will help in preventing unnecessary rework.

Based on the previous information, TED Engineering developed an Inspection Plan (IP-M-003) for Quality Control (QC) to establish the as-installed condition of the BISCO flexible boot overlap axial seams. For currently installed flexible boot seals, the governing acceptance criteria for the overlap axial seam will be that one inch is required as a minimum. The inspection was completed on December 21, 1985. The results will be evaluated and all non-conforming conditions related to overlap axial seams will be corrected prior to February 21, 1986.

(2) Corrective action to be taken to avoid further violation.

On December 10, 1985, TED approved Procedure MP 1700.29.0, Fabrication and Installation of Flexible Pressure and Fire Seals, for use at Davis-Besse. This procedure identifies specific overlap axial seam requirements based upon the diameter of the pipe to be sealed. This procedure also requires documentation of cure times which will allow for appropriate QC review.

Procedure AD 1844.00.14, Maintenance, specifies that "All Nuclear Safety-Related, ASME, ANSI B31.1, Fire Protection System MWO's,...shall be routed by MPG for review by the QC Supervisor, Code Inspection Supervisor, or their designees to determine the inspection

requirements." The QC/Code reviewer will then enter any special instructions on the MWO which are required during the performance of the MWO. Instructions will typically inform maintenance when to contact the designated inspector for in process inspections or final inspection.

Procedure MP 1700.29 will be revised by January 24, 1986 to include QC hold witness points for the inspection of BISCO flexible boot seals during fabrication and installation.

(3) Date when full compliance will be achieved.

Full compliance will be achieved upon the completion of the current inspection and any flexible boot repairs necessary prior to February 21, 1986.

Very truly yours,

Joe Williams Jr.

JW:TJB:SGW:amb

cc: DB-1 NRC Resident Inspector

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Georgia Power Company
ATTN: Mr. R. J. Kelly
Executive Vice President
P. O. Box 4545
Atlanta, GA 30302

Gentlemen:

SUBJECT: REPORT NOS. 50-424/85-53 AND 50-425/85-38

On November 18-22, 1985, NRC inspected activities authorized by NRC Construction Permit Nos. CPPR-108 and CPPR-109 for your Vogtle facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, no violations or deviations were identified.

Should you have any questions concerning this letter, please contact us.

Sincerely,

Hugh C. Dance/for

Virgil L. Brownlee, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Enclosure:
Inspection Report Nos. 50-424/85-53
and 50-425/85-28

cc w/encl:
R. E. Conway, Senior Vice President
Nuclear Power
D. O. Foster, Vice President
and General Manager Vogtle Project
H. H. Gregory, III, General
Manager, Vogtle Nuclear Construction
G. Bockhold, Jr., Vogtle
Plant Manager
L. T. Gucwa, Chief
Nuclear Engineer
cc: (Continued See page 2)

IE01

cc w/encl: (Continued)
Ruble A. Thomas,
Vice President-Licensing Vogtle
Project
Ed Groover, Quality
Assurance Site Manager
C. W. Hayes, QA Manager
J. T. Beckham, Vice President
& General Manager - Operations
J. A. Bailey, Project Licensing
Manager
George F. Trowbridge, Esq.
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James E. Joiner, Troutman, Sanders,
Lockerman and Ashmore
James G. Ledbetter, Commissioner
Department of Human Resources
Charles H. Badger, Office of
Planning and Budget, Management
Review Division
Deppish Kirkland, III, Counsel
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Council
Douglas C. Teper, Georgians Against
Nuclear Energy
Laurie Fowler, Esq., Legal Environmental
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Tim Johnson, Executive Director
Campaign for a Prosperous Georgia
Morton B. Margulies, Esq., Chairman
Administrative Judge, Atomic Safety
and Licensing Board Panel
Dr. Oscar H. Paris, Administrative Judge
Atomic Safety and Licensing Board Panel
Gustave A. Linenberger, Jr., Administrative
Judge, Atomic Safety and Licensing Board
Panel
Billie Pirner Garde, Citizens
Clinic Director, Government
Accountability Project

bcc w/encl: (See page 3)

bcc w/encl:
✓E. Reis, ELD
✓M. Sinkule, RII
✓NRC Resident Inspector
Document Control Desk
State of Georgia

