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Record Services Branch (Document Control Desk)

SUBJECT: Forwards info on alternate shutdown capability (App R) at facility, in response to NRC 861124 request.

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FLORIDA POWER & LIGHT COMPANY

JANUARY 23 1987

L-87-29

U. S. Nuclear Regulatory Commission
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Gentlemen:

Re: St. Lucie Unit 1
Docket No. 50-335
Fire Protection
Alternate Shutdown Capability

In response to your request dated November 24, 1986, and consistent with the schedule provided by Florida Power & Light Company (FPL) letter L-86-518 dated December 22, 1986, FPL is providing the attached information on the Alternate Shutdown Capability at St. Lucie Unit 1.

Should there be any additional questions regarding this matter, please contact us.

Very truly yours,

C. O. Woody
Group Vice President
Nuclear Energy

COW/GRM/gp

Attachment

cc: Dr. J. Nelson Grace, Region II, USNRC
R. V. Crlenjak, USNRC SRI, St. Lucie Plant

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REQUEST FOR ADDITIONAL INFORMATION
APPENDIX R ALTERNATE SHUTDOWN CAPABILITY
FLORIDA POWER AND LIGHT COMPANY
ST LUCIE UNIT 1

QUESTION 1 Indicate the current status of the evaluation of the effect of spurious signals on the ability to achieve safe shutdown (Reference April 12, 1983 letter). Incomplete items as of that date included the evaluation of Safety Injection Actuation Signals and Containment Spray Actuation Signals on safe shutdown as well as the effect of spurious actuation of equipment which could effect safe shutdown. If this evaluation is complete, provide the results and a description of any hardware/procedural modifications required. Your response should be in terms of conformance with the guidance contained in Generic Leters 81-12 and 86-10.

RESPONSE The evaluation of a spurious Safety Injection Actuation Signal (SIAS) and Containment Spray Actuation Signal (CSAS) has been completed as part of the ESFAS (Engineered Safety Features Actuation System) Spurious Signal Study. In addition to SIAS and CSAS, this study included spurious Containment Isolation Actuation Signal (CIAS), Main Steam Isolation Signal (MSIS), Auxiliary Feedwater Actuation Signal (AFAS) and Recirculation Actuation Signal (RAS). The result of this study has been incorporated into the current Alternate Shutdown Procedure EOP 1-0030134 Rev 1 and modifications to the plant were implemented with various other changes to bring the plant into conformance with Appendix R (Generic letter 81-12 and 86-10).

QUESTION 2 In some instances, you have indicated that the adverse consequences of spurious signals can be compensated for by manual actions. Describe how the post-fire shutdown procedures are written to reflect the impact of spurious signals and the corresponding manual actions necessary to overcome them.

RESPONSE The post fire shutdown procedure EOP 1-003-134 Rev 1 "Alternate Shutdown" provide for manual actions to prevent or mitigate the consequences of spurious signals or actions. This is accomplished by incorporating the results of the spurious actuation studies. Such actions consist of removing power from components, positioning isolation switches and checking equipment status when performing the above actions. These actions are required by procedure without regard to if a spurious condition has occured.

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QUESTION 3 Previous staff guidance in Generic Letter 81-12 identifies reactor coolant hot leg temperature or exit core thermocouples as instrumentation needed for safe shutdown. You have not provided either of these indications as part of the alternate shutdown capability. This represents an unjustified deviation from the above referenced guidance and should be corrected.

RESPONSE Both St Lucie Unit 1 and Unit 2 use Cold Leg Temperature (T_C) instead of Hot Leg Temperature (T_H) at the Hot Shutdown Control Panel for Reactor Coolant System Temperature Indication. This matter was resolved in a series of meetings with the NRC in 1982.

This matter was reviewed again for both Units during the February 18 - 22, 1985 St Lucie Plant Appendix R Audit and found acceptable for both units. Attached is a record of this question and response.

