



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report No.: 50-302/90-01

Licensee: Florida Power Corporation
3201 34th Street, South
St. Petersburg, FL 33733

Docket No.: 50-302

License No.: DPR-72

Facility Name: Crystal River 3

Inspection Conducted: January 8-12, 1990

Inspector: Paul J. Fillion 1/25/90
P. J. Fillion Date Signed

Approved by: M. Conlon 1/25/90
T. Conlon, Chief Date Signed
Plant Systems Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This special, announced inspection was conducted in the areas of design basis document programs with emphasis on electrical systems.

Results:

In the areas inspected, violations or deviations were not identified. Using electrical systems as an object of inspection, it may be concluded that the licensee's Enhanced Design Basis Document Program is proceeding according to schedule, as submitted to the NRC.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *K. B. Baker, Manager, Nuclear Configuration, Management
- *A. E. Friend, Nuclear Principal Licensing Engineer
- *R. H. Pinney, Manager, Nuclear Engineering Assurance
- *R. P. Schmiedel, Supervisor, Nuclear Configuration Management, (Electrical)
- *D. A. Shook, Manager, Nuclear Electrical/I&C Engineering
- *G. R. Westafer, Director, Quality Programs
- M. Rahman, Senior Nuclear Electrical Engineer
- G. W. Castleberry, Senior Nuclear Electrical Engineer
- J. R. Maseda, Supervisor (Acting), Nuclear Electrical Engineering

Other licensee employees contacted during this inspection included engineers, security force members, technicians, and administrative personnel.

*Attended exit interview

2. Enhanced Design Basis Document Program

The nuclear industry has recognized for some time that most utilities do not have in their possession all of the design basis information for their plants because the information is scattered at different companies involved in the construction of the plant. This situation has led to problems at operating plants. Upper level management at Crystal River Unit 3 (CR3) saw the need to create an Enhanced Design Basis Documents (EDBD) Program. An EDBD is a statement of the design basis for a particular system. It concisely states the design requirements for the system and individual major components. Each requirement has a stated reason which is supported by a valid source document.

CR3 has completed two pilot EDBD's, the Decay Heat Removal System and the Main Steam System. These pilot EDBD's served to crystallize the methodology before starting the approximately 35 other EDBD's. Three EDBD's now being prepared are:

- AC Power System
- DC Power System
- Emergency Diesel Generator Power System

The scope of this inspection was to review the "Logic Trees" for the three systems mentioned above. A "Logic Tree" is the first stage in the development of an EDBD. "Logic Trees" outline (in an easy to understand visual format) the regulatory requirements, safety functions, and major

component ratings for the subject systems. A separate "Logic Tree" is developed for each design scenario. For example, three "Logic Trees" were created in support of the AC Power System EDBD: (a) Power from grid, (b) power from on-site source, and (c) blackout condition. Typical components appearing in the "Logic Trees" are: Transformers, circuit breakers, voltmeters, batteries, inverters and diesel generator auxiliary equipment. Even though the "Logic Trees" are a tool in the development of an EDBD, they have potential for future use, and will be permanently maintained along with the EDBD.

The objective of the inspection was to gain greater understanding of the enhanced design basis document process. This is essential because the EDBD will play an important role in future operational activities such as plant modifications, 50.59 reviews, reporting requirements, etc. The NRC also realizes that the EDBD process holds the potential for identifying areas where the original design basis was not as solid as it should have been.

The inspection started with a careful review of the "Logic Trees" for the AC, DC and EDG Power Systems. Questions and comments were then discussed with the Manager, Configuration Management and the Supervisor, Nuclear Configuration Management. Some of the discussion centered around the limits or bounds that must necessarily be imposed on an EDBD. Where the bounds are placed will ultimately affect the usefulness of the document. As previously stated, "Logic Trees" contain statements about regulatory requirements for a system. Examples of legal requirements not explicitly stated on the "Logic Trees" are: Appendix R to Part 50, Equipment Qualification (50.49), seismic adequacy, single failure criteria, and certain industry codes and standards. This class of requirement is referred to in the CR3 EDBD Program as "Relevant Design Topics," and these will be listed in the EDBD document. What has not yet been fully defined and decided is the extent to which compliance with these "Relevant Design Topics" will be validated in the validation stage. One approach under consideration is to make a separate EDBD type document for each "Relevant Design Topic." This would be an extension to the program as now defined, and would be put at the tail end of the EDBD program schedule.

CR3 has not yet decided how motors will be treated in the EDBD program. At present, motors do not appear in the electrical systems "Logic Trees," nor do they appear in the pilot EDBD's for mechanical systems containing pumps and valves. Almost certainly, motors will have to be included in the EDBD Program, but the extent to which their design function will be validated is uncertain.

Control circuits are unique to electrical systems in that they are not analogous to anything in a mechanical system. A control circuit is not hardware; it is the embodiment of the logic necessary to fulfill a design function. To describe the design philosophy used to design the control circuits or to validate the control circuits function is outside the scope of CR3's EDBD Program.

The EDBD's for the AC, DC and EDG Power Systems will be issued on or before March 31, 1990, and the validation phase will be completed by October 1990. Separate from the EDBD Program, the licensee is also carrying out an Electrical Calculation Enhancement Program. The calculation program is in progress, and is scheduled for completion by March 1991.

To summarize, the NRC has an interest in EDBD programs, such as that being implemented at CR3. The inspection objective of gaining insight and understanding of the EDBD process was accomplished. A complete understanding cannot be achieved until the EDBD's themselves are complete, because certain aspects have not yet been decided by the licensee. In situations where necessary support documents are not available or appear to be inadequate, the subsequent reconstitution will be in-depth; and therein lies the potential for revealing problems.

3. Exit Interview

The inspection scope and results were summarized on January 12, 1990, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. Proprietary information is not contained in this report.