

**Florida  
Power**  
CORPORATION

December 6, 1979

File: 3-0-3-a-3

Mr. Robert W. Reid  
Chief  
Operating Reactors Branch #4  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: Crystal River Unit 3  
Docket No. 50-302  
Operating License No. DPR-72  
Fire Protection Program Modifications

Dear Mr. Reid:

On July 27, 1979, the Commission issued Amendment No. 23 to the Operating License for Crystal River Unit 3. This amendment added license conditions relating to the completion of modifications at CR-3 regarding fire protection.

Certain items listed in Section 3.0 of the Safety Evaluation enclosed in Amendment 23, were marked with an asterisk which indicated that the NRC staff required additional design information in order to complete their review of these proposed modifications. In that regard, Florida Power Corporation hereby submits the attached evaluation information and design drawings concerning Items 3.2, 3.17, 3.23, 3.25, 3.27, 3.28, 3.29, 3.30 and 3.31. Additional information regarding Items 3.1, 3.5, 3.14, 3.15 and 3.18 will be submitted as soon as possible.

Your expeditious review of this information will be greatly appreciated in order that these modifications can be completed at CR-3. If you require any additional information or wish to discuss our submittal, please contact us.

Very truly yours,

FLORIDA POWER CORPORATION

Dr. P. Y. Baynard  
Manager, Nuclear Support Services

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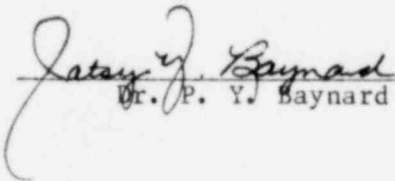
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STATE OF FLORIDA  
COUNTY OF PINELLAS

Dr. P. Y. Baynard states that she is the Manager, Nuclear Support Services, of Florida Power Corporation; that she is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.

  
\_\_\_\_\_  
Dr. P. Y. Baynard

Subscribed and sworn to before me, a Notary Public in and for the State and County above named, this 6th day of December, 1979.

  
\_\_\_\_\_  
Notary Public

Notary Public, State of Florida at Large,  
My Commission Expires: August 8, 1983

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ADDITIONAL INFORMATION CONCERNING CR-3 FIRE MODIFICATIONS  
SER TABLE 3.1

Item 3.2 Fire Detection Signaling System

The list of drawings below show the installation procedures for supplying emergency power to the fire detection system at Crystal River Unit 3. Emergency power will be supplied to the following systems:

- Products of Combustion Cabinet - Office Building
- Products of Combustion Cabinet - Plant
- Halon System
- Cable Spreading Room Fans
- Cardox System
- Fire Service Control Panel

List of Drawings Provided

<u>Drawing Number</u>	<u>Revision</u>	<u>Drawing Number</u>	<u>Revision</u>
S-224-103 SH.75	A	E-212-031 FSF17	A
E-212-031 FSF18	A	E-201-052	A
ES-C-1188 2 of 5	A	B-208-031 FS25	A
E-201-061 AC-10	A	Y-90550 2 of 17	A
E-201-061 AC-16	A	EC-209-031 FS-16	A
SS-211-031 FS-01	A	EC-209-031 FS-27	A
SS-211-031 FS-34	A	EC-209-031 FS-33	A
SS-211-031 FS-36	A	EC-209-031 FS-34	A
SS-211-031 FS-41	A	EC-209-031 SH.03	A
SS-211-031 FS-43	A	EC-210-612	A
E-212-031 FSC1	A	E-215-174	A
E-212-031 FSF1	A	E-215-205	A
E-212-031 FSF2	A	EC-220-224	A
E-212-031 FSF3	A	EC-220-226	A
E-212-031 FSF9	A	E-215-201	A
E-212-031 FSF11	A	E-215-204	A

Item 3.17 Fire Stops

Enclosed are the following drawings showing the locations of the cable tray fire stops to be installed at CR-3.

