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November 14, 1984

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
GEORGIA POWER CO., et al)	Docket Nos. 50-424
)	50-425
(Vogtle Electric Generating Plant,)	(OL)
Units 1 and 2))	

APPLICANTS' MOTION TO CORRECT ASLB'S
MEMORANDUM AND ORDER DATED
NOVEMBER 5, 1984

By Memorandum and Order dated November 5, 1984, the Li-
censing Board, among other rulings, restated and admitted
CPG/GANE Contention 8 (Quality Assurance) permitting litigation
of a broad range of quality assurance matters. While Appli-
cants are not reconciled to the low threshold set by the Board
for the admission of a contention which could result in the ne-
cessity of producing thousands of QA documents in the course of
discovery, nor to the consistency of the Board's ruling with

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opinions of the Appeal Board cited in Applicants' response to the original contention, Applicants do not now seek to reargue the Board's ruling. Applicants do, however, request a correction of one aspect of that ruling.

In its Memorandum and Order the Board found that adequate bases existed for a contention focusing on concrete placement, testing and records including the "falsification of concrete quality test records." Applicants request that the Board correct the quoted words and delete from Contention 8 the words "for the preparation of correct concrete quality test records."

The Board's Memorandum and Order was presumably based on the following statement contained in an NRC SALP report (IE Report No. 83-06):

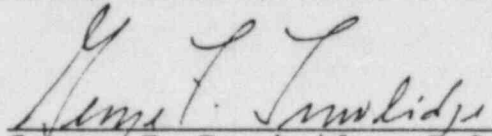
"In addition to the inspections, an investigation was performed, by a regional inspector and an investigator of four allegations made by a former employee pertaining to inadequate concrete QC testing and falsification of concrete QC test records. Two allegations were not substantiated. The remaining two allegations were partially substantiated. However, the licensee's QA program had detected and corrected the problems prior to the investigation. During the investigation, one violation was identified, (5) above. This violation was not associated with any of the allegations but was identified during review of concrete records. The licensee was cooperative with NRC investigators."

The Board did not have before it the report of the I&E

investigation to which the SALP report referred. A copy of that report (IE Report No. 81-09) is enclosed. The I&E investigation resulted in a finding that the allegation of falsification of concrete quality test records was unfounded.

Respectfully submitted,

SHAW, PITTMAN, POTTS & TROWBRIDGE



George F. Trowbridge, P.C.
Counsel for Applicants

Dated: November 14, 1984



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

INVESTIGATION REPORT NOS. 50-424/81-09 and 50-425/81-09

SUBJECT: Georgia Power Company
Vogtle Nuclear Plant, Units 1 and 2
Waynesboro, Georgia

Possible Improper Construction and Quality Control Inspection Practices

PERIOD OF INVESTIGATION: May 18 - August 7, 1981

INVESTIGATORS:

James A. Vorse
James A. Vorse, Regional Investigator
Enforcement and Investigations Staff

10-15-81
Date Signed

Joseph J. Lenahan
Joseph J. Lenahan, Civil Engineer
Engineering Inspection Branch
Division of Engineering and Technical Inspection

10-19-81
Date Signed

OTHER PARTICIPATING PERSONNEL: J. C. Howell, Regional Investigator
Enforcement and Investigations Staff
(May 18-21, 1981 only)

REVIEWED BY:

Carl E. Alderson
Carl E. Alderson, Director
Enforcement and Investigations Staff

10-20-81
Date Signed

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SECTION I
SUMMARY OF INVESTIGATION
GEORGIA POWER COMPANY
VOGTLE NUCLEAR PLANT
MAY 18, 1981 - AUGUST 7, 1981

A. BACKGROUND

On April 30, 1981, the NRC Office of Inspection and Enforcement, Headquarters, Washington, D.C. advised Region II that a letter dated April 24, 1981, had been received from an attorney stating that his client, hereinafter referred to as the alleged, was concerned about improper compaction of backfill at Georgia Power Company's Vogtle nuclear plant site. On May 18, 1981, as per agreement with the alleged and the attorney, NRC Region II personnel (a Civil Engineer and two Investigators) interviewed the alleged at his attorney's office in Augusta, Georgia. The information the alleged provided was formally executed in a signed sworn statement on May 19, 1981. Based on this information, an investigation was initiated by Region II on May 19, 1981, under the authority provided by Section 161.c of the Atomic Energy Act of 1954, as amended.

B. SCOPE OF INVESTIGATION

A review of the information contained in the alleged's statement disclosed seven allegations to be addressed during the investigation. These were:

1. Calibration data for some of the sieves used in concrete aggregate and soils testing were altered to indicate that the sieves complied with the calibration requirements, when in fact, they did not.
2. An error was made in calculation of the results of approximately 200 backfill gradation tests which were performed prior to June 1980.
3. The results from backfill proctor analyses were altered to indicate that failing tests (those which did not meet specification requirements) complied with specification requirements.
4. On several occasions, testing of concrete aggregate disclosed that the aggregate did not meet the specified gradation requirements.
5. Concrete with slumps exceeding the specification requirements was placed in the Unit 1 Reactor Building foundation basemat. The quality records for such concrete placement were altered to reflect that the concrete placed in the basemat met requirements.
6. Personnel involved in testing of plastic concrete for the Unit 1 basemat were instructed to obtain samples for testing from the best trucks when the samples were supposed to be randomly selected.
7. Concrete cylinders were discarded without being tested as required. Records were fabricated to indicate the tests had been performed and the results complied with specification requirements.

During the course of the investigation, the investigators held discussions with numerous current and former licensee and licensee contractor employees. Formal interviews were conducted with 45 individuals who were either named in the alleged's sworn statement, or who, based on information developed

during the investigation, had specific knowledge of the alleged acts, omissions, or practices.

The investigation included a review of appropriate regulatory requirements, NRC records, and licensee procedures and records including:

- Title 10, Code of Federal Regulations;
- Vogtle Nuclear Plant Preliminary Safety Analysis Report;
- Various Bechtel specifications and drawings for the construction of the Vogtle plant;
- Various Georgia Power QC inspection procedures;
- Various American Society for Testing Materials (ASTM) Standards;
- NRC Regulatory Guides;
- NRC reports of past inspections conducted at the Vogtle site; and
- Various records required to be retained by the licensee including those documenting laboratory equipment calibration testing, inspection personnel training, construction material testing, concrete and backfill placement records, and nonconformance reports.

In addition, the investigators interviewed an NRC Region II Civil Engineering Specialist (inspector) who had been on site inspecting the Unit 1 foundation basement concrete placement. Two of the allegations concerned events which occurred during that inspection and were observed by the inspector.

This investigation was conducted by two investigators and one inspector (Civil Engineer) from the Region II office. A total of 105 man-hours of investigative activity was conducted on site and an additional 55 man-hours was involved in conducting interviews of former site employees at various locations in Alabama, Georgia, and South Carolina.

