

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

### SEP 2 1 1983

NOTICE OF SIGNIFICANT LICENSEE MEETING

Name of Licensee: Mississippi Power and Light Company

Name of Facility: Grand Gulf Nuclear Station Unit 1

Docket No.: 50-416

Date and Time of Meeting: September 23, 1983, at 10:00 a.m.

Location of Meeting: Region II Office, Atlanta, Georgia

Purpose of Meeting: Management Meeting Requested by the Licensee on Agastat Relay Failures and Other Topics of Current Interest

NRC Attendees: J. P. O'Reilly, Regional Administrator R. C. Lewis, Director, Division of Project and Resident

Programs (DPRP), RII

J. A. Olshinski, Director, Division of Engineering and Operational Programs (DEOP), RII

A. R. Herdt, Branch Chief, DEOP, RII

D. M. Verrelli, Branch Chief, DPRP, RII C. A. Julian, Chief, Project Section 1A, DPRP, RII

A. R. Wagner, Senior Resident Inspector, DPRP, RII

L. J. Watson, Reactor Engineer, Project Section 1A, DPRP, RII Additional members of the NRC staff may attend.

Licensee Attendees: J. P. McGaughy, Vice President-Nuclear C. K. McCoy, Plant Manager Additional MP&L representatives may attend.

NOTE: Attendance by NRC personnel at this NRC/Licensee meeting should be made known by 2:00 p.m., September 22, 1983 via telephone call to L. J. Watson, FTS: 242-4299.

Distribution: Victor Stello, Jr., DEDROGR J. Lieberman, Director, ROED R. DeYoung, Director, IE H. R. Denton, Director, NRR D. Houston, Licensing Project Manager, (Grand Gulf), NRR

Region II Distribution List C Receptionist

8412260142 840625 PDR FOIA BELL84-316 PDR

TO: NICHOLS/PINTO

## GENERAL S ELECTRIC

NUCLEAR POWER SYSTEMS DIMINON GENERAL ELECTRIC COMPANY + 175 CURTINER AVENUE + SAN JOSE, CALIFORNIA 95125 MC 396. (408) 925-2937

September 15, 1983

Mr. J. F. Pinto Manager of Nuclear Plant Engineering Mississippi Power & Light Co. P. O. Box 756 Port Gibson, MS 39150

Middle South Energy, Inc. Grand Gulf Nuclear Station Bechtel Job No. 96456 File No. 0275/M-001.0 AGASTAT RELAY PERFORMANCE INVESTIGATION STATUS MPGE-83/212

Dear John:

As a result of extensive investigations, testing, and failure and reliability analyses conducted subsequent to the preliminary generation of FDDR JB1-1940, GE's C&I Engineering Group has determined that this FDDR should be cancelled. Accordingly, my Site Installation Manager, John Nichols will forthwith cancel and rescind FDDR JB1-1940.

During the week of September 30, 1983, I will issue a report to you which will include our observations, findings, conclusions and recommendations for maintenance and service life considerations. We have concluded that there is no known need to replace the Agastat Relays in Grand Gulf Unit 1 prior to nuclear heatup except for those specific relays that are known to have malfunctioned.

Very truly yours,

.R. Amith A. R. Smith, Manager

Grand Gulf Project

ARS: pes/109F

- cc: M. D. Archeacon T. H. Cloninger L. F. Dale M. G. Farschon J. S. Gills C. K. McCoy J. P. McGauhy J. E. Nichols T. E. Reaves J. B. Richard R. S. Trickovic
  - A. Zaccaria
  - A. Zaccaria File: 16.21

# GENERAL 🍪 ELECTRIC

 NUCLEAR ENERGY

DIVISION

September 3, 1983

Mr. J. F. Pinto Manager, Nuclear Plant Engineering Mississippi Power & Light P. O. Box 756 Port Gibson, Mississippi 39150

> Middle South Energy, Inc. Grand Gulf Nuclear Sta. Bechtel Job No. 9645 File No. 0275/M-001.0 MSGS-83/107 FDDR JB1-1940

Subject: FDDR JB1-1940 - Agastat Relays

Dear John,

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Additional information has come to our attention concerning agastat relays covered by the subject FDDR. This letter rescinds and supersedes our letter MSGS-83/105 transmitting FDDR JB1-1940.

Our engineering department is conducting a thorough failure mode analysis in conjuction with the Vendor. At the conclusion of the analysis we will provide you with the appropriate implementation decisions.

Sincerely,

The E. Neda S

John E. Nichols Resident Site Manager

JEN: gah

- cc: J. C. Roberts
  - F. Valdez
  - C. K. McCoy
  - M. G. Farschon
  - W. Warshawsky
  - A. R. Smith

ATTACHMENT 2

FDDR JB1-1940 Sh. 13 of 13



NUCLEAR POWER

SYSTEMS DIVISION

GENERAL ELECTRIC COMPANY, 175 CURTNER AVE., SAN JOSE, CALIFORNIA 95125 MC 396, (408) 925-2937

April 22, 1983

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Mr. J. F. Pinto Mississippi Power & Light Company Grand Gulf Nuclear Station P.O. Box 756 Jackson, MS 39150

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Middle South Energy, Inc. Grand Gulf Nuclear Station Bechtel Job No. 9645 File No. 0275/M-001.0 INPO SER 68-82 MPGE-83/083

Dear Mr. Pinto:

Reference: GEMP-82/194

Our engineering evaluated the subject report, and provided us with the following response:

The problem associated with Agastat GP Relay was first reported by the Susquehanna site in a Interim Deficiency Report, dated November 17, 1981.

A problem was reported with the relay's normally closed contacts. When the relay is returned to a deenergized state, some of the contacts occasionally fail to close. The cause of the problem is that the nylon arm on the moving contact can rub against the divider between the sets of contacts on the relay base.

Agastat has determined that only pre-August 1977 relays are suspect. Sufficient clearance between the contact arm and divider is provided during the factory alignment of the adjustable moving contact arm. However, the malamine pheonal base may not have ful, 'cured at the time of factory adjustment/test operation. As a result the base may have "shrunk" and caused subsequent interference to the mechanical actuation.

Agastat has changed the mold which is used for fabricating the relay base to provide additional clearances. This modification was made in September of 1977.

NC&ID contacted the vendor in January, 1982 to determine the resolution to the problem reported by the Susquehanna Site. Agastat's stated position regarding pre-August 1977 relays is that if the relays are



J. F. Pinto Page 2 April 22, 1983

presently operating properly, they will not fail to operate due to this problem at some time in the future.

Further engineering evaluation reveals that during Site Startup Operations all Agastat Relays would be tested in both energized and de-energized states. Successful completion of "Pre-Ops" serves as evidence that the Agastat GP Relays are operating correctly and will continue to do so.

The attached table provides list of panels in which we supplied Agastat GP relays (159C4622P001, -P002, -P004, and -P017). The table is given for your information only, and no action is warranted on any of these relays concerning the subject as justified above.

This completes our response to the referenced letter, GEMP-82/194.

Very truly yours,

Miger Dem

★. A. R. Smith, Manager Grand Gulf Project

ARS: ca1/K042212

cc: M. D. Archdeacon T. H. Cloninger M. G. Farschon J. S. Gills C. K. McCoy J. P. McGaughy J. E. Nichols L. F. Dale T. E. Reaves

J. B. Richard R. S. Trickovic A. Zaccaria File 22.14

### LIST OF PANELS WITH AGASTAT GP RELAYS

D17-J034 G36-P002 G41-P001 G46-P002 H13-P612 H13-P613 H13-P619 H13-P632 H13-P801 H13-P810 H13-P845 H13-P849 H13-P871 H13-P872 H13-U711 H13-U712 **H13-U713** H13-U715 H13-U720 H13-U733 H13-U734 H13-U735 H13-U737 H22-P011 N64-P002

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SSINS No.: 6835 IN 82-48

### UNITED STATES NUCLEAR REGULATORY COMMISSION OFFICE OF INSPECTION AND ENFORCEMENT WASHINGTON, D. C. 20555

### December 3, 1982

### IE INFORMATION NOTICE NO. 82-48: FAILURES OF AGASTAT CR 0095 RELAY SOCKETS

### Addressees:

All holders of a nuclear power reactor operating license (OL) or construction permit (CP).

#### Purpose:

This information notice is provided as an early notification of a potentially significant problem pertaining to Agastat CR 0095 Relay Sockets manufactured by Amerace Corporation Control Products Division in Union, New Jersey. Because of the potential safety significance and related generic implications of this problem, addressees are expected to review the information for applicability to their facilities. No specific action or response is required at this time.

#### Description of Circumstances:

Since 1978 several deficiencies on Agastat CR 0095 relay sockets have been ntified:

- I. On December 21, 1978, Northern States Power Company submitted a Licensee Event Report (LER) for the Monticello nuclear facility. While performing a surveillance test during normal operation, a high pressure instrument channel relay failed to energize. A CR 0095 Agastat relay socket contact was disengaged from the socket and not making contact with the mating Agastat relay contact.
- On January 5, 1979, Alabama Power Company submitted an LER for Farley 1 nuclear plant. During a diesel generator operability test, while at 100% power level, a sequencer failed to pick up Step 6 (battery charger). After the Agastat relay socket was replaced, the test was satisfactorily completed.
- 3. On April 6, 1979, Northern States Power Company submitted an LER for the Monticello nuclear facility. During a surveillance test a motor generator field breaker trip relay failed to trip the breaker. A CR 0095 Agastat relay socket contact was disengaged from the socket and not making contact with the mating Agastat relay contact.
- 4. On December 7, 1979, Detroit Edison submitted a 10 CFR 50.55(e) report No. EF 2-50-658 for the Enrico Fermi 2 nuclear facility. In their two primary containment monitoring system cabinets, problems were experienced with

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IN 82-48 December 3, 1982 Page 2 of 3

Agastat relay assemblies. When the relays are plugged into the socket, the terminals are pushed back and this sometimes results in no contact between the relay pin and the socket terminal.

5. On June 11, 1981, Florida Power Corporation submitted an LER for Crystal River 3 nuclear facility. During a monthly functional test of engineered safeguards, the load sequence block 3 trip circuit would not reset following the actuation test. The cause was identified as a loose connection in the Agastat relay mounting block.

Several more LERs since 1978 identified problems of similar nature but did not specifically identify the Agastat relay socket as the problem; however, the type of failure in specific circuits indicates that the Agastat relay socket may be the cause.

During early 1979 the General Electric Company (GE), Nuclear Energy Business Operation (NEBO), tested more than 2200 Agastat CR 0095 relay sockets and found that a significant number of sockets tested exibited contact retention problems and potential electrical connection problems. As a result of this test and subsequent evaluations; GE, NEBO made recommendations to its nuclear customers.

In February 1979 the Amerace Corporation, Control Products Division redesigned and modified the relay base molding by:

- Providing a better guide for the relay male contact into the base (socket) female contact.
- Providing a female contact support behind the female contacts to prevent a push-back.
- 3. Redesigning and modifying the "fast-on" terminal on the relay base.

These modified Agastat relay sockets were available from the Amerace Corporation in the latter part of February 1979 and all Agastat CR 0095 relay sockets shipped during and after March 1979 were of the redesigned and modified type.

Another means of correcting the problem which has been found to be effective is the installation of cardboard insulator strips behind the relay sockets. These strips are available from the Amerace Corporation.

Agastat CR 0095 relay sockets are used in PWRs as well as in BWRs. While most of the nuclear plant owners of BWRs have been made aware of this problem by GE-NEBO not all PWR owners are aware or were informed of this problem and its resolution.

1N 82-48 December 3, 1982 Page 3 of 3

you have any questions regarding this matter please contact the administrator the appropriate NRC Regional Office.

