Central Files

50-269
50-270
50-287

DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

May 21, 1979

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. R. W. Reid, Chief
Operating Reactors Branch #4

Re: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Sir:

Pursuant to my letter of April 25, 1979, Mr. W. S. Lee's letter of April 26, 1979, the NRC Order of May 7, 1979, and IE Bulletin 79-05B attached is a system design description for a safety grade anticipatory reactor trip on turbine trip or loss of main feedwater. Based on an examination of feedwater system related transients, it is not considered that a reactor trip on low steam generator level would be anticipatory and, thus, was not included in the submittal.

With regard to installation schedule, this modification will be installed on each unit the first refueling outage after 12 months following NRC approval of the design.

Very truly yours,

William O. Parker, Jr.

RLG:scs
Attachment

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SAFETY GRADE ANTICIPATORY

REACTOR TRIPS

Introduction

Duke Power Company will implement safety grade anticipatory reactor trips for the following events:

1. Turbine Trip
2. Loss of Main Feedwater

For the most probable causes of the above events, these anticipatory trips will operate in advance of the reactor coolant system (RCS) high pressure reactor trip, to reduce the peak RCS pressure and thereby reduce challenges to the power operated relief valve. These trips will be added to the Reactor Protective System (RPS).

Design Basis

The added safety grade protective system inputs are designed to monitor parameters which inherently allow these trips to operate in advance of the reactor coolant high pressure trip for turbine trip and main feedwater pump trip conditions. In each case, the fluid which initiates a trip signal to the main turbine or feedwater pump turbine stop valves is monitored as a reactor trip parameter. As the fluid pressure is reduced in order to allow the stop valves to close, a reactor trip signal is generated. Also, as a diverse indication of loss of main feedwater, feedwater pump discharge pressure will be monitored.

Four independent channelized safety grade pressure switches will be provided to monitor hydraulic fluid pressure for the main turbine and each of the two main feedwater pump turbines. Similarly, four independant channelized safety grade pressure switches will be provided to monitor feedwater pump discharge pressure. Each of these pressure switches will provide a direct input to the Reactor Protective System. Cabling for each of the input channels will be physically and electrically independent from the sensor to the RPS cabinets.

The cables and sensors used to implement the anticipatory reactor trips will be fully qualified for operation in the installed environment.

The reactor protective input channels will be designed to allow on-line testing to prove operability and demonstrate reliability.

Channel trip status and sequence will be provided in the control room to enable the operator to readily identify protective trip actions and initiating events.

Description

Anticipatory Reactor Trip Upon Turbine Trip:

The anticipatory reactor trip upon turbine trip is initiated by any two of four pressure switches mounted near the turbine in the Turbine Building. Each of these four pressure switches will be independently monitoring the hydraulic

fluid pressure in the turbine Emergency Trip System (ETS) header. When a turbine trip is initiated either electrically through the turbine Electrohydraulic Controller (EHC) or mechanically, the header pressure drops and thereby initiates a closure of the stop valves.

Each of the four pressure switches will send a trip signal to its respective RPS channel upon low header pressure. Upon receipt of any two of the four inputs the RPS will generate a reactor trip signal (see logic diagram).

A reactor flux level permissive is provided to facilitate startup and shutdown of the plant. This permissive automatically blocks the reactor trip upon turbine trip when reactor power is decreased below 20%. Upon power escalation as reactor power increases to above 20%, the bypass is automatically removed and the reactor trip reinstated.

Anticipatory Reactor Trip Upon Loss of Main Feedwater:

