



**Duke Energy**

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February 5, 2002

U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
ATTENTION: Document Control Desk

SUBJECT: Duke Energy Corporation  
Docket No(s). 50-269, -270, -287  
Oconee Nuclear Station Units 1, 2, and 3  
Documentation of discrepancies between Duke  
Energy Automatic Feedwater Isolation System  
(AFIS) submittal and Nuclear Regulatory  
Commission Safety Evaluation Report dated  
September 26, 2001

Duke Energy Corporation (Duke) has reviewed the Safety Evaluation Report (SER) for Amendment 320, 320, and 320, related to installation of an Automatic Feedwater Isolation System at Oconee Nuclear Station (ONS). Duke noted minor discrepancies between Duke documentation and the SER. These discrepancies are documented in the Attachment.

Duke had planned to complete the AFIS modification on Unit 3 during the 2001 fall outage. However, prior to the outage, Duke decided to delay installation of AFIS on Unit 3 to resolve a single failure concern identified during an independent review. The concern identified was that a random failure of a transistor in a logic module board of an AFIS channel could cause a trip contact to close, which would result in one AFIS channel actuating. The worst case event would result in isolation of the main feedwater and steam driven EFW sources. The motor driven EFW would remain available; however, the isolation of main feedwater would result in a reactor trip. Duke now plans to install AFIS on Unit 1, 2 and 3 during U1EOC20, U2EOC19, and U3EOC20 respectively. The Unit 1 outage is scheduled to begin March 21, 2002.

Design changes made to resolve the single failure concern have no impact on the proposed Technical Specifications for AFIS. The design change adds a logic module (STAR module)

A001

to each digital channel. Prior to the design change, a single STAR module was to monitor for a two out of four condition in each of the two AFIS channels, and actuate AFIS from either of the two channels. In the redesign, each of the two channels has redundant processors that receive the inputs in parallel and produce the trip outputs in series. In this configuration a random failure of one of the STAR modules will not result in a spurious AFIS actuation or preclude a valid AFIS actuation.

Duke plans to make minor changes to the TS Bases to clarify that each digital channel contains two logic modules. The Bases will clarify that each logic channel of the low steamline pressure function consists of two STAR modules: a Trip Module and a Trip Confirm Module. These Modules are configured in a 2/2 arrangement. If either of these modules is failed in a trip condition, then the digital channel is considered inoperable since it no longer meets UFSAR Criterion 19.

Inquiries on this matter should be directed to Boyd Shingleton at (864) 885-3364.

Very truly yours,



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U.S. Nuclear Regulatory Commission  
February 5, 2002  
Page 3 of 4

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**ATTACHMENT**

**Discrepancies between Duke Energy AFIS Submittals and  
Nuclear Regulatory Commission Safety Evaluation Report**

## Attachment

### **Discrepancies between Duke Energy AFIS Submittals and Nuclear Regulatory Commission Safety Evaluation Report**

#### **SER, Page 2, paragraph 4 states:**

Manual isolation of EFW was assumed in the MSLB design basis analysis because the existing MSLB detection circuitry did not meet all the protection system criteria set forth in IEEE Std 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations."

#### Clarification:

The MSLB detection circuitry was not part of the original design basis. This circuitry was installed in the fall 1995 outage and the spring and fall 1996 outages for Units 1, 2, and 3. When it was installed it did not meet all the protection system criteria set forth in IEEE Std 279-1971.

#### **SER, Page 3, paragraph 3, last sentence states:**

Although the MFW isolation function closes these valves, the ONS licensing analysis does not credit this MFW isolation function for limiting the mass and energy released into the containment and minimizing the resulting containment pressurization.

#### Clarification:

The ONS licensing analysis credits the automatic closure of the control valves for limiting the mass and energy release. No credit is taken for automatic closure of the block valves. The sentence should be revised as follows to clarify this:

Although the main and feedwater block valves are automatically closed, they are not credited for mitigation of a MSLB.

**SER, Page 5, last paragraph, last two sentences state:**

The evaluation concluded that the design of the MSLB isolation system was acceptable because the design basis and most limiting MSLB for Oconee does not rely on automatic MFW isolation. This formed the basis of NRC approval for crediting the MSLB isolation system and for allowing the use of equipment that does not fully satisfy the criteria for safety-related applications.

**SER, Page 6, first paragraph, 2<sup>nd</sup> bullet, last sentence states:**

Although MFW is isolated from the affected SG, the isolation is not credited in the licensing basis for mitigation of a MSLB because the isolation function does not use safety grade components and is not single failure-proof.

Clarification:

Duke credits MFW isolation using the control valves for the SG tube loading analysis and the containment response analysis. Therefore, this does not accurately reflect the licensing basis established by Amendment 315 and the associated Safety Evaluation Report (SER). Also, refer to related clarification for SER, Page 3, paragraph 3, last sentence.

**SER, Page 6, first paragraph, third sentence states:**

In addition, the Bases Section would be changed to indicate closure of these valves is also credited for a feedwater line break.

Clarification:

The automatic closure of the main and startup feedwater control valves is also credited for a feedwater line break event.

**SER, Page 12, Table 1 is entitled:**

Table 1. Environmental Qualifications for AFIS Equipment  
Located Outside the ONS Containment Building

Clarification:

The table title needs to be clarified. The environmental qualification conditions in the table are for AFIS equipment located in the Control Complex (control room, cable room, and equipment room). The Control Complex is located outside the containment building.

**SER, Page 15, Section 3.3.1.1, first paragraph, 5<sup>th</sup> sentence states:**

MFW isolation will continue to be provided by the MFW block valves and the MFW control valves, but the AFIS circuitry will make the isolation header-specific.

Clarification:

This is a true statement. However, the use of the MFW block valves for MFW isolation is not credited in the analyses.

**SER, Page 22 and 23, Section 3.4.1, last sentence states:**

Because of the likelihood of a MLSB event is small when steam pressure is less than 700 psig and the consequences are considered to be less severe, the licensee has determined that additional SG tube load analyses for this condition were warranted.

Clarification:

There is a typographical error in this sentence. The sentence should read: "Because the likelihood of a MLSB event is small when steam pressure is less than 700 psig and the consequences are considered to be less severe, the licensee has determined that additional SG tube load analyses for this condition were not warranted."

**SER, Page 26, Section 4.1.1, 7<sup>th</sup> and 8<sup>th</sup> sentences state:**

With SG levels maintained at 25-inch in the startup range during Mode 3 conditions, the SFCVs will not provide sufficient feedwater to the SGs to overcool the reactor coolant system or overpressurize the containment building in a MSLB event. The TS requirement to close all SFCVs, therefore, is not necessary.

Clarification:

Duke is uncertain of the origin of the information in the seventh sentence. This statement is not supported by Duke analysis and is not the basis Duke provided for changing the LCO Applicability to eliminate Operability requirements for the SFCVs when the unit is in MODE 3 and RCS pressure is < 700 psig. Duke provided the following justification in the July 18, 2000 License Amendment Request:

"The AFIS circuitry will be manually disabled when main steam pressure is below 700 psig. Manual operator action is credited for the mitigation of a MSLB when the AFIS circuitry is disabled. The plant is operated with main steam pressure less than 700 psig only during startup and shutdown evolutions. These evolutions are very short in duration."

"AFIS is not required in MODE 3 < 700 psig and is bypassed to avoid actuation during normal unit cooldowns."