C. FINDINGS

The investigation revealed that of the seven allegations, three were wholly or partially substantiated. That is, the allegations were correct or partially correct as stated. However, the licensee's QA program had detected the problems described and adequate corrective action had been taken; therefore, there was no safety significance to these three allegations.

The remaining four allegations were found to be unsubstantiated based on either a lack of corroborative evidence, or on contradicting evidence obtained during the investigation.

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During the course of the investigation, the investigators identified one violation. This violation was not associated with any of the allegations, but was identified by the investigators during review of the licensee's QA records. The violation is discussed in Sections II.B.5 and II.B.7 of this report and was identified to the licensee as Violation Item 424/81-09-01 and 425/81-09-01, "Failure to maintain sufficient QA records in the area of concrete testing."

In addition, one unresolved item was identified during the investigation. Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. The unresolved item was not associated with any of the allegations, but was identified by the investigators during review of the licensee's documentation and during interviews of licensee and contractor QC personnel. The unresolved item is discussed in paragraph II.B.5 of this report and was identified to the licensee as Unresolved Item 424/81-09-02 and 425/81-09-02, "Training Requirements of Contractor Furnished QC Inspection Personnel."

D. MEETINGS WITH LICENSEE

The licensee was informed on May 19, 1981, that an investigation had been initiated into allegations made by a former employee which concerned testing of soils, concrete, and concrete materials. The licensee was informed of the approximate number of specific allegations which would be addressed during the investigation, but the details of the allegations were not discussed.

On August 7, 1981, at the conclusion of the investigation, the investigation scope and findings were summarized with those persons listed below. The violation and the unresolved item identified during the investigation were discussed.

Individuals who attended the exit interview were as follows:

Georgia Power Company (GPC)

E. D. Groover, QA Site Supervisor
 K. W. Sweat, Civil QC Supervisor
 M. H. Googe, Manager of Field Operations
 B. C. Harbin, Civil Project Section Supervisor
 H. H. Gregory, III, Assistant Construction Project Manager
 R. W. McManus, Manager of Quality Control

Bechtel, Inc.

H. R. Reuter, Resident Engineer

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SECTION II
DETAILS OF INVESTIGATION
GEORGIA POWER COMPANY
VOGTLE NUCLEAR PLANT
MAY 18, 1981 - AUGUST 7, 1981

A. INDIVIDUALS CONTACTED

In addition to the allegor, the following individuals were contacted during the course of the investigation. Individuals no longer employed at the site, but still affiliated with the company indicated are denoted by an asterisk (*). Individuals no longer employed by the company indicated are denoted by a double asterisk (**). The positions indicated for persons no longer employed at the site are the positions the individuals occupied prior to terminating employment at the site.

Georgia Power Company (GPC)

- L. V. Alvis, Civil QC Inspector
- R. W. Allen, Assistant Construction Project Manager
- C. D. Bailey, Civil QC Inspector
- **D. C. Charret, Construction Aide
- J. F. D'Amico, QA Field Representative
- M. W. Dean, Civil QC Supervisor
- M. Flanders, Electrical QC Inspector (telephone conversation)
- W. C. Gabbard, Civil QC Inspector (telephone conversation)
- K. M. Gillespie, Construction Project Manager
- J. T. Going, Civil QC Inspector
- M. C. Googe, Manager of Field Operations
- H. H. Gregory, III, Assistant Construction Project Manager
- B. L. Grier, Civil QC Inspector
- E. D. Groover, QA Site Supervisor
- B. C. Harbin, Civil Project Section Supervisor
- J. Herrington, Jr., Civil QC Inspector
- *R. C. Houston, Soils and Concrete Laboratory Supervisor
- *J. C. Hurst, Civil QC Inspector
- L. James, Jr., Civil QC Supervisor
- W. C. Kent, Jr., Civil QC Senior Inspector
- R. W. McManus, Manager of Quality Control
- *J. L. Milam, Construction Aide
- C. R. Miles, QA Field Supervisor
- **J. A. Parrish, Civil QC Inspector
- F. M. Peterson, Civil QC Inspector
- G. R. Rodemer, Civil QC Inspector
- **P. A. Ryals, Civil QC Inspector
- C. Sarver, Senior QA Field Representative
- J. E. Seagraves, Civil QC Section Supervisor
- K. W. Sweat, Civil QC Supervisor
- F. D. Williams, Civil QC Inspector

Soils and Materials Engineers, Inc.

- **C. D. Clarey, Civil QC Inspector (telephone conversation)
- **W. N. Gross, Civil QC Inspector

Bechtel, Inc.

*D. P. Armstrong, Resident Civil Engineer
H. R. Reuter, Resident Engineer

Walsh Construction Company, Inc.

Note: These individuals were truck drivers and drove the concrete trucks for the Unit 1 basemat pour on September 16-17, 1981.

- J. W. Blalock, Jr.
- R. Braden
- H. T. Carter
- J. A. Cloud
- W. Foskey
- E. L. Grubbs
- Jerry Grubbs
- Joseph Grubbs
- R. Hankerson
- T. F. Hixon
- M. J. Irwin
- D. Jackson
- J. M. Jarrill
- W. W. Kayler
- R. F. Key
- J. McFadden
- A. B. Poe
- W. H. Saunders

Nuclear Regulatory Commission (NRC)

J. R. Harris, Civil Engineer/Geologist

B. ALLEGATIONS, DISCUSSIONS, FINDINGS

1. ALLEGATION

Calibration data for some of the sieves used in concrete aggregate and soils testing were altered to indicate that the sieves complied with the calibration requirements, when in fact, they did not.

DISCUSSION

This allegation results from paraphrasing by the investigators of information provided by the allegor in his sworn statement.

The allegor stated that in late 1979 he performed calibration tests on sieves (wire cloth screens) used for gradation testing of concrete aggregate and/or soils backfill materials. On that occasion the

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percent passing or retained on the No. 50 sieve being calibrated (the production sieve) was 4 to 5 percent different from the percentage recorded for the control sieve. The allegor stated that the acceptance criteria used in sieve calibration was that the percentage difference between the production sieve and the control sieve could not exceed one percent. There was also a problem with a No. 30 and a No. 40 sieve being calibrated which had percentage differences of approximately 1.6 to 2.5 percent from the control sieves. After re-running the calibration test 3 or 4 times, the allegor informed his supervisor, Individual G of the failures. According to the allegor, Individual G then instructed Individual C to repeat the test. Individual C's tests also failed to meet the procedure requirements. Individual C discussed the results with the supervisor, however the allegor was not aware of what they discussed. The allegor stated that the figures for the sieve calibration on the finished data sheets were different from those he had submitted to the supervisor on his work-sheets. Approximately six months later, the allegor performed the sieve calibration test again and experienced similar problems with sieves having percentage differences larger than permitted by the calibration procedure. He did not see the final data sheets nor know the results of this sieve calibration test.