ST. LUCIE PLANT
APPENDIX "R"
FIRE PROTECTION AUDIT
FEBRUARY 18-22, 1985

NRC QUESTION/RESPONSE FORM

DATE: 2-25-85 Pete Closed TIME: 9:27 A.M.

NRC INSPECTOR: Pete Taylor

FPL ESCORT: Marple

INSPECTION CATEGORY: Procedure

QUESTION: Has FPL filed for exemption on lack of TH Indication on HSCP's?

RESPONSE:

A deviation request for using T COLD in lieu of T HOT has not been filed since this matter was resolved in a series of meetings with the NRC in 1982, as described below:

1) During an FPL/NRC meeting on March 24, 1982, the subject of T HOT was discussed. Per NRC minutes of that meeting dated March 31, 1982, item #3 was:

   "FPL will submit reasons explaining why the cold leg temperature indication is sufficient reactor coolant system temperature indication on the hot shutdown panel"

2) A follow-up meeting was held with NRC on May 7, 1982. Per NRC minutes of that meeting dated June 1, 1982, item #3 reads:

   "Reasons were submitted and found satisfactory. FPL will submit formally by 5/17/82."

3) Per FPL letter L-82-208 dated May 17, 1982, FPL provided the following information:

   "Primary system analyses have been performed to insure that natural circulation will occur and maintain the core in a safe condition following a loss of offsite power (see FSAR sections 15.3 & 15.C.4). These analyses demonstrate that natural circulation maintains a close relationship between reactor coolant hot and cold leg temperatures. In addition, several natural circulation cool downs at St. Lucie Unit 1 have verified the accuracy of the above results. Thus, an operator can confidently monitor primary system conditions from the hot shutdown panel using T COLD as a guide."

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QUESTION 4 Provide a description of the hot standby panel electrical isolation design which confirms that a fire in Fire Aarea C does not affect the shutdown capability from the control room.

RESPONSE A fire in Fire Area C affects Zones 43, 44, 54, 55W, 56, 57B, 58 and 78 which encompasses the "B" switchgear room and the Hot Shutdown Panel (HSP serves as the Alternate Shutdown Panel). Train "A" equipment is relied upon for shutdown with a fire in this area. The required Train "A" cables have been protected and Train "A" instrumentation at the HSP has been isolated and a description of the isolation design is provided below.

A selector switch is provided at the isolation panel A with normally closed contacts to provide a path from the sensor to the instrumentation and control devices in the control room. During normal operation the HSP instrumentation and control devices are inoperable due to normally open selector switch contacts between the sensor and these devices at the HSP. The normally open contacts provide isolation from the control room devices. Generally transfer switches are located on the switchgear supplying power to the component. In conclusion a fire in Area C will not affect the shutdown capability from the control room.

QUESTION 5 Describe how the safe shutdown procedures reflect the need to take tank level indication and diagnostic instrumentation readings in order to achieve safe shutdown. It is not evident from a review of the present (draft) Emergency Operating Procedure (EOP) 1-0030142 submitted in the licensee's October 7, 1983 letter that such guidance has been provided.

RESPONSE Level indication is provided only to determine if an adequate amount of boric acid solution has been injected. Procedure 1-0030134 Rev 1 instructs the operator to inject the entire contents of the boric acid makeup tank if level instrumentation is not available. Therefore level instrumentation for the boric acid makeup tank is not required. For the condensate storage tank a local mechanical level indicator is provided which will not be affected by an alternate shutdown fire. The refueling water storage tank is used for primary system makeup only. This quantity of water is a small percent of tank capacity, thus level indication is not required.

QUESTION 6 Provide a description of the circuit isolation devices and include verification that they conform with the guidance contained in Generic Letter 81-12.

RESPONSE All isolation switches are either keylocked or alarmed in the control room if in the "local" or "isolated" position which conforms to the guidance contained in Generic Letter 81-12.