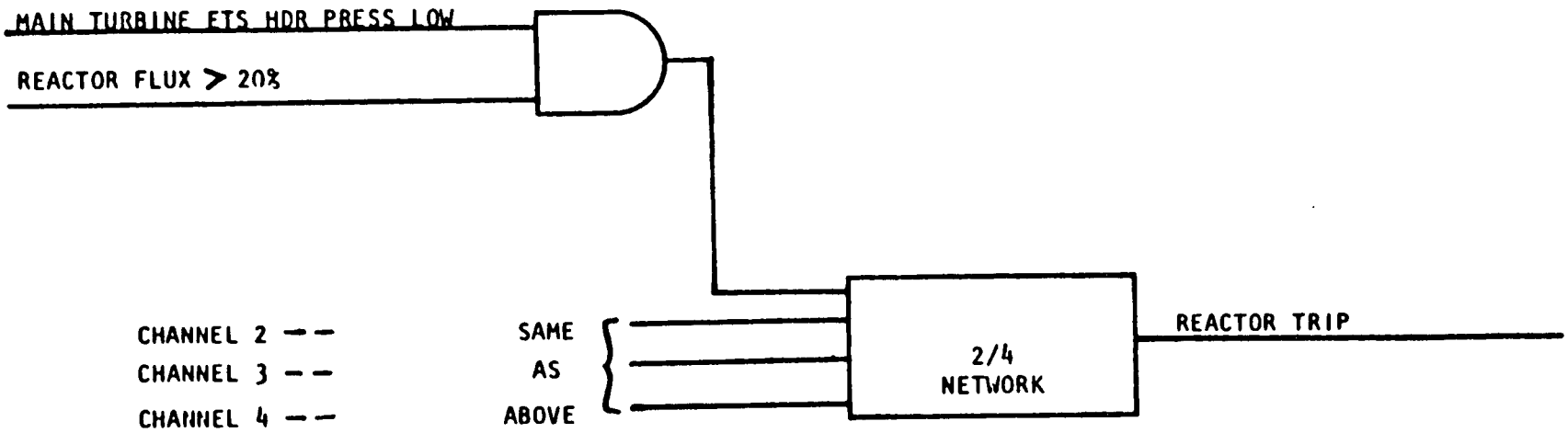
The anticipatory reactor trip upon complete loss of main feedwater utilizes eight pressure switches, mounted near each main feedwater pump in the Turbine Building. Four of these switches will monitor the hydraulic fluid pressure which actuates the turbine stop valves to open or close. When a main feedwater pump turbine trip is initiated, whether manually or automatically, the fluid pressure will drop, actuating the four pressure switches and closing the stop valves. The other four pressure switches per pump will actuate any time low discharge pressure is reached in the respective pumps discharge header.

Each RPS channel will receive a signal from one hydraulic fluid pressure switch and one discharge header pressure switch for each main feedwater pump. The RPS logic is arranged such that a channel trip will occur when a low hydraulic fluid pressure or low pump discharge header pressure condition exists for the A pump and a low hydraulic fluid pressure or low pump discharge header pressure condition also exists on the B pump. When two of the four RPS channels trip a reactor trip will be generated. (see logic diagram)

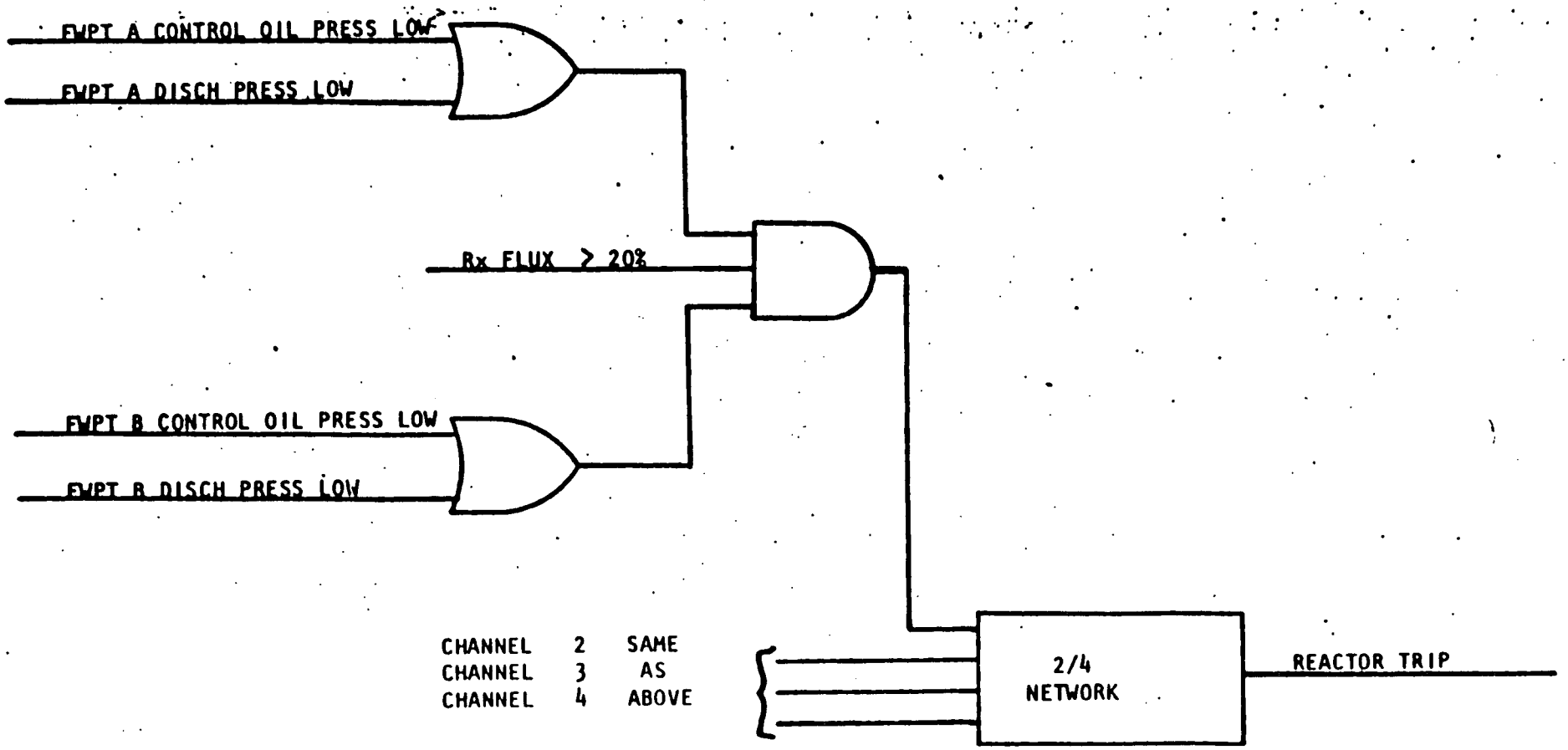
An automatic inhibit will be initiated into this logic arrangement when neutron flux falls below 20% full power value to prevent tripping of the reactor under these low power conditions. When the neutron flux passes upwards through the 20% setpoint, the inhibit is automatically removed and the trip circuit armed.