As a result of an NRC inspection of the soils and concrete laboratory on January 10-12, 1979, Georgia Power Company was cited with an item of noncompliance for failure to calibrate the sieves used in gradation testing of concrete aggregate and soils as required by ASTM standards. In response to this noncompliance, GPC developed Calibration Instruction C-CI-35, "8-inch Sieves". The development of this procedure was discussed with NRC inspectors and its implementation was reviewed by NRC inspectors during NRC inspections performed at the Vogtle site on March 26-29, 1979, June 12-14, 1979, and July 24-26, 1979. The results of these inspections are documented in NRC inspections reports.

The investigator examined Revision 0 of Calibration Instruction C-CI-35. The required frequency of sieve calibration is once every three months. The procedure to be followed in calibration of the sieves is as follows:

- a. Obtain three 500 gram samples of fine aggregate for the sieve calibration.
- b. Process the three samples through the production set of sieves and record results. The results recorded are the percent passing each sieve.
- c. Recombine the samples to their original state and process the samples through the control set of sieves. Record the results (percent passing each sieve).

- d. Compare the results obtained with the control set with those obtained from the production set. The sieves meet the calibration requirement if the difference between the percent passing each of the production sieves is within plus or minus two percent of the percent passing each of the control sieves. If the plus or minus two percent passing tolerance is exceeded, the sieve or sieves are considered to be out of tolerance and discarded.

The investigators reviewed the calibration records for the sieves which have been used at the site since the sieve calibration program was initiated. The date of the initial calibration of the production set of sieves was July 24, 1979. Review of the records disclosed that the sieves were calibrated at the required frequency of once every three months. The data sheets were reviewed to verify that the difference in percent passing between the control sieves and production sieves did not exceed two percent. Three sieves had been removed from service since the calibration program was initiated. These were control Nos. 334 and 341 (No. 50 sieves) and control No. 333 (No. 100 sieve). The Nos. 30 and 40 production sieves which were in service when the calibration program was initiated were still in service.

The investigators interviewed Individual C regarding any problem he may have had with sieve calibration. Individual C stated that he never experienced any problem in sieve calibration, and, in fact, had never performed the calibration of a sieve which failed to conform to the calibration requirements. Individual C was questioned as to whether he had any knowledge of or knew of anyone who worked in the soils and concrete laboratory or was associated with the Vogtle project who had altered figures on data sheets to reflect that sieve calibration tests, which failed to meet the calibration requirements, complied with the requirements. Individual C stated that he had no knowledge of any such individual.

The investigators interviewed the supervisor, Individual G, who the allagur stated he had informed when the sieves failed to meet calibration requirements. The supervisor stated that he did not know of any problems with sieve calibration. The supervisor stated that if he became aware of anyone altering or falsifying data on any laboratory test, he would report this individual to higher management for disciplinary action.

Two other individuals were also interviewed regarding sieve calibration tests. These individuals stated that they did not know of any problems with the calibration tests and had no knowledge of anyone altering or falsifying sieve calibration test data to reflect that a sieve which a test indicated was out of calibration met the calibration requirements.

FINDING

The allegation was not substantiated. The sieves were being controlled and calibrated in accordance with the project and NRC requirements. No deviations or violations were identified.

2. ALLEGATION

An error was made in calculation of the results of approximately 200 backfill gradation tests which were performed prior to June 1980.

DISCUSSION

This allegation results from paraphrasing by the investigators of information provided by the alleged in his sworn statement.

The alleged stated that in June 1980, he observed another laboratory technician (QC Inspector), Individual AA doing calculations for backfill gradation tests incorrectly. Individual AA purportedly told the alleged that he was doing the calculations following the directions of the Supervisor, Individual G. A subsequent discussion and argument concerning the correct calculation or method followed between the alleged and Individual G. According to the alleged, another supervisor, Individual F got involved and consulted with engineers in the project office regarding the correct method for calculating the backfill gradation test results. The alleged stated that the engineers said that the calculation method used by him, the alleged, was correct and that the method used by Individual AA, G and others was incorrect. The alleged stated that as a result of this error, it was necessary to correct approximately 200 backfill gradation test calculations and that the error made a difference of approximately three to four percent in the calculations.

The investigators reviewed Bechtel Specification X2AP01 "Earthwork and Related Site Activities" and Georgia Power Procedure CD-T-01, "Earthwork Quality Control." Review of the documents disclosed that Category I backfill is required to have a maximum particle size of not more than three inches and not more than 25 percent by weight finer than the No. 200 sieve. The minimum specified testing to confirm that the backfill materials meet these requirements is at least one gradation test in accordance with the wet sieving (Wash 200) procedure of ASTM D-422 for each 5000 cubic yards of backfill.

Appendix 2C of the Vogtle PSAR was examined by the investigators to verify that the methods specified in the procedures for acceptance and placement of Category I backfill materials complied with the commitment made by the licensee to NRC.

The results of the backfill gradation tests are documented on Form CD-T-01*07, "Sieve Analysis." The investigators reviewed the test

results for the period October 1979 through June 1980. Review of these test results disclosed that many (more than 100) had been revised to correct an error in the method of calculation of the percent passing various sieve sizes. Some inspectors incorrectly determined the percent passing various sieves by using the weight of the sample after it had been washed through the No. 200 sieve in the gradation calculation instead of the total sample weight prior to washing. As the allegor stated, this error resulted in differences of three to four percent in the gradation calculations for the soil samples tested. However, the calculation for the percent passing the No. 200 sieve was done correctly. Therefore, the error had no effect on the acceptance criteria of the backfill material, and thus, no effect on safety. Based on a review of the revised gradation test results shown on Form CD-T-01*07, the investigators noted that several Civil QC inspectors including the allegor made this calculation error.

The investigators questioned Civil QC inspectors and laboratory and Civil QC Section supervisory personnel regarding the problem with the Wash 200 calculations. Seven of the QC inspectors, Individuals A, B, H, I, J, N and AA recalled a disagreement involving the Wash 200 sieve analysis concerning the method to be used in calculating the test results.

Individual AA stated that he had performed the sieve analysis calculations incorrectly. He said that he had used the sample weight after washing in the calculations instead of the total sample weight before washing. He did not realize his error until the supervisor, Individual G corrected him. Individual AA identified the allegor as the individual who had told him to use the weight after washing in the sieve analysis calculations.

One of the laboratory supervisors, Individual G, recalled that he discovered that some individuals were performing the sieve analysis calculations incorrectly, and that he had an argument regarding the calculated method with one of the civil QC inspectors who had been performing the analysis incorrectly. To settle the argument, another laboratory supervisor, Individual F, consulted with the Civil QC Section Supervisor and the Bechtel Resident Civil Engineer regarding the correct method to be used in calculation of the gradation test results. After this discussion, the question was resolved, and Individual F corrected the gradation test calculations which had been performed incorrectly. All laboratory personnel were then informed of the correct method to be used in computing the sieve analysis calculations. The Civil QC Section Supervisor and Individual F, when interviewed by the investigators, confirmed the statement made by Individual G in their description of the discrepancy involving the sieve analysis (Wash 200) calculations.

