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IPPOLITO,T.A. Operating Reactors Branch 2

SUBJECT: Forwards partial response to 791022 ltr re alternate safe shutdown capability.Response partial & should be considered preliminary.Detailed analysis in process of final review. Final review of analysis should be completed within two wks.

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Iowa Electric Light and Power Company

June 5, 1980
LDR-80-153

LARRY D. ROOT
ASSISTANT VICE PRESIDENT
NUCLEAR GENERATION

Mr. Thomas A. Ippolito, Chief
Operating Reactors, BR-2
Division of Licensing
Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20034

Dear Mr. Ippolito:

This letter and its attachments are a partial response to your letter dated October 22, 1979 concerning Alternate Safe Shutdown Capability. Based upon your position entitled "Safe Shutdown Capability", we have reviewed the plant design, procedures and the information in our Fire Hazard Analysis which was transmitted to you by our letter dated June 7, 1979.

This response is partial at this time and should be considered preliminary, as the detailed analysis is in the process of final review. The final review of the analysis should be completed within two weeks of the date of this letter and will be transmitted at that time.

The attachments include a Summary and Conclusions and a Description of Methods for Analysis.

Very truly yours,

Larry D. Root

Larry D. Root
Assistant Vice President
Nuclear Generation

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SUMMARY AND CONCLUSIONS

The Fire Hazard Analysis concludes that there are no areas in the plant where a fire could preclude safe shutdown of the plant except fire in safety related cabinets and control boards (control panels) in the Control Room. A fire in these control panels would be subject to early detection and suppression. For purposes of this response, we have assumed damage to individual panels in the Control Room.

The analysis identifies the potential vulnerabilities to safe shutdown systems as a result of fire in individual control panels. The analysis also points out those design and procedure modifications that will address the potential vulnerabilities.

The safety systems necessary for Hot and Cold Shutdown are consistant with paragraphs 6 and 7 of your position entitled "Safe Shutdown Capability."

Conclusions of the alternate shutdown analysis indicate the need for some revisions to procedures and some circuit modifications.

Procedures will be revised to include checklists for RCIC, HPCI, RHR, and RHR service water motor operated valve lineups and pump operation (as applicable) and instructions on how to isolate a motor control center from spurious control room inputs that are precluding a correct lineup.

The control circuitry for the two safety relief valves used to manually control depressurization will be rerouted outside the Control Room to insure their operability after a Control Room fire.

The circuitry for RHR system flow indicators and suppression pool temperature indication will be rerouted outside the Control Room to insure the reliability of their indications.

DESCRIPTION OF METHODS FOR ANALYSIS

The analysis was conducted by determining those safety systems necessary to go to Hot Shutdown and Cold Shutdown and analyzing the electrical circuitry used to control the components of those systems. The electrical circuitry was analyzed to determine what areas the wires pass through and where the contacts (relays, limit switches, and hand switches) are physically located. The networks of relays were traced through to identify all areas where a fire might be able to affect a safety system included in that network of relays. Simple block diagrams were prepared showing the location of basic control circuit elements and their interconnections. A logic equation was prepared for each safety system component showing how the circuit elements combine to control that component. In the case of process instrumentation, logic equations were not used because no control function was at issue. The block diagrams, logic equations, and relay networks were then used to evaluate system vulnerability to a fire in the control panel.

Examining the logic equations, relay networks and block diagrams allows one to determine all the control panels where circuit elements and their interconnections are located. Each control panel is then examined with a fire postulated in it. The worst possible combination of shorted or open circuits is then assumed. This combination of short and open circuits is then followed through the relay network and safety system component logic equation to determine whether it will preclude desired functioning of the component. Simultaneous fires in more than one control panel were not considered.