

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:7909260360 DOC.DATE: 79/09/19 NOTARIZED: NO DOCKET #  
 FACIL:50-305 Kewaunee Nuclear Power Plant, Wisconsin Public Service 05000305  
 AUTH.NAME AUTHOR AFFILIATION  
 MATHEWS,E.R. Wisconsin Public Service Corp.  
 RECIP.NAME RECIPIENT AFFILIATION  
 SCHWENCER,A. Operating Reactors Branch 1

SUBJECT: Responds to NRC 790717 ltr w/degraded grid voltage questions.

DISTRIBUTION CODE: A0155 COPIES RECEIVED:LTR 1 ENCL 0 SIZE: 4  
 TITLE: Onsite Emergency Power Systems

NOTES: I & E - 3 CYS ALL MATL. LAWRENCE (OELD) - 1 CY ALL MATL.

	RECIPIENT ID CODE/NAME	COPIES		RECIPIENT ID CODE/NAME	COPIES	
		LTR	ENCL		LTR	ENCL
ACTION:	05 BC ORB #1	7	7	LA	1	0
INTERNAL:	<del>01 REG FILE</del>	1	1	02 NRC PDR	1	1
	12 TA/EDO	1	1	13 I&E	2	2
	15 OELD	1	1	16 MPA	1	1
	17 AUXIL SYS BR	1	1	18 I&C SYS BR	1	1
	20 ENGR BR	1	1	21 REAC SFTY BR	1	1
	22 PLANT SYS BR	1	1	23 ADV REAC BR	1	1
	24 PWR SYS BR	1	1	25 WAMBACH T	1	1
	26 TONDI,D	1	1	27 MCDONALD,D	1	1
	28 HANNON,J	1	1	29 BRINKMAN	1	1
	30 EEB	1	1	S HANAUER	1	1
EXTERNAL:	03 LPDR	1	1	04 NSIC	1	1
	31 ACRS	16	16			

SEP 28 1979

MA  
4

TOTAL NUMBER OF COPIES REQUIRED: LTR

51  
47 ENCL 0  
46

(6)

# WISCONSIN PUBLIC SERVICE CORPORATION



P.O. Box 1200, Green Bay, Wisconsin 54305

September 19, 1979

Mr. A. Schwencer, Chief  
Operating Reactors Branch #1  
Division of Operating Reactors  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Gentlemen:

Docket 50-305  
Operating License DPR-43  
Degraded Grid Voltage Questions

The following is our response to questions transmitted in the July 17, 1979, letter from C. M. Trammell to E. R. Mathews:

1. The set point of 80% for the 4160V bus is below the voltage range recommended by ANSI C84.1-1973 and most manufacturers. While postulating a degraded grid of 82% for an indefinite time, show by analysis that thermal damage will not occur to the safety related equipment.

RESPONSE: At the time of the design of the Kewaunee Plant undervoltage protection system, it was not a design consideration that operation at undervoltage conditions would continue for any long periods significant enough to cause motor damage. Thus, the undervoltage trip settings were set very low to primarily detect a loss of offsite power from the supplying transformer while avoiding unnecessary trips during motor starts. In light of the events at Millstone we raised the undervoltage setpoints to protect the safeguard motors from long term low voltage operation. The trip settings were raised to 87.5% of nominal (4160V) bus voltage. The operating voltage range of ANSI C84.1-1973 (nameplate motor voltage rating  $\pm 10\%$ ) is thus assured by our undervoltage relays since 4160V motors are purchased to 4000V and 480V motors are purchased to 460V. Safeguard motors at the Kewaunee Plant are purchased to exceed the standards ( $\pm 10\%$  rated voltage) established by NEMA criteria. The original proposed Tech Spec transmitted

A015  
5/10  
7909260 360

P

in our August 4, 1977, letter was intended for providing protection for all motors rated  $\pm 20\%$  of rated voltage. Since this condition has not been verified, the setpoint was raised to 87.5% of nominal voltage. Therefore, no analysis is necessary.