<u>Drawing Number</u>	<u>Revision</u>	<u>Title or Description</u>
E-214-011	A	Electrical Cable Trays Turbine Bldg. Above EL. 95'-0" West
E-214-032	A	Electrical Cable Trays Control Complex Above EL. 108'-0", 124'-0" and 145'-0"
E-214-041	A	Electrical Cable Trays Aux. Bldg. Above EL. 95'-0" North

Item 3.17 Fire Stops (Cont'd)

<u>Drawing Number</u>	<u>Revision</u>	<u>Title or Description</u>
E-214-042	A	Electrical Cable Trays Aux. Bldg. Above EL. 95'-0" South
E-214-043	A	Electrical Cable Trays Aux. Bldg. Above EL. 119'-0" North
E-214-044	A	Electrical Cable Trays Aux. Bldg. Above EL. 119'-0" South
E-214-051	A	Electrical Cable Trays Reactor & Intermediate Bldg. Above EL. 95'-0"
E-214-052	A	Electrical Cable Trays Reactor & Intermediate Bldg. Above EL. 119'-0"
E-214-061	A	Electrical Cable Tray Miscellaneous Details
E-215-046	A	Electrical Conduit Layout Intermediate Bldg. EL. 95'-0"

Item 3.23 Fire Detector Locations

Enclosed are copies of the Fire Detection System Description and the following drawings showing their location:

<u>Drawing Number</u>	<u>Title or Description</u>
SK-790906	Electrical Equipment, Reactor, Aux. & Int. Bldg. El. 75' and 95'
SK-790907	Electrical Equipment, Reactor, Aux. & Int. Bldg., El. 119'

Item 3.25 Evaluation of Fire Consequences in Certain Areas

This evaluation encompasses Items 3.27, 3.28, 3.29, 3.30 and 3.31. The attached drawings and summary provide the results and modifications planned at CR-3 as a result of this evaluation. The detailed design information for these modifications will be submitted as soon as possible.

We have performed a detailed review of the electrical circuits in the following fire areas and the effects of their loss upon safe shutdown due to an unsuppressed fire. Based on this analysis, we are committing to a wet pipe fusible link sprinkler system in the following areas:

Auxiliary Building Elevation 95, Fire Zones 1, 5 and 16.

Auxiliary Building Elevation 119, Fire Zones 1 West End, 7 and 18.

In the makeup pump rooms, barriers will be installed to prevent unacceptable fire damage. See Item 3.17 for design details of fire stops.

Our evaluation of the Intermediate Building at Elevation 119' (Item 3.30) has indicated the need to install a wet-pipe fusible link water spray system to protect the cable trays above the personnel airlock shield structure. This option is consistent with Section 5.7.6 of the SER.

We have analyzed the Reactor Building Fire Zone 1, Elevation 95' and 119' and we have found there are many more "A" safety-related circuits inside the Reactor Building than "B" circuits since the isolation valves inside the Reactor Building are "A" and those outside the Reactor Building are "B". Redundant pressure, level and flow instruments for primary coolant system and steam generators are physically located in separate quadrants of the Reactor Building so as to offer large mechanical and electrical separation. Further analysis has shown that a single, unsuppressed fire will not affect redundant safe shutdown systems or their power, instrumentation or control functions.

List of Drawings Provided

<u>Drawing Number</u>	<u>Revision</u>	<u>Title or Description</u>
E-215-043	17	Electrical Conduit Layout Aux. Bldg. EL. 95'-0" Southeast
E-215-044	20	Electrical Conduit Layout Aux. Bldg. EL. 95'-0" Southwest
E-215-061	13	Electrical Conduit Layout Reactor Bldg. EL. 95'-0" North
E-215-062	10	Electrical Conduit Layout Reactor Bldg. EL. 95'-0" South
E-215-063	15	Electrical Conduit Layout Reactor Bldg. EL. 119'-0" North
E-215-064	13	Electrical Conduit Layout Reactor Bldg. EL. 119'-0" South
E-214-061	9	Electrical Cable Tray Miscellaneous Details

