



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555  
August 5, 1988

Docket No. 50-255

Mr. Kenneth W. Berry  
Director, Nuclear Licensing  
Consumers Power Company  
1945 West Parnall Road  
Jackson, Michigan 49201

Dear Mr. Berry:

SUBJECT: ANTICIPATED TRANSIENTS WITHOUT SCRAM (10 CFR 50.62 ATWS RULE)  
(TAC NO. 59123)

Consumers Power Company provided information concerning the Palisades Plant proposed design conformance to the requirements of the subject rule by submittal dated June 30, 1987. The ATWS rule requires that the equipment/systems installed to prevent and/or mitigate the consequences of ATWS events be electrically independent of the existing reactor protection system (RPS) to ensure that faults within nonsafety-related ATWS circuits cannot degrade RPS circuits, and to minimize the potential for common mode failures (CMF) that could affect both RPS and ATWS circuits. Electrical independence of the diverse scram system (DSS) from the existing RPS should be provided from the sensor outputs up to and including the final actuation device. Electrical independence of the diverse auxiliary feedwater system (AFWS) actuation circuitry and diverse turbine trip system (DTT) from the existing RPS should be provided from the sensor outputs up to the final actuation device.

The matrix relays in the proposed Palisades DSS design receive power from the same 120 Vac vital instrument buses that provide power to the RPS. The use of shared power supplies for RPS and DSS components is not in conformance with the requirements of the ATWS rule. It is the NRC staff's understanding that Consumers Power Company had intended to use the existing RPS power supplies to provide power to the DSS matrix relays because of their high reliability, and considers the use of electrically independent supplies that may be somewhat less reliable to be poor engineering practice.

The intent of the ATWS rule is to require systems/equipment that are diverse (i.e., hardware/component diversity) from the existing RPS components, and which are capable of preventing and/or mitigating the consequences of an ATWS event. This diversity ensures that a CMF of identical components within the existing RPS that prevents a reactor trip by normal means will not also prevent the diverse ATWS prevention/mitigation systems from performing their design functions.

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The ATWS rulemaking process as documented in SECY 83-293, "Amendments to 10 CFR 50 related to Anticipated Transients Without Scram (ATWS) Events," recognized that existing RPSs were highly reliable. The largest contributor to RPS unreliability was shown to be a CMF of identical components. The diverse equipment to be installed for the prevention and/or mitigation of ATWS events, although required to perform in a reliable manner, was not required to be procured and installed as safety-related (Class 1E) equipment because it was determined that nonsafety-related diverse equipment (if properly maintained) had a sufficient degree of reliability to reduce the probability of unacceptable consequences from an ATWS event, P(ATWS), to an acceptable level. Providing power to both the RPS and ATWS prevention/mitigation system circuits from a common source results in an interface between the systems that is difficult to analyze and could potentially be a mechanism for CMFs to affect both systems (e.g., degraded voltage or frequency conditions). The ATWS rule requires that the power supplies for ATWS prevention/mitigation systems be electrically independent from the existing RPS power supplies to 1) prevent faults within nonsafety-related ATWS circuits from degrading the safety-related RPS, and 2) prevent interactions between the systems that could potentially compromise the added diversity by providing a means for CMFs to affect both the RPS and the DSS equipment installed to prevent unacceptable plant conditions given failure of the RPS.

The NRC staff has not approved any designs that share power supplies between RPS and ATWS circuits, except where the ATWS circuits are designed, procured and installed as a fully redundant and independent 4 channel safety-related (Class 1E) system (thus, exceeding ATWS rule requirements), and where an analysis has been provided that demonstrates that a CMF of the shared power supplies (including sustained degraded voltage or frequency conditions) cannot adversely affect both the RPS and ATWS prevention/mitigation functions. In these special cases, the lower level power supplies (e.g., + 15 Vdc logic power supplies) are required to be diverse. It is the staff's understanding that the DSS at Palisades will be a nonsafety-related system. Therefore, this is to inform you that the proposed power supply design for Palisades does not meet the requirements of the ATWS rule and to advise you as to what the NRC staff has found acceptable for other facilities.

Sincerely,

original signed by

Martin J. Virgilio, Director  
 Project Directorate III-1  
 Division of Reactor Projects - III,  
 IV, V & Special Projects

cc: See next page

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Palisades Plant

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