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12/23/85

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-424/85-53 and 50-425/85-38

Licensee: Georgia Power Company
P. O. Box 4545
Atlanta, GA 30302

Docket Nos.: 50-424 and 50-425 License Nos.: CPPR-108 and CPPR-109

Facility Name: Vogtle 1 and 2

Inspection Conducted: November 18-22, 1985

Inspector: J. B. Harris 12/23/85
J. B. Harris Date Signed

Approved by: T. E. Conlon 12/23/85
T. E. Conlon, Section Chief Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection entailed 37 inspector-hours on site in the areas of structural concrete, post tensioning activities, and employee concerns in civil construction.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*R. E. Conway, Senior Vice President
*D. O. Foster, General Manager Vogtle Project
*M. H. Googe, Project Construction Manager
*E. D. Groover, QA Site Manager
*R. C. Harbin, Manager, Quality Control
*P. Ciccanes, Regulatory Compliance Specialist
*G. A. McCarley, Project Compliance Coordinator

Other licensee employees contacted included construction craftsmen, engineers, and technicians.

NRC Resident Inspector

*R. J. Schepens

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 22, 1985, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during the inspection.

5. Independent Inspection Effort

Construction Progress

The inspector conducted a general inspection of the soils and concrete testing laboratory, concrete structures, ongoing concrete curing operations and backfill operations to observe construction progress and construction activities.

Within the areas examined, no violations or deviations were identified.

6. Containment, Structural Concrete (47054) - Unit 2

The inspector observed preparation for the final concrete placement of the Unit 2 containment dome. The placement was scheduled for November 22, 1985, but had to be rescheduled for November 26, 1985, due to adverse weather resulting from Hurricane Kate. Acceptance criteria examined by the inspector appeared in the following documents:

- Specification X2AP01, Placing, Finishing and Curing Concrete
- Procedure CD-T-02, Concrete Quality Control
- FSAR Sections 3, 12, and 17.

Observations showed that the area was being properly cleaned, that reinforcing steel was properly installed, and that equipment was being installed to allow proper placement of the concrete. Examination of the concrete testing laboratory and batch plant showed that the calibration of the batch plant and testing equipment were current and that they were in good working order. Discussions with QC inspectors and craft personnel concerning preparation for the dome placement indicated that they were aware of the specification and procedure requirements for the preparation and placement of the concrete pour for the dome.

Within the areas examined, no violations or deviations were identified.

7. Containment (Post-Tensioning) Observation of Work (47063) Unit 1

The inspector observed the stressing of horizontal tendon numbers 127, 129, and 139. Acceptance criteria examined by the inspector appear in the following documents:

- Specification X2AF04 - Rev. 3, Containment Post Tensioning System
- VSL Field Instruction Manual for Installation of Post-Tensioning System, Rev. 10
- Drawing PT-11.2-1, Horizontal Tendons, Unit 1
- Drawing P1372.23, Horizontal Tendon Stressing Data

Observations included checking calibration of the stressing rams, witnessing measurement of elongation of the tendon strands, seating measurements, lift off pressure, and cutting of wire strands following completion of stressing activities. Observations and review of stressing data showed that the stressing operations were being conducted in accordance with requirements and that the operations were being monitored by quality control

inspectors. Discussions with craft and quality control personnel and responsible engineers indicated they understood the requirements for the stressing operations.

Within the areas examined, no violations or deviations were identified.

8. Containment (Post-Tensions) Review of Quality Records (47065) - Unit 1

The inspector examined quality records relating to post-tensioning activities for horizontal tendons in the Unit 1 containment. Acceptance criteria examined by the inspector appear in the documents listed in paragraph 7. Records examined were for horizontal tendon numbers 2, 3, 4, 9, 13, 14, 15, 19 and 20. Records examined included; tendon installation reports, quality control checklists, stressing reports, and tendon greasing reports.

Review of these records showed that the tendons were installed in accordance with specification requirements and that problems encountered during stressing operations were being identified and properly addressed.

Within the areas examined, no violations or deviations were identified.

9. Employee Concerns, Discussions, and Findings

The following employee concerns were reviewed:

a. Backfilling Against North Wall of Control Building

(1) Concern

The north wall of the control building (an exterior wall at level D) was backfilled before it cured. As a result, there was a lot of honeycombing on the wall.

(2) Discussion

The inspector examined drawings of the control building, walked down the exterior and interior of the control building, discussed placement of concrete and backfill activities in the control building with quality control inspectors and engineers and examined records relating to backfill and concrete placement for the control building.