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CRYSTAL RIVER UNIT 3  
DESCRIPTION OF SYSTEM OPERATION  
FOR FIRE PROTECTION EQUIPMENT  
PROVIDED IN FIRE ZONES WHERE REQUIRED BY  
THE FIRE PROTECTION PROGRAM REVIEW

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## FIRE DETECTION SYSTEM DESCRIPTION

As required by the "Fire Protection Program Review" (FPPR), 24 zones located in the Reactor, Intermediate, and Auxiliary buildings will be provided with fire detection. The detectors provided for these zones will all tie into one system with the main control panel being located in the Control Room. This detection system shall be "Class A" as defined in NFPA Standard No. 72D and shall have Essential Service (ES) power feeds.

Each of the fire detection zones shall be connected to one of three control modules. These control modules shall be located in prominent positions related to the zones signaling to them. The modules alarm (audible and visual) upon receiving fire or trouble signals and also transmit the fire or trouble signal to the control room panel. The signals (audible and visual) received at the control room panel will indicate what building the signal originates from and the approximate location in that building. The exact zone sending the signal will be determined by going to the appropriate control module.

Attached is Table 1 which identifies each new zone, the type of detection used in that zone, the control module associated with that zone, and the relationship between the new detection zones and the zones described in the FPPR.

By referencing Table 1, it can be seen that the design includes three different types of detection. These types of detection and their functions are as follows:

1. Ionization

Ionization detectors have been located in the zones to be protected in both the auxiliary and the intermediate buildings.

2. Linear Thermal

Linear Thermal detection has been selected for the zones in the Reactor Building located outside of the Reactor Compartment. These linear thermal detectors are to be installed parallel to the top tray in the stacks of trays as shown on the drawings. Each of these lines running parallel to the top tray will represent a separate zone. This consists of 3 zones on elevation 95'-0" and 6 zones on elevation 119'-0".

3. Heat Detectors

Heat detectors will be of the rate compensation type and will be located inside the Reactor Compartment at each of the reactor coolant pumps. The detectors shall be in the immediate vicinity of the oil lift pumps and the oil reservoirs on each of the four reactor coolant pumps. In order to insure that each of the reactor coolant pumps will continue to have detection in their immediate vicinity, in case of a detector or detector circuit failure, there will be two detection zones providing coverage at each of the pumps.

The signals relayed from the local control modules to the control room panel will be as follows:

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From Control Module #1	Reactor Building El. 95'-0"
	Reactor Building El. 119'-0"
	Reactor Coolant Pump
From Control Module #2	Intermediate Building El. 95'-0"
	Auxiliary Building El. 75'-0"
	Auxiliary Building El. 95'-0"
	Auxiliary Building El. 119'-0"
From Control Module #3	Intermediate Building El. 119'-0"

This information will enable the control room operator to identify the building and elevation from which the signal was generated. For the exact zone to be identified, personnel must go to the appropriate local control module. These control modules will be located at readily accessible points adjacent to the zones protected.

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TABLE 1

Fire Detection Zones To Be Installed  
To Comply With The FPPR\*

Zone No.	Zone Description	Zone Designation In FPPR			Name of Zone	Type Of <sup>1</sup>	
		Bldg.	Elevation	Zone		Detection	Control Module
1	RB Cable Trays El. 95'-0"	RB	95'-0"	1	Area Outside Reactor Compartment	LT	1
2	RB Cable Trays El. 95'-0"	RB	95'-0"	1	Area Outside Reactor Compartment	LT	1
3	RB Cable Trays El. 95'-0"	RB	95'-0"	1	Area Outside Reactor Compartment	LT	1
4	RB Cable Trays El. 119'-0"	RB <sup>2</sup>	119'-0" & 160'-0"	1	Area Outside Reactor Compartment	LT	1
5	RB Cable Trays El. 119'-0"	RB <sup>2</sup>	119'-0" & 160'-0"	1	Area Outside Reactor Compartment	LT	1
6	RB Cable Trays El. 119'-0"	RB <sup>2</sup>	119'-0" & 160'-0"	1	Area Outside Reactor Compartment	LT	1
7	RB Cable Trays El. 119'-0"	RB <sup>2</sup>	119'-0" & 160'-0"	1	Area Outside Reactor Compartment	LT	1
8	RB Cable Trays El. 119'-0"	RB <sup>2</sup>	119'-0" & 160'-0"	1	Area Outside Reactor Compartment	LT	1
9	RB Cable Trays El. 119'-0"	RB <sup>2</sup>	119'-0" & 160'-0"	1	Area Outside Reactor Compartment	LT	1
10	Decay Heat Pit 3B	AB	75'-0"	1	Decay Heat Pit 3B	I	2
11	Decay Heat Pit 3A	AB	75'-0"	2	Decay Heat Pit 3A	I	2
12	Heat Exchanger Room	AB	95'-0"	17	Sea Water Pump Room	I	2
		AB	95'-0"	32	Pump and Tank Room	I	2

