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the southern electric system

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September 8, 1988

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

PLANT VOGTLE - UNIT 1
NRC DOCKET 50-424
OPERATING LICENSE NPF-68
RESPONSE TO BULLETIN 88-05
NONCONFORMING MATERIAL

Gentlemen:

NRC Bulletin (NRCB) 88-05, "Nonconforming Material Supplied by Piping Supplies, Inc. at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey", dated May 6, 1988, requested Georgia Power Company (GPC) to submit information regarding materials from Piping Supplies, Inc. (PSI) and West Jersey Manufacturing Company (WJM) that either provides assurance that materials comply with the American Society of Mechanical Engineers' (ASME) Boiler and Pressure Vessel Code Section III, American Society of Testing and Materials (ASTM), and applicable procurement specification requirements, or that demonstrates that such materials are suitable for their intended service. The Bulletin was received by GPC on May 11, 1988, and an extensive program including a document search of existing procurement records to identify material from PSI or WJM was begun. The issuance of Supplement 1 to the NRCB on June 15, 1988, narrowed the scope of review from ASME and ASTM certified materials to fittings and flanges. It also instructed the affected licensees to commence, on an accelerated schedule, appropriate testing of accessible flanges and fittings promptly to identify conformance of materials to ASME and ASTM materials specifications. Subsequently, the NRC issued Supplement 2 to the NRCB on August 3, 1988. The second supplement added an additional company, Chews Landing Metal Manufacturers, Inc. (CLM), to the search and revised the testing and reporting requirements. Pursuant to Supplement 2, we have suspended further testing of materials. This letter reports the results of our investigation into the subject NRCB.

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It has been recognized in the pressure vessel and piping industry for many years that the certified physical test results of a material lot tested at a steel mill may vary from tensile tests performed on that lot's formed product. There are a number of reasons for these variations. Tests on products often must be taken on a specimen with different orientation, depth or size than the original. Subsize tensile test specimens may yield more conservative (lower) results than full-size specimens. Other reasons for variations are: the fact that steel is not homogenous, different amounts of work on the material goes into the manufacturing of various product forms, and cooling rates may vary. The American Iron and Steel Institute (AISI) performed an elaborate study of plates and shapes to determine what tensile test variances could be expected between the results of mill tests and product test for carbon steel. This study was issued in September, 1974 and demonstrated that material with test coupons acceptable at the mill can have tensile test results, when tested as products, as much as 14,000 psi lower or higher than the results reported on the CMTR (10-20% variance). Variances were found to be greater for shapes than for plate products. The results of tests on structural shapes would be expected to be closer to the results for flanges and fittings because of configuration, product method and amount of working. The results of the AISI Study on variances in carbon steel strength were reported to the ASME Code Committee with the suggestion that allowable stresses be reduced for ASME Code materials. The ASME Code Committee considered the AISI Study and determined that no changes in allowable stresses were necessary. However, the Code Committee did acknowledge that variances, as reported by AISI, were a known phenomena.

After publication of NRCB 88-05, NUMARC/EPRI initiated an independent testing program to: (1) determine through destructive testing the tensile strength and other physical properties of approximately 250 pieces of warehoused carbon steel materials supplied by PSI or WJM to various utilities, (2) develop a correlation between Equotip hardness test results and tensile strength values for carbon steel, and (3) perform magnetic testing, alloy analysis and physical testing on a sampling of the small percentage of stainless steel materials furnished by PSI and WJM. Results obtained from the independent laboratory destructive testing revealed a bell-shaped tensile strength distribution curve very similar to the results obtained in the earlier AISI Study. The tensile strength test results were within the range expected for carbon steel materials with the exception of certain blind flanges. The interim results of the NUMARC/EPRI carbon steel study were presented to the NRC on July 29, 1988. Additionally, a chemistry evaluation of the items

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tested proved to meet material specification requirements. NUMARC/EPRI supervised testing of the stainless steel specimens supplied by PSI or WJM to various utilities showed that the tested material was within the expected limits of the material specification requirements.

During construction, the Plant Vogtle practice was to follow ASME Section III Code requirements for material procurement and installation of piping systems. Contractors involved with the fabrication, installation and supply of ASME Code materials/equipment were properly certified by ASME, or, in the case of some suppliers and manufacturers, either ASME or the Certificate Holders. ASME Section III requires that pressure retaining material be supplied to an N-type Certificate Holder by an organization qualified in accordance with specific ASME rules. While PSI and CLM materials have not been used at Plant Vogtle Unit 1, WJM materials were used through supply to N-type Certificate Holders, such as Bechtel. WJM has been surveyed, audited and qualified by ASME or Bechtel (and other N-type Certificate Holders) in compliance with the ASME Code rules. After Plant Vogtle Unit 1 was ASME Code stamped, repair and replacement activities have been performed under ASME Section XI Code requirements. Work has been performed and material certified in compliance with ASME code requirements. NRCB 88-05 raised an important question regarding possibly fraudulently documented materials furnished by WJM. Subsequently, a limited number of blind flanges found at some nuclear plants did not appear to meet ASME Code requirements. This does not, however, demonstrate that all materials supplied to the nuclear industry by WJM failed to meet ASME Code requirements.