Edward L. Jordan, Director Division of Engineering and Quality Assurance Office of Inspection and Enforcement

Technical Contact: W. Laudan 301-492-9759

Attachment: List of Recently Issued IE Information Notices

Attachment IN 82-48 December 3, 1982

### LIST OF RECENTLY ISSUED IE INFORMATION NOTICES

Notice No.	Subject	Date of Issue	Issued to
82-47	Transporation of Type A Quantities of Non-Fissile Radioactive Material	11/30/82	All NRC licensees
82-46	Defective and Obsolete Com- bination padlocks	11/26/82	All facilities pursuant to 10 CFR Parts 50 and 70 and Part 95 appli- cable facilities
82-45	PWR Low Temperature Over- pressure Protection	11/19/82	All PWR facilities holding an OL or CP
82-44	Clarification of Emergency Plan Exercise Requirements	11/18/82	All power reactor facilities holding an OL or CP
82-43	Deficiencies in LWR Air Filtration/Ventilation Systems	11/16/82	All power reactor facilities holding an OL or CP
•42	Defects Observed in Panasonic Model 801 and Model 802 Thermoluminescent Dosimeters	11/5/82	All NRC licensees
82-41	Failure of Safety/Relief Valves to Open at a BWR	10/22/82	All power reactor facilities holding an OL or CP
80~35 Supp. 1	Leaking and Dislodged Iodine-125 Implant Seeds	10/6/82	Medical licensees holding specific licenses for human use of byproduct material in sealed sources
82-40	Deficiencies in Primary Con- tainment Electrical Penetra- tion Assemblies	09/22/82	All power reactor facilities holding an OL or CP
82-39	Service Degradation of Thick Wall Stainless Steel Recircu- lation System Piping at a BWR Plant	9/21/82	All BWR facilities holding an OL or CP

 $\Omega L = Operating License$ CP = Construction Permit Distribution list, IE Information Notice No. 82-48, dated December 3, 1982

O'Reilly Butcher Martin Crlenjak Long Foster Olshinski Ignatonis Lewis . Heh1 Stohr Hinckley Gibson Landis Herdt Rogge Dance Swan Verrelli Trojanowski Potter Rogers Barr Bemis McGuire Blake(2) McAlpine Wilson Upright (2) Conlon (2) Economos (2) Jape (2) Bryant RII Incident Response Center Brownlee Burger Cantrell Corvell Julian Quick Sinkule Montgomery Jenkins Clark Rausch LEAD RESPONSIBILIT. ETP PRP EPOS J. K. Rausch 242-4184 IE:HQ CONTACT W. Laudan 301/492-4755

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MISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

January 20, 1984

NUCLEAR PRODUCTION DEPARTMENT

U. S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station Unit 1 Docket No. 50-416 License No. NPF-13 File: 0272/L-334.0 Ref: AECM-84/0024 MAEC-83/0327 Additional Information on Agastat Relays AECM-84/0034 //

31 P2:18

This letter will confirm certain actions being taken by MP&L to resolve the full power licensing issue regarding Agastat relays. MP&L transmitted on January 6, 1984 (AECM-84/0024), the GGNS response to the NRC request for additional information on Agastat relays along with the accelerated schedule for the relay replacement. Subsequent discussions were conducted on January 13, 1984, between Mr. Marty Virgillio of the Instrumentation and Control Systems Branch (ICSB) and MP&L to address any remaining clarifications or actions necessary for NRC review.

As a result, MP&L will perform an analysis on the effect of varying the testing intervals for the ECCS (includes RHR, LPCS, LPCI, HPCS and RCIC systems). This analysis is being performed to consider systems containing a significant number of Agastat relays which are tested on an 18 month interval. The ECCS analysis will be conducted in a similar manner to that performed for the RPS analysis discussed in AECM-84/0024. An expanded discussion on the application of common mode failure rate assumptions used in the GGNS analysis will also be provided with the ECCS results as requested by Mr. Virgillio. The results of this analysis will be provided to the NRC by February 17, 1984.

Mr. Virgillio also requested MP&L to clarify its position on the replacement of the new date code (i.e., post-August 1977) Agastat GP series relays used in normally energized, safety related applications. These relays were not replaced due to the improved design modification performed to remove the identified failure mechanism of the contact arm interference with the relay base. Rowever, based on recent test data the GP series relays were initially determined to have a conservatively calculated service life of 4.5 years in the energized application, as reported in AECM-83/0668, dated October 17, 1983. These relays are not expected to reach the end of this service life until approximately mid-1985. MP&L, in coordination with GE and Amerace Corporation (Agastat re ay manufacturer), will continue to evaluate the service life of the GP s. 'es relays in order to either extend their service life or to develop a progr for their replacement prior to reaching the end of their calculated service 84-18 tilties System

Member M

#### MISSISSIPPI POWER & LIGHT COMPANY

Based on the additional information provided in this letter and that provided on January 6, 1984 (AECM-84/0024), MP&L considers this matter to be resolved for GGNS Unit 1 full power licensing.

Yours truly,

Dale

Manager of Nuclear Services

SAB/JGC:rg

cc: Mr. J. B. Richard Mr. R. B. McGehee Mr. T. B. Conner Mr. G. B. Taylor

> Mr. Richard C. DeYoung, Director Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D. C. 20555

Mr. J. P. O'Reilly, Regional Administrator U.S. Nuclear Regulatory Commission Region II 101 Marietta St., N.W., Suite 2900 Atlanta, Georgia 30303

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MISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi 39205 Julien PR P. D. BOX 1640, JACKSON, MISSISSIPPI 39205

January 6, 198410: 34

NUCLEAR PRODUCTION DEPARTMENT

U. S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station Unit 1 Docket No. 50-416 License No. NPF-13 File: 0272/L-334.0 Ref: AECM-83/0668 MAEC-83/0327 Response to NRC Questions on Agastat Relays AECM-84/0024

Please find attached MP&L's response to the NRC's Request for Additional Information regarding Agastat Relays dated October 13, 1983. In addition, MF&L will perform the Agastat relay replacement program during the current outage, as discussed herein and in MP&L's final report to 10 CFR 21 on this matter dated October 17, 1983 (AECM-83/0668).

The attached response shows that the failure rate of Agas at relays experienced at GGNS are within design considerations and that the existing test intervals are considered sufficient to detect relay failures in order to maintain plant reliability goals. Based on these results along with the current relay replacement program, MP&L believes that the relay failure concerns have been resolved for full power licensing on GGNS Unit One.

The figures referenced in this response are considered proprietary to General Electric Company and were transmitted under separate cover by AECM-84/0023, dated January 6, 1984.

Please advise if you require additional information.

Yours truly,

lanager of Nuclear Services

SAB/JGC:rg

Attachment

OFFICIAL COP

cc: See next page

### MISSISSIPPI POWER & LIGHT COMPANY

AECM-84/0024 Page 2

cc: Mr. J. B. Richard (v/a)
 Mr. R. B. McGehee (v/o)
 Mr. T. B. Conner (v/o)
 Mr. G. B. Taylor (v/o)

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Mr. Richard C. DeYoung, Director (w/a) Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D. C. 20555

Mr. J. P. O'Reilly, Regional Administrator (w/a) U.S. Nuclear Regulatory Commission Region II 101 Marietta St., N.W., Suite 2900 Atlanta, Georgia 30303 1

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### RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION ON AGASTAT RELAYS

### I QUESTION: Of the total population of Agastat relays in the plant's safety-related systems provide a breakdown identifying the; (1) systems involved, (2) the number of Agastat relays in each system, and (3) the frequency for testing the relays/systems.

RESPONSE: A listing of the Agastat relays by GGNS system which are safety-related or important to safety is provided in Table 1. A total of forty-four systems containing greater than 1700 Agastat relays have been identified.

> The frequency of testing for specific relays is dependent on the test requirements established by the GGNS Technical Specifications which are patterned after the BWR Standard Technical Specifications. A review of each safety related Agastat relay for surveillance frequency has not been performed, however, due to the extent of technical specification surveillance testing most safety related relays are actuated on at least 18 month intervals.

> The Logic System Functional Tests, which are performed approximately every 18 months, actuate virtually all relays within the logic circuits required by the GGNS Technical Specifications for system operability. The specific logic systems checked during the logic system functional tests are provided in Table 2.

> In addition, System Functional Tests are performed periodically to verify system initiation of containment spray, suppression pool makeup, MSIV leakage control, standby gas treatment and RCIC. The relays required for system initiation and operation on these systems are observed for state change by simulating an initiation signal into the circuit.

> Channel Functional Tests are performed monthly by similarly injecting a simulated initiation signal into a specified trip unit to verify that the trip unit relay changes state as required. Functional tests are performed on selected required trip units as specified by the GGNS Technical Specifications. A list of trip units tested by functional testing is provided in Table 3.

> Of the forty four systems containing Agastat safety related relays, a sampling of eight systems underwent a review to determine the approximate number of relays that are actuated during the monthly functional tests. The relays actuated for the eight systems reviewed are contained in the following table:

System	Total No. of Relays	Approx. No. of Relays Actuated	Percent of Relays Actuated
B21	340	139	41
· C71	124	58	47
E12	112	31	28
E21	32	18	56
E22	38	24	63
E51	59	42	71
M71	120	14	12
<u>P41</u>	_74	_23	31
Total	899	349	39 (ave.)

As noted above the sampling of systems reviewed represents over half the total safety related Agastat population. Even though the monthly functional tests are not intended to test the relays in a circuit, a significant number of relays are actuated by performance of these functional tests.

- II QUESTION: Provide a detailed discussion, with illustrations from applicable elementary diagrams, on the at-power testing capability provided in the Grand Gulf design for those Agastat relays/systems currently tested only during plant shutdowns.
  - RESPONSE: A review of the NSSS elementary diagrams was conducted to determine the test capability at full power operation of the systems containing Agastat relays. The testability of a-relay considered the effects upon system or plant operation to assure that the relay testing does not place the station in an unsafe condition. The following criteria were applied to the NSSS system relays to classify them as testable during plant operation:
    - Actuating the relay coil while in the circuit by proper manipulations of a pump, motor, fan, valve, switch, or system initiation was considered permissible as long as undesired actions do not occur (i.e., depressurization, over pressurization, injection into the vessel, mode change, reduction in power, and partial inhibition of the system's function).
    - Actuating the relay by tripping the trip unit in calibrate mode was considered an acceptable practice.
    - Verifying that the contacts have changed state by indication, annunciation, or by voltage/continuity checks.

Additional special tests and administrative procedures would have to be developed in order to conduct testing beyond that already being conducted during the surveillance tests. Of the relays analyzed in the NSSS system, approximately 73% could be tested under the above criteria. Testing of these relays will not prevent the required number of safety systems from operating in accordance with the FSAR, but in some cases the accommodations made for testability may place a redundant loop out of operation for a greater period of time and at more frequent intervals than already required for the present testing.

The remaining 27% of the NSSS relays were considered to only be testable during full power operation by initiating systems, relay removal and other certain normally non-desirable actions (i.e., closing/opening a valve or tripping a pump).

- III QUESTION: Provide a discussion on the test intervals selected for the systems that include Agastat relays which demonstrates consideration of the following factors:
  - (1) system availability,
  - (2) manufacturers recommendations,
  - (3) historical experience with the use of similar equipment,
  - (4) failure rate data,
  - (5) results of preoperational testing,
  - (6) quality information, and
  - (7) regulatory requirements.

This discussion should address the single failure assumptions of the FSAR transient and accident analyses.

RESPONSE: <u>Selected Test Intervals</u> -- The test intervals for system testing at GGNS were established based on previous generic system design and availability considerations that evolved into the testing intervals contained in the standard BWR Technical Specifications. The test intervals contained in these Technical Specifications, as developed by the NRC, provided adequate testing frequency for all BWRs given typical system availability and component failure rates. Channel Functional Tests (monthly) and Logic System Functional Tests (every 18 months) have provided adequate assurance of system availability and failure detection to assure system function on demand.

> The GGNS design is in compliance to IEEE 338-1971 which does not specifically address the review of each of these factors for test interval determination, but is based on the design of the protective systems such that periodic testing can be performed. Once test intervals have been established, verification of the test interval can later be performed using plant operational data. Section 5.2 of IEEE 338-1971 states that:

"Information derived from operational data and test results (especially failure rates, MTTR, and test duration) shall be used to verify or correct the initial interval selections. During the life of the equipment, the test interval may be increased or decreased consistent with maintaining the reliability goals of the subsystem."

Attachment to AECM-84/0024

As will be further discussed in this response, the Agastat relay failures experienced at GGNS are within expected reliability goals and also the existing surveillance test intervals are considered sufficient to detect relay failures in order to maintain these goals.

Design Vs. Experienced Failure Rates -- The failure rate  $(\lambda)$  for the relays as stated on the GE purchase part drawings is  $1 \times 10^{-6}$ failures per hour, or a mean time between failures (MTBF) of one million operating hours. This failure rate is also stated in vendor literature. The GGNS specified failure rate for these relays is supported by the control relay failure rate represented in IEEE 500 (1977). The IEEE 500 high and low expected failure rates for control relays are 2.7 x 10 and 0.06 x 10 failures/hour, respectively, and the GGNS specified failure rate of 1 x 10 failures/hour is within the values established by this standard.