QUESTION 7 For a fire in the cable spread room (CSR), EOP 1-0030142 calls for isolating panel 1AB, which is located in the CSR. Does this require an operator to enter the fire area to affect safe shutdown? Are there any other plant areas where it is necessary for an operator to enter the fire area as part of the post-fire safe shutdown procedures? If so, justify this practice.

RESPONSE The current procedure for a fire in the control room or cable spread room, EOP 1-0030134 Rev 1 "Alternate Shutdown", requires that isolation switches located in the cable spread room be positioned (steps 5.9-2 M through Q) only if these switches are accessible (ie. fire is in the control room). The purpose of these switches is to make available additional equipment to assist in the unit shutdown. The equipment affected by these switches are not required for shutdown with a fire in the control room and/or cable spread room.

QUESTION 8 Has the potential for multiple high impedence faults been analyzed in terms of the adequacy of circuit isolation devices? If yes, provide a brief description regarding how this was done which confirms that multiple high impedence faults will not affect the safe shutdown capability.

RESPONSE Appendix R, Section III.G.2 requires protection from associated non-safety circuits which could degrade or prevent operation of safe shutdown systems through failure caused by ... "hot shorts, open circuits, or shorts to ground". A distinct analysis of multiple high impedence faults of associated safety cables is not required.

A coordination study has been performed to assure that a fault condition on an individual non-essential branch circuit will not trip the main supply breaker and result in the loss of essential loads. Also, proper sizing should preclude the possibility of supply breaker trip for any one high impedence fault on a branch circuit. Coordination of the supply breaker under the condition of multiple high impedence faults on branch circuits goes beyond the scope of an electrical distribution system design.

For the multiple high impedence faults scenario to take place, all the following specific conditions would be required:

A. Essential circuits must be mixed with non-essential circuits on the same power supply.

B. Multiple high impedance faults must occur on the non-essential circuits in a fire area which is designated as the opposite train to that of the power supply. All fire areas at PSL-1 are designated for safe shutdown with only one electrical train.

C. In order to achieve multiple high impedence faults, each branch circuit cable (carrying a different load current), would have to fail along its length in such a manner as to result in a unique insulation resistance that would produce a leakage current to ground (or conductor to conductor) which added to the conductor load would result in a current just below the protective device rating.

Due to the relatively low occurrence of multiple non-essential circuits from the same power supply routed in a fire area of the opposite train and the low probability of the above described specific fault conditions of these cables, an analysis of multiple high impedence faults was not deemed necessary.

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QUESTION 9 In your description of the alternate shutdown capability for the control room and cable spreading room provided in the October 7, 1983 letter, it is stated that certain safe shutdown systems will be protected inside these areas. Identify these systems and describe the protective enclosures used to achieve compliance with Section III.G.2 of Appendix R.

RESPONSE Various cables pertaining to the "B" train 125V DC distribution system have been protected in the cable spread room with approved 3 hour fire wrap to achieve compliance with Section III.G.2 of Appendix R.

QUESTION 10 Regarding the associated circuit analyses, you state that spurious signals to valves are assumed to move them to their worst-case position. Explain how this assumption conforms with the staff position on this subject contained in the response to Question 5.3.1 of Generic Letter 86-10.

RESPONSE The response to Question 5.3.1 of Generic Letter 86-10 requires that all circuit failure modes be considered. For valves that would be in either the open position or closed position the associated circuit analysis assumed the worst-case position. This is consistent with Question 5.3.1 since the desired position for a valve would either be open for a line that must maintain flow or closed for a line which must maintain isolation. The worst-case would be for the valve to go to the position opposite of the desired position. The desired position need not be considered since this is the position that valve be in to perform its required function. Two cases fall outside this consideration. For the rare case that a valve is required to throttle flow then the open and closed positions were examined. The only other case is for a valve for which neither position is required and such valves were removed from further consideration.