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FINDINGS

The allegation was substantiated. Some individuals apparently had been performing the sieve analysis calculations incorrectly. However this error was minor and had no impact on the qualification and acceptance of the Category I backfill materials. The error was detected and resolved by the licensee in accordance with their QA program. No deviations or violations were identified.

3. ALLEGATION

The results from backfill proctor analyses were altered to indicate that failing tests (those which did not meet specification requirements) complied with specification requirements.

DISCUSSION

This allegation results from paraphrasing by the investigators of information provided by the alleged in his sworn statement.

The alleged stated that on one particular day 12 of 25 soil compaction (proctor) tests performed in the concrete and soils laboratory failed. The alleged stated that he performed three tests himself on this particular day, and that one of them failed. He thought that this test may have been No. 1205. The compaction test value obtained in this test was only 89 pounds per cubic feet (pcf) versus the required compaction value of 93 pcf. When he informed his supervisor, Individual G, of the failure, his supervisor told him to "beat another point" (that is, do some additional testing to obtain the information required for an additional data point). After completing the testing required to obtain the additional data, the alleged stated that the compaction test result was the same, 89 pcf. He gave his worksheet showing the failing test result (89 pcf) to Individual G. The following day the alleged stated that the finished data sheet reflected a value of 96 pcf instead of the 89 pcf figure he had submitted. The alleged said that Individual A performed numerous proctor tests and had many failing test results.

The investigators examined Bechtel Specification X2AP01, "Earthwork and Related Site Activities," and Georgia Power Company Procedure CD-T-01, "Earthwork Quality Control". Review of these documents disclosed that a minimum absolute density value for the backfill in terms of pcf was not specified. The required backfill density is specified in terms of percent of maximum dry density determined from the modified proctor test (ASTM D-1557). The compaction requirement stated in the specification is as follows: "The Category I backfill shall be compacted to an average of 97 percent of the maximum dry density determined in accordance with ASTM D-1557 with not more than 10 percent of the tests below 95 percent and no test below 93 percent." This requirement is in accordance with the commitment specified in Appendix 2C of the PSAR.

In performance of the proctor (ASTM D-1557) test, soil samples are compacted at varying moisture contents in a steel mold of known volume using a specified compactive 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 of the soil versus moisture content. The ASTM test procedure requires that a smooth curve be drawn to connect the plotted points. The test procedure also requires that sufficient data (a minimum of 5 points) be obtained to bracket the maximum density and optimum moisture content values. If some of the test data does not fall on the smooth curves, or the data does not bracket the maximum density value, it is necessary for the laboratory technician to "beat another point." That is, compact another sample or samples in the mold until sufficient data is obtained to bracket the maximum density value and plot a smooth curve.

In addition to specifying that Category I backfill is required to be compacted to an average of 97 percent proctor density, the Bechtel specification also requires that the moisture content of the soil at the time of compaction be controlled to within minus three percent or plus two percent of the optimum moisture content. NRC inspectors, during inspections performed in 1979, issued two items of noncompliance to the licensee for failure to control the moisture content of the fill as required by the specification. However, no problems were found with the backfill density results during any previous inspections.

The investigators reviewed proctor test No. 1205. The results of that test were a maximum dry density of 107.5 pcf. This test had not been performed by the alleged. The investigator reviewed the results of the proctor tests performed from July 1979 through November 1979. Results of the 120 proctors performed during that period were as follows: Four had results of 99 pcf, 10 were between 100 and 105 pcf, and the remainder were between 105 and 120 pcf. Based on the results of this sampling of proctor results, and the fact that the acceptance criteria is based on percent maximum dry density, the investigators concluded that the alleged probably confused the terminology, and actually meant that instead of 89 pcf, the resultant field density was 89 percent of the maximum dry density determined from the proctor analysis. (Investigator's Note: During the interview of the alleged on May 18, 1981, the alleged was not certain, when discussing this allegation with the investigators, whether he meant 89 pcf or 89 percent. The investigators discussed this point at considerable length with the alleged who finally stated that he meant 89 pcf and not percent.)

Procedure CD-T-01 details the method for quality control testing Category I backfill to assure that the backfill is compacted to the specification requirements. The testing is performed by field soils inspectors using the field density (sand cone) test (ASTM D-1556). The

results of the field density tests and the soil samples collected in performance of the field density test are sent to the soils laboratory by the field inspectors. In the soils lab, laboratory technicians test the soil samples and calculate the results of the field density tests. The laboratory testing involves performance of a proctor (compaction) test, or selection of the results of a previously performed proctor test provided certain criteria specified in procedure CD-T-01 are met. The field density test results are determined by comparing the density of the in-place soil (determined by sand cone) with the proctor results and computing the percent compaction (field density divided by proctor density) of the in-place backfill material. If the test results have not been compacted to the specified density (average of 97 percent proctor density) the procedure requires that a fill failure notice (Form No. CD-T-01*01) be issued and forwarded to the contractor. The area represented by the failing test result is identified (marked) in the field by the field inspector. The contractor is then required to recompact the backfill. After recompaction, the fill is retested and if found to be acceptable, a fill correction notice signifying that proper corrective action has been taken is issued to the contractor.

During interviews of Civil QC inspection personnel, eight Civil QC inspectors and three Civil QC supervisors were questioned by the investigators regarding this allegation. The inspectors stated that they were not aware of anyone changing proctor, sand cone, or any other test results. One QC inspector, Individual I recalled being told by another QC inspector (he named the alleged as that inspector) that he, the alleged, thought that figures were being changed. Individual I said that no one else ever made a similar statement. Individual B stated that he had some compaction (sand cone test) failures in non-Category I backfill areas, but did not recall having any in Category I backfill. Individual A stated that he personally performed a large number of proctor tests and computed the results of many sand cone tests. He stated that he occasionally had failures which he estimated at perhaps 1 or 2 a month, but that when this occurred, the failures were handled in accordance with project procedures. None of the QC inspectors or supervisors questioned could recall a day when a large number of tests failed (e.g. 12 out of 25).

A supervisor, Individual G stated that 25 sand cone and proctor tests were never performed in a one day period in the lab. According to him, the most tests ever performed in one day was in 1977 (prior to the alleged's employment at the site) when 17 were done in conjunction with the Category I test fill program. Individual G stated that he reviewed and checked all calculations. He said that the only time he ever changed any test results was when he found errors in the calculations, and that when this occurred, he would always try to discuss the errors with the individual who had made them. He also said that he would occasionally transfer (copy over) the test results from a worksheet to

a final calculation sheet so that the test results would be neat and legible. Individual G stated that if he became aware of anyone altering test data or results of lab tests, he would report this individual to higher management for disciplinary action.

Two other individuals, Individual F and Individual R, who were supervisors in the lab during the alleged's employment at the site were questioned regarding whether any laboratory personnel (QC inspectors) complained to them concerning lab test data and results being changed to reflect that failing tests had met the project requirement. Neither of them could recall anyone voicing this complaint.