An exponential distribution model;  $R(t) = e^{-\lambda t}$  (Eq. 2; IEEE 352 (1975) for calculating reliability (R) can be used to determine the probability of failure for the relays. Assuming that the failures occurred at a random failure rate within their design life and given a GGNS failure rate of 10<sup>-6</sup> failures/hour, the expected failures for the GGNS Agastat relay population over various time periods are provided below:

Time Yr	(t) (hours)	Reliability (R)	Exp. Fail. Frobability (1 - R)	Expected Failures/1000 Population	Expected Failures/ 1700 GGNS Pop.
. 25	(2,190)	.9978124	0.0021876	2.1876	3.719
.50	(4,380)	.9956296	0.0043704	4.3704	7.430
.75	(6,570)	.9934515	0.0065485	6.5485	11,132
1.00	(8,760)	.9912783	0.0087217	8,7217	14.827
1.25	(10,930)	.9891097	0.0108903	10,8903	18.513
1.50	(13,140)	.9869460	0.0130540	13.0540	22.192

The relay failures identified during the 18 month surveillance test period were within the 22 failures expected from the reliability calculations and the test intervals presently used at GGNS were sufficient to detect relay failures within the expected failure rate.

> Review of BWR Risk Assessments -- The BWR-6 standard plant (solid state design) and Limerick Station (BWR-4 with relays) risk assessments were reviewed in combination to verify that the failure rate experienced at GGNS is within the failure rate covered by these analyses. The assumptions used in these studies have a failure rate consistent with  $1 \ge 10^{-6}$ /hour specified for GGNS. Even though these risk assessments do not directly model GGNS, the system similarities and failure rates provide a reasonable assurance that similar risk reduction will be maintained.

The results of these studies show that the core damage frequency and public risk associated with those plants are one to two orders of magnitude less than values specified in the NRC safety guidelines. Therefore, these studies support the failures experienced at GGNS to be fully acceptable within given assumptions used for previous risk assessments.

Review of Test Intervals -- In order to confirm the existing GGNS test intervals, an analysis consistent with IEEE 352 guidelines has been performed for Grand Gulf on the Reactor Protection System (RPS). Calculations were performed using standard reliability and fault tree analysis and then confirmed using the WAM code (User Manual for Engineering Computer Programs, WAM-BM-01, NEDE-25359, November 1980). The RPS was selected for review since RPS relays are normally closed (energized) and open on demand and the RPS would be the most sensitive to relay failures.

The RPS study closely followed the format of the RPS availability calculations in the BWR-6 risk assessment. Logic design features specific to GGNS were added and failure rates applicable to GGNS components were included. For this analysis a common mode failure rate for all Agastat relays was assumed, and all test intervals were made consistent with GGNS requirements. The RPS, however, has a high degree of testing at monthly intervals, as required by the Technical Specifications, and may not represent the testing of other systems. The results, as provided in Figure 1, show how the RPS failure frequency (unavailability) is impacted by the test interval.

While the RPS unavailability is affected by the test interval, Figures 2, 3 and 4 show that the scram failure frequency, the core damage frequency and public risk are insignificantly affected by changes in the test intervals and will be consistent with longer (i.e., 18 month) test intervals.

Based on knowledge from the Limerick and BWR-6 Standard Plant PRA work completed, it is expected that the less frequent ECCS test intervals would not have a significant impact on plant safety as measured by changes in core damage frequency and public risk.

Single Failure Criteria -- It is MP&L's position that the single failure assumptions used in the GGNS design should not be directly related to the establishment of test intervals.

The single failure criterion is primarily a design requirement which requires that the plant be capable of achieving (1) emergency reactivity control, (2) emergency core and containment heat removal, and (3) containment isolation, integrity, and cleanup given an initiating event plus an independent single failure in any one of the systems required to support directly or indirectly these three nuclear safety functions (i.e., only one single failure needs to be assumed in the plant nuclear safety-related equipment for any initiating event).

In contrast, test intervals and component failure rates are primarily considerations in the assessment of system reliability. The shorter the interval, the more likely it will be that a failure is found before a demand is placed on the component or system. The failed item can then be replaced or repaired and the component or system restored to its original condition. As shown in our previous discussion the present surveillance test intervals are adequate to recognize relay failures.

### AGASTAT RELAY REPLACEMENT PROGRAM

MP6L committed to a replacement program of all GGNS Unit 1 safety related normally energized older design GP series relays (date code prior to August, 1977) during the spring of 1984. This replacement program is discussed in the MP6L final report for PRD-83/12, "Failure of Agastat GP Series Relays to Switch" transmitted by AECM-83/0668, dated October 17, 1983. However, due to the availability of replacement relays and the current Unit 1 outage, MP6L will replace these relays prior to starting up from this outage.

The retest program for the Agastat relays is being developed in accordance with plant procedures and programs. Each replacement relay will be bench tested prior to installation to ensure proper electromechanical operation of the relays (coil and all contacts), proper coil voltage, and correct time response (when applicable). Although the bench testing and installation controls provide a high level of confidence, additional in-place testing will be done to ensure the relay/base interface is not affected during the changeout. Continuity checks, valve strokes, and miscellaneous functional tests will verify the integrity of the affected circuits. The special tests will be reviewed by the Plant Safety Review Committee as required. The plant surveillance tests will also provide redundant verification of system operability when performed.

The remaining normally de-energized pre-August, 1977 Agastat GP Series relays for Unit 1 are not subject to the accelerated aging, but will be replaced in the future based on relay, system and plant availability due to their design characteristics.

Acceptability of Later GP Agastat Relays -- Only the pre-August, 1977 GP relays are being replaced since we have not experienced similar failures and have no evidence of an accelerated failure rate by the newer GP series relay design and considering their exhibited reliability in present use at GGNS.

As has been reported and discussed previously with the NRC, the failures experienced during GGNS 18 month surveillance test period were in the older date code GP series relays. These relays have exhibited failures due to the movable contact arm interfering with a rib on the melamine phenol relay base. The

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newer GP series relays have been modified to prevent the movable arm and the phenol base interference. Even though not all of the GGNS relay failures exhibited this failure mode, at yeast two did and another six failed in a similar manner but could not be specifically attributed to this type of failure when later observed.

During subsequent GE testing, 14 pre-August, 1977 relays and 2 post-August, 1977 relays were subjected to ambient temperatures of 130°F for six days. Four failures occurred during testing or in the post test analysis, which all were in the pre-August, 1977 relays. These relays exhibited the same failure mode which was the contact arm interfering with the relay base rib.

GE analysis of the pre-August, 1977 GP relays has determined that service aging of the normally energized relays in a mild environment in combination with the mechanical configuration and tolerances of their internal parts were the primary cause of failure. The service life of the continuously energized Agastat GP series relays has been initially and conservatively calculated to be approximately 4.5 years. It is MP&L's understanding that this 4.5 year service life is based on the nylon relay coil bobbin. The Amerace Corporation, manufacturer of Agastat relays, is reported to be in the process of evaluating later series relays to substantiate an extended service life in the continuously energized state. The August, 1977 and later GP series Agastats which are presently being used at GGNS have shown to be very reliable and are not subject to the type of failure experienced at GGNS.

#### CONCLUSION

The recent Agastat failure rate experienced at GGNS has been shown to be acceptable based on the expected failure rates provided in IEEE 500 and that specified by the NSSS supplier. Generic BWR risk assessments have also been shown to support the acceptability of the GGNS experienced failures. Initial reviews of the surveillance test intervals have generally shown that even though system unavailability increases with increased failure rates, the scram failure rates, core damage frequency, and public risk are relatively unaffected and the existing surveillance test intervals are acceptable. Even though the experienced failure rate can be considered as random failures, specific failures can be accredited to the pre-August, 1977 GP series relay design.

New prst-August, 1977 Agastat relays are being installed to replace the normally energized Agastat GP series relays that have a date code of pre-August, 1977 with completion scheduled for prior to startup from the current outage. The newer Agastat GP relays, which have been modified to remove the relay base/contact arm interference material from the barrier strip have experienced a high reliability and are not believed by MP&L to warrant replacement at this time. MP&L concluded that the Agastat relay failure rate experienced at GGNS is within the specified requirements and that the surveillance test intervals are adequate to recognize relay failures. MP&L believes that the proposed relay replacement program will resolve the concerns with the reliability of the Agastat relays.

### TABLE 1

### GGNS SYSTEMS AND QUANTITY OF SAFETY RELATED AGASTAT RELAYS

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GGNS	GGNS GGNS			
SISIEM	QUANTITI	SISTER	QUANITIT	
B21	340	P41	74	
B33	14	P42	15	
C11 .	14	P44	23	
C41	5	P45	18	
C71	124	P52	10	
C88	2	P53	8	
E12	112	P60	8	
E21	32	P64	12	
E22	38	P66	4	
E30	34	P71	22	
E31	52	P75	24	
E32	25	P81	10	
E38	6	R20	116	
E51	59	F21	37	
E61	64	T41	2	
G33	4	T42	6	
G36	4	T48	88	
G41	10	X77 -	3	
G46	2	¥47	3	
M41	18	Z51	67	
M71	120	277	16	
P11	20	Non System Specific	64 -	
P21	4	(local panels)		

TOTAL 1733

#### TABLE 2

### SYSTEMS TESTED DURING LOGIC SYSTEM FUNCTIONAL TESTING

- <u>Reactor Protection System</u> Tested from sensor to verification of control rod insertion.
- <u>Containment Drywell and Auxiliary Building Isolation System</u> including the primary containment, secondary containment, main steam line (MSIV's), reactor water cleanup, reactor core isolation cooling, and the residual heat removal.

- Tested from sensor to verification of automatic closure of isolation valves.

- ECCS Actuation System Tested from sensor to starting of ECCS pumps and standby diesel generators, opening of valves and opening of ADS SRV's.
- Anticipated Transient Without Scram (ATWS-RPT) Tested from sensor to opening of recirculation pump breakers.
- End-of-Cycle Recirc Pump Trip (EOC-RPT) Tested from sensor to opening of recirculation pump breakers.
- <u>RCIC Initiation</u> Tested from sensor to starting of RCIC turbine and repositioning of valves.
- <u>RHR Containment Spray</u> Tested from sensor to RHR pump start and valve realignment.
- Main Turbine/RFPT LL8 Trip Tested from sensor to the tripping of the main turbine and feed pump turbines.
- 9. SRV Relief & Low-Low Set Logic Tested from sensor to opening SRV's.
- Note: A detailed list of the specific circuits tested within each of the above logic systems has not been included due to the extent of the list.

#### TABLE 3

### GGNS SYSTEM TRIP UNITS VERIFIED BY MONTHLY FUNCTIONAL TESTING

 Reactor Protection System for: IRM, APRM, Reactor High Pressure, Reactor Low Level, Reactor High Level, MSIV Closure, MSL High Radiation, Drywell Pressure High, Scram Discharge Volume High Level, Turbine Stop Valve Closure, Turbine Control Valve Fast Closure, Manual Scram.