We have found no evidence of PSI or CLM materials being supplied to Plant Vogtle Unit 1. To assure that unacceptable material was not installed in Plant Vogtle Unit 1, a program was undertaken to review and test WJM material which had been discovered. The purpose of the investigation was to assure that nonconforming material was not installed in an ASME Code stamped system. The initial action was to perform a documentation review to identify material. The review included both primary and secondary suppliers. Then separate tests were developed for carbon steel and stainless steel materials. The testing of carbon steel (SA-105) consisted of measuring the hardness of each accessible piece. The purpose of the hardness testing was to determine by direct conversion to tensile strength if any of the material appeared to have a lower tensile strength than would be expected for SA-105 materials. Because of its availability, ease of use, and general acceptance, the Equotip hardness tester was selected, both for the industry-wide NUMARC/EPRI

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program and for the GPC test program. Initially, each temperature corrected GPC Equotip hardness test value was converted to a Brinell value which, in turn, was compared to the specified hardness value for SA-105 material. The conversion to Brinell values was taken because no direct conversion from hardness to tensile strength was then available for Equotip testing. Apparently as a consequence of the double conversion, rather than direct, from Equotip to tensile strength, the initial hardness data erroneously indicated low strength material with the result that 312 items were reported as nonconforming to specification requirements because NRCB 88-05, Supplement 1, required Justification for Continued Operation (JCO) for "any deviation from the specification." The NUMARC/EPRI Study provided the necessary direct conversion from Equotip to tensile strength which was unavailable during most of the initial evaluation period (when the failures were reported to the NRC). The stainless steel material was tested by a magnet to verify that the material was austenitic stainless steel.

Upon further review, it was evident that the GPC Equotip hardness test results had a bell-shaped distribution similar to the NUMARC/EPRI study. Moreover, these results are also consistent with the AISI Study which performed product tests on material that had already met specification requirements by the official mill test. On this basis, it was demonstrated that the carbon steel meets ASME Code requirements. Therefore, a number of flanges which were initially conservatively reported to the NRC as nonconforming have been re-evaluated as meeting the Code specifications. Additionally, GPC personnel performed magnet tests to assure that the WJM provided stainless steel was austenitic. Chemistry and metallographic tests on WJM supplied stainless steel used on Plant Vogtle Unit 2 show the material to be 304 and 316 as applicable. These tests show that the stainless steel material furnished meets Code requirements. The majority of the material at issue which is installed in GPC nuclear units has been tested, and it has been determined, using the NUMARC/EPRI carbon steel study presented to the NRC on July 29, 1988, as a basis, that none of the carbon steel or stainless steel material tested at Plant Vogtle Unit 1 is discrepant. Therefore, there is basis to conclude that ASME Code requirements have been met.

GPC's response to the subject NRCB is contained as Enclosure 1. Plant Vogtle Unit 2 will be addressed in a separate response prior to initial fuel load. If you have any further questions in this regard, please contact this office.

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Mr. W. G. Hairston, III states he is Senior Vice President of Georgia Power Company and is authorized to execute this oath on behalf of Georgia Power Company, and to the best of his knowledge and belief, the facts set forth in this letter are true.

GEORGIA POWER COMPANY

By: W. G. Hairston, III
W. G. Hairston, III

Sworn to and subscribed before me this 8th day of September, 1988.

Mae H. Battle
Notary Public, Fulton County, Ga.
My Commission Expires Nov. 2, 1991
Notary Public

Enclosure: Plant Vogtle Unit 1 Response to Bulletin 88-05

MJB:ju

c: Georgia Power Company
Mr. P. D. Rice, Vice President and Vogtle Project Director
Mr. G. Bockhold, Jr., General Manager - Plant Vogtle
Mr. J. P. Kane, Manager Vogtle Engineering and Licensing
GO-NORMS

U. S. Nuclear Regulatory Commission, Washington D.C.
Mr. J. B. Hopkins, Licensing Project Manager - Vogtle

U. S. Nuclear Regulatory Commission, Region II
Dr. J. N. Grace, Regional Administrator
Mr. J. F. Rogge, Senior Resident Inspector, Operations - Vogtle

ENCLOSURE 1

PLANT VOGTLE - UNIT 1
 NRC DOCKET 50-424
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PLANT VOGTLE UNIT 1 RESPONSE TO BULLETIN 88-05

The following tabulation quantifies the number of WJM parts at Plant Vogtle Unit 1:

A.	Total number of parts installed per ASME Section III in safety-related systems and in non-safety-related augmented systems using ASME Section III material procurement without stamping.	1172
1.	Number tested/evaluated	1081
2.	Number remaining	91
B.	Total number of applicable parts not installed (i.e., in the warehouse)	108
1.	Number tested/evaluated	108
2.	Number remaining	0
C.	Total number of parts installed since receipt of an Operating License whose use is currently being determined.	11

During the period between the issuance of Supplement 1 and Supplement 2, 312 carbon steel material potential nonconformances were reported under the 48-hour notification requirement imposed by Supplement 1. The material at issue which is installed in Plant Vogtle Unit 1 has been tested, and it has been determined, using the NUMARC/EPRI carbon steel study presented to the NRC on July 29, 1988, as a basis, that none of the carbon steel or stainless steel material tested at Unit 1 is discrepant. Therefore, Code requirements have been met.

ENCLOSURE 1 (continued)

PLANT VOGTLE UNIT 1 RESPONSE TO BULLETIN 88-05

In summary, in-situ testing of NRCB 88-05 material was stopped when approximately 90% complete for Unit 1 due to the Supplement 2 suspension of testing. A documentation review has revealed that PSI and CLM materials have not been procured or installed at Unit 1, but WJM supplied numerous flanges and fittings. The WJM flanges and fitting tested at Unit 1 have been determined to be in conformance with applicable code requirements and procurement specifications. Therefore, NRCB 88-05 Action Requested Items 2.a, 2.b, 2.c, 3.a and 3.b are considered to be answered as "not applicable". Due to the large sample number and acceptable test results obtained on WJM flanges and fittings installed in Unit 1 safety-related systems, there is substantial evidence to conclude that WJM supplied materials used in systems that are not safety-related are suitable for their intended use. GPC believes this conclusion answers NRCB Action Requested Item 4.