The investigators reviewed the fill failure notices which were issued while the alleged was employed at the site. One of the fill failure notices was written to document a field density test result which was computed by the alleged. The results of this test indicated that the backfill had been compacted to only 87 percent of the proctor density of 107.1 pcf, or 93 pcf. The investigators reviewed fill correction notices to verify that the area had been recompacted and retested as required by site procedures. This review disclosed that a fill correction notice had been written, and that the area had been recompacted, and when retested, was found to have an in-place density of 104 percent of proctor density. Based on a review of field (sand cone) density test results, fill failure notices, and fill correction notices, the investigators concluded that the backfill was being compacted and tested as required by the site procedure. During review of the nonconformance report (NCR) log, the investigators noted that an NCR (No. CD-478) was written to document that the soil samples obtained from two field density tests were lost prior to completion of testing. The corrective action for disposition of this NCR was to retest the area represented by the tests.

FINDINGS

The allegation was not substantiated. There is no evidence that test data was being altered to indicate failing tests meet requirements. No deviations or violations were identified.

4. ALLEGATION

On several occasions, testing of concrete aggregate disclosed that the aggregate did not meet the specified gradation requirements.

DISCUSSION

This allegation results from paraphrasing by the investigators of information provided by the alleged in his sworn statement.

The alleged stated that he performed many gradation tests on size No. 4 concrete aggregate. When many of these tests failed, the alleged stated, use of this size aggregate was discontinued. Size No. 67 aggregate was then brought onto the job site for use in concrete. Problems were also encountered with the size No. 67 aggregate in that there were numerous failures in the gradation test results. The placement of Category I ("Q") concrete was stopped for several months because of some problems, but resumed again even though tests on samples of No. 67 aggregate still failed. The alleged was not aware of any changes to test data to indicate that concrete aggregate gradation tests complied with project requirements when they actually failed.

The investigators reviewed Georgia Power Company Procedure No. CD-T-02, "Concrete Quality Control." Review of this procedure disclosed that the coarse aggregate is required to conform to the gradation requirements specified in ASTM C-33 for either size No. 4 or size No. 67 aggregate. The procedure specifies that aggregate is to be sampled and tested for conformance to these gradation requirements for each 1000 tons of aggregate as received, prior to placement in the stockpile, and twice daily during concrete production. The daily production samples are taken from the batch plant conveyor belts. If the results of a gradation test for an aggregate sample fails to conform to ASTM C-33 requirements, the procedure requires that two additional samples be obtained and tested. If either of these tests fail, concrete production is required to be stopped until corrective action is taken.

The investigators reviewed the nonconformance report (NCR) log. This review disclosed that several NCRs had been written to document and correct problems with the No. 67 (3/4 inch) size aggregate failing to meet specification (ASTM C-33) gradation requirements. The investigators reviewed the NCRs and verified that the action taken to correct the problem was technically adequate and that the NCRs had been properly dispositioned. NCRs reviewed were as follows: NCR CD-529, CD-535, CD-567, CD-568, CD-658, CD-834, and CD-918.

The investigators questioned Civil QC inspectors and Civil QC supervisory personnel concerning aggregate gradation problems. Several of the QC inspectors recalled testing No. 67 aggregate and experiencing failures. When a failure occurred, the inspectors stated, they obtained two additional samples and performed gradation tests on them as required by the procedure. The inspectors stated that they seldom had a failure on either of the two additional samples. One inspector recalled an occasion that, when one of the additional samples failed the gradation test, concrete production was stopped for 24 hours. The Civil QC supervisory personnel recalled several problems with the No. 67 aggregate. These problems were either documented on NCRs or were resolved in other ways. On one occasion the entire No. 67 stockpile was removed and used for non-safety related purposes (e.g. road base materials, etc). On another occasion, several rail cars of

aggregate were returned to the quarry. During the interviews, no one cited an instance where aggregate gradation failures were not handled in accordance with the procedure requirements.

Additional discussions with the licensee and Bechtel engineers disclosed that in late 1977 and early 1978, prior to placement of any safety related (Category I) concrete on the project, mix designs were developed for both coarse aggregate sizes. That is, one group of mix designs were developed for No. 4 size aggregate and another for No. 67 aggregate. The production of concrete using the No. 4 aggregate was stopped in early 1979 due to problems experienced in pumping the concrete produced using this size aggregate. The use of the size No. 4 aggregate was not discontinued due to gradation problems. No one questioned recalled any problems with the gradation of the No. 4 aggregate.

As the allegor stated, the placement of Category I concrete was stopped on several occasions from late 1978 through early 1979. The Category I concrete work stoppages were due to the licensee's QA audit findings or to other problems which affected concrete placement (e.g., severe erosion of the excavated embankment slopes which required extensive remedial work in the powerblock area during which all Category I concrete placement was stopped). The licensee informed NRC Region II whenever Category I concrete placements were stopped for an extended period, and in the case of the erosion damage, NRC Region II issued a confirmation of action letter to the licensee confirming that among other items, Category I concrete placement would not be resumed until corrective action was completed to resolve the problem with the slope erosion. There were no long term (longer than 1 day) concrete placement stoppages due to aggregate gradation problems.

FINDINGS

The allegation was partially correct as stated. The licensee has had problems with the No. 67 aggregate gradation. However, the licensee's QA program had detected the problems and adequate corrective action was taken to resolve the problems. No violations or deviations were identified.

5. ALLEGATION

Concrete with slumps exceeding the specification requirements was placed in the Unit 1 Reactor Building foundation basemat. The quality records for this concrete placement were altered to reflect that the concrete placed in the basemat met requirements.

DISCUSSION

This allegation results from paraphrasing by the investigators of information provided by the allegor in his sworn statement.

The alleged stated that high slump concrete was placed in the Unit 1 Reactor Building (RB) basemat on the second day (September 17, 1980) of the concrete pour. The alleged stated that he personally tested, in an approximate six hour period on September 17, sixty samples of concrete which had eight inch slumps and ten others which had ten inch slumps. When he (the alleged) questioned the practice of accepting the high slump concrete for placement in the basemat, he was told by Individual K that a supervisor told him, Individual K, to keep the pour alive and not to reject any trucks. The alleged stated that he then complained to the supervisor regarding the practice of placing concrete in the basemat pour with a slump which exceeded the acceptance limit of six inches. When he did this, the supervisor relieved him of his duties on the pour.

The next day (the day after the pour was completed), the alleged stated, he saw Individuals K, L and M reviewing the records from the placement. The alleged said that they were reconstructing the records using batch tickets since the original paperwork had been lost. The alleged said he looked at the records and reviewed the slump test results for the time period he had performed them and noted that no 8 or 10 inch slumps were indicated on the records. When he asked why they were not shown on the records he did not get an answer.

The Unit 1 Reactor Building (RB) basemat concrete placement started at 4:00 A.M. on September 16, 1980, and was completed at 5:00 P.M. on September 17, 1980. The total quantity of concrete placed was 6839 cubic yards. The concrete for the placement was batched from both of the onsite concrete plants (Plant No. 1 and Plant No. 2).