#### 2. Isolation Actuation Instrumentation for:

a) Primary Containment Isolation

Reactor Low, Low Level, High Drywell Pressure, Containment and Drywell Ventilation Exhaust High Radiation

b) Main Stear Line Isolation

Reactor Low, Low, Low Level, Main Steam Line High Radiation, Main Steam Line High Flow, Condenser Vacuum Low, Main Steam Line Tunnel High Temperature, Main Steam Line Tunnel High dT

c) Secondary Containment Isolation

Reactor Low, Low Level, Drywell Pressure High, Fuel Handling Area Ventilation Exhaust High Radiation, Fuel Handling Area Pool Sweep Ethaust High Radiation.

d) Reactor Water Cleanup Isolation

High Differential Flow, Differential Flow Timer, Equipment Area High Temperature, Equipment Area High dT, Reactor Low, Low Level, MSL Tunnel High Ambient Temperature, MSL Tunnel High dT.

f) RCIC Isolation

RCIC Steam Line High Flow, RCIC Steam Supply Low Pressure, RCIC Turbine Exhaust Diaphram High Pressure, RCIC Equipment Room High Temperature, RCIC Equipment Room High dT, MSL Tunnel High Temperature, MSL Tunnel High dT, MSL Tunnel Temperature Timer, RHR Equipment Room High Temperature, RHR Equipment Room High dT, RHR/RCIC High Steam Line. Flow.

g) RHR System Isolation

RHR Equipment Room High Temp, RHR Equipment Room High dT, Reactor Low Level, Reactor High Pressure, Drywell High Pressure

3. ECCS

a) LPCS, RHR A, B and C (LPC1 Mode)

Reactor Low, Low, Low Level, Drywell High Pressure, LPCI Pump A/B Start Time Delay Relay

b) ADS A and B

Reactor Low, Low, Low Level, Drywell High Pressure, ADS Timer, Reactor Low Level, LPCS/LPCI A, B, C Discharge High Pressure

c) HPCS

Reactor Low, Low Level, Drywell High Pressure, Reactor High Level, CST Low Level, Suppression Pool High Water Level

4. ATWS - Recirc Pump Trips

Reactor Low, Low Level, Reactor High Pressure

5. End-of-Cycle-Recirc Pump Trips

Turbine Stop Valve Closure, Turbine Control Valve Fast Closure

- 6. RCIC System System Actuation Instrumentation for Reactor Low, Low Level, Reactor High Level, CST Low Level, Suppression Pool High Water Level
- 7. Containment Spray for Drywell High Pressure, Containment High Pressure, Reactor Low, Low, Low Level, Containment Spray Timers
- 8. Feedwater/Main Turbine Trip for Reactor High Level
- 9. Lo Lo Set/Pressure Relief Valves for Reactor High Pressure

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### FIGURE 1

### RPS (ELECTRICAL) FAILURE FREQUENCY AS A FUNCTION OF SURVEILLANCE TEST INTERVAL

Transmitted by AECM-84/0023 dated January 6, 1984.

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PROPRIETARY

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### FIGURE 2

### SCRAM FAILURE FREQUENCY AS A FUNCTION OF SURVEILLANCE TEST INTERVAL

Transmitted by AECM-84/0023 dated January 6, 1984. PROPRIETARY

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### FIGURE 3

CORE DAMAGE FREQUENCY AS A FUNCTION OF SURVEILLANCE TEST INTERVAL

> Transmitted by AECM-84/0023 dated January 6, 1984.

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PROPRIETARY

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### FIGURE 4

PUBLIC RISK AS A FUNCTION OF SURVEILLANCE TEST INTERVAL

Transmitted by AECM-84/0023 dated January 6, 1984.

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MISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi P. O. BOX 1640. JACKSON. MISSISSIPPI 39205 84 JAN 16 123 4984

NUCLEAR PRODUCTION DEPARTMENT

U. S. Nuclear Regulatory Commission Region II 101 Marietta St., N.W., Suite 2900 Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station Unit 1 Docket No. 50-416 License No. NPF-13 File 0260/L-835.0 Update Report - M4-R4 Contacts in Agastat Relay 95X for MOV 1E22-F010 Found Failed in Open State LER 83-121/03 X-2 AECM-84/0004

This letter submits an update to previous reports submitted on September 16 and November 10, 1983. The event for which the reports were submitted occurred on August 17, 1983 during a surveillance when the M4-R4 contacts in Agastat Relay 95X for MOV 122-F010 were found failed in the open state. The contacts must close to remove the overload protection from the valve circuit as required by Technical Specification 3.8.4.2. The event was reported pursuant to Technical Specification 6.9.1.13.b.

Our investigation into the cause of the relay failure is complete. Replacement of safety-related, normally energized, pre-August 1977 Agastat CP series relays is expected to be completed prior to the next Startup. Attached is LER 83-121/03 X-2 which is a final report. AECM-84/0024, dated January 6, 1984, provides additional information on the Agastat GP series relays and the replacement program.

Yours truly,

SHHelk

L. F. Dale Manager of Nuclear Services

EBS/SHH:sad Attachment

cc: (See Next Page)

77 LIGH. .. N. .. I K.FQ. EQUARE OF DRMATIO 110 - 00 00 0 - 00 0 1 0 CONT 0 1 THON AND PROBABLE CONSEQUENCES (10) during a surveillance, the M4-R4 contacts in Agastati din August 17. 1983, [0]] [Relay 95% for MOV 1E22-F010 were found failed in the open state. The 0 4 contacts must close to remove the overload protection from the valve [1] circuit as required by T.S.3.8.4.2. The affected system was inoperable 0 1 for other reasons. This is reported pursuant to T.S.6.9.1.13.b and was [0 7] Ireported in PRD 83/12 under 10 CFR 21. This is a final report. 08 SYSTEA CODE 0 9 RE EVISION (1) 0 PONEL ANUFACTURE 0 0 0 0 110 PTION AND CORRECTIVE ACTIONS (7) [1]0] [The relay failure was due to mech. interface of a nylon movable contact [1] [arm & the barrier strip on the melamine phenol relay base. The failures [1] [are applicable to Agastat GP series relays manufactured prior to 8/77. [1]] [Replacement of safety-related, normally energized pre 8/77 Agastat IGP series relays is expected to be completed prior to the next Startup. OTHER STATUS POINT A DIRCOVERY DESCRIPTION (82) Surveillance Testing AMOUNT OF ACTIVITY 35 LOCATION OF MELEASE 80 DESCRIPTION (30) TION (41 OUTY (4) 9 KIT NAC USE ONLY PTION C Ron Byrd NAME OF PREPARER. PHONE -



MISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

A9:42

November 10, 1983

NUCLEAR PRODUCTION DEPARTMENT

U. S. Nuclear Regulatory Commission Region II 101 Marietta St., N.W., Suite 2900 Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station Unit 1 Docket No. 50-416 License No. NPF-13 File 0260/1-835.0 Update Report - M4-R4 Contacts in Agastat Relay 95% for MOV 1E22-F010 Found Failed in Open State LER 83-121/03 X-1 AECM-83/0707

This letter submits an update to a previous report submitted on September 16, 1983. The event for which the report was submitted occurred on August 17, 1983, during a surveillance, when the M4-R4 contacts in Agastat Relay 95X for MOV 1E22-F010 were found failed in the open state. The contacts must close to remove the overlead protection from the valve circuit as required by Technical Specification 3.8.4.2. The event was reported pursuant to Technical Specification 6.9.1,13.b.

The cause of this and other similar failures are under investigation by General Electric and Amerace (Agastat relay supplier). Mississippi Power & Light's (MP&L) proposed corrective actions were communicated at a meeting with the the Nuclear Regulatory Commission (NRC) on September 23, 1983, in Atlanta, Georgia and by PRD-83/12 (AECM-83/0668, dated October 17, 1983) in accordance with 10CFR 21. Any further response to this subject will be addressed separate from this LER in response to the NRC's Division of Licensing request for additional information dated October 13, 1983, pertaining to Agastat Relays. Attached is LER 83-121/03 X-1, which is a final report.

Yours truly, Dale

Manager of Nuclear Services

EBS/SHH:sap Attachment

cc: (See Next Page)

Member Middle South Utilities System

### MISSISSIPPI POWER & LIGHT COMPANY

AECM-83/0707 Page 2

cc: Mr. J. B. Richard (w/a)
Mr. R. B. McGehee (w/o)
Mr. T. B. Conner (w/o)
Mr. G. B. Taylor (w/o)

Mr. Richard C. DeYoung, Director (w/a) Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D. C. 20555

Document Control Desk (w/a) U. S. Nuclear Regulatory Commission Washington, D. C. 20555
U. S. NUCLEAR REGULATORY COMMISSION NRC FORM THE Update Report - Previous Report Date 9/16/83 12 771 LICENSEE EVENT REPORT Attachment to AECM-83/0707 Page 1 of 1 PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION 10 CONTROL BLOCK ष नै 🕤 (5) 4 00 0 100 GL 0 9 0 1 G CONT 0 11 671 0 8 1 7 B 3 (8) L ( ) 0 REPORT 00 4 90 0 1 REPORT DATE SOURCE EVENT DATE DOCK IT NU EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (N a surveillance, the M4-R4 contacts in Agastat 1983. during 0 21 00 17. AUQUEL 10 3 | Relay 95% for MOV 1E22-F010 were found failed in the open state. The [contacts must close to remove the overload protection from the valve 0 4 [circuit as required by T.S.3.8.4.2. The affected system was inoperable 0 5 [0 6] for other reasons. There was no effect on the health and safety of the 0 7 public nor was there a threat to plant safety. This is reported pursuant to T.S.6.9.1.13.b. This is a final report. 0 8 80 COMP SUBCODE CALE SYSTEM CODE COMONER" CODE SUBCODE 2003 1 C 1 (15 Z | (16) RE A X Z (13) (12) X 0 9 REVISION OCCURRENCE REPOR SPELENTLA CODE TYPE NO NOW T NO LER AO 1 X 121 0 REPORT 22 NUMBER COMPONEN NPRD-4 PRIME COMP HOURS (22 CTION ACTIO SUPPLIER MANUFACTURER TARE FORM SUE MC THCE OR PL N 24 A 1 110 A1(75) 00 0 (23 Z A (31) ×](15) 33 CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27) failed relay was replaced. The cause of this and other similar 10 The 1] [failures are under investigation by General Electric and Amerace 1 [2] [(Agastat Relay Supplier). MP&L's proposed corrective actions were communicated at a meeting with the NRC on 9/23/83 in Atlanta, GA. and 131 by PRD 83/12 (AECM-83/0668 dated 10/17/83) in accordance with 10CFR 21. 4 . NE THOD OF (30) DISCOVERY DESCRIPTION (32) FACILITY STATUS OTHER STATUS S POWER Surveillance Testing 8 (31) 0 0 (29) 6 (28) 01 5 80 10 CONTENT ACTIVITY LOCATION OF MELEADE (36) MOUNT OF ACTIVITY (36) RELEASED OF RELEASE 2 (34) NA 1 (33) E BC. 10 11 PERSONNEL EXPOSURES DESCRIPTION (38) TYPE NUMBER 2 38 NA 0 0 Ő. 12 FRSON DESCRIPTION (41) Kaox Ni 0 0 0 1 14 8 11 12 LOSS OF OR DAMAGE TO FACILITY (43) DESCRIPTION 2 (42) 9 8 10 NAC USE ONLY PUBLICITY DESCRIPTION (45 N (as) NA 2 0 80 68 64

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Pennsylvania Power & Light Company

Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

Norman W. Curtis Vice President-Engineering & Construction-Nuclear 215/770-7501

March 2, 1983

Mr. R. C. Haynes Director, Region I U. S. Nuclear Regulatory Commission 631 Park Avenue King of Frussia, PA 19406

SUSQUEHANNA STEA	M ELECTRIC STATION	.83
UPDATE TO FINAL	REPORT OF A DEFICIENCY	S
TWOLVING DEFECT	S IN AGASTAT GP SERIES	P
RELAYS	8 FILE 821-10	23
pra-1534		P
E 184 - 1004	and a second s	~
Poference: PLA-	984 dated December 23, 1981	••
PLA-	1022 dated March 9, 1982	<u>د</u>

Dear Mr. Haynes:

This latter serves to provide the Commission with an update to the corrective action contained in PLA-1022 dated March 9, 1982. The revised corrective action should state: All safety related Agastat GP series relays, except those in the Diesel Generator Fanels, have been replaced with new Qualified Agastat GP Relays (Agastat EGP Relays). The work for SSES Unit I and Common was coordinated via PFeL NCR 81-255 and 81-364 and WA-U21067 and is now complete. SSES Unit II safety related Agastat GP Relays will also be replaced with EGP Relays. Unit II work will be documented on Design Change Package DCP #20041 Rev. 1.

Very truly yours,

WLE: sab

N. W. Curtis Vice President-Engineering & Construction-Nuclear

830516022

CDR 81-00-32



# Pennsylvania Power & Light Company

Two North Ninth Street + Allentown, PA 18101 + 215 / 770-5151

March 9, 1982

Norman W. Curlis Vice President-Engineering & Construction-Nuclear 2157 770-5381

Mr. R. C. Haynes Director, Region I U. S. Nuclear Regulatory Commission 631 Park Avenue King of Prussia, PA 19406

SUSQUEHANNA STEAM ELECTRIC STATION FINAL REPORT OF A DEFICIENCY INVOLVING DEFECTS IN AGASTAT GP SERIES RELAYS SRs 100450/100508 FILE 821-10 FLA-1022

Reference: PLA-984 dated December 23, 1981

Dear Mr. Haynes:

This letter serves to provide the Commission with a final report on a deficiency involving defects in Agastat GP Series auxiliary control relays.

