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SUBJECT: Forwards Design Analysis 4525-1, "Fault Current Analysis for Power Distribution Sys," Rev 1 & Design Analysis 4525-2.

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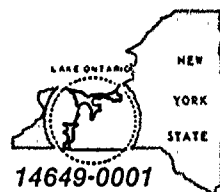
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September 20, 1990

U.S. Nuclear Regulatory Commission
Document Control Desk
Attn: Allen R. Johnson
Project Directorate I-3
Washington, D.C. 20555

Subject: Offsite Power System Analyses
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Johnson:

Per your request, we are enclosing copies of Design Analysis 4525-1 "Fault Current Analysis of Power Distribution System" Rev 1 and Design Analysis 4525-2 "Adequacy of Electric System Voltages" Rev 1 for your review. These analyses quantify the effects associated with the recently completed offsite power reconfiguration (EWR 4525).

EWR 4525 modified the offsite power system such that there would be a dedicated 34.5/4.16kV transformer associated with each of the two independent offsite transmission lines. Station 204 energizes transformer 12A which is now the normal source of power for Bus 12A and safety train A while Station 13A energizes transformer 12B which is now the normal source of power for Bus 12B and safety train B (see figure 1).

This normal configuration is referred to as the 50/50 mode since each independent offsite power source supplies 1/2 of the required offsite power. The operators still have the ability to put the offsite power system in either the 100/0 mode (Transformer 12B supplies all offsite power) or the 0/100 mode (Transformer 12A supplies all of the offsite power). The normal configuration prior to EWR 4525 was to have all offsite power supplied by transformer 12A.

EWR 4525 has significantly reduced the likelihood of a simultaneous loss of offsite power to both safety trains and has improved system performance since the electrical load is now normally divided between two transformers.

The primary objective of Design Analysis 4525-2 is to demonstrate that the reconfigured offsite power supply will be capable of maintaining adequate voltages for all required operating conditions. The results indicated that both offsite sources

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(circuit 751 from Station 204 & 767 from Station 13A) are capable of providing adequate voltages for all required functions. Two special cases are discussed below which represent the limiting cases:

1. The computer simulations indicated that both offsite sources may have difficulty in maintaining adequate voltages during the startup of a Reactor Coolant Pump (RCP) for the special case when the offsite grid voltage was at its minimum value (33 kv for circuit 751 and 116 kv for circuit 767). This issue is currently being addressed by modifying the RCP normal start procedures. The operators have been instructed to verify that adequate prestart voltages exist prior to attempting an RCP start. We have calculated circuit 767 may also have a similar problem when attempting a Steam Generator Feedwater Pump (SGFWP) Start. This computer analysis is currently being reevaluated to determine if any excessive conservatism is present in the analysis and if required, the SGFWP start procedure will also be modified. It should be noted that Circuit 767 has not had any difficulty to date in starting either the RCP or the SGFWP.

2. The worst case Loss of Coolant Accident (LOCA) simulation assumes two degraded operating conditions: operating solely on line 767, (100/0 mode), and a minimum grid voltage (116kv). The results show all bus voltages above 414 volts, indicating that all of the 1E pump motors will operate and that the undervoltage relaying on these busses will not disconnect them from offsite power. However, the lowest 480 volt MCC voltage was 405 volts, which is lower than RG&E's acceptance criteria. The only loads on the MCCs required to mitigate this accident would be MOVs.

We believe that the MOVs will operate properly at this voltage, however, to provide greater assurance we have revised our operating limits to which the offsite grid voltages will be controlled when safeguards equipment is required. When the offsite supply is provided in the 100/0 mode (767 is the lone source) the grid voltage will be maintained no lower than 118 kv. A simulation has been run at this voltage which provided results within all acceptance criteria. Historical data demonstrates that the grid voltage is at least 118 kv over 95% of the time.

For the normal operating mode, in the 50/50 configuration, the simulation results show that all of the voltages are within the established criteria, even at the minimum grid voltage of 116 kv.

It should be noted that this potential low voltage condition was not created by the reconfiguration of the offsite power system and in fact, the likelihood of the condition occurring was significantly reduced. The ability to run the offsite power system in the 50/50 mode was a major objective of the power system reconfiguration project (EWR 4525). It should also be noted that the most severe LOCA simulation for circuit 751 (0/100 mode and minimum source voltage 33kv) resulted in acceptable voltages.