The investigators examined Section C3.1 of Bechtel specification X2AP01, "Furnishing Concrete," Section C3.2 of Bechtel specification X2AP01, "Forming, Placing, Finishing, and Curing of Concrete", and Georgia Power Company Procedure No. CD-T-02, "Concrete Quality Control." Review of these procedures disclosed that the working limit of the slump specified for the concrete (Mix No. 511) placed in the Unit 1 basemat was 4 inches, with an inadvertency margin of 2 inches and a rejection limit of 6 inches. The procedure requires that concrete be sampled at the truck discharge in accordance with ASTM C-172 and tested for slump, entrained air, and temperature for each 50 cubic yards of concrete placed. In addition, when the concrete is placed by pumping, as was the case for the Unit 1 basemat placement, samples are also required to be obtained from the pumpline discharge for correlation testing.

The investigators reviewed quality records related to batching, inspection and testing of the Unit 1 basemat concrete. The following records were examined:

- a. Concrete batch tickets
- b. Concrete placement log
- c. Nonconformance Reports CD-1122, CD-1123, and CD-1124
- d. Concrete mix design data for Mix No. 511
- e. Concrete pour card
- f. Results of 7, 28, and 91 day unconfined compression tests performed on cylinders from the basemat pour.
- g. Results of in-process testing of plastic concrete, including slump, unit weight, and temperature performed on the basemat concrete.
- h. Training and qualification records of the Georgia Power Company QC inspectors who inspected the basemat.
- i. Results of moisture content tests performed on fine and coarse aggregate used in batching of concrete for the basemat.
- j. Batch plant scale calibration records for months of July and October 1980.
- k. Results of mixer uniformity tests performed on Batch Plant No. 1 in March and October 1980 and on Batch Plant No. 2 in August 1980.
- l. QA Audit Report CD03-80/39. This was an audit of the concrete placement activities for the Unit 1 basemat pour.

Review of the above quality records disclosed the following violation: 10 CFR 50, Appendix B, Criterion XVII requires the licensee to maintain sufficient inspection and test records to furnish evidence of activities affecting quality. Criterion XVII requires that the identification of the inspectors, testers, or data recorders be included on the records. The identification of the individuals who performed the in-process testing of the plastic concrete for the Unit 1 RB basemat pour and the identification of the individuals who inspected the concrete placement for this pour was not noted on the quality records for the placement. Review of the Unit 2 basemat placement records disclosed that the inspectors were not identified on these (Unit 2) records either. This was identified to the licensee as Violation Item 424/81-09-01 and 425/81-09-01, "Failure to Maintain Sufficient QA Records in the Area of Concrete Testing."

Discussions with licensee QC inspectors and engineers, and review of the above records disclosed that the training requirements for Civil QC inspection personnel supplied by licensee contractors to supplement the licensee's civil inspection staff may not comply with NRC requirements. This was identified to the licensee as Unresolved Item 424/81-09-02 and 425/81-09-02 "Training Requirements of Contractor Furnished QC Inspection Personnel", pending further review by NRC.

Some of the above records were reviewed previously by NRC during an inspection conducted on January 6-9, 1981. This records review disclosed that the licensee failed to sample the concrete cylinders in accordance with procedure CD-T-02 and Bechtel specification X2AP01. This was identified to the licensee as a violation (Item 50-424/81-01-01) at the time of that inspection.

The concrete placement logs indicate that 30 truck loads of concrete (approximately 300 cubic yards of concrete) were rejected by inspectors at the pumps or testing station due to high slump (i.e., slump in excess of 6 inches), 10 trucks (approximately 100 cubic yards) were rejected due to low slump, and 6 other trucks (60 cubic yards) were rejected for various other reasons. The concrete placement logs indicate that two truck loads of 7 1/2 inch slump concrete were placed in the basemat pour on the afternoon (between 3 and 5 p.m.) on the first day of the pour (September 16). The placement of this high slump concrete (in excess of the 6 inch rejection limit) was documented as NCR CD-1124. In addition, review of the concrete batch tickets disclosed that an additional 7 truck loads of concrete (70 cubic yards) were rejected at the batch plants by the licensee's batch plant inspectors. These rejections were due to batching errors.

The concrete batch plants each use a computer to control batching of the concrete. The computer console has a digital printer which prints a batch ticket for each batch of concrete. The printed batch ticket indicates the time and date batched, the mix number, the weight of the materials (cement, aggregate, water, etc.) in the batch, and the cumulative total of the volume of concrete produced on that date for that mix number. The investigators reviewed the batch tickets and verified that all of the individual batches of Mix No. 511 which were produced on September 16 and 17 were recorded and that the materials (aggregate, cement, water, etc.) used to produce the concrete were controlled as required.

The investigators interviewed 8 QC inspectors who performed the testing (slump, air, temperature) of the plastic concrete placed in the basemat. These individuals included 6 of the 8 inspectors who worked on the day shift, including those who worked with the allegor, and 2 inspectors who worked on the night shift. The QC inspectors stated that they were aware that some high slump concrete was placed in the basemat in the late afternoon of September 16. They said that this decision was made by the Manager of Quality Control to avoid a cold joint in the basemat when problems were encountered with one of the batch plants. The inspectors stated that this was the only time during the placement that they were aware that some high slump concrete was accepted in order to "keep the pour alive" (i.e., avoid a cold joint), and that only a few truck loads were accepted with the higher slumps. The inspector who worked at the allegor's testing station and was in

charge of recording the test data on concrete placement log, Individual K, stated that he did not record the two 7½ inch slump figures shown on the log, but that they were recorded by Individual Q in error. Individual K stated that to the best of his knowledge, no concrete with a slump in excess of 6 inches was ever placed in the pour. Individual Q denied the 7½-inch slump figures were in error, and stated that two loads of concrete with 7½-inch slumps were placed in the pour. The other six QC inspectors stated that they never accepted any concrete with a slump in excess of six inches for placement in the pour.

Individual Q was interviewed on two occasions by the investigators. During the first interview, Individual Q said that he thought that some truckloads of concrete with high slump which may have been rejected by QC inspectors may have been placed in the pour. Individual Q stated that this occurred when, after being instructed to take their load of concrete to the dump by QC inspectors at the testing station, QC inspectors working at the pumps would wave down the drivers and instruct them to discharge their concrete (which had been rejected by other inspectors) into the pumps. During the second interview, Individual Q retracted this statement and said he was not aware of any other concrete with slump in excess of 6 inches being placed in the basemat with the exception of those noted on the concrete placement log (the two batches with the 7½ inch slumps).

To further pursue the possibility that concrete from trucks which were rejected was placed in the basemat, the investigators interviewed 18 truck drivers employed by the contractor who drove the concrete trucks on the days of Unit 1 basemat pour. All of the drivers questioned said they never received an order from one QC inspector which contradicted the instruction of another QC inspector who had directed them to take the concrete in their truck to the dump. When asked what they would do if that would happen, all of the drivers stated that they would question the inspector who told them not to take concrete to the dump, and check with the inspector who originally told them to take the concrete to the dump to clarify the situation. Fourteen of the drivers distinctly remembered taking rejected concrete to the dump on the days of the Unit 1 basemat pour. Some of them said they took several loads to the dump.