The deficiency was originally reported by telephone to Mr. E. C. NcCabe of NEC Region I by Mr. A. R. Sabol of PP&L on November 24, 1981 and was considered to be potentially reportable. The referenced letter provided the Commission with an interim report on the subject deficiency.

The attachment to this letter contains a description of the deficiency, its cause, an analysis of safety implications and the corrective action taken and planned. This information is furnished pursuant to the provisions of 10 CFR 50.55(e).

Since the details of this report provide information relevant to the reporting requirements of 10 CFR 21, this correspondence is considered to also discharge any formal responsibility PPSL may have in compliance thereto.

We trust the Commission will find this report to be satisfactory.

Very truly yours,

WW Curtos

0. W. Curtis Vice President-Engineering & Construction-Nuclear

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## ATTACHMENT TO PLA-1022

SSES PLA-1022 ERs 100450/100508 File 821-10 Page 1 of 1

#### FINAL REPORT

Subject:

Agastat GP series auxiliary control relays

# Description:

The Agastat GP relay is a general purpose, auxiliary control relay, used as a contact multiplier. This relay is used in various safety-related circuits at Basquehanna SES. A problem has been identified with the contacts of the relay.

When the relay is operated, the contacts occasionally fail to transfer (the normally open contacts fail to close when the relay is energized, or the normally closed contacts fail to close when the relay is de-energized). The GP relay has four single pole, double throw contacts; normally one or two sets of contacts fail to transfer.

## Cause:

Defective relays were sent to Agastat Corporation, Grafton facility, for analysis. It was determined that the relay bases were improperly manufactured. This resulted in insufficient clearance between the contact arm and the divider in the relay base between the sets of stationary contacts.

Agastat has modified the design of the relay base on newer model relays. With the old design, the contact divider was a uniform height across the entire relay base. The new relay has a stepped contact divider, which provides sufficient clearance between the contact arm and the divider. The new relay bases were manufactured after August, 1977.

# Analysis of Safety Implications:

The Agastat GP relays are used in the start and run circuits for the Emergency Diesel Generators. The failure of these relays to properly operate could adversely sffect the safe operation of the plant by preventing the diesel generators from atorting and performing their safety functions. These relays are used in other rafety-related circuits where contact failures would also prevent or degrade safety system functions. Therefore, PPSL has determined that this condition is reportable under the provisions of 10 CPR 50.55(e).

#### Corrective Action:

Il Agastat GP series relays used in safety related applications except those avoing the stepped contact divider, will be returned to the Agastat Corporation or rework. Agastat will replace improperly manufactured relay bases with new, otherly manufactured bases.

A scope of work will be coordinated through PPSL NCR's 81-255 and 81-364 and A Authorization WA-U21067. Bechtel will be requested to coordinate their scope

MISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

JAMES P. MCGAUGHY, JR

October 17, 1983

21 610:30

Concon

U. S. Nuclear Regulatory Commission Region II 101 Marietta Street, N.W. Suite 2900 Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station Unit 1 License No. NPF-13 Docket No. 50-416 File 0260/15525/15526/16694.4 PRD-83/12, Final Report for Unit 1, Interim Report for Unit 2, Failure of Agastat GP Series Relays to Switch AECM-83/0668

References: (1) AECM-83/0551 (2) AECM-83/0610

On September 2, 1983, Mississippi Power & Light Company notified M. D. Verrelli, of your office, of a Reportable Deficiency at the Grand Gulf Nuclear Station (GGNS). The deficiency concerns the failure of Agastat GP series relays to change state when called upon to operate.

MP&L has evaluated this deficiency and determined that it could potentially create a substantial safety hazard under the guidelines of 10CFR21 for Unit 1. It is indeterminate at this time as to whether this deficiency is applicable to Unit 2.

Yours truly,

RDC:dr

Attachment

See Page 2 for Distribution

Mr. J. P. O'Reilly NRC AECM-83/0668 Page 2 of 2

cc: Mr. J. B. Richard Mr. R. B. McGehee Mr. T. B. Conner

> Mr. Richard C. DeYoung, Director Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D.C. 20555

Mr. G. B. Taylor South Miss. Electric Power Association P. O. Box 1589 Hattie burg, MS 39401

Attachment to AECM-83/0668 Page 1 of 3

# FINAL REPORT FOR UNIT 1; INTERIM REPORT FOR UNIT 2 FOR PRD-83/12

1. Name and address of the individual ... informing the commission:

J. P. McGaughy, Jr. Vice-President, Nuclear P.O. Box 1640 Jackson, Mississippi 39205

Notification of Part 21 applicability made to Mr. J. P. O'Reilly, NRC, Region II by letter AECM-83/0551, September 6, 1983.

2. Identification of the facility ... which ... contains a deficiency:

Grand Gulf Nuclear Station (GGNS) Unit 1 Port Gibson, Mississippi 39150

MP&L is presently determining the applicability of the deficiency to Unit 2.

 Identification of the firm ... supplying the basic component which ... contains a deficiency:

> The Agastat GP series relays were manufactured by the Amerace Corporation, Control Products Division, and supplied to Grand Gulf by the Bechtel Power Corporation in Gaithersburg, Maryland and by the General Electric Company, San Jose, California.

- 4. Nature of the deficiency ... and the safety hazard which ... could be created by such a deficiency ...:
  - A. Description of the Deficiency

The failures at GGNS involve Agastat GP series relays not changing state when called upon to operate. The failure of the relays to operate properly has been determined to be due to the nylon movable contact arm coming in contact with the barrier strip on the melamine phenol relay base. This resulted in mechanical interference and inability of the relay contacts to make proper contact. MP&L has determined that these failures are applicable to Agastat GP series relays manufactured prior to August 1977. Agastat GP series relays manufactured at a later date were of a different design that prevented moveable arm and barrier strip interference.

# B. Analysis of Safety Implications

MP&L considers that the possible failure of the GP series Agastat relays to operate could result in degradation of the function of safety related systems and potentially create a substantial safety hazard.

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Attachment to AECM-83/0668 Page 2 of 3

5. The date on which the information of such deficiency ... was obtained.

Information concerning the specific deficiency at GGNS was obtained on July 25, 1983. The deficiency was reported to Mr. D. Verrelli, of your office, on September 2, 1983, by the MP&L "Responsible Officer", Mr. J. P. McGaughy, Jr.

6. In the case of the basic component ... the number and location of all such components:

The deficiency concerning Agastat GP series relays is located at Grand Gulf Nuclear Station, Unit 1. MP&L is undertaking actions to determine applicability to Unit 2.

7. The corrective action which has been taken ... the name of the individual ... responsible for the action; and the length of time that has been ... taken to complete the action.

#### A. Corrective Actions Tak n

MP&L sent several malfunctioning GP Series Agastat relays to General Electric for evaluation and determination of the cause of failure.

Initial indication of the failure mode of the relays indicated the possibility of post-mold shrinkage. Failure mode testing and reliability analysis was cooperatively performed by MP&L, Amerace Corporation, and General Electric, to determine the root cause of the GGNS failures. It has been determined by G. E. and Amerace through extensive testing that the failures were due to service aging of normally energized relays in a mild environment in combination with the mechanical configuration and tolerances of the internal parts specific to pre-August 1977 relays.

The calculated service life, based on test data, for Agastat GP Series relays in a continuous operating mode (normally energized) is 4.5 years. The calculated service life for normally non-energized relays is greater than 40 years. GE recommends replacement of normally energized relays at GGNS over the next two years.

MP&L has determined by inspection the location of all the safetyrelated GP Series relays. MP&L will replace as required affected Agastat GP series relays with relays which are of a different design.

B. Responsible Individual

Unit 1 C. K. McCoy Nuclear Plant Manager Unit 2 T. H. Cloninger Unit 2 Project Manager

For Unit 2, our Architect/Engineer has issued QAR F-409 and QAR F-410 to track this deficiency.

Attachment to AECM-83/0668 Page 3 of 3

# C. Length of Time to Complete Actions

Replacement of the safety-related Agastat Relays which are normally energized is expected to be completed when the electrical divisions are out of service during the Battery Surveillances in the Spring of 1984. This schedule is more conservative than the GE recommended schedule.

A projected completion date for Unit 2 is not available at this time due to the limited ongoing construction effort; however, we expect to submit our next Interim Report for Unit 2 by April 30, 1984.

8. Any advice related to the deficiency ... that has been, is being, or will be given to purchasers or licensees:

As the deficiency did not originate with MP&L, we have no advice to offer.

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5 mar zohrs

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UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON D. C. 20555 October 13, 1983

-25 A10:47

Docket No.: 50-416

Mr. J. P. McGaughy, Jr. Vice President - Nuclear Production Mississippi Power & Light Company P. O. Box 1640 Jackson, Mississippi 39205

Dear Mr. McGaughy:

Subject: Request for Additional Information - Agastat Relays

During recent surveillance testing at Grand Gulf, Unit 1, twelve inoperable Agastat type relays were found. These relay failures precluded the automatic operation of three standby service water system valves, one LPCI injection valve, and components in the control room HVAC system, combustible gas control system, RCIC system, RHR system, Containment Drywell instrumentation, HPCS system and fire protection system. From discussions with your staff, a review of the FSAR and a review of the Technical Specifications for Grand Gulf, it appears that a significant percentage of these relays are tested only during the 18 month surveillance. To operate the facility consistent with the single failure assumptions of the FSAR transient and accident analysis, more frequent testing may be appropriate.

Accordingly, we are enclosing a request for additional information to resolve our concerns in this area. A copy of the enclosure was telecopied to your staff on October 4, 1983. We request that you provide this information as soon as possible since this matter must be resolved prior to full power licensing. If you have any questions concerning this matter, please contact M. Dean Houston, Project Manager (301) 492-8358.

Sincerely,

timular

A. Schwencer, Chief Licensing Branch No. 2 Division of Licensing

Enclosures: As stated cc w/ enclosures: See next page

102402

\$3- 207

Grand Gulf

Mr. J. P. McGaughy Vice President Nuclear Production Mississippi Power & Light Company P. O. Box 1640 Jackson, Mississippi 39205

cc: Robert B. McGehee, Esquire Wise, Carter, Child, Steen and Caraway P. O. Box 651 Jackson, Mississippi 39205

Troy B. Conner, Jr., Esquire Conner and Wetterhahn 1747 Pennsylvania Avenue, N. W. Washington, D. C. 20006

Dr. D. C. Gibbs, Vice President Middle South Energy, Inc. 225 Baronne Street P. O. Box 6100 New Orleans, Louisiana 70161

Mr. Larry Dale Mississippi Power & Light Company P. O. Box 1640 Jackson, Mississippi 39205

Mr. R. Trickovic, Project Engineer Grand Gulf Nuclear Station Bechtel Power Corporation Gaithersburg, Maryland 20760

Mr. Alan G. Wagner Resident Inspector Route 2, Box 150 Port Gibson, Mississippi 39150

ENCLOSURE

# LEQUEST FOR ADDITIONAL INFORMATION

During a recent 18-month surveillance test at Grand Gulf 12 inoperable Agastat type relays were identified. These relay failures precluded the automatic opera-, tion of components in at least 9 safety-related systems. In a meeting with the NRC staff on September 23, 1983 at the NRC's Region II offices, representatives from Mississippi Power and Light stated that the failures were random, end of life failures and that the relay failures were within the bounds of the expected failure rates for Grand Gulf. The Mississippi Power and Light representatives stated that there are approximately 1740 relays at Grand Gulf and that the expected relay failure rate is 13 failures per 1000 relays every 18 months.

From a review of the FSAR and the Grand Gulf Technical Specification the NRC staff has determined that a significant number of safety-related relays are tested only during the 18-month surveillance tests. It is the staff's concern that 18-month surveillance test intervals may not be justified in view of the relay failure rates. To operate the facility consistent with the single failure assumptions of the FSAR transient and accident analysis more frequent testing may be appropriate.

The design of instrumentation channels, logic and actuation devices of safetyrelated systems should include provisions for at-power surveillance testing. General Design Criterion 21 states that "the protection system shall be designed to permit periodic testing of its functioning when the reactor is in operation, including a capability to test channels independently to determine failures and losses of redundancy that may have occurred." Additional requirements and guidance for at-power testing and the establishing of test intervals is included in IEEE Standard 279, Reg. Guide 1.118 and IEEE Standard 338. Based on the above we request that you provide the following information:

 Of the total population of Agastat relays in the plant's safety-related systems provide a breakdown identifying the systems involved, the number of Agastat relays in each system and the frequency for testing the relays/systems.