Review of drawings showed that the exterior wall on the north side of the control building begins at level B at elevation 180 and not at the D level as stated in the concern. Discussions with QC inspectors and engineers and examination of records disclosed the backfill was placed against the north wall of the control building before the specified time. This was identified by a quality control inspector in Deviation Report CD-1762 dated February 17, 1982. This deviation report stated that backfill was placed

against the north wall of the control building to elevation 196 which was contrary to requirements that no backfill be placed above elevation 186 before placement of the level A concrete slab which ties into the north wall at elevation 200. This problem was submitted for engineering review and as a result the backfill was removed. Analysis by design engineers showed that no structural damage was done to the north control building wall. A walkdown of the control building by the inspector showed no evidence of any adverse cracking or structural damage.

Placement of the backfill against the wall would not cause honeycomb in the concrete because by the time the forms were removed, the concrete would have hardened to the point where the backfill could not have had any affect on the concrete surface. Research of the literature and experience has shown that honeycomb is caused by inadequate vibration near the outer face of the walls where the reinforcing steel interferes with the flow of the plastic concrete.

(3) Findings

Investigations showed that backfill was placed against the north wall of the control building before the specified time. This was identified and investigated by the licensee. The backfill was removed and the structure was evaluated to determine if the backfill had caused any structural damage. The analysis showed no structural damage due to the placement of the backfill. A walkdown of the structure by the inspector disclosed no evidence of structural damage. Backfill against the walls would not cause honeycomb or defects in the concrete because the concrete would have been in a hardened state by the time the forms were removed. No problems with the quality of the concrete were substantiated.

b. Falsification of Soil Density Tests

(1) Concern

Soil density test results had been falsified. Proctor tests were run on the soil compaction which was done at the site. Proctor tests are tests to determine soil density and moisture and these test were done on the compacted soil for the power block. Individuals involved in this matter manipulated the test results to indicate that they were acceptable. Results are too good to be true in that results are too perfect.

(2) Discussion

The inspector examined Bechtel Specification X2AP01, "Earthwork and Related Site Activities", and Georgia Power Company procedure CD-T-01, "Earthwork Quality Control", and reviewed proctor and

field density test data on compaction of soil material in the power block from 1978 through 1980. The inspector also interviewed seven quality control inspectors that were involved in inspection of compaction of backfill in the power block.

Review of specification X2AP01 and procedure CD-T-01 showed that the required field compaction of the backfill is specified in terms of percent of maximum dry density as determined from the laboratory modified proctor test (ASTM D-1557). In performance of the laboratory proctor test (ASTM D-1557), soil samples are compacted at varying moisture contents in a steel mold of known volume using a specified compacting effort. The purpose of the test is to determine the maximum soil density and the corresponding optimum moisture content at which this maximum density can be obtained. The test results are presented as a plot of the dry density versus moisture content. Connection of the plotted points results in a curve shaped line. A line to the curve peak from the vertical axis containing density values in pounds per cubic foot represents the maximum dry density for that material and a vertical line from the peak of the curve to the horizontal axis containing water content values in percent of dry weight represents the optimum moisture content at which the maximum dry density is obtained. Specification X2AP01 requires that soil in the power block to be compacted to an average of 97 percent of the maximum dry density determined by the laboratory proctor test. The specification also requires that the moisture content of the soil at the time of compaction be within minus three percent or plus two percent of the optimum moisture content determined by the laboratory proctor test.

Procedure CD-T-01 details the method for quality control testing of Category I backfill to assure the backfill is compacted to the density and moisture limits determined by the laboratory proctor test. The testing is performed by quality control (QC) soil inspectors using field density (sand cone) tests (ASTM D-1556). The results of the field density tests and the soil samples collected in performance of the field density tests are sent to the soils laboratory by the QC field inspectors. In the soils lab, laboratory technicians test the soil samples and calculate the results of the field density tests. The field density test results are determined by comparing the density of the in-place soil (determined by sand cone method) with the laboratory proctor results and computing the percent compaction (field density divided by proctor density) of the in-place backfill material. Review of the field density test data from 1978 through 1980 showed that, for the most part, the power block backfill was compacted to a density of 97 to 107 percent of the maximum density determined by the laboratory proctor. Some of the field density tests showed that backfill was compacted to 93 to 96 percent of the maximum proctor density. These low test results were identified and addressed by the licensee. Review of the data

indicated that the results were reasonable and normal for the compacted effort being used to compact the backfill (compacted with a ten ton vibratory roller).

Interviews with the seven quality control inspectors disclosed no evidence of manipulation or falsification of soil test data. Two inspectors indicated that they heard one individual would sometimes round a decimal up (e.g., 96.5 to 97.0) to make a test appear better, but that they had never witnessed or actually seen the individual do this. Review of test data by this inspector showed no evidence where decimals had been rounded up. All seven inspectors stated that they had no knowledge of any falsification of test data and indicated that they were satisfied with the quality of the compaction of the backfill.

