Central File

WISCONSIN PUBLIC SERVICE CORPORATION

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

October 29, 1979

Mr. J. G. Keppler, Regional Director
Office of Inspection & Enforcement
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Mr. Keppler:

Docket 50-305
Operating License DPR-43
IE Bulletin No. 79-23, Potential Failure of
Emergency Diesel Generator Field Exciter Transformer

IE Bulletin No. 79-23 identifies a design error which occurred at another facility and resulted in the failure of an emergency diesel generator during loaded operation. The identified problem was that the neutral of the generator and the neutral of the excitation power transformer primary windings were connected; this resulted in harmonically induced circulating currents through the excitation power transformer which exceeded the transformer ratings and led to failure of the transformer.

The emergency diesel generator excitation and control system installed in the Kewaunee Nuclear Power Plant has been reviewed by our corporate nuclear staff with input from the vendor who supplied the Kewaunee Plant diesel generator units and our Architect Engineer.

The Kewaunee Plant emergency diesel generator units are not susceptible to the type of failure identified in IE Bulletin No. 79-23. The excitation power system installed on each of the Kewaunee Plant diesel generators consists of three saturable transformers and three current transformers. The saturable transformers derive their output power from the generator voltage. The current transformers are connected in series with the generator terminals and the load (i.e., load current flows through the current transformers) and their output is determined by the load. The vector summation of these two outputs is the excitation field power supply.

The saturable transformers are connected with their primary neutrals isolated from other parts of the circuit and, therefore, are allowed to float as recommended in the bulletin. Fused (1 ampere) power supply connections between the generator output and three instrument potential transformers provide an indirect path between the neutrals of the generator and the current transformer primary windings; however, the limited circulating currents that may be induced through this interconnection would not affect the current transformers which are designed for operation at generator full load currents. The primary winding neutrals of the instrument potential transformers are connected to the generator neutral (the configuration described in IE Bulletin No. 79-23 for power potential transformers.) This installation of the instrument potential transformers is not subject to the failure mechanism identified in the bulletin because the instrument potential transformers operate under constant load, independent of generator output power.

Both emergency diesel generators installed in the Kewaunee Nuclear Power Plant were subjected to extremely rigorous pre-operational testing that included operation at specified loads, up to 122 percent of full load, for specified times. Additionally, each diesel generator is operated at full load for four continuous hours during monthly surveillance testing. The satisfactory performance of the diesel generators throughout these tests provides a high level of confidence in the long-term load carrying capability of the units.

Considering the demonstrated performance capabilities of the Kewaunee Plant diesel generators and the fact that the excitation power supply system for the Kewaunee Plant diesel generators differs substantially from that identified in Bulletin No. 79-23, additional sustained full-load testing of the diesel generators, as recommended by the bulletin, is unwarranted and will not be performed.

Very truly yours,

Carl Ginkel for

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

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cc - Dir, Office of Inspection & Enforcement
US NRC, Washington, D. C. 20555
Mr. Tsun-lit Poon
Public Service Commission of Wisconsin