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- Provide a detailed discussion, with illustrations from applicable elementary diagrams, on the at-power testing capability provided in the Grand Gulf design for those Agastat relays/systems currently tested only during plant shutdowns.
- Provide a discussion on the test intervals selected for the systems that include Agastat relays which demonstrates consideration of the following factors:
  - (1) system availability.
  - (2) manufacturers recommendations.
  - (3) historical experience with use of similar equipment.
  - (4) failure rate data,
  - (5) results of preoperational testing,
  - (6) quality information, and
  - (7) regulatory requirements.

This discussion should address the single failure assumptions of the FSAR transient and accident analyses.



UNITED STATES NUCLEAR REGULATORY COMMISSION REGION II 101 MARIETTA STREET, N.W. ATLANTA, GEORGIA 30303 OCT 3 1983

Acrest file

Mississippi Power and Light Company ATTN: Mr. J. E. Richard Senior Vice President, Nuclear P. O. Box 1640 Jackson, MS 39205

Gentlemen:

SUBJECT: MEETING SUMMARY

This letter refers to a meeting conducted at your request in the NRC Region II office on September 23, 1983. This meeting was held to discuss the results of MP&L's investigation of Agastat relay failures at Grand Gulf Unit 1 and proposed corrective action. The details of the meeting are provided in Enclosure 1. A list of attendees at the meeting is contained in Enclosure 2.

It is our opinion that this meeting was beneficial. It provided a better understanding of the actions being taken to resolve this item.

In accordance with Section 2.790 of NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and enclosures will be placed in the NRC's Public Document Room.

Should you have any questions concerning these matters, we will be pleased to discuss them.

Sincerely,

R. C. Lewis, Director

R. C. Lewis, Director Division of Project and Resident Progams

Enclosures:

- 1. Meeting Summary
- 2. Attendance List
- cc w/encls:
- J. F. Fager, Vice President Engineering and Construction Middle South Energy, Inc.
- C. K. McCoy, Plant Manager

3110 70241

#### ENCLOSURE 1

# MEETING SUMMARY

On September 23, 1983, representatives of Mississippi Power and Light Company (MP&L) met with the NRC in the NRC Regional Office in Atlanta, Georgia. The results of MP&L's investigation of Agastat relay failures at Grand Gulf Unit 1 and proposed corrective action were discussed.

MP&L discussed the chronology leading to the current investigation. The investigation was expedited on August 19, 1983, after several failures of Agastat relays were identified during surveillance testing.

General Electric (GE) and Amerace, the Agastat supplier, have tested twelve of the failed relays. In three relays the failure could not be repeated. In seven relays a normally closed contact failed to open, and in one relay a normally open contact failed to close. One relay had a welded contact. Exposure to abnormal temperatures was indicated by discoloration of the coils. MP&L and GE monitored the temperature in relay cabinets on site and found them to be within an acceptable range.

MP&L stated that the random failure rate for these relays had been estimated at 13 failures per 1,000 relays in 18 months. This is the random failure rate used in the safety analysis. MP&L concluded that the 18 failures which have occurred at Grand Gulf fall within the predicted failure rate. Failures may have been accelerated due to exposure to higher than normal temperatures during construction. MP&L, therefore, proposed the following corrective action. Upon receipt of recommendations from GE/Amerace, MP&L will submit a scheduled maintenance/ replacement program to assure replacement within the currently predicted service life for Agastat relays which have not been modified.

The NRC requested that the submittal of the planned program be expedited and that NRC be notified of any additional failures of Agastat relays in both safetyrelated and nonsafety-related systems. MP&L agreed to submit the program by October 15, 1983, and notify the NRC of failures.

# ENCLOSURE 2

# ATTENDEES

Name	Organization
J. F. Groves	MP&L
C. W. Angle	MP&L
J. E. Pinto	MP&L
J. P. McGaughy	MP&L
A. R. Smith	GE
C. A. Cameron	GE
N. G. Lurin	GE
E. C. Spencer	GE
M. J. Virgilio	NRC
M. D. Hunt	NRC
T. E. Conlon	NRC
A. R. Herdt	NRC
J. A. Olshinski	NRC
James P. O'Reilly	NRC
R. C. Lewis	NRC
D. M. Verrelli	NRC
C. A. Julian	NRC
A. G. Wagner	NRC
L. J. Watson	NRC



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

SEP 2 3 1983

# SSINS 9162

MEMUKANDUM FUK:	Edward L. Jordan, Director, Division of Engineering and Quality Assurance, IE Richard W. Starostecki, Director, Division of Project and Resident Programs, RI
	Charles E. Norelius, Director, Division of Project and Resident Programs, RIII
	James E. Gagliardo, Director, Division of Resident, Reactor Project and Engineering Programs, RIV
	Thomas W. Bishop, Director, Division of Resident, Reactor Project and Engineering Inspection, RV
FROM:	Richard C. Lewis, Director, Division of Project and Resident Programs

SUBJECT: POTENTIALLY GENERIC DEFICIENCY OF AGASTAT GP SERIES RELAYS

The enclosed potentially generic issue data sheet concerning deficiencies found in Amerace Corporation Agastat GP series relays is forwarded for information per TI 2500/3.

R.C. Lewis

Enclosure: Potentially Generic Issue Data Sheet No. RII:DPRP:83-11

cc w/ encl: C. J. Heltemes, Jr., AEOD



CONTACT: L. J. Watson 242-4299

8412060441

# ENCLOSURE

# Data Sheet No.: RII: DPRP-83-11

Appendix A TI 2500/3 4/1/80

# POTENTIALLY GENERIC ISSUE DATA SHEET

Facility Grand Gulf Docket No(s). 50-416

Date of Event 07/25/83 Inspection or other Report Construction Deficiency Report PRD-83/12

1. Brief Description of Issue (Not required if included in supporting data)

Agastat GP series relays fail to change state when called upon to operate. The attached MP&L Part 21 Report, Construction Deficiency Report PRD-83/12, states that the failure could be due to mechanical interference of the nylon movable contact arm and the barrier strip on the melamine phenol relay base. The cause of the failure has not, however, been absolutely determined.

2. How Found (If appropriate)

15 of 1700 relays installed in safety related applications at the plant failed during surveillance testing.

Why Considered Potentially Generic (i.e. - reference applicable criteria or 3. give reason)

Failures could occur at other nuclear facilities using this relay.

4. II	L. J. Watson	C. A. Julian/D. M. Verrelli
Region	Originator	Section Chief/Branch Chief

5. Other Region Reporting That The Problem Has Also Been Identified By Them

Region , Chief , Reporting , Docket No.

6. Evaluation by IE:HQ

Bulletin / / Circular / / Information Notice / /

Other

No further action required / /

Attachment: MP&L Part 21 Report, Construction Deficiency Report PRD-83/12

# MISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi P. D. BOX 1640. JACKSON. MISSISSIPPI 39205 03 SE214 ALC: 35

September 6, 1983

JAMES P MEGAUS- JA

Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Region 11 101 Marietta Street, N.W. Suite 2900 Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Lear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station Unit 1 License No. NPF-13 Docket No. 50-416 File 0260/15525/15526/16694.4 PRD-83/12, Interim Report, Failure of Agastat GP Series Relays to Switch AECM-83/0551

On September 2, 1983, Mississippi Power & Light Company notified Mr. D. Verrelli, of your office, of a Potentially Reportable Deficiency at the Grand Gulf Nuclear Station (GGNS). MP&L has evaluated this deficiency and determined that it could potentially create a substantial safety hazard under the guidelines of 10CFR21 for Unit 1. The deficiency concerns the failure of Agastat GP series relays to change state when called upon to operate. It is indeterminate at this time as to whether this deficiency is applicable to Unit 2.

Details are provided in our attached Interim Report. We expect to submit a Final Report by November 7, 1983.

Yours truly,

Q309190110

RDC:ky

Attachment

See Page 2 for Distribution Middle South Utilities System

Mr. J. P. O'Reilly NRC AECM-83/0551 Page 2 of 2

cc: Mr. J. B. Richard Mr. R. B. McGehee Mr. T. B. Conner

.

Mr. Richard C. DeYoung, Director Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D.C. 20555

Mr. G. B. Taylor South Miss. Electric Power Association P. O. Box 1589 Hattiesburg, MS 39401

Attachment to AECM-83/0551 Page 1 of 3

# INTERIM REPORT NO. 1 FOR PRD-83/12

1. Name and address of the individual ... informing the commission:

J. P. McGaughy, Jr. Vice-President, Nuclear P.O. Box 1640 Jackson, Mississippi 39205

Notification of Part 21 applicability made to Mr. J. P. O'Reilly, NRC, Region II by letter AECM-83/0551, September 6, 1983.

2. Identification of the facility ... which ... contains a deficiency:

Grand Gulf Nuclear Station (GGNS) Unit 1 Port Gibson, Mississippi 39150

MP&L is presently determining the applicability of the deficiency to Unit 2.

 Identification of the firm ... supplying the basic component which ... contains a deficiency:

> The Agastat GP series relays were manufactured by the Amerace Corporation, Control Products Division, and Supplied to Grand Gulf by the Bechtel Power Corporation in Gaithersburg, Maryland and by the General Electric Company, San Jose, California.

- Nature of the deficiency ... and the safety hazard which ... could be created by such a deficiency ...:
  - A. Description of the Deficiency

The deficiency involves the failure of Agastat GP series relays to change state when called upon to operate. The failure of the relays to operate properly has been determined to be due to the nylon movable contact arm coming in contact with the barrier strip on the melamine phenol relay base. This resulted in mechanical interference and inability of the relay contacts to move. MP&L believes that this deficiency is applicable only to some Agastat GP series relays manufactured prior to August 1977 as all relay failures at GGNS to date are pre-August 1977 relays. Agastat GP series relays manufactured at a later date were of a different design that prevented moveable arm and barrier strip interference.

Attachment to AECM-83/0551 Fage 2 of 3

MP&L had earlier notification of a similar problem occurring at another plant due to INPO Significant Event Report (SER) 68-82. MP&L's investigation at that time determined that the deficiency was due to "post-mold shrinkage." Communication with General Electric, at that time, provided justification of continued use of the pre-August 1977 GP series Agastat relays. G. E. had stated that Agastat's position regarding pre-August 1977 relays is that if the relays are presently operating properly, they will not fail to operate due to this problem at some time in the future. The relays presently failing to operate at GGNS had previously operated properly during and after the Pre-Operational and Acceptance Testing Program.

The root cause of the possible failures of GP series relays at GGNS has not been determined at the present time.

B. Analysis of Safety Implications

MP&L considers that the possible failure of the GP series Agastat relays to operate could result in degradation of the function of safety related systems and potentially create a substantial safety hazard.

5. The date on which the information of such deficiency ... was obtained.

MP&L received information concerning a similar deficiency in December, 1982. However, information concerning the specific deficiency at GGNS was obtained on July 25, 1983. We then evaluated the deficiency and determined the deficiency could potentially create a substantial safety hazard. The deficiency was then reported to Mr. D. Verrelli, of your office, on September 2, 1983 by the MP&L "Responsible Officer," Mr. J. P. McGaughy, Jr.

 In the case of the basic component ... the number and location of all such components:

The deficiency concerning Agastat GP series relays is located at Grand Gulf Nuclear Station, Unit 1. MP&L is undertaking actions to determine applicability to Unit 2.

- 7. The corrective action which has been taken ... the name of the individual ... responsible for the action; and the length of time that has been ... taken to complete the action.
  - A. Corrective Actions Taken

MP&L has sent several malfunctioning GP Series Agastat relays to General Electric for evaluation and determination of the cause of failure.

Attachment to AECM-83/0551 Page 3 of 3

MP&L is inspecting and replacing as required affected pre-August 1977 Agastat GP series relays used in safety-related applications with relays manufactured after August 1977 which are of a different design.

B. Responsible Individual

Unit 1 C. K. McCoy Nuclear Plant Manager Unit 2 T. H. Cloninger Unit 2 Project Manager

C. Length of Time to Complete Actions

MP&L will inspect and replace as required the safety-related affected pre-August 1977 GP Series Agastat relays. MP&L expects to have determined the cause of the relay failures and provide a final report by November 7, 1983.