In addition to the investigation of compaction of soil material in the power block during this inspection to satisfy the stated concern, this NRC inspector and two other NRC inspectors from the Region II office have examined controls on backfill activities during routine inspections conducted from 1978 through 1985. During these inspections, controlling specifications and procedures were reviewed, work activities were observed and records were examined to verify that backfill activities were being conducted in accordance with NRC requirements. During these visits, the inspectors also discussed quality control of backfill activities with civil quality control inspectors to verify that quality control inspectors understood the specification requirements and that these requirements were being implemented. During these inspections, several minor violations regarding control of moisture content were identified. The licensee was responsive in addressing and correcting these items. During one of these inspections conducted on November 16-18, 1979, this NRC inspector was informed by the Georgia Power Company QA supervisor that a severe storm on November 2, 1979, had aggravated ongoing moisture problems and eroded part of the backfill. Because the applicant failed to report the deficient condition to the backfill as required by 10 CFR 50.55(e), a Notice of Violation was issued. Subsequently a Confirmation of Action letter dated November 15, 1979, from NRC Region II to Georgia Power was issued in which it was understood that Georgia Power would not continue with backfill placement in or around the power block area or concrete placement on affected structures without concurrence of NRC. Meetings were held with the applicant at the site and at the Office of Nuclear Reactor Regulation (NRR) in Bethesda, Maryland regarding measures to be taken to correct the backfill. Corrective measures included testing to determine the extent of defective backfill, removal of defective backfill and foundation slabs, installation of drainage facilities and a dewatering system and application of gunite (sand cement mixture) on slopes to prevent additional erosion problems.

The NRC inspectors observed the corrective measures taken to correct the backfill and examined records documenting the corrective measures during several onsite inspections. Results of these inspections showed that the backfill was properly repaired and that measures were taken to prevent future erosion problems.

Reviews of backfill activities were also performed by Geotechnical Engineers from the NRC office of Nuclear Reactor Regulation (NRR). These reviews resulted in some concerns being raised by an NRR Geotechnical Engineer regarding the density of the compacted backfill in the power block. To satisfy these concer s, samples representative of the Category I backfill were taken by the licensee and tested by both an independent testing laboratory and the licensee's testing laboratory. The sampling and testing of these samples were witnessed and reviewed by NRC inspectors. Comparison of the test results from the two laboratories indicated that the methodology being used by the licensee to control the compaction of the backfill was reasonable and correct. In addition to the laboratory tests, the licensee hired a drilling company to perform in-place standard penetration tests on the existing backfill to verify that the density of the backfill meets design requirements. These standard penetration tests were made by driving a two-foot eight-inch long cylindrical tube (called a sampling spoon) having a two-inch outside diameter and a one-and-three-eight inch inside diameter into the existing backfill. In this method, the sampling spoon, which is attached to drill rods, is driven into the soil by blows of a 140-pound hammer falling from a height of 30 inches and impacting on a driving collar attached to the drill rods. Each blow count is accomplished by raising the cylindrical shaped hammer, which has a center hole that allows it to be raised along the shaft attached to the drill collar, with a rope to a height of 30 inches and then allowing the hammer to free fall and strike the drive collar. After the sampling spoon has penetrated six inches into the soil, the penetration test is started and the number of blows required to produce the next one foot of penetration is recorded. Anything over 50 blows per foot is considered very dense. Review of the penetration data showed the following range of blow counts for the backfill: 0-10 feet, 32- 131 blows with a conservative average of 50 blows; 10 to 30 feet, 62-200 blows with a conservative average of 100 blows; 30 to 80 feet, 100 to 200 blows with a conservative average value of 150 blows. Results of the confirmatory testing by the independent laboratory and the standard penetration tests indicated that the recorded density values accurately reflect the in-place density and compaction of the backfill.

Review of NRC inspection reports also showed that a similar concern was identified in 1981. This concern indicated that results from backfill proctor analyses were altered to indicated that failing tests complied with specification requirements. This

concern was investigated by an NRC Region II inspector and an NRC investigator during the period of May 18 to August 7, 1981. Results of this investigation, documented in NRC report number 50-424/81-09 and 50-425/81-09 dated October 22, 1981, indicated there was no evidence that test data was being altered to indicate failing tests meet requirements.

(3) Findings

Review of records and discussions with civil quality control inspectors failed to show any evidence that backfill records were falsified. Additional independent confirmatory testing of the backfill by independent organizations confirmed that the methodology being used and that the in-place density of the backfill met specification requirements. The concern was not substantiated.