12184

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Sheldon J. Wolfe, Chairman
Dr. James H. Carpenter
Dr. Thomas S. Elleman

In the matter of
GEORGIA POWER COMPANY, ET AL.
(Vogtle Electric Generating
Plant, Units 1 and 2)
Docket Nos. 50-424 & 50-425 - OLA-2
ASLBP No. 91-647-OLA-2

August 9, 1991

GANE AMENDMENT TO PETITION FOR LEAVE TO INTERVENE

GANE appreciates the consideration of the Atomic Safety and Licensing Board in scheduling a prehearing conference. GANE also appreciates your granting of standing by accepting our recently established standing. The rules you forwarded have been read and honored in this filing. If there is a need to reestablish our spokesperson's right to represent GANE, an affidavit is attached from our treasurer, Dennis Hoffarth.

GANE supplements its June 14 Petition with the following contentions:

1. The NRC Branch Technical Position EICSB 2 "Diesel-Generator Reliability Qualification Testing" dated 11/24/75, of the Standard Review Plan (Appendix 7-A of NUREG-75/087) established a reliability goal of 0.99 (at a nominal 50% confidence level) for a plant's diesel generator system. GANE contends that Georgia Power's request to delete the 5:100 test failures standard will unacceptably lower the confidence level in the statistical reliability of the diesels at Plant Vogtle to prevent a dangerous station blackout. (The NRC's basis of stating diesel reliability in terms of a statistical confidence level of 50% is used in every calculation of reliability included in this petition to assure consistency with the NRC's basis. Note that at higher statistical confidence levels the reliability would be lower.)

2. Georgia Power's request to delete the 5:100 criteria runs counter to NRC Regulatory Guide 1.108 which sets forth periodic testing provisions "to

provide a basis for taking those corrective actions needed to maintain high inservice reliability of installed diesel generator units." The reliability required in Regulatory Guide 1.108 position C.2.a(9) is to "demonstrate the required reliability by means of any 69 consecutive valid tests (per plant) with no failures." Completing 69 tests without a failure yields a .99 reliability at a confidence level (ß) of 50% and is therefore consistent with the Branch Technical Position shown in Contention 1. This is shown by statistical calculation:

$ß = 1 - (p)^n$

$ß = 1 - .99^{69}$

$ß = .5$ or 50%

(ß = confidence coefficient, p = probability of starting [reliability], n = number of consecutive tests without failures)

Reference: **Handbook of Probability and Statistics with Tables**, 2nd Edition, Burlington/May

After the reliability demonstration, Reg. Guide 1.108 C.2.d presents a logical series of corrective actions to increase the testing frequency should a diesel generator system fall below the .99 reliability basis at a statistical confidence level of 50%.

1) If the number of failures in the last 100 valid tests is one or zero, the test interval should not be more than 31 days (p = .983 or .993 @ ß = 50%).

2) If the number of failures in the last 100 valid tests is two, the test interval should be not more than 14 days (p = .973 @ ß = 50%).

3) If the number of failures in the last 100 valid tests is three, the test interval should be not more than 7 days (p = .963 @ ß = 50%).

4) If the number of failures in the last 100 valid tests is four or more, the test interval should be not more than 3 days (p = .953 @ ß = 50%).

This standard is consistent with the 99% reliability goal at a 50% confidence level of the branch technical position since increasing testing is required when there is more than 1 failure per 100 tests.

GANE contends that Georgia Power's request is very distant from this standard in allowing a 31-day interval for .95 or greater reliability and a 7-day interval for .90 or greater reliability. Further, the reduced sample size undermines the statistical ability to ascertain when the diesel has fallen below the marginal level of reliability (90%), a significant warning flag of declining diesel reliability.

3. Georgia Power's request to delete the 5:100 criteria for establishing diesel generator reliability should not be allowed because it is inconsistent

with the basis and recommendations of Generic Letter 84-15. Enclosure 3 "Example of Diesel Generator Performance Technical Specification" clearly maintains the "failures in the last 100 valid demands" as the basis for the "Reliability Levels Remedial Actions" ("Reliability Program" item 2).