The primary objective of Design Analysis 4525-1 was to verify that the reconfiguration of the offsite power system did not result in excessive short circuit duties for either the new or existing equipment. The results indicated that the reconfiguration had a negligible impact on the short circuit duties for the existing equipment and that all of the new equipment was specified with short circuit ratings well in excess of the calculated duties. The existing equipment was found to have adequate short circuit capacity for all cases except for one case of diesel generator testing, discussed below:

A special case involving the diesel generator when it is in its monthly test configuration was computer simulated and it was determined that potential short circuit duties could exceed acceptable limits. This is a low probability event requiring a phase-to-phase fault occurrence during a two hour test period. The consequence of such an event is an economic concern only, not a safety issue. The event could result in a shutdown of the plant for repairs. Safeguard system redundancy could be reduced, however, the event would not require the use of the safeguards system for plant shutdown. This condition was not created by the reconfiguration of the offsite power system and various alternatives to resolve this issue are currently being evaluated. We expect to be able to inform you of our intended corrective action by October 30, 1990.

Very truly yours,



Robert C. Mecredy

THM/122

Attachments

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Washington, D.C. 20555

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King of Prussia, PA 19406

Ginna Senior Resident Inspector

OFFSITE DISTRIBUTION SYSTEM

EWB 4525

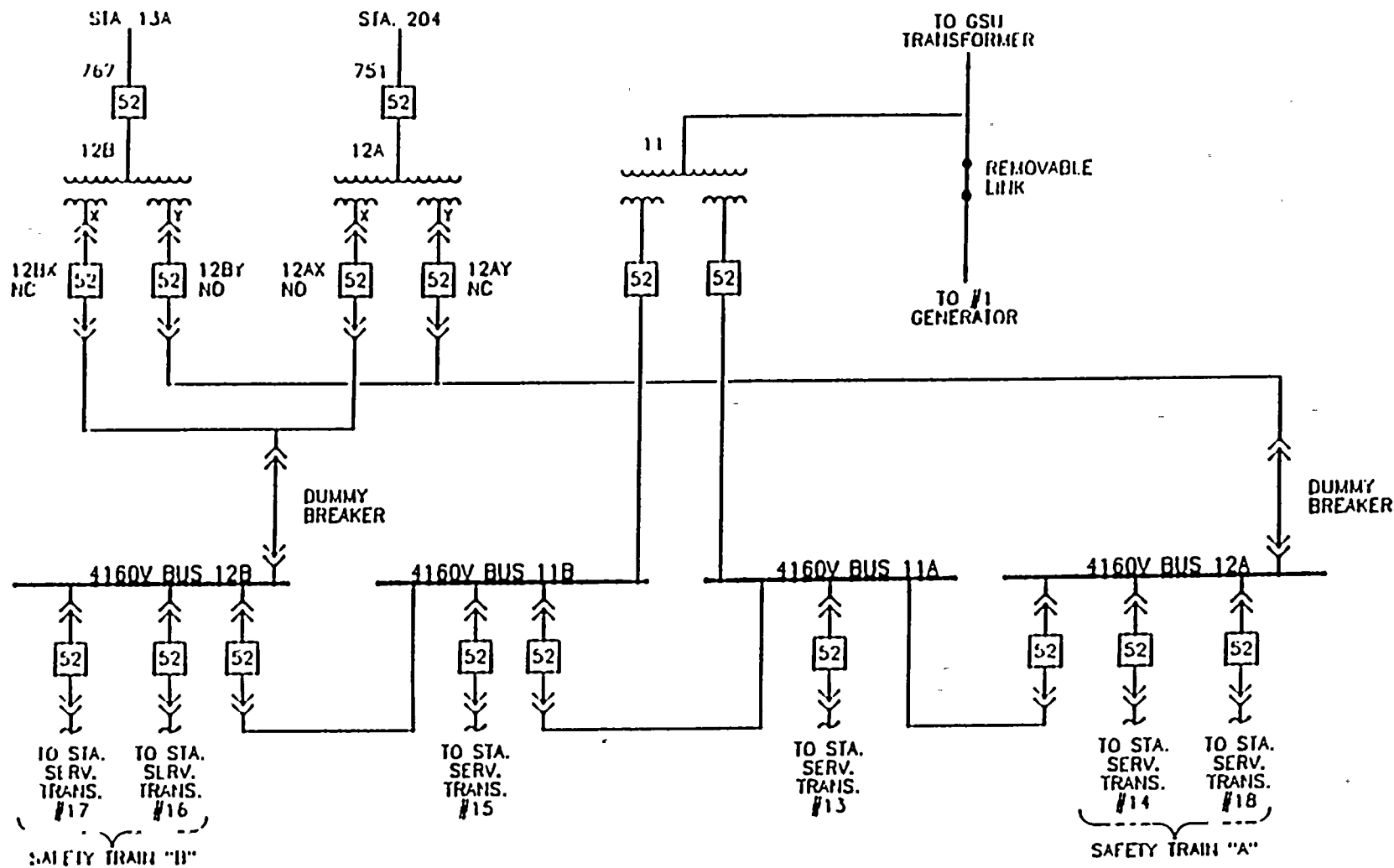


FIGURE 1