2. Please provide the voltage profile of the 480V and 120V busses at your chosen setpoint for fully loaded conditions.

RESPONSE: Fluor Power Services, our Architect-Engineer for the Kewaunee Plant, has been contracted to perform this analysis and the analyses requested in the August 8, 1979, letter from William Gammill to All Power Reactor Licensees that was prompted from the Arkansas Nuclear One event. We expect to have the results of those analyses for transmittal by October 10, 1979.

3. The intent of the NRC letter dated June 3, 1977, was that the second level undervoltage protection be part of the Class IE system. One of the criteria of the letter is that the modifications be designed to IEEE 279-1971. This includes Class IE qualification, testability, and redundancy. The modifications must meet all the criteria of the June 3, 1977, letter or some other justification must be documented.

RESPONSE: The undervoltage protective relays at Kewaunee are part of the Class IE system and comply with IEEE 279-1971.

4. Does the chosen time delay of "less than or equal to 2.5 seconds" preclude spurious trips of the off-site power when large safety related motors are started? Provide the results of the worst case analyzed. If spurious trips are expected justify your selection of the 2.5 second setpoint.

RESPONSE: Testing has been performed on sequence loading of safeguards loads onto the safeguard buses while supplied by the Diesel Generator. We consider the voltage drops caused by motor starting loads to be greatest for these conditions. Voltage returned to above the undervoltage trip setting of 87.5% in less than one (1) second for the largest load. Thus, no spurious trips are expected.

5. The proposed Technical Specification change for the second-level undervoltage protection is not acceptable. Staff position 1.f of the June 3, 1977, letter states that trip setpoints with minimum and maximum limits, and allowable values for second-level undervoltage monitors should be included. Also, provide the information regarding channel check, channel calibration, channel functional test, and operating modes in which surveillance is required in the proposed Technical Specification changes.

RESPONSE: As stated in response to Item 2, we are currently undergoing a worst case analysis that will finalize the value chosen for

the undervoltage trip setpoint. We anticipate this value to be  $\geq 87.5\%$  of nominal voltage. We cannot find a safety related reason to establish a maximum setpoint. From an operating standpoint of avoiding unnecessary undervoltage trips, we will maintain the trip setting as close as possible to the limit, taking into account instrument error. Since no safety basis for an upper voltage limit has been identified, none will be provided.

Our review of time delays indicates that the maximum and minimum values for time delay are dependent upon final selection of the trip setpoint and review of test data.

Diesel Generator surveillance is specified in existing Technical Specifications. The modified bases provides information that undervoltage relay testing is included in the specified Diesel Generator surveillance. Further delineation in the form of tables as shown in your draft specifications is unnecessary.

A revised proposal for Technical Specification change will be sent in upon completion of our review of the aforementioned analysis.

6. The intent of surveillance test 4.8.1.1.X.c, as shown in Enclosure 2 of the June 3, 1977, letter, is to verify load shedding and subsequent load sequencing on a diesel generator trip and restart. We require that this test be included in the surveillance requirements or provide reasons why it cannot be performed.

RESPONSE: We have reviewed our specific plant logic and cannot conceive of a possible scenario where this test would verify a required safety function. If the diesel is tied to the safeguard bus and is the only source of power available, the undervoltage relays are disabled and will not trip the diesel from the bus. If the diesel fails and trips due to a mechanical reason, the bus tie breaker will open as the diesel slows below 700 RPM and the undervoltage restoring scheme will search for a power source. Since mechanical failure of the diesel was the cause for failure, the diesel would not be functional even though the auto start feature will attempt to start the diesel. An electrical trip associated with the D/G source breaker is intended to detect a bus fault, in which case a bus lockout is initiated for protection of the power source. There are no other automatic tripping schemes which would be tested by proposed

Mr. A. Schwencer,  
September 19, 1979  
Page 4

surveillance. Therefore, the surveillance test proposed in item 4.8.1.1.X.c does not verify a safeguard function and only causes undue stress and fatigue on the diesel generator systems at Kewaunee.

Very truly yours,



E. R. Mathews, Vice President  
Power Supply & Engineering

snf