The investigators questioned the Manager of Quality Control and 3 Civil Section QC supervisory personnel regarding the placement of high slump concrete in the basemat. The Manager of QC stated that on the first afternoon of the placement (September 16) one of the batch plants malfunctioned and had to be shut down for approximately two hours. At this point, he became concerned that a cold joint might develop in the placement because the concrete in most of the pump line began to harden. He stated that he discussed the problem with the Bechtel Resident Civil Engineer and that they decided to increase the slump of the concrete being placed to a maximum of 6 inches in order to prevent

the occurrence of a cold joint. One of the other QC supervisors, Individual L, when questioned, said that he participated in the discussion between the Manager of QC and the Bechtel engineer. Individual L's description of the circumstances leading to a decision to use concrete with a maximum slump of 6 inches was in agreement with those described by the Manager of QC. Individual L said that one batch of concrete with a slump of 7½ inches was inadvertently placed in the pour, but that this was documented on an NCR. The description of the use of the high slump concrete in the placement, provided by the other Civil QC supervisory personnel questioned was in agreement with that provided by Individual L and the Manager of QC.

The investigators questioned the Bechtel Resident Civil Engineer. His description of the circumstances involving the high slump concrete was also in agreement with those provided by the QC inspectors and QC supervisory personnel.

An NRC inspector was on site when the Unit 1 basemat concrete was placed. The results of that inspection were documented in IE Report No. 50-424/80-14. The investigators interviewed the inspector concerning the placement of the high slump concrete in the basemat. The inspector was familiar with the problem. He had identified an Inspector Follow-up Item (IFI) during the inspection to follow-up on the licensee's disposition of the NCR which was written to document and resolve the placement of the concrete with a slump of 7½ inches in the basemat. The inspector closed the IFI during an inspection of February 12, and 17-18, 1981, after he reviewed the disposition of NCR CD-1124. No violations were identified in the manner in which the problem was resolved.

The investigators reviewed NCR CD-1124. The disposition of this NCR resulted in an analysis of the water content of the high slump concrete which was placed in the basemat. The water/cement ratio of the high slump concrete was within the specification limits. In review of the results of the 91 day unconfined compression tests on the concrete cylinder from the Unit 1 basemat, the investigators noted that the cylinder breaks were on the average 25 to 30 percent higher than design requirements.

Based on the results of the interviews and the review of the quality records, the investigator concluded that a maximum of two truckloads of concrete with a slump which exceeded the six inch rejection limit (i.e., the two 7½ inch slump loads) may have been placed in the basemat. A total of approximately 700 truckloads of concrete was placed in the basemat. This problem was properly documented and evaluated. There are no safety concerns with the possible placement of these two truckloads of concrete in the basemat. The decision to increase the slump of the concrete to avoid a cold joint was the best engineering solution for avoidance of the cold joint.

Regarding the allegation that the records were lost from the basemat pour, the investigators interviewed the Civil QC supervisor and the four QC inspectors who were responsible for maintaining these records. These were individuals K, L, M, S and Q. These individuals stated that some of the concrete placement logs had been recopied from the original data sheets because the originals were badly soiled, some had lines which were scratched out, or there were errors in the total cumulative yardage on some of the sheets. The error in the total cumulative yardage was resolved by reviewing the concrete batch tickets. The main purpose for recopying the data sheets was to make them more legible since they are required to be maintained for the life of the plant. From the results of the interviews, the investigators determined that there was apparently some problem which resulted due to Individual Q possibly making an error in recopying some of the data, and discarding the original data sheets before they were reviewed by the other inspectors. This concerned the possible error in recording of 7 1/2 inch slumps for two trucks as discussed above. The investigator concluded that nothing improper was involved in recopying the data sheets. This is common practice at most sites.

FINDINGS

The allegation as stated was partially correct in that some high slump concrete was apparently placed in the basemat. However, this was detected by the licensee's QA program and evaluated. Some of the original data sheets were "lost." However, the data had been recopied onto finished data sheets prior to when the original data sheet had been discarded ("lost").

The portion of the allegation concerning placement of 60 to 70 truck-loads of concrete with slumps in the range of 8 to 10 inches in the basemat and falsifying records to indicate that all concrete placed was in compliance with project requirements was not substantiated.

One violation and one unresolved item were identified as described above.

6. ALLEGATION

Personnel involved in testing of plastic concrete for the Unit 1 basemat were instructed to obtain samples for testing from the best trucks when the samples were supposed to be randomly selected.

DISCUSSION

This allegation results from paraphrasing by the investigators of information provided by the alleged in his sworn statement.

According to the alleged, on the second day of the Unit 1 Reactor Building (RB) basemat concrete pour, a supervisor instructed quality control inspectors who were sampling and testing plastic concrete to obtain the samples of plastic concrete to be tested from the "best" truck. The alleged stated that by "best" truck he meant the truck which carried concrete which, based on a visual inspection, would have a slump which complied with specification requirements. The alleged stated that this was done by visually examining the concrete being carried by each truck prior to deciding which truck was to be sampled and tested instead of selecting the truck to be sampled at random as was done on the first day of the Unit 1 RB basemat pour and on previous pours on which the alleged was involved.

The requirements for sampling and testing plastic concrete are specified in Georgia Power Company Procedure No. CD-T-02, "Concrete Quality Control." The procedure requires the concrete to be sampled at the truck discharge in accordance with ASTM C-172 and tested for slump, entrained air, and temperature for each 50 yards of concrete placed. Concrete cylinders for compressive strength testing are required to be cast from concrete samples which represent a maximum of 100 cubic yards of concrete placed. In addition, when the concrete is placed by pumping, as was the case for the Unit 1 basemat placement, samples are also required to be obtained from the pumpline discharge for correlation testing. Procedure CD-T-02 specifies that the concrete trucks from which samples are obtained for testing are to be selected at random.

The investigators interviewed eight Civil QC inspectors who performed the sampling and testing of plastic concrete during the Unit 1 basemat placement. This included six inspectors who worked on the day shift when the alleged instruction to sample the "best trucks" was given by the supervisor, and two inspectors from the night shift. The inspectors stated that no one had instructed them to sample from the "best" trucks. They all said that the concrete was sampled at random. The inspectors stated that the individual monitoring the concrete placement log would often instruct them to sample the next truck before that truck ever arrived at the testing station. Visual inspections of the trucks were not made until after the truck left the testing station and arrived at the pumps. Visual inspection of the concrete was made by the inspectors after the truck driver initiated discharge of the concrete into the pumps, per procedure requirements. Several of the inspectors stated that, based on this visual inspection, they rejected trucks with low slump concrete, or required concrete to be sampled because it appeared to have too high a slump. In addition, when questioned by the investigators, the QC supervisor whom the alleged claimed gave the order to pick the best trucks denied ever issuing this instruction.