8. Any advice related to the deficiency ... that has been, is being, or will be given to purchasers or licensees:

As the deficiency did not origina ; with MP&L, we have no advice to offer.

MISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

September 22,91983 |

JAMES P. MCGAUGHY. JR.

Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Region II 101 Marietta Street, N.W. Suite 2900 Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station Unit 1 License No. NPF-13 Docket No. 50-416 File 0260/15525/15526/16694.4 PRD-83/12, Interim Report #2, Failure of Agastat GP Series Relays to Switch AECM-83/0610

Reference: AECM-83/0551

On September 2, 1983, Mississippi Power & Light Company notified Mr. D. Verrelli, of your office, of a Potentially Reportable Deficiency at the Grand Gulf Nuclear Station (GGNS). MP&L has evaluated this deficiency and determined that it could potentially create a substantial safety hazard under the guidelines of 10CFR21 for Unit 1. The deficiency concerns the failure of Agastat GP series relays to change state when called upon to operate. It is indeterminate at this time as to whether this deficiency is applicable to Unit 2.

Details are provided in our attached Interim Report. We expect to submit a Final Report by November 7, 1983.

Yours truly,

RDC:ky

Attachment

See Page 2 for Distribution

Attachment to AECM-83/0610 Page 1 of 3

# INTERIM REPORT NO. 2 FOR PRD-83/12

1. Name and address of the individual ... informing the commission:

J. P. McGaughy, Jr. Vice-President, Nuclear P.O. Box 1640 Jackson, Mississippi 39205

Notification of Part 21 applicability made to Mr. J. P. O'Reilly, NRC, Region II by letter AECM-83/0551, September 6, 1983.

2. Identification of the facility ... which ... contains a deficiency:

Grand Gulf Nuclear Station (GGNS) Unit 1 Port Gibson, Mississippi 39150

MP&L is presently determining the applicability of the deficiency to Unit 2.

 Identification of the firm ... supplying the basic component which ... contains a deficiency:

> The Agastat GP series relays were manufactured by the Amerace Corporation, Control Products Division, and Supplied to Grand Gulf by the Bechtel Power Corporation in Gaithersburg, Maryland and by the General Electric Company, San Jose, California.

- 4. Nature of the deficiency ... and the safety hazard which ... could be created by such a deficiency ...:
  - A. Description of the Deficiency

The failures at GGNS involve Agastat GP series relays manufactured prior to August 1977 to change state when called upon to operate. The failure of the relays to operate properly has been determined to be due to the nylon movable contact arm coming in contact with the barrier strip on the melamine phenol relay base. This resulted in mechanical interference and inability of the relay contacts to make proper contact. MP&L has determined that these failures are applicable to Agastat GP series relays manufactured prior to August 1977. Agastat GP series relays manufactured at a later date were of a different design that prevented moveable arm and barrier strip interference. Mr. J. P. O'Reilly NRC

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AECM-83/0610 Page 2 of 2

cc: Mr. J. B. Richard Mr. R. B. McGehee Mr. T. B. Conner

> Mr. Richard C. DeYoung, Director Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D.C. 20555

Mr. G. B. Taylor South Miss. Electric Power Association P. O. Box 1589 Hattiesburg, MS 39401

Attachment to AECM-83/0610 Page 2 of 3

#### B. Analysis of Safety Implications

MP&L considers that the possible failure of the GP series Agastat relays to operate could result in degradation of the function of safety related systems and potentially create a substantial safety hazard.

5. The date on which the information of such deficiency ... was obtained.

Information concerning the specific deficiency at GGNS was obtained on July 25, 1983. The deficiency was reported to Mr. D. Verrelli, of your office, on September 2, 1983 by the MP&L "Responsible Officer", Mr. J. P. McGaughy, Jr.

6. In the case of the basic component ... the number and location of all such components:

The deficiency concerning Agastat GP series relays is located at Grand Gulf Nuclear Station, Unit 1. MP&L is undertaking actions to determine applicability to Unit 2.

7. The corrective action which has been taken ... the name of the individual ... responsible for the action; and the length of time that has been ... taken to complete the action.

#### A. Corrective Actions Taken

MP&L sent several malfunctioning GP Series Agastat relays to General Electric for evaluation and determination of the cause of failure.

Initial indication of the failure mode of the relays indicated the possiblity of post-mold shrinkage. Failure mode testing and reliability analysis was cooperatively performed by MP&L, Amerace Corporation, and General Electric, to determine the root cause of the GGNS failures. It has been determined by G. E. and Amerace through extensive testing that the failures were due to service aging in a mild environment in combination with the mechanical configuration and tolerances of the internal parts specific to pre-August 1977 relays.

MP&L has determined by inspection the location of all the safetyrelated pre-August 1977 relays. MP&L will replace as required affected pre-August 1977 Agastat GP series relays with relays manufactured after August 1977 which are of a different design.

#### B. Responsible Individual

Unit 1 C. K. McCoy Nuclear Plant Manager Unit 2 T. H. Cloninger Unit 2 Project Manager

Attachment to AECM-83/0610 Page 3 of 3

# C. Length of Time to Complete Actions

. . .

MP&L has inspected and will replace as required the safety-related affected pre-August 1977 GP Series Agastat relays. MP&L expects to provide a final report by November 7, 1983.

8. Any advice related to the deficiency ... that has been, is being, or will be given to purchasers or licensees:

As the deficiency did not originate with MP&L, we have no advice to offer.

# MISSISSIPPI POWER & LIGHT COMPANY

D-EDX 1640 JACKSON, MISSISSIPPI 35205

JANES # M+54.35-\* JE

September 6, 1983

9ASTAT RelAYS

Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Region 12 101 Marietta Street, N.W. Suite 2900 Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. C'Reilly:

SUBJECT: Grand Gulf Nuclear Station Unit 1 License No. NPF-13 Docket No. 50-416 File 0260/15525/15526/16694.4 PRD-83/12, Interit Report, # 1 Failure of Agastat GP Series Relays to Switch AECM-83/0551

On September 2, 1983, Mississippi Power & Light Company notified Mr. 1. Verrelli, of your office, of a Potentially Reportable Deficiency at the Grand Gulf Nuclear Station (GGNS). MP&L has evaluated this deficiency and determined that it could potentially create a substantial safety hazard under the guitelines of 10CFR21 for Unit 1. The deficiency concerns the failure of Agastat OF series relays to change state when called upon to operate. It is indeterminate at this time as to whether this deficiency is applicable to Unit 2.

Details are provided in our attached Interim Report. We expect to submit a Final Report by November 7, 1983.

Yours truly,

RDC : ky

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Attachtet:

See Page 1 for Distribution Member Middle South Utilities System

Mr. J. I. C'Reilly NRC

...

AECH-ES (151 Fage 1 of 2

cc: Mr. J. B. Richard Mr. R. B. McGehee Mr. T. B. Conner

> Mr. Richard C. DeYoung, Director Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D.C. 20555

Mr. G. B. Taylor South Miss. Electric Fover Association F. O. Box 1589 Hattiesburg, MS 39401

Attachment to AECM-E3/0551 Page 1 of 3

#### INTERIM REPORT NO. 1 FOR PRD-83/12

1. Name and address of the individual ... informing the commission:

J. P. McGaughy, Jr. Vice-Freeident, Nuclear P.O. Box 1640 Jackson, Mississippi 39205

Notification of Fart 21 applicability made to Mr. J. P. O'Reilly, NRC, Region II by letter AECM-83/0551, September 6, 1983.

2. Identification of the facility ... which ... contains a deficiency:

Grand Gulf Nuclear Station (GGNS) Unit 1 Port Gibson, Mississippi 39150

MP&L is presently determining the applicability of the deficiency to Unit 2.

 Identification of the firm ... supplying the basic component which ... contains a deficiency:

> The Agastat GF series relays were manufactured by the Amerace Corporation, Control Products Division, and Supplied to Grand Gulf by the Bechtel Power Corporation in Gaithersburg, Maryland and by the General Electric Company, San Jose, California.

- 4. Nature of the deficiency ... and the safety hazard which ... could be created by such a deficiency ...:
  - A. Description of the Deficiency

The deficiency involves the failure of Agastat GF series relays to change state when called upon to operate. The failure of the relays to operate properly has been determined to be due to the nylon novable contact are coming in contact with the barrier strip on the relamine phenol relay base. This resulted in techanical interference and inability of the relay contacts to move. MPSL believes that this deficiency is applicable only to some Agastat GF series relays manufactured prior to August 1977 as all relativities at GGNS to date are pre-August 1977 relays. Agastat GF series relays manufactured at a later date were of a different design that prevented moveable arm and barrier strip interference. MP61 had earlier notification of a similar problem occurring at another plant due to INPO Significant Event Report (SER) 68-82. MP61's investigation at that time determined that the deficiency was due to "post-mold shrinkage." Communication with General Electric, at that time, provided justification of continued use of the pre-August 1977 GF series Agastat relays. G. E. had stated that Agastat's position regarding pre-August 1977 relays is that if the relays are presently operating properly, they will not fail fto operate due to this problem at some time in the future. The relays presently failing to operate at GGNS had previously operated properly during and after the Pre-Operational and Acceptance Testing Frogram.

The root cause of the possible failures of GF series relays at GGNS has not been determined at the present time.

B. Analysis of Safety Implications

MP&L considers that the possible failure of the GP series Agastat relays to operate could result in degradation of the function of safety related systems and potentially create a substantial safety hazard.

5. The date or which the information of such deficiency ... was obtained.

MP&L received information concerning a similar deficiency in December, 1982. However, information concerning the specific deficiency at GGNS was obtained on July 25, 1983. We then evaluated the deficiency and determined the deficiency could potentially create a substantial safety hazard. The deficiency was then reported to Mr. D. Verrelli, of your office, on September 2, 1983 by the MP&L "Responsible Officer," Mr. J. F. McGaughy, Jr.

 In the case of the basic component ... the number and location of all such components:

The deficiency concerning Agastat GP series relays is located at Grand Gulf Nuclear Station, Unit 1. MP&L is undertaking actions to determine applicability to Unit 2.

- 7. The corrective action which has been taken ... the name of the individual ... responsible for the action; and the length of time that has been ... taken to complete the action.
  - A. Corrective Actions Taken

MF61 has sent several malfunctioning GF Series Agastet relays to General Electric for evaluation and determination of the cause of failure.

Attachment to AECM-83/0551 Fage 3 of 3

MP6L is inspecting and replacing as required affected pre-August 1977 Agastat GP series relays used in safety-related applications with relays manufactured after August 1977 which are of a different design.

E. Responsible Individual

• • •

Unit 1 C. K. McCoy Nuclear Plant Manager

Unit 2 T. E. Cloninger Unit 2 Project Manager

C. Length of Time to Complete Actions

MP&L will inspect and replace as required the safety-related affected pre-August 1977 GP Series Agastat relays. MP&L expects to have determined the cause of the relay failures and provide a final report by November 7, 1983.

 Any advice related to the deficiency ... that has been, is being, or will be given to purchasers or licensees:

As the deficiency did not originate with MP&L, we have no advice to offer.





ISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi D. BOX 1640, JACKSON, MISSISSIPPI 39205

August 31, 1983

NUCLEAR PRODUCTION DEPARTMENT

U. S. Nuclear Regulatory Commission Region II 101 Marietta St., N.W., Suite 2900 Atlanta, Georgia 30303

Biblions Ag: 00 ple reniew, Brief me

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. O'Reilly:

Agastat relay Failures in Duesel Gen.

SUBJECT: Grand Gulf Nuclear Station Unit 1 Docket No. 50-416 License No. NPF-13 File 0260/L-835.0 Update Report - Standby Diesel Generator 11 Eighteen Month Functional Test Unsatisfactory LER 83-083/01 X-1 AECM-83/0525

This letter submits an update to a previous report submitted on August 1, 1983. The event for which the report was submitted occurred on July 16, 1983, when a LOCA signal was simulated for the performance of an eighteen (18) month Emergency Diesel Generator functional test. Several Standby Service Water System valves did not reposition, the LPCI "A" injection valve did not open and the applicable Division I electrical loads did not shed as required. This was reported pursuant to Technical Specification 6.9.1.12.e and 6.9.1.12.i.

