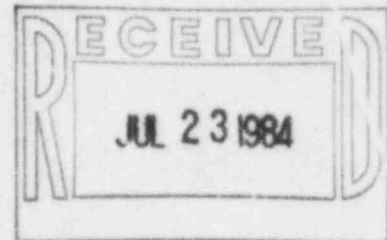




ARKANSAS POWER & LIGHT COMPANY

POST OFFICE BOX 551 LITTLE ROCK, ARKANSAS 72203 (501) 371-4000

July 20, 1984



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Mr. John T. Collins
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

SUBJECT: Arkansas Nuclear One - Units 1 & 2
Docket Nos. 50-313 and 50-368
License Nos. DPR-51 and NPF-6
Response to IE Bulletin 84-02

Gentlemen:

This letter is provided in response to IE Bulletin 84-02, pertaining to the failure of General Electric type HFA relays in use in class 1E safety systems.

Upon receipt of the Bulletin a two phase approach was taken to identify and inspect those HFA relays used in both safety and non-safety related applications at ANO. The first phase of the inspection was to visually examine those HFA relays which, through a previous effort, had been identified. This visual examination was to verify that the relay coils were not deteriorated (cracked or melted) and to confirm the relay's cleanliness.

The second phase of the inspection program was to conduct a detailed engineering review of safety related systems to assure that we had identified all HFA relays utilized in those systems at ANO. This second phase was completed in late June followed by a visual examination of the additionally identified relays.

In all a total of 250 HFA relays were examined in both ANO-1 and 2 (including those in stores). Of this total, 102 are installed in safety related systems. None of the HFA coils inspected during the visual examinations exhibited the gross signs of failure characteristic of the failure mechanism described in IE Bulletin 84-02. However, five of the relays examined did show some evidence of minor coil cracking. Three of the cracked relays are used for training purposes only and are located in the training storeroom. One of the five was in the plant storeroom and had yet to be placed in service. This coil was removed from stores and tagged to

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preclude its use in safety related systems. The remaining cracked relay was in service in a non-safety related control scheme for a circulating water pump. Based on past experience, the types of minor cracks observed were judged not to have adversely effected relay performance. None of the safety related relays examined showed any signs of degradation.

From our review we have determined that there are no HFA relays utilized in the Class 1E Reactor Protective System at ANO-1 or 2. The Reactor Protective Systems are; however, normally tested once per month to assure their availability per Technical Specifications 4.1.a and 4.3.1.1.1 for ANO-1 and 2 respectively.

All HFA relays utilized in safety related applications at ANO-1 and 2 are scheduled to be replaced with new General Electric Century series relays during the next refueling outages. The refueling outages are scheduled to begin in October of 1984 and February 1985 for ANO-1 and 2 respectively. This replacement schedule is contingent upon obtaining these relays from General Electric.

AP&L has inspected those HFA relays identified as being located in safety related systems at ANO and a number that are utilized in non-safety related applications. The results of this inspection showed no signs of the gross failure mechanism described in IE Bulletin 84-02 (with the exception of the minimal cracking found in the five relays used for non-safety related applications). A review of the past several years operating history of safety related relays also did not indicate any abnormal failures or excessive failure rates for the HFA relays. Based on the above findings AP&L believes that both ANO-1 and 2 can be operated safely, without adversely affecting the public health and safety until the subject relays can be replaced.

As requested in IE Bulletin 84-02 a further review of the general concern expressed in the Bulletin as it applies to other relays was conducted. To accomplish this AP&L first identified the manufacturers of other relays used in safety related application at ANO. AP&L then contacted representatives of these firms by telephone and interviewed them pertaining to the concerns expressed in Bulletin 84-02. None of the vendors contacted have internally identified or been given any reason to suspect that their relay has a history that would indicate a generic problem similar to the thermal end-of-life characteristics shown by the HFA nylon or Lexan coil spool material.

A review of past operating history of safety related relays was also conducted. This was accomplished by 1) reviewing the past several years Report of Abnormal Condition reports (an internal report used to identify potentially reportable events) which pertained to safety related relay failure and 2) by interviewing Electrical Maintenance personnel on their recollection of past relay operating history. From this review isolated failures of several different models of relays were noted; however, these failures did not exhibit the same characteristics as the HFA failure nor did they suggest any type of generic problem.

