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50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
AUTH.NAME AUTHOR AFFILIATION
UHRIG,R.E. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards mod of 810605 submittal of conceptual design rel emergency operations facility.

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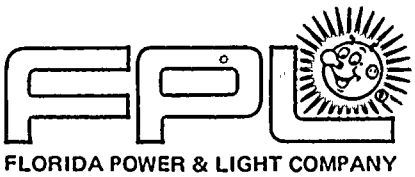


FLORIDA POWER & LIGHT COMPANY

October 8, 1981
L-81-441

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

Dear Mr. Eisenhut:

Re: St. Lucie Units 1 & 2
Docket Nos. 50-335 & 50-389
Post TMI Requirements for the
Emergency Operations Facility

Although we have to date received no written reply to our sumittal of June 5, 1981, we did meet in Bethesda with members of the Division of Emergency Preparedness Development Branch staff on May 21, 1981 prior to our submittal and on August 12, 1981 subsequent to the submittal.

In the August 12 meeting the staff after having just completed a review of our submittal indicated that a number of changes would be required to that portion of our conceptual design dealing with the placement of our EOF in order for the staff to support our concept in their recommendation to the Commission (in accordance with Generic Letter 81-10, if the licensee desires to locate the EOF beyond 20 miles, specific approval by the Commission is required).

Attached herewith is a modification of our previous submittal which reflects a change in our conceptual design with respect to the EOF.

In light of the significant scope of this effort, your expeditious review of this matter is requested.

Very truly yours,

Robert E. Uhrig

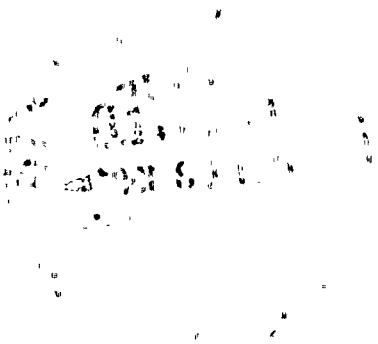
Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/HDJ/ah

Attachment

cc: Mr. James P. O'Reilly, Director, Region II
Harold F. Reis, Esquire
Mr. S. Ramos, Region II

A044
S-1



I. FACILITY CONCEPTUAL DESCRIPTION

The Florida Power and Light Company has established a five level hierarchy of functions essential to effective emergency operations:

- Funding
- Policy, Public Information, and Executive Government Liaison
- Management, Resources, Technical Support, Public Health & Safety and on scene government liaison
- Day to day plant operation and maintenance
- Hands-on minute-to-minute operation

The FPL Emergency Organization is a strong line organization in which responsibility for each of these five functional areas is placed on a single person, with the exception that extensive funding responsibility is legally required to remain with the Board of Directors.

The emergency organization is headed up by the Emergency Control Officer, a Vice President, who has been assigned responsibility for Policy, Public Information and Governmental Liaison at the executive level. Accident management, resources, technical support and public health and safety are the responsibility of the Recovery Manager, a Senior Operating Manager. The Plant Manager is relieved of administrative details and is responsible for day to day operations and maintenance of the unit in trouble. The Nuclear Plant Supervisor, commonly called the Shift Supervisor, remains responsible for minute-to-minute operations with assistance from the Technical Support Center.

When an emergency is declared, the Nuclear Plant Supervisor as Emergency Coordinator notifies the Emergency Control Officer who then mobilizes the emergency organization to the extent he deems advisable. Until the Emergency Operations Facility (EOF) is manned, the Emergency Control Officer directs emergency operations from the General Office Building. The Emergency Operations Facility would be activated by local FPL personnel within approximately an hour after the decision to activate it. It would be staffed over a 3-5 hour period. The Recovery Manager is the EOF Director and is the line manager in command of emergency and recovery operations. Within the policy set by the Emergency Control Officer, the Recovery Manager is responsible for command and control decisions for the emergency and recovery.

1. TECHNICAL SUPPORT CENTER

The Technical Support Center (TSC) will be located in a 1924 square foot room adjacent to the Control Room. Desks and office space will be provided for the NRC, and sanitary facilities will be available.

2. EMERGENCY OPERATIONS FACILITY

The EOF will be located in Stuart, Florida, 10.6 miles south of the Plant. The design of this facility is incomplete at this time; however, it will meet the intent of NUREG-0696 and provide for effective management of overall FPL emergency response, coordination of radiological and environmental assessment, determination of recommended public protective actions, and coordination of emergency response activities with Federal, State and agencies.

The Recovery Manager will command the EOF and when notified by the Recovery Manager, designated managers with responsibility for the following functional areas will either be stationed or represented in the EOF.

Operations

Engineering

Radwaste

Health Physics

Personnel

Security

Nuclear Analysis

Scheduling

Procurement

Accounting

Administration

Licensing

State-County Coordination

In addition, public information and governmental affairs managers will be represented.

Desk space will also be provided for State of Florida and NRC representatives in the EOF and private offices will be set aside for their exclusive use.