4. Georgia Power's request is inconsistent with the requirements of Regulatory Guide 1.108, regulatory position C.2.d.1-4 which Georgia Power committed to in its FSAR and represents a significant reduction in the level of safety provided. Eliminating the 100 start basis from the surveillance testing schedule effectively reduces the sample size supporting current diesel reliability by a factor of five. Georgia Power presents no reliability calculations in their 50.92 evaluation to show that their proposed test plan meets NRC's requirements of demonstrating 99% reliability per plant or 95% reliability per diesel at a 50% confidence level. GANE contends that Georgia Power's technical specification change request must be denied as it conflicts with the vital safety analysis upon which its operating license is based.

5. Georgia Power's request selectively includes those portions of the Generic Letter it desires and deletes those criteria it does not want. Georgia Power includes no criteria from the GL 84-15 that would declare the diesel inoperable due to excessive failures and low reliability (regardless of how bad the diesel performance may be) such as that of "Table 4.8-2 of Attachment to Enclosure 1" or "Items 2 and 5 in Attachment to Enclosure 3" of the Generic Letter. GANE contends that the methodology Georgia Power intends to use to establish operability of the diesels will not provide adequate indication of declining generator reliability.

6. If the 100 valid tests basis is eliminated and replaced only by a "zero out of 7" and a "one out of 20" valid tests basis then the fundamental diesel reliability assumptions of the NRC's Standard Review Plan are being abandoned (i.e. 0.99 reliability at 50% confidence level) as well as the requirements of 95% reliability per diesel generator stated in Generic Letter 84-15. Thus, with this change the safety assumptions of Georgia Power's and the NRC's accident analysis are no longer supported by the surveillance testing

provisions of the Technical Specifications. Zero failures out of 7 valid tests yields only a:

$$\beta = 1 - (p)^n$$
$$\beta = 1 - (p)^7$$
$$.50 = 1 - (p)^7$$
$$p = (.5)^{1/7} = .906$$

reliability of 90.6% at a 50% confidence level.
(β = confidence coefficient, p = probability of starting [reliability], n = number of consecutive tests without failures)

Allowing one failure in 20 and using the F-distribution tables to calculate the sum of the terms on one end of the binomial expansion establishes only a:

$$p/(1-p) = (m_1/m_2)\ F$$
$$p/(1-p) = (38/4) * 1.171$$
$$p = .917$$

reliability of 91.7% at a 50% confidence level.
(p = probability of starting, S = number of successful tests, n = total number of tests, m_1 = 2S degrees of freedom, m_2 = 2(n-S+1) degrees of freedom, F = F-distribution table value for β=.5)

References: **Handbook of Probability and Statistics with Tables**, 2nd edition, Burlington ... y, **Probability and Statistics in Engineering and Management Science**, ...nes/Montgomery

GANE contends neither 90.6% or 91.7% reliability meet the NRC's reliability goal or would warrant the decreased test frequency per the Generic Letter, rather these probabilities would require accelerated testing that borders on the disqualification limit of 90%. The NRC's intent of requiring a 99% reliability per plant or a 95% reliability per diesel generator as the minimum desired level cannot be assured (even at the fairly low statistical confidence level of 50%) without the 100 tests criteria basis included in Technical Specifications. GANE contends that 0:7 or 1:20 tests is just too few tests to establish the high diesel reliability (95%) with any reasonable statistical confidence.

7. GANE contends that allowing "2 failures in 20" as proposed by Georgia Power for the threshold to initiate corrective actions only establishes a:

$p/(1-p) = (m_1/m_2)\ F$

$p/(1-p) = 36/6 * 1.1006$

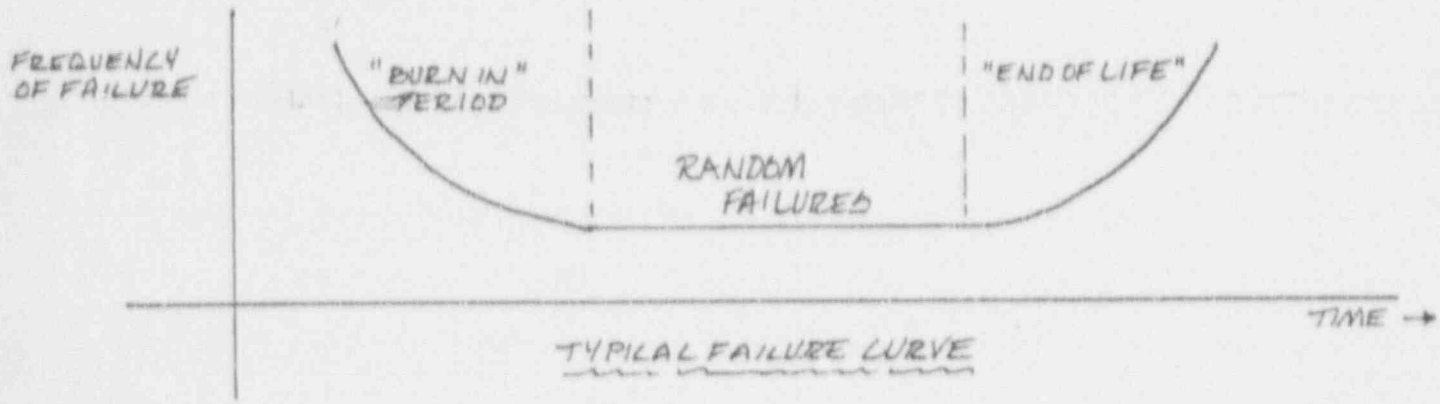
$p = .868$

reliability of 86.8% at a confidence level of 50%.

GANE contends that Georgia Power proposes to change Technical Specifications to allow a diesel that fails to meet NRC criteria for operability (90%) to continue service with only increased surveillance testing. Georgia Power's request represents a significant reduction in the assurance of diesel reliability below that previously required and below that established by the NRC for safe operation and as such must be denied. (Reg. Guide 1.108)

8. GANE contends that while decreasing the testing frequency may in some circumstances be warranted where high reliability has been established and considerations of wear and increased "end of life" failures dominate, such is not the case with the Vogtle diesel generators.

The failure of the Vogtle diesel generator during the Site/Area emergency of 3-20-90 as described in Nureg 1410 (Sections 2.4,3.2,3.3,6.5, Appendices I&J) and the failures experienced by the Vogtle generators both before and after the Site/Area Emergency exhibit a characteristic of the "shake down" or "burn in" period of typical failure curves below:



TYPICAL FAILURE CURVE

In circumstances such as Vogtle's, increasing the test frequency would actually be beneficial to safety to further "shake down" any other hidden, neglected, or otherwise unrecognized problems (like CALCON switches, air start valve clearances and binding, voltage regulator problems) and reduce operator error events (such as inadvertent starting and improper duplex filter operation) by increased operating experience.

9. GANE contends that the true reliability of the Vogtle diesels may not have been accurately evaluated or reported to the NRC as evidenced by several repeat past cited violations including 50-424/87-57 as well as NRC investigations that are still pending (**Augusta Chronicle** 9/17/90). In this light, the significant threat posed by a station blackout and the failure of the Vogtle diesel to perform during the Site/Area Emergency of 3/20/90 (Nureg 1410 [Sections 2.4,3.2,3.3,5.1,5.4,5.5,6.5,6.6,6.7]), approving this change proposed by Georgia Power at this time would be adverse to safety.

10. GANE contends that lack of operator familiarity was shown to be a significant factor in the 3/20/90 Site/Area Emergency and increased, rather than decreased, testing is recommended to offset the hazard posed by human error. Section 5.5.2 of Nureg 1410 discusses the lack of familiarity among the operators with the annunciator load sequencer and diesel pneumatic control systems, Section 5.4.1 of Nureg 1410 cites lack of operator familiarity with the diesels and the disabling effect of the confusing array of instructions, Section 10.3.2 (Nureg 1410) investigates diesel generator lockout following shutdown and finds that the control circuits are complex and not well understood, while 10.4.3 shows that operators have had difficulty diagnosing causes. The diesel is so crucial a factor in preventing station blackout and so complicated, a rigorous testing schedule is warranted. Enclosure 3 of the ACRS Briefing on Status of Staff Followup Actions Resulting from the Investigation of the March 20, 1990 Incident at Vogtle Unit 1 dated 3/25/91 (3-b) reiterates this in its status report of the ongoing evaluation of diesel generator operation saying, "Because of the time between these tests, the operators may not be as alert and prepared to diagnose EDG problems as they might be if EDG operating procedures were used more frequently." Section 3-1 for the ACRS Briefing also notes the importance of operating experience to facilitate diagnosis. The 4/11/91 ACRS Meeting Transcript contains an enlightening discussion of the importance of the EDGs to prevent station blackout but more significantly on p. 61 Mr. Rubin's discussion highlights the infrequency of operator experience with the diesels and points out that testing is sometimes the only experience an operator gains with a diesel generator prior to emergency need. If increased testing cannot be required under the jurisdiction of the 2.714 rules, certainly decreased testing cannot be allowed and Georgia Power's request must be denied.