Schedule

The above described safety grade anticipatory reactor trips will be installed and the existing control grade trips removed at the first refueling shutdown after 12 months from receipt of NRC approval.



LOGIC DIAGRAM FOR SAFETY GRADE ANTICIPATORY TRIP ON LOSS OF MAIN TURBINE



LOGIC DIAGRAM FOR SAFETY GRADE ANTICIPATORY REACTOR TRIP ON COMPLETE LOSS OF MAIN FEEDWATER

ORB#4-199/79 w/inc.

William O. Miller, Chief
License Fee Management Branch, ADM

Date: JUNE 21, 1979
Amended Form Date: _____

FACILITY AMENDMENT CLASSIFICATION - DOCKET NO(S). 50-269, 270 & 287

Licensee: DUKE POWER CO.

Plant Name and Unit(s): OCONEE 1, 2 & 3

License No(s): DPR-38, 47 & 55 Mail Control No: 7905240478

Request Dated: MAY 21, 1979 Fee Remitted: Yes _____ No X

Assigned TAC No: 11852, 11853 & 11854

Licensee's Fee Classification: Class I ___, II ___, III ___, IV ___, V ___, VI ___, None X.

Subject: REVIEW REQUESTED OF SAFETY GRADE ANTICIPATORY REACTOR TRIP

Amendment No. _____ Date of Issuance _____

☒ 1. This request has been reviewed by DOR[illegible] in accordance with Section 170.22 of Part 170 and is properly categorized.

☐ 2. This request is incorrectly classified and should be properly categorized as Class ___. Justification for classification or reclassification: _____

☐ 3. Additional information is required to properly categorize the request:

☒ 4. This request is a Class III type of action and is exempt from fees because it:

(a) ___ was filed by a nonprofit educational institution,

(b) ___ was filed by a Government agency and is not for a power reactor,

(c) ___ is for a Class ___ (can only be a I, II, or III) amendment which results from a written Commission request dated _____ for the application and the amendment is to simplify or clarify license or technical specifications, has only minor safety significance, and is being issued for the convenience of the Commission, or

(d) ✓ other (state reason therefor): SUBMITTED BY DUKE PER REQUIREMENT OF NRC ORDER OF MAY 7, 1979

CC: Docket File(3)
Reactor File(3)
Exemption File
ORB-4(R.Reid)

MB Fairtile 6/21/79 R. W. Reid 6/21/79
Division of Operating Reactors/~~Project Management~~

☐ THE INITIAL FEE DETERMINATION HAS BEEN REASSESSED AND IS HEREBY AFFIRMED _____.

☒ The above request has been reviewed and is exempt from fees.

W O Miller
William O. Miller, Chief
License Fee Management Branch

7/5/79
Date

LFMB-6/78