A potentially related problem to that demonstrated by the HFA relay has; however, been demonstrated by relays utilized in our facility which are

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manufactured by Potter and Brumfield (P&B). During the performance of the ANO-2 Integrated Engineered Safeguards test procedure, in October 1982, while the unit was in mode 5, eleven thermal overload bypass relays failed to actuate when tested. These relays are normally energized and are required to deenergize upon an ESFAS actuation in accordance with ANO-2 FSAR section 8.3.1.1.8.11.11. When retested, three of the relays operated satisfactorily and were returned to service. The remaining eight relays were replaced and an investigation of the failure mechanism was initiated by AP&L. The particular relays that failed were Potter and Brumfield (P&B) models MDR 137-8 and MDR 138-8. The only difference in these models is that the 138-8 has two decks of contacts while the 137-8 has a single deck.

The deficiencies in the MDR relays at ANO-2 have been identified to other utilities via INPO Significant Event Report (SER) 83-04, which was issued in January 1983.

Failure investigations conducted by both AP&L and P&B showed the cause of the failures to be outgassing of the coil varnish. When the varnish on the relay coils is subjected to heat for long periods of time, gassing of the varnish begins. This gas then condenses on the various parts of the relay that are cooler, such as bearing and shaft, shrouds, iron, etc. The gum in the varnish when collected on the shaft and bearing in sufficient quantities will cause binding of the relay. Such high coil temperatures occur in relays which are normally energized. This mechanism may potentially be accelerated by higher than normal coil voltages which may occur periodically during equalization of station batteries. Potential effects of elevated DC system voltages was the subject of IE Information Notice 83-08. Actions as a result of this Notice are still under evaluation by AP&L.

During the 1983 refueling, 2R3, during unrelated testing, two similar failures were observed in P&B relays utilized in a different application than discussed above. As a result of the two additional failures, AP&L decided during the 2R3 refueling to replace the existing P&B relays. The eight relays which had been previously replaced during 2R2 were tested and one was subjected to detailed disassembly and inspection. All eight relays operated properly. The detailed examination indicated that minor outgassing had occurred during the previous cycle of operation; however, the extent of the outgassing was not sufficient to affect relay operation. Since qualified replacement relays could not be found during the refueling outage and testing and inspection indicated the P&B relays would perform reliably for at least one full cycle, the old relays were replaced with new Potter and Brumfield relays of like kind. This replacement was performed to ensure reliable operation of the relays until an engineering evaluation determines a more permanent solution.

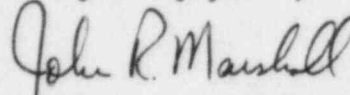
The subject P&B relays are used for thermal overload bypasses, load shedding functions, anti-flyback, and interlocks of Engineering Safety Features Actuation System (ESFAS) overrides. In all cases, the relays serve to enhance the reliability of the system in which they operate, but are not required for safety system function.

During the upcoming refueling outage AP&L plans to implement a design change which will permanently resolve the problems we have experienced with the P&B

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relays. Currently we are evaluating several options which range from relay replacement to periodic exercising of the existing relays. These options are currently being evaluated both internally and by an outside engineering consulting firm.

Very truly yours,

A handwritten signature in dark ink, appearing to read "John R. Marshall". The signature is fluid and cursive, with the first name "John" being more prominent.

John R. Marshall
Manager, Licensing

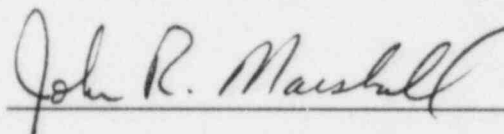
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cc: U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

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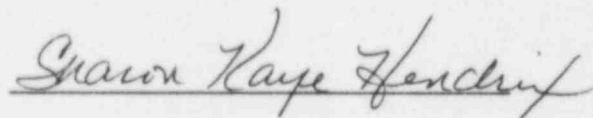
STATE OF ARKANSAS)
)
COUNTY OF PULASKI) SS

I, John R. Marshall, being duly sworn, subscribe to and say that I am Manager of Licensing for Arkansas Power & Light Company; that I have full authority to execute this oath; that I have read the document numbered ØCANØ784Ø9, and know the contents thereof; and that to the best of my knowledge, information and belief the statements in it are true.



JOHN R. MARSHALL

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for the County and State above named, this 20th day of July, 1984.



Notary Public

My Commission Expires:

9-19-89