11. GANE has filed a Freedom of Information Act Request for Licensee Event Reports and Special Reports about the Vogtle Diesel Generators after not finding most of these documents in the Public Document Room and being denied a

request by Georgia Power. We ask that these documents be allowed into the discussion as they become available. For now, we have reviewed an 8/7/90 Special Report on Valid Diesel Failures and a 2/28/91 Licensee Event Report which raise grave concerns as to the current statistical reliability of the generators in service. The 8/7/90 report shows 6 valid failures in the last 79 tests (projects to 7.6 valid failures in 100 tests) or generator 1B and 5 valid failures in 43 valid tests for the 2A generator which projects to 11.6 failures per 100 tests. The later report we have been able to see, 2/28/91, shows the 2A generator record a bit improved at 6 failures per 76 tests for a 7.8 out of 100. Reg. Guide 1.108 requires special evaluation of the generator units if the number of failures in the last 100 valid tests is seven or more and requires the licensee to describe corrective measures to increase the reliability of the generator, provide an assessment of the reliability of electric power and provide the basis for continued plant operation. GANE boldly contends that these diesels may not NOW be qualified for nuclear service until reestablished. If the 2.714 rules don't allow this party relief on that level, we officially contend that this poor record of diesel reliability at the very least warrants the rigor of the original testing criteria of 5:100 and 1:20.

12. GANE contends that the TDI generators are rated for 25,000 hours of service and expected by the industry to operate for 50,000 hours, that this is common knowledge, and that excessive wear of the diesels by testing as frequently as at 3 day intervals is not a legitimate concern and does not provide a rationale for decreased testing of the problematic diesels at Plant Vogtle.

13. GANE contends that Georgia Power has a history of reluctance to face the problems with its diesel generators as well as a history of not availing themselves of INPO information and NRC notices that would help them address chronic and serious problems with their generators. Section 6.2 of Nureg 1410 notes this lack of use of available information. GANE's experience in a previous petition concerning the high jacket water temperature switch bypass which is now pending in appeal before the Commission is that Georgia Power has avoided the issue and spent its energy on attacking the legality of GANE's method of expression rather than the technicalities of why their diesels don't work properly. Section 5a of the 3/25/91 ACRS Briefing implies that testing the diesels offsets Vogtle's lack of use of information notices, etc. and supports our contention that Georgia Power should retain the 5:100 and 1:20 criteria for their Vogtle diesels.

14. GANE contends that EDG reliability is acknowledged by the NRC to play a most significant role in reducing the threat of the serious situation of station blackout (ACRS Transcript of 4/11/91 Meeting) and to relax the testing requirements for the Vogtle Plant which had a Site/Area Emergency on 3/20/90 would send a confusing message to other power plants which should be able to learn from the mistakes at Vogtle. The request should be denied.

15. GANE contends that maintenance of the current testing requirements will help Vogtle operators identify the problems with their diesels. If they are having trouble proving the diesels at the level of reliability required by the NRC perhaps they will have more incentive to take corrective measures, such as finding a way to repair the CALCON switches which have shown chronic failures throughout their operating history, probably due to contamination of the pneumatic logic (Nureg 1410, Appendix I and ACRS Briefing 3/25/91, Section 3). GANE believes this damaged logic should be replaced with a more rugged electronic logic. Perhaps then their diesels would prove reliable.

Respectfully submitted.

glenn carroll

Glenn Carroll
Representative for GANE

Dated and signed in Decatur, Georgia
August 9, 1991