LOUISIANA POWER & LIGHT / 142 DELARONDE STREET
P O BOX 6008 • NEW ORLEANS, LOUISIANA 70174 • (504) 366-2345
MIDDLE SOUTH UTILITIES SYSTEM

May 4, 1984

W3P84-1277
3-A1.01.04
3-A1.10

Director of Nuclear Reactor Regulation
Attention: Mr. G.W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford SES Unit 3
Docket No. 50-382
Results of Emergency Feedwater (EFW)
Control System Meeting on April 26, 1984

REFERENCE: LP&L Letter W3P84-1214 to Mr. G.W. Knighton from K.W. Cook dated May 2, 1984

Dear Sir:

Please note that Attachment II of the Referenced Letter contained two substantive typographical errors and with this letter we are now submitting this Attachment in its corrected form.

The errors mentioned above are contained in the first sentence of Paragraph II. The sentence should read as follows:

> As illustrated in FSAR Figure 7.3-10, the Train A EFAS valves are controlled directly from Plant Protection System (PPS) SSRs 1A and 2A without the use of a lockout relay.

We apologize for any inconveniences this may have caused.

Should you need further assistance, please advise.

Yours very truly,

K.W. Cook
Nuclear Support & Licensing Manager

KWC/TJG/pco

Attachment

cc: E.L. Blake, W.M. Stevenson, J.T. Collins, D.M. Crutchfield, J. Wilson, G.L. Constable, R. Stevens

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ATTACHMENT II

SUMMARY OF FAILURE ANALYSIS ON ESFAS

AUXILIARY RELAY CABINET

On January 17, 1984, the NRC raised a concern regarding the failure of a single Auxiliary Relay Cabinet (ARC) and its effect on the ability of the EFWS to operate properly. One set of shutoff and control valves is indirectly controlled by one train of the ARC, while the other set of valves is controlled by the remaining train of the ARC. Should a single failure exist which would prevent one of the ARCs from actuating, then feedwater to that generator could not be provided since both legs of piping having a series valve within it are controlled by the failed ARC. The ARC has to fail in the unactuated state to maintain the valves closed. If they fail actuated, then the other train of the ARC would provide the appropriate feed or isolation. Subsequently, a review of the ARC should be limited to failures which could prevent actuation.

As illustrated in FSAR Figure 7.3-10, the Train A EFAS valves are controlled directly from Plant Protection System (PPS) SSRs 1A and 2A without the use of a lockout relay. These relays are called cycling relays because they cycle depending on the status of the PPS relays. Actuation relays, which latch in the actuated state upon initiation of the PPS EFAS, control actuation of the feedwater pumps. Since both trains of the ARC control the operation of the feedwater pumps, a single failure of a train would lead to the failure of only one pump to energize. The remaining two pumps would energize and thus the failure of the actuation relays need not be considered. Also, the ARC cabinet is powered from two separate 120 V power busses such that deenergization of a single bus will have no effect on the operation of the ARC.

A question may arise as to what single failure would prevent both cycling relays from deenergizing (or actuating). When the SSR in the PPS deenergizes, only a short circuit from the positive bus to the top of the cycling relays could maintain power to the relays. What must be considered next is what failure would have the same effect for both cycling relays.

With regard to ARC critical components, the following should be noted:

- All latching relays and their associated output terminal blocks are located in the rear bays of the cabinet. The only wires penetrating the thermal barrier to the front bays are the coil lead wires. Since no part of these wires is exposed to the rear bays, failure in the rear bays is limited from propagating to the front bays.

- Cycling relays are located in the front bays along with their associated terminal blocks.

- Cycling relays associated with the left side of the cabinet are physically and thermally isolated from the cycling relays associated with the right side of the cabinet. Subsequently, failures affecting the left side of the cabinet do not affect the right side of the cabinet.

It should also be noted that a considerable amount of effort has been expended to prevent any single failure from maintaining a cycling relay energized. A large amount of conduit is used in the system to maintain the control wiring for the actuation relays. The conduit also maintains separation of the positive bus wiring from the negative bus wiring.

Another failure consideration is the presence of a fire. Since each of the 4 sections of the ARC is separated from the others by a thermal barrier, the effect of a fire in any one quadrant is limited from affecting another quadrant.

In conclusion, failures on one side of the cabinet can affect only one cycling relay, thus yielding results comparable to the failure of a single valve in the AFWS. Consequently, a single failure which could prevent the proper operation of both cycling relays is not credible.