The investigators questioned the NRC inspector who witnessed the Unit 1 basemat concrete placement regarding this allegation. The inspector stated that he reviewed the results of the tests being performed on the plastic concrete on several occasions during the placement, and verified that the samples for testing were being selected at random.

The investigators reviewed the results of the in-process testing of the plastic concrete documented on the concrete placement logs (Form CD-T-02*22). No information was obtained which would indicate that the samples were not selected at random.

FINDINGS

The allegation was not substantiated. The concrete samples for testing were selected from trucks which were picked at random. All of the inspectors questioned denied ever being instructed to sample the "best trucks." No violations or deviations were identified.

7. ALLEGATION

Concrete cylinders were discarded without being tested as required. Records were fabricated to indicate the tests had been performed and the results complied with specification requirements.

DISCUSSION

This allegation results from paraphrasing by the investigators of information provided by the allegor in his sworn statement.

The allegor stated that he personally observed Individual H perform the unconfined compression test on only a few of the concrete cylinders which were scheduled to be tested. Individual H would then dispose of the remaining cylinders and complete the paperwork (test reports) to indicate that the cylinders which had been discarded without being tested had been tested. The allegor said that Individual H would also do the same thing for grout cubes (i.e., test only a few and fabricate the paperwork for the remainder). The allegor stated that Individuals A, B and N had told him (the allegor) that they also observed Individual H in this practice. The allegor stated that on one occasion the laboratory supervisor, Individual F, found untested concrete cylinders in the fog room after the test reports had been completed showing the cylinders had been tested. Those test reports had been completed by Individual H. When this occurred, the allegor stated that Individual F had a meeting of all laboratory personnel and instructed them to be more careful in the future. Individual F found a similar problem several months later. However, that time grout cubes were involved. Individual H also signed those test reports.

The requirement for performing unconfined compression tests on concrete cylinders are specified in Georgia Power Company Procedure CD-T-02, "Concrete Quality Control." The procedure requires that a set of concrete cylinders be made for each 100 cubic yards of concrete placed. A set consists of five cylinders. The cylinders in the set are tested at the following intervals: One at 7 days, one at 28 days, two at 91 days. The remaining cylinder is a reserve cylinder which can be discarded without testing if the average of the 91 day tests comply with the concrete design requirements. Testing of the cylinders is done in accordance with ASTM C-39.

The investigators reviewed quality records relating to testing of concrete cylinders. Records examined were as follows:

- a. Results of unconfined compression tests performed on cylinders for Mix Nos. 411 and 511 for the period of November 1979 through April 1981
- b. NCR CD-923
- c. Soils and Material Engineers (S&ME) Communication Number 52, dated January 9, 1981

NCR CD-923 was written to document the fact that all the cylinders from an Auxiliary wall pour (1 set of 5) had been misplaced before being tested. Disposition of the NCR resulted in obtaining two drilled core samples from the wall and performing the unconfined compression tests on the cores at 91 days to verify that the concrete met design strength requirements.

S&ME Communication No. 52 contains an evaluation of all testing, including cylinder testing, performed on the concrete at the site for the period of January 1980 through January, 1981.

Review of the above documents disclosed that the unconfined compressive strength of the concrete met or exceeded design requirements. However, review of the unconfined compression test data sheets disclosed that the identification of the individual performing the cylinder tests were not recorded on the data sheets. Review of procedure CD-T-02 disclosed that this is not required by the procedure. This was identified to the licensee as another example of failure to maintain records as required by 10 CFR 50, Appendix B, Criterion XVIII, as discussed in Section II.B.5 of this report.

The investigators interviewed Individuals A, B, C, D, E, N, J, K and I regarding the concrete cylinder testing. None of these individuals were aware of Individual H or anyone else not testing the required number of cylinders or grout cubes, or discarding any cylinders or

grout cubes and fabricating test reports to indicate that the testing had been performed. The QC inspectors questioned indicated that Individual H had the reputation for testing the cylinders rapidly, but none of the individuals ever observed Individual H discard cylinders which required testing. Some of the inspectors questioned stated that there had been some minor problems with cylinders. Examples of these were an occasional missing cylinder from a set of 5, misnumbered cylinders, filing of test reports in the wrong folders, and the one occasion when the set of 5 cylinders from the auxiliary building wall pour were misplaced. These problems were all resolved. For example, when a cylinder was missing from a set, the reserve cylinder was tested in its place. When individual cylinders were misnumbered, it was possible to determine the correct number from the date recorded on the cylinder, or the reserve cylinder was tested in its place.

The laboratory supervisor, Individual F was questioned by the investigators regarding this allegation. He stated that he did not recall any problem with finding untested cylinders or grout cubes in the fog room after the paper work had been completed. He recalled problems with some misnumbered cylinders, the missing set of 5 cylinders, and occasional missing cylinders in a set. Individual F stated that he believed he held a meeting with laboratory personnel after the set of 5 cylinders was discovered missing and admonished the laboratory personnel to be more careful in the future. Four other Civil QC supervisory personnel were questioned concerning this allegation. These individuals stated that they were aware of the same problems involving cylinder testing as expressed by the QC inspectors questioned and Individual F. None of the supervisory personnel, including Individual F were aware of Individual H or anyone else not performing the required tests on concrete cylinders.

The investigators questioned Individual H regarding his alleged failure to test the required number of concrete cylinders Individual H denied ever not testing the required number of cylinders or fabricating paperwork. Individual H acknowledged that he often did test the cylinders faster than anyone else because he wanted to get the job done. However, he stated that he never applied the test load to the cylinder faster than specified in the ASTM (C-39) test procedure.

Testing of the concrete cylinders was witnessed by NRC inspectors during previous NRC inspections. No problems were observed during the inspections with the method of cylinder testing.

FINDINGS

The allegation was not substantiated. Concrete cylinders are being tested in accordance with requirements. Another example of the violation discussed in Section II.3.5 concerning failure to record the identification of the tester on quality records was identified.

November 14, 1984

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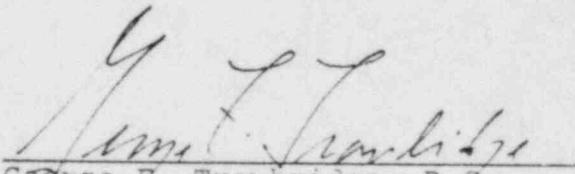
OFFICE OF SECRETARY
DOCKETING & SERVICE
BOARD

Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
GEORGIA POWER CO., et al)	Docket Nos. 50-424
)	50-425
(Vogtle Electric Generating Plant,)	(OL)
Units 1 and 2))	

CERTIFICATE OF SERVICE

I hereby certify that copies of Applicants' Motion to Correct ASLB's Memorandum and Order Dated November 5, 1984," dated November 14, 1984, were served upon those persons on the attached Service List by deposit in the United States mail, postage prepaid, this 14th day of November, 1984.


George F. Trowbridge, P.C.

Dated: November 14, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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In the Matter of)
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) 50-425
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