St. Lucie Unit 2
Docket No. 50-389
Proposed License Amendment
Deletion of Movable Incore Detector
Option from Technical Specifications

ATTACHMENT 1

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INSTRUMENTATION

INCORE DETECTORS

LIMITING CONDITION FOR OPERATION

3.3.3.2 The incore detection system shall be OPERABLE with:

a. At least 75% of all incore detector locations, and

b. A minimum of two quadrant symmetric incore detector locations per core quadrant.

An OPERABLE incore detector location shall consist of a fuel assembly containing a fixed detector string with a minimum of three OPERABLE rhodium detectors ~~or an OPERABLE movable incore detector capable of mapping the location.~~ delete

APPLICABILITY: When the incore detection system is used for:

a. Recalibration of the excore axial flux offset detection system,

b. Monitoring the AZIMUTHAL POWER TILT,

c. Calibration of the power level neutron flux channels, or

d. Monitoring the linear heat rate.

ACTION:

a. With the incore detection system inoperable, do not use the system for the above applicable monitoring or calibration functions.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.2 The incore detection system shall be demonstrated OPERABLE:

a. By performance of a CHANNEL CHECK within 24 hours prior to its use and at least once per 7 days thereafter when required for:

1. Recalibration of the excore axial flux offset detection system,

2. Monitoring the linear heat rate pursuant to Specification 4.2.1.3,

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EVALUATION OF PROPOSED TS CHANGE

EVALUATION OF PROPOSED TS CHANGES

Introduction

Florida Power and Light Company (FPL) proposes to change the St. Lucie Unit 2 Technical Specifications (TS) for Incore Detector Instrumentation. The revision will delete the use of movable incore detectors as an alternative means of determining operability of an incore detector location. Removing this option will allow FPL to delete the Movable Incore Detection System from the existing plant design.

Description of Change

TS 3.3.3.2 states, "The incore detection system shall be OPERABLE with: a. At least 75% of all incore detector locations, and b. A minimum of two quadrant symmetric incore detector locations per core quadrant. An OPERABLE incore detector location shall consist of a fuel assembly containing a fixed detector string with a minimum of three OPERABLE rhodium detectors, or an OPERABLE movable incore detector capable of mapping the location." TS 3.3.3.2 will be revised by deleting "or an OPERABLE movable incore detector capable of mapping the location".

Background

The Incore Instrumentation System is provided with fixed and movable detectors for monitoring the neutron flux distribution within the reactor core. The fixed and movable systems are designed to perform the following functions:

a) To provide data sufficient to determine the gross power distribution in the core during different operating conditions from 20 percent to 100 percent power;

b) To provide data to estimate fuel burnup in each fuel assembly; and

c) To provide data for the evaluation of thermal margins in the core.

The incore system is used to assist in the calibration of the excore neutron detectors by providing azimuthal and axial power distribution information. However, it is not used for automatic protective or control functions. Protective/control functions based on neutron flux are provided by the excore neutron detector systems.

The Fixed Incore Detector System (FICDS) contains 56 instrument assemblies inserted into selected fuel assemblies to provide a uniform radial distribution of detector locations within the reactor core. Each instrument assembly contains four self-powered Rhodium neutron detectors (fixed instruments) positioned at axial locations corresponding to 20, 40, 60 and 80 percent of active core height. This arrangement of "fixed detector strings" permits representative three dimensional mapping of the incore neutron flux.

The Movable Incore Detector System (MICDS) consists of two fission chambers and associated hardware which is designed to position the movable detectors at selected locations within any of the 56 fixed instrument assemblies via Dry Calibration Tubes. The MICDS is designed as a redundant system which can provide a neutron flux map independent of the fixed detector system. The MICDS can be controlled by the Digital Data Processing System (DDPS) to provide an automatic mapping capability.

The MICDS is not a safety-related system and was included in the St. Lucie plant design as a backup to the FICDS. Specific functions for which the MICDS could be used to back up the FICDS include detection/verification of fixed detector failures, confirmation of power distribution anomalies measured by the fixed detectors, and substitution for failed fixed detectors. In addition, the MICDS could be used to calibrate the fixed detectors.