An area in clear view of the data displays will be set aside with a conference table so that progress of the accident can be observed, discussions held, and rapid decisions made.

3. EOF COMMUNICATIONS

Exclusive FPL Bell Telephone tie lines will connect the EOF to division offices, power plants and the Corporate Offices. In addition, dedicated private telephone lines will be provided to the TSC, Control Room and Plant Manager's office.

Three CRT displays of plant parameters will be available in the EOF. Computer terminals, teletype and facsimile equipment and access to the State Local Government Radio (LGR) and Health and Rehabilitative Services (HRS) radio networks will also be provided. In addition, the private office that has been set aside for the NRC will have telephone communications specified by NUREG-0696 for the NRC staff.

4. PRESS

Facilities have been provided to accommodate a limited number of press representatives at the nearsite Emergency News Center which would be used to brief small groups of reporters. Larger facilities are available if needed for regular briefings of media representatives at the Jensen Beach Holiday Inn south of the Plant on Hutchinson Island.

5. STATE OF FLORIDA

In the event of an accident at the St. Lucie Plant, the South Florida Area Emergency Operations Center (EOC) at Jupiter would be the state command center. This center is 25 miles south of the EOF and 35 miles south of the

St. Lucie Plant. Local monitoring teams would be directed from the State of Florida Mobile Emergency Radiological Laboratory (MERL). This van, operated by the State Division of Health and Rehabilitative Services, is headquartered in Orlando, and would be immediately deployed to the White City Substation, approximately five miles west of the Plant where power and communication connections have been provided. Communications with the MERL will be by telephone, facsimile and two radio channels, both of which will be accessible from the EOF.

6. TRANSPORTATION

Witham Field, located about two miles from the EOF, is a general service airport which has helicopter landing facilities. The Miami General Office is equipped with a helicopter landing pad on the roof and a dedicated landing pad is located at the plant site. Executives and engineers are routinely transported from the General Office to the plant site. Our experience has been that there are, on the average, only 3 to 4 days a year when weather would prevent using helicopter transportation. Shuttle surface vehicles will be provided for non-priority transportation and messenger service and to supplement the helicopter service. There is now a daily private messenger service serving the Plant and the General Office daily.

7. Summary

It is therefore, FPL's opinion that the proposed EOF contains the space, communications, information access and accessibility to appropriate personnel to allow the effective management of emergency response. The ability of the press to gather and accurately disseminate information and the radiological monitoring activities of the State are also included as part of the overall plan.

II. ADDITIONAL INFORMATION

The following responses are numbered to correspond to the specific additional information requests in the NRC February 18, 1981 letter. (Generic Letter 81-10)

(1) ST. LUCIE UNIT 1 INDIVIDUAL TASK FUNCTIONS

Staff Functions	Plant Position Title
TSC Supervisor	Operations Superintendent or his alternate
Communication	Support Staff
Offsite Dose Assessment	Chemistry Supervisor
Radiological Surveys	Health Physics Supervisor
Chemistry/Radiochemistry	Chemistry Supervisor
Technical Support/Repairs and Corrective Action	Shift Technical Advisor Department Supervisor Maintenance Superintendent Quality Control Supervisor
Radiation Protection Actions (In-Plant)	Health Physics Supervisor

Support staff will be called in as needed by their supervisors. Personnel called in to perform emergency response functions are expected to arrive at their designated emergency response facility within a 45 minute to 90 minute time frame (after notification from the plant).

(2) The Safety Assessment System will provide the Safety Parameter Display System (SPDS) display and all other data required in the Control Room, Technical Support Center (TSC) and Emergency Offsite Facility (EOF). (See Attachment B for detailed generic description of the display system for the SPDS).

The TSC will have at least two color CRT's, a data logger and a console. The equipment shall receive data needed in the TSC to analyze plant conditions without interrupting the plant operation. It will be possible to access the high level display (SPDS) in all modes of operation. The operation of the TSC equipment will not degrade performance of any Safety System equipment or displays. The quality and accuracy of the instruments used will be of the same design as used for SPDS in the Control Room. The overall system reliability shall be designed to achieve an unavailability goal of 0.01 during all operations above cold shut down.

(3) A conceptual design for the TSC power supply is presently being developed. There are several possible power sources being considered but the final decision has not been made at this time. FPL will meet the intent of requirements set forth in NUREG-0696.

(4) The SPDS portion of the TSC display system is explained in Section 3.0 of the Generic Conceptual Design of the Safety Assessment System attached. In addition, the data system will have all available variables needed to follow the course of an accident. Data display system and print out devices shall be adequate to provide TSC personnel unhindered access to sufficient data to perform their assigned tasks.

The TSC display will include plant system variables, radiological variables, meteorological information and offsite radiological information. Trend graph and time history capability will be provided. Selected control wire diagrams and as built drawings will be supplied.

(5) Data transmission between TSC and the Control Room will be via RS-232 or equivalent link with appropriate error checking.

