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ACCESSION NBR:8210130289 DOC.DATE: 82/10/05 NOTARIZED: NO DOCKET #
FACIL:50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
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RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards util responses to NRC concerns re inadequate core cooling instrumentation,per 820914 telcon w/NRC. Qualification testing of heated junction thermocouple sys scheduled for completion by 821015.

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FLORIDA POWER & LIGHT COMPANY

October 5, 1982
L-82-429

Office of Nuclear Reactor Regulations
Attention: Mr. Darrell G. Eisenhut, Director
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Eisenhut:

Re: St. Lucie Unit No. 2
Docket No. 50-389
Instrumentation for Detection of Inadequate Core Cooling

Attached are Florida Power and Light's (FPL) responses to the concerns raised by your staff regarding the inadequate core cooling instrumentation during a telephone conversation on September 14, 1982. If you have any questions on this submittal, please contact us accordingly.

Very truly yours,

J. A. de Mosbey

Robert E. Uhrig
Vice President
Advanced Systems and Technology

REU/RJS/JES/jea

Attachment

cc: J. P. O'Reilly, Region II
Harold F. Reis, Esquire

B001

ATTACHMENT

Section II, F.2, Provide Inadequate Core Cooling (ICC) Information as follows:

1. Qualification testing of the heated junction thermocouple system.

   Response: Qualification testing of the heated junction thermocouple system is scheduled to be completed by 10/15/82. The report on this testing will be submitted to the NRC by 10/31/82.

2. Environmental and seismic qualification of the in-vessel and out-of-vessel instrumentation equipment.

   Response: Qualification will be handled by the appropriate branch, therefore no additional information will be provided with this submittal.

3. Modify Emergency Operating Procedures (EOP's) by incorporating ICC instrumentation into the procedures as appropriate.

   Response: Emergency Operating Procedures will be revised to incorporate ICC instrumentation by October 31, 1982.

4. Proposed Changes to Technical Specifications.

   Response: These changes are incorporated into the T. S. submittal of July, 1982.

5. Description of ICC signal transmission processing and display information.

   Response: ICC Signal Transmission Processing and Display Information

   Sensors for ICC Detection

   The ICC instrumentation consists of four sensor types. The sensors include: 1) pressure transmitter on the pressurizer, 2) Resistance Temperature Detectors (RTD) in the hot and cold legs, 3) pairs of heated and unheated junction thermocouples (HJTC) arranged in an axial string in the upper plenum, and 4) Core Exit Thermocouples (CET). Except for the HJTC, these sensors already exist in all C-E designed reactors.

   Variables for ICC Indication

   The signals from the ICC sensors are processed to yield five variables. The ICC variables include 1) temperature margin to saturation from pressurizer pressure and temperature of RTD, 2) temperature margin to saturation from pressurizer pressure and temperature of unheated thermocouples in the HJTC, 3) collapsed coolant level above the core, detected by the HJTC, 4) temperature margin to saturation from CET and pressurizer pressure, and 5) core exit steam temperature from the CET.

Inadequate Core Cooling Associated Signal Transmission

(Ref. Fig. 1.9B-1 in FSAR) The hot and cold leg temperatures (resistance analogs sensed in the control room) are sensed via conventional cabling from the primary (RCS) piping to the control room, where a resistance bridge measures the resistance of the RTD and converts it to a 4 to 20 ma DC analog signal (current) which becomes an input to the Sub Cooled Margin Monitor (SMM). The pressurizer pressure transmitter provides a 4 to 20 ma DC analog signal from inside the containment to the control room via conventional cable. In the control room this signal is routed to the EFAS, RPS, and SMM. These pressure and temperature signals are now existing instrument measurement channels of which there are 4 each.

The HJTC and CET's are Chromel/Alumel thermocouples which provide a DC milivolt signal via Mineral Insulated (MI) cable from the reactor vessel to the containment penetration. Outside of the containment these signals are transmitted via conventional cables to the control room where they are processed for the SMM. (ref. fig. 1.9B-9 FSAR) The signals from the various sensors are processed and then displayed (see table) on both QSPDS channels SA & SB. The QSPDS consists of microcomputers and plasma display units that are class IE.

FPL has committed to having the SMM portion of the QSPDS for core load. The remaining portion of the QSPDS will be implemented by 5% power.

Summary of Processing Requirements

The following table lists the ICC variables. For each variable, the table summarizes the thermal hydraulic requirements for display, trending and alarm.

ICC Variable	Operator Access To Individual Sensor Input	Continuous Trended Display	Audible Alarm
Saturation Margin From RTDs	X	X (1)	X (1)
Saturation Margin From HJTC	X		
Saturation Margin From CETs	X	X	X (2)
Collapsed Level From HJTC	X	X	X (3)

Summary of Processing Requirements (Table Continued)

ICC Variable	Operator Access To Individual Sensor Input	Continuous Trended Display	Audible Alarm
Temperature From CETs	X	X	X (2)

(1) Highest temperature used for trend of Saturation Margin and for alarm on approach to saturation.
(2) Alarm only earlier of CET superheat or maximum CET temperature and only after prior saturation alarm, (1).
(3) Alarm on first level indication.

6. Detailed description of SMM system to be used during first cycle.

Response: The Saturation Margin Monitor is described in FSAR Chapter 1, App. 1.9B.B

7. Description of CET processing and display to be used during first cycle.

Response: The Core Exit Thermocouple system is described in FSAR Chapter 1, App. 1.9B.D.