The major components of the MICDS are two (2) cable assemblies (movable fission chamber detectors), two (2) drive assemblies (detector positioning devices), and two (2) transfer assemblies (fuel bundle selecting devices). Each drive assembly functions to push or pull the cable assembly via guide tubes, thereby moving the detector to pre-determined locations into or out of the core. Each transfer assembly functions to route the cable assembly into any one of 28 associated pathways. The drive assemblies are physically located on the reactor vessel missile shield. The other equipment is located below the missile shield near the reactor vessel head.

Justification for TS Change

Experience with the FICDS has shown that the Rhodium detectors completely satisfy the Incore Instrumentation design functions over their typical design life of two fuel cycles. On-line calibration of these detectors is accomplished by means of a well-established Rhodium detector sensitivity depletion correlation implemented via the DDPS. The minimum complement of equipment specified in TS 3.3.3.2 for the FICDS ensures that the measurements obtained from use of the Incore

Instrumentation System accurately represent the spatial neutron flux distribution of the reactor core.

As a result of FICDS operating performance, the MICDS has never been used at St. Lucie to assist in meeting the operability requirements for incore detector locations, and the absence of correlation data between fission chambers and Rhodium detectors precludes use of the MICDS as a routine calibration tool. Therefore, the MICDS has become obsolete and is no longer a practicable backup system for the FICDS.

During each refueling outage, the tubing from the drive machines must be disconnected, the drive machines must be lifted clear of the reactor vessel head area by crane, and the 56 head connections must be disconnected at the vessel head instrument flanges to facilitate reactor disassembly. This process is then reversed during reactor reassembly. The radiation exposure from these tasks is an ALARA concern and the performance time is critical path work. Since the MICDS is not safety-related and is not required to accomplish the Incore Instrumentation design functions, FPL considers that the burden of maintaining the MICDS as an option for incore instrumentation is not justified by any safety significance or other operational need.

The proposed amendment will delete the TS reference to a system that is not used for plant operation nor required for reactor safety, and will thereby obviate the burden (personnel radiation exposure, critical path outage time, spare parts inventory) associated with maintaining the MICDS as an option for incore instrumentation. Therefore, FPL has concluded that the proposed amendment is acceptable.

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DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Pursuant to 10CFR50.92, a determination may be made that a proposed license amendment involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. Each standard is discussed as follows:

(1) Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed license amendment will remove the option of using movable neutron detectors to determine incore instrumentation system operability. Removing this option will thereby support deleting the Movable Incore Detector System (MICDS) from the present plant design. The MICDS is a passive system designed only as an alternative method of monitoring the local neutron flux within the reactor core and does not perform automatic interlock, control, or protective functions. Removal of this passive system can not increase the frequency of occurrence of a neutron flux/power anomaly since the incore detectors are not accident initiators.

Criteria established in the facility Technical Specifications (TS) for monitoring core performance remain unchanged by this proposed amendment. The MICDS is merely a backup system to the Fixed Incore Detector System (FICDS) which will continue to be used, in conjunction with the excore detector systems, to adequately monitor the reactor power distribution. Assumptions made for core power distributions in previously evaluated accidents are not changed nor will they be impacted by removal of the MICDS.

Therefore, operation of the facility in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

(2) Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

Since the MICDS is a passive system, deletion of the MICDS will not produce any new types of failure. Equipment important to safety will continue to perform their safety functions as previously evaluated and will not be affected by this proposed amendment.

Therefore, operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

(3) Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety.

The movable incore detectors are not relied upon for any automatic protective functions and are considered non-safety related. The MICDS only provides flexibility in determining operability of the Incore Instrumentation System. Deletion of the movable detector option from the TS only removes this operational flexibility.

The basis for incore instrumentation operability is unaffected by this change since the minimum complement of equipment (percentage of incore locations operable and core symmetry requirements) to satisfy the Limiting Conditions for Operation remains unchanged. The MICDS is not required to monitor or otherwise evaluate existing margins of safety for plant operation.

Therefore, operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety.

Based on the discussion presented above and on the supporting Evaluation of Proposed TS Changes, FPL has concluded that this proposed license amendment involves no significant hazards consideration.