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TABLE 1

Fire Detection Zones To Be Installed  
To Comply With The FPPR\*

Zone No.	Zone Description	Zone Designation In FPPR			Name of Zone	Type Of <sup>1</sup>	
		Bldg.	Elevation	Zone		Detection	Control Module
13	Waste Disposal Control Area	AB	95'-0"	13	Open Area	I	2
		AB	95'-0"	16	Equipment Hatch Area	I	2
		AB	95'-0"	18	Nuclear Service Booster Pump Room	I	2
14	Cable Corridors, AB El. 95'	AB	95'-0"	1	Hallway	I	2
		AB	95'-0"	5	Hallway	I	2
		AB	95'-0"	7	Hallway	I	2
15	Make-up Pump Rooms	AB	95'-0"	4	Makeup and Purification Pump Rooms	I	2
16	Auxiliary Feedwater Area	IB	95'-0"	2	Motor Driven Emergency Feed Pump Room	I	2
		IB	95'-0"	3	Turbine Driven Emergency Feed Pump Room	I	2
		IB	95'-0"	4	Penetration Area	I	2
		IB	95'-0"	5	Air Supply Fan Room	I	2
17	Boric Acid Area & Cable Penetration	AB	119'-0"	7	Penetration Area	I	2
		AB	119'-0"	18	Equipment Hatch Area	I	2
18	Waste Drumming, AB El. 119'	AB	119'-0"	25	Waste Drumming Area	I	2
		AB	119'-0"	26	Rad. Waste Press. Room	I	2
19	Cable Corridors, AB El. 119'	AB	119'-0"	1	Hallway and Stairwell	I	2
		AB	119'-0"	5	Hallway	I	2
20	Cable Area, RB Personnel Access Area IB El. 119'	IB	119'-0"	5	Personnel Access Area	I	3

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TABLE 1

Fire Detection Zones To Be Installed  
To Compy With The FPPR\*

Zone No.	Zone Description	Zone Designation In FPPR			Name of Zone	Type Of <sup>1</sup>	Control Module
		Bldg.	Elevation	Zone		Detection	
21	Intermediate Building Cable Areas El. 119'	IB	119'-0"	3	Pressurizer Control Cabinet Area	I	3
		IB	119'-0"	4	Heating and Ventilation MCC Area	I	3
22	Intermediate Building Cable Areas El. 119'	IB	119'-0"	1	Leak Rate Test Area	I	3
		IB	95'-0"	2	Industrial Cooler Room	I	3
23	A-D Reactor Coolant Pumps	RB	95'-0"	2	Reactor And Primary System Compartment	T	1
24	A-D Reactor Coolant Pumps	RB	95'-0"	2	Reactor and Primary System Compartment	T	1

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\* FPPR - Fire Protection Program Review

Notes: 1. I - Ionization (POC) Detectors

T - Rate Compensation Thermal Detectors

LT - Linear Thermal Detector

2. The detectors provided in zones 4-9 apply to the FPPR zone 1 at elevation 119'-0" of the RB and zone 1 at elevation 160'-0" of the RB.