Modifications and retesting of the Load Shedding and Sequencing panel are complete. Investigation into the cause of the relay failures is continuing. This is an interim report. An update report is expected to be submitted by November 10, 1983. Attached is LER 83-083/01 X-1 with Supplementary Information.

Yours truly,

LADI

L. F. Dale Manager of Nuclear Services

EBS/SHH:sap Attachment

cc: (See Next Page)

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# MISSISSIPPI POWER & LIGHT COMPANY

cc: Mr. J. B. Richard (w/a) Mr. R. B. McGehee (w/o) Mr. T. B. Conner (w/o) Mr. G. B. Taylor (w/o)

> Mr. Richard C. DeYoung, Director (w/a) Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D. C. 20555

Document Control Desk (w/a) U. S. Nuclear Regulatory Commission Washington, D. C. 20555

NUCLEAR REGULATORY COMMISSION RC FORM 366 Update Report - Previous Report Date 8,1/83 7771 . LICENSEE EVENT REPORT Attachment to AECM-83/0525 Page 1 of LEASE PRINT OR TYPE ALL REQUIRED INFORMATION CONTROL BLOCK. 0000-0034 1 (4)1 (2) 0 0 -(5)0 1 GG S LICENSE NUMBER LICENSEE CODE CON'T 4 1 6 0 0 7 16 8 3 8 0 REPORT 8 31 1 8 3 0 1 5000 0 (6) SOURCE EVENT DATE DOCKET NUMBER EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10) On July 16, 1983, a LOCA signal was simulated for the performance of an } 0 2 18 month Emergency Diesel Generator functional test. Several SSW valves | 03 Idid not reposition, the LPCI "A" injection valve did not open and the 0 4 lapplicable Division I electrical loads did not shed as required. The 0 5 levent had no affect on the health and safety of the public and did not 0 6 constitute a threat to plant safety. This is reported pursuant to T.S. 077 6.9.1.12.e and T.S.6.9.1.12.1. 0 8 COMP. CODE SUBCODE SUBCODE CAUSE COMPONENT CODE CODE B 1 (15 Z (16) SF RELALYX (14 0 9 (12) Z (13) 1 E REVISION SEQUENTIAL OCCURRENCE REPORT REPORT NO CODE TYPE NO. EVENT LER RO 111 011 X REPORT 0 8 3 8 NUMBER 32 COMPONET PRIME COMP THOO NPRD-4 ACTION ACTION HOURS (22) MANUFACTURER FORM SUE ON PLANT SUBMITTED 00000 N 25 A | 1|0| Y N 24 Z (20) Z (21) C (18) X (19) (23) CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27) [] [] [The cause was a combination of Agastat relay failure and an apparent [flaw in the Load Shed and Sequencing (LSS) panel supplied by Vitro [Laboratories. The relay failures are under investigation. Modifications] and retesting of the LSS panel are complete. This is an interim report. ITal IAn update should be expected by November 10, 1983. 80 METHOD OF DISCOVERY STATUS OTHER STATUS (30) DISCOVERY DESCRIPTION (32) S POWER [ I (31) Surveillance Testing 0 0 0 (29) 0 (28) 80 CONTENT ACTIVITY LOCATION OF RELEASE (36) AMOUNT OF ACTIVITY (35 RELEASED OF RELEASE 1 33 134 6 80 OSURES PERSONNEL ET DESCRIPTION (39) NUMBER (37) 2 (38) NA 0 PERSONNEL INJURIES DESCRIPTION (41) MRER 10 0 (40) NA OSS OF OR DAMAGE TO FACILITY (43 DI SCRIPTION 1 (42) 13 NRC USE ONLY PUBLICITY DESCRIPTION (5) ¥ j@a) 6.8 EC.
Attachment to AECM-83/0525 Page 2 of 3

on Part 21 Repor

## SUPPLEMENTARY INFORMATION TO LER 83-083/01 X-1

Mississippi Power & Light Company Grand Gulf Nuclear Station - Unit 1 Docket No. 50-416

Technical Specification Involved: N/A Reported Under Technical Specification: 6.9.1.12.i and 6.9.1.12.e

## Event Narrative:

This is an update to a previous report submitted on August 1, 1983. The event for which the report was submitted is described in the following paragraphs.

On July 16, 1983, Division I was given a LOCA signal in accordance with the Standby Diesel Generator 11 eighteen (18) month functional test. All intended results were demonstrated except for the following:

- 1. SSW valves P41-F113, F160A and F238 did not reposition.
- 2. The RHR LPCI "A" injection valve E12-F042A did not open.
- The required Division I loads did not shed from the Division I bus (15AA).

For the SSW valves the causes are as follows:

o F113 (SSW Fill Tank Outlet Valve)

Contacts R4-M4 of relay R7 malfunctioned and the relay was replaced. Contacts R4-M4 (normally closed contacts when the relay is deenergized) are used to energize the 42R device and thus drive the valve shut on a LOCA. Relay type is AGASTAT.

o F160A (Outboard Outlet From Drywell Purge Compressor)

Contacts R1-M1 of relay R8 malfunctioned and the relay was replaced. Contacts R1-M1 (normally closed contacts when the relay is deenergized) are used to energize the 42F device and thus drive the valve open on a LOCA. Relay type is AGASTAT.

o F238 (Outlet From ESF Room Cooler)

Problem was found to be a tripped 49 (thermal overload) device. The device was reset and the valve was retested satisfactorily. On a valid LOCA, this device is not in the logic circuit.

For the RHR LPCI "A" injection valve the cause is a follows:

Contacts R<sub>1</sub>M<sub>1</sub> of relay K24A malfunctioned. Contacts R<sub>1</sub>M<sub>1</sub> (normally closed contacts when the relay is deenergized) serve to energize K23A which in turn opens the valve on a valid LOCA signal (level 1). Relay is AGASTAT.

Attachment to AECM-83/0525 Page 3 of 3

For the Load Shed and Sequencing (LSS) panel the cause is as follows:

A test pulse signal which is periodically sent through the logic "blocked" the LOCA signal from being processed. When the test pulse signal is input and a LOCA signal is received superimposed on the test signal the LSS panel <u>should</u> "hold onto" the LOCA signal and process it as though the pulse was not there, allowing completion of the required actions. The test pulse signal lasts for such a short duration that it is never seen as a valid LOCA signal (signal has cleared before relays have time to act) and is not meant to block the LOCA signal, however, tests were conducted and the above verified i.e., when a LOCA signal was input to the system coincident and synchronous with the test pulse signal, the LOCA signal was found to be lost.

Corrective actions implemented or being implemented are as follows:

All subject relays were replaced in the field and tests are being conducted to determine the cause of the failed sets of contacts. Future actions will be dictated by these tests. The vendor for the LSS panel (Vitro) has subsequently verified that a design problem exists for both Division I and II and that ECCS pumps will not start if the LOCA signal occurs at exactly the same time that the test pulse is initiated. In addition, the exact same test was re-performed on July 25, 1983, and the results were totally satisfactory (test pulse and LOCA not superimposed on one another).

Design Change Package 83/398 implemented modifications to the logic circuitry to insure proper response to real input while in the automatic test mode.

This is a written followup report consistent with the reporting requirements of Technical Specification 6.9.1.12 paragraphs (e) and (i). An update report should be expected by November 10, 1983.

MISSISSIPPI POWER & LIGHT COMPANY Helping Build Mississippi P. D. BOX 1640, JACKSON, MISSISSIPPI 39205

August 20, 1983

JAMES P MCGAUGHY JR

Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Region II 101 Marietta Street, N.W. Suite 2900 Atlanta, Georgia 30303

Attention: Mr. J. P. O'Reilly, Regional Administrator

Dear Mr. O'Reilly:

SUBJECT: Grand Gulf Nuclear Station Units 1 and 2 License No. NPF-13 Docket Nos. 50-416/417 File 0260/15525/15526/16694.4 PRD-83/11, Final Report for Unit 1; Interim Report for Unit 2; Agastat CR0095 Relay Bases AECM-83/0484

On August 18, 1983, Mississippi Power & Light Company notified Mr. M. Branch, of your office, of a Reportable Deficiency at the Grand Gulf Nuclear Station (GGNS) construction site. The deficiency concerns the failure of Agastat CR0095 relay bases where the design of the socket allows the female connection, if not properly ceated during manufacturing, to be pushed out of the base when a relay is inserted.

MP&L has determined that this deficiency is reportable under the provisions of 10CFR21 for Unit 1 and potentially reportable under the provisions of 10CFR50.55(e) for Unit 2.

Yours truly,

ACP:dr ATTACHMENT

cc: See page 2

- C

Mr. J. P. O'Reilly NRC AECM-83/0484 Page 2

cc: Mr. J. B. Richard Mr. R. B. McGehee Mr. T. B. Conner

> Mr. Richard C. DeYoung, Director Office of Inspection & Enforcement U. S. Nuclear Regulatory Commission Washington, D.C. 20555

Mr. G. B. Taylor South Miss. Electric Power Association P. O. Box 1589 Hattiesburg, MS 39401

## FINAL REPORT UNIT 1; INTERIM REPORT UNIT 2 FOR PRD-83/11

1. Name and address of the individual ... informing the commission:

J. P. McGaughy, Jr. Vice-President, Nuclear P.O. Box 1640 Jackson, Mississippi 39205

Notification of Part 21 applicability made to Mr. J. P. O'Reilly, NRC, Region II by letter AECM-83/0484, August 20, 1983.

2. Identification of the facility ... which ... contains a deficiency:

Grand Gulf Nuclear Station (GGNS) Unit 1 Port Gibson, Mississippi 39150

 Identification of the firm ... supplying the basic component which ... contains a deficiency:

Supplied to Grand Gulf by the Bechtel Power Corporation in Gaithersburg, Maryland and by General Electric Company, San Jose, California.

- Nature of the deficiency ... and the safety hazard which ... could be created by such a deficiency ...:
  - A. Description of the Deficiency

The deficiency concerns problems identified in Agastat CR0095 relay sockets manufactured by the Amerace Corporation, Control Products Division in Union, New Jersey.

The design of the socket allows the female connection, if not properly seated during manufacturing, to be pushed out of the base when a relay is inserted.

B. Analysis of Safety Implications

MP&L considers that failure of contact retention in the base could result in degradation of the function of the safety system and create a substantial safety hazard.

5. The date on which the information of such deficiency ... was obtained.

Mississippi Power and Light received information of the deficiency on December 9, 1982, via IE Information Notice 82-4°. We reported the deficiency to Mr. M. Branch, of your office, as a Reportable Deficiency for Unit 1 on August 18, 1983. An evaluation for 10CFR21 reportability has been completed for Unit 1 and the MP&L "Responsible Officer," Mr. J. P. McGaughy, Jr., has been notified.  In the case of the basic component ... the number and location of all such components.

The deficiency concerning the Agastat CR0095 relay base is located at Grand Gulf Nuclear Station, Unit 1. MP&L will undertake actions to determine applicability to Unit 2. The NRC has been previously notified of similar occurrences as identified by IE Information Notice 82-48.

- 7. The corrective action which has been taken ... the name of the individual ... responsible for the action; and the length of time that has been ... taken to complete the action.
  - A. Corrective Actions Taken

For Unit 1, MP&L has performed an inspection and testing of the CR0095 relay bases used in safety-related applications. The inspection/testing utilized was based on General Electric Service Information Letter No. 384. A "push test" of the female connectors was performed on the relay base. The results of this testing indicated that approximately 21% of the relays tested showed indications that the female connector had not been properly seated in the base. The defective CR0095 relay bases identified have been replaced with fully inspected and accepted CR0095 relay bases. For Unit 2, MP&L will investigate to determine the applicability of IE Information Notice 32-48.

B. Responsible Individual

C. K. McCoy	I. H. Cloninger
Plant Manager	Unit 2 Project Manager
Mississippi Power & Light Co.	Mississippi Power & Light Co.
Responsible for Unit 1	Responsible for Unit 2

C. Length of Time to Complete Actions

The Agastat CR0095 bases applied to safety-related functions for Unit 1 have been inspected, tested and replaced as necessary. A projected completion date for Unit 2 is not available at this time due to the limited ongoing construction effort. MP&L is planning to resolve the concerns in IE Information Notice 82-48 for Unit 2 prior to Unit 2 fuel load, however we expect to submit our next interim report by October 15, 1984.

 Any advice related to the deficiency ... that has been, is being, or will be given to purchasers or licensees:

As the deficiency did not originate with MP&L, we have no advice to offer.