Consumers Power Company

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January 9, 1980

Director, Nuclear Reactor Regulation
Att Mr Dennis L Ziemann, Chief
Operating Reactors Branch No 2
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 -
PALISADES PLANT - ADEQUACY OF STATION
ELECTRIC DISTRIBUTION SYSTEMS VOLTAGES

Reference 1 - Letter From NRC to All Power Reactor Licensees (Except Humbolt Bay), August 8, 1979

Reference 2 - Letter From NRC to Palisades Plant, June 3, 1977

Reference 3 - Letter From Consumers Power Company to NRC, July 20, 1977

Consumers Power Company was requested by the NRC (Ref 1) to provide responses to some items of concern on adequacy of electric power systems, specifically, the acceptability of the voltage conditions on the station electric distribution systems with regard to both (a) potential overloading due to transfers of either safety or nonsafety loads, and (b) potential starting transient problems in addition to the concerns expressed by the NRC (Ref 2) with regard to degraded voltage conditions due to conditions originating on the grid.

Attached are responses pertaining to Consumers Power Company's Palisades Plant. Items expressed by the NRC in Reference 2 have been previously addressed (Ref 3) and will not be incorporated in this letter.

David P Hoffman
Nuclear Licensing Administrator

CC JGKeppler, USNRC

Attachment (2 Pages)

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RESPONSES TO NRC LETTER DATED AUGUST 8, 1979
Adequacy of Station Electric Distribution Systems Voltages

Item 1

Determine analytically if, assuming all on-site sources of a-c power are not available, the off-site power system and the on-site distribution system is of sufficient capacity and capability to automatically start as well as operate all required safety loads. Within their required voltage ratings in the event of (a) an anticipated transient (such as unit trip), or (b) an accident (such as a LOCA), regardless of other actions, the electric power system is designed to automatically initiate, and without the need for manual shedding of any electric loads. Protection of safety loads from undervoltage conditions must be designed to provide the required protection without causing voltages in excess of maximum voltage ratings of safety loads and without causing spurious separations of safety buses from off-site power.

Response to Item 1

The plant's first level of undervoltage protection is designed to shed the loads from the off-site source - 0.5 seconds after reaching 70% of nominal voltage. Under worse case conditions, with the grid at .95 per unit (pu), all of the units normal loads on, and with the simultaneous starting of all ESF loads, an analysis* shows that the voltage will drop to an instantaneous value of .714 pu. The worse case normal operating condition, with the grid at .95 pu, with all the normal loads on, and starting an 800 hp heater drain pump, the instantaneous voltage drop is .858 pu.

Based on the analysis, frequent spurious shedding from the off-site source will not occur under either accident or normal worse case conditions and, therefore, modifications involving sequential loading or partial shedding are not necessary.

The plant's second level of undervoltage protection is designed to protect the ESF loads from sustained degraded voltage (approximately equal to .91 pu to .70 pu) in excess of 6.5 seconds.

Item 2

The adequacy of the on-site distribution of power from the off-site circuits shall be verified by test to assure that analysis results are valid. Please provide: (a) A description of the method for performing this verification, and (b) the test results. If previous tests verify the results of the analysis, then test results should be submitted and additional tests need not be performed.

*The analysis will be incorporated along with the test results a month after plant start-up of the present outage.

Response to Item 2

It is the intention of Consumers Power Company's personnel to monitor strategic points on the station power system during the plant's routine Technical Specifications surveillance testing while the plant is in hot functional testing from the current refueling outage. The exact loading conditions will then be modeled and the computer data will be compared with the test data to verify the analysis. This computer data will then be extrapolated to the worst case conditions to verify that data. A report will be submitted after all analysis is completed.

Item 3

Review the electric power systems of your nuclear station to determine if there are any events or conditions which could result in the simultaneous or consequential loss of both required circuits to the off-site network to determine if any potential exists for violation of GDC-17 in this regard.

Response to Item 3

General Design Criterion-17 was not in effect at the time that the Palisades Plant was licensed. The design of the off-site power source for the Palisades Plant is described in FSAR Chapter 8, FSAR Amendment 14, Page 8.1-1, and FSAR, Appendix I. Consideration of the adequacy of the off-site power sources will again be evaluated under SEP Topic VIII-1.A.