(6) The Safety Assessment System will be capable of transmitting all the TSC data and meteorological data to the EOF. The EOF shall be provided with facilities for data acquisition, display and evaluation of radiological, meteorological and plant data to determine offsite protective measures. It will have all the SPDS functions, and all other data available in the Technical Support Center.

SAFETY ASSESSMENT SYSTEM

GENERIC CONCEPTUAL DESIGN DESCRIPTION

FOR

SAFETY PARAMETER DISPLAY

1.0 GENERAL CONSIDERATIONS

The Safety Assessment System (SAS) meets the requirements of the Safety Parameter Display System (SPDS). This report describes that portion of the SAS which meets the SPDS requirements of NUREG-0696. It provides a centralized, flexible, computer-base data and display system to assist control room personnel evaluating the safety status of the plant. This assistance is accomplished by providing the operator and other Emergency Response Facilities (ERFs) a high-level graphical display containing a minimum set of key plant parameters representative of the plant safety status.

All data displayed by the SAS is validated by comparing redundant sensors, checking the value against reasonable limits, calculating rates of change, and/or checking temperature versus pressure curves.

All displays of the SAS have been carefully designed by persons with plant operating experience and evaluated against human factors design criteria. The concepts used in the SAS design will be verified using data

recorded from a similar power plant simulator. The intent of the SAS is to present to the control room personnel a few easily understandable displays which use color coding and pattern recognition techniques to indicate off-normal values. These displays are updated and validated on an essentially real time basis.

The SAS will be operable during normal and abnormal plant operating conditions. The SAS will operate during all SPDS required modes of plant operation. The normal operation mode will encompass all plant conditions at or above normal operating pressure and temperature. When the reactor coolant system is intentionally cooled below normal operating values, the operator will select the Heatup-Cooldown mode which alters the limit checking algorithm for the key parameters. An additional mode may be provided to address concerns of cold shutdown plant conditions.

2.0 DISPLAY HARDWARE LOCATIONS AND OPERATION

The SPDS portion of the SAS may be implemented on a CRT located in an area of the control room visible to the control room operator and the Senior Reactor Operator. This CRT contains the high-level display from which the overall safety status of the plant may be assessed. A dedicated function button panel allows the operator to select any of the high level displays and various supporting displays at any time.

The SAS has been designed such that control room personnel can utlize its features without requiring additional operations personnel.

The SAS displays will be provided to other ERFs such as the Technical Support Center and Emergency Operations Facility.

3.0 DISPLAY CONTENTS

The primary display consists of bar graphs of selected parameter values, digital status indicators for important safety system parameters and digital values. The parameters indicated by bar graphs and digital values include: RCS pressure, RCS temperature, pressurizer level, steam generator levels and steam generator pressures. Status indicators are provided for containment environment and secondary system radiation. Reactor vessel level (if available), core exit temperature, amount of subcooling and containment radiation are indicated by digital values.

In addition, there is a message area for an appropriate secondary display providing information related to off-normal value or event detection.

The bar graphs indicate wide-range values and if a parameter is outside its normal range the bar color will change. The direction (increasing or decreasing) of change is indicted by an arrow.

During normal operation, the message area will be used to display average power, reactor core average temperature, date, time, and unit time. These messages may be displaced by higher priority messages as required.

Trend graph groups of selected related parameters, showing the last thirty minutes of plant operation are available.

4.0 HUMAN FACTORS CONSIDERATIONS

Human factors engineering and industrial design techniques have been effectively combined in accord with established man-machine interface design requirements to maximize system effectiveness, reduce training and skill demands, and minimize operator error.

The CRT color graphic formats and functional key board designs have been developed through an interdisciplinary team of senior operational, human factors, industrial design and computer interface personnel.

Minimum use of color, combined with simplified format throughout the CRT presentation, have been key design features to provide both normal and off-normal pattern recognition. The operator, who is the end user, has been directly involved from the conception to insure that man-machine interface goals of SAS have been satisfied. The human factor engineering standards and testing verification methods which have been used are consistent with accepted practices.

5.0 VERIFICATION AND VALIDATION

The SAS is implemented on a digital computer system. The display software that controls the sensor data, key parameter construction and display

formats have been developed under strict verification and validation. The functional specification of the software was started 18 months ago by a technical committee comprising members from several utilities and their consultants. The functional specifications are being transformed into a design specification. Reviews of the design specification will assure conformance of the SPDS portion of SAS to those functions discussed in NUREG-0696.

During the course of software development, a set of static test cases will be developed which test the key features of each software module. Furthermore, static system test cases will be developed and used to verify the correct operability of the total system. A set of dynamic test cases will be generated by recording nuclear simulator data on magnetic tape from a number of different plant transients which test the dynamic behavior of the system under "real" conditions. A design review that compares these test results to the original functional and design specifications will be performed. A selected number of the static test cases will be "frozen" such that they could be used to verify future changes to the software. In summary, verification and validation is addressed and designed into the SAS software from the beginning to provide a highly reliable product and a mechanism for identifying and controlling future changes.