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SUBJECT: Forwards response to Generic Ltr 91-11, "Resolution of  
 Generic Issues 48 'LCOs for Class 1E Vital Instrument Buses'  
 & 49 'Interlocks & LCOs for Class 1E Tie Breakers.'"

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January 29, 1992

10 CFR 50.54(f)

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Docket 50-305

Operating License DPR-43

Kewaunee Nuclear Power Plant

Response to Generic Letter 91-11; "Resolution of Generic Issues 48, LCOs for Class 1E Vital Instrumentation Buses, and 44, Interlocks and LCOs for Class 1E Tie Breakers, Pursuant to 10CFR50.54(f)"

Generic Letter (GL) 91-11 delineates the NRC staff's positions regarding the evaluation of Generic Issue (GI)-48, "LCOs for Class 1E Vital Instrument Buses," and GI-49, "Interlocks and LCO's for Class 1E Tie Breakers" as a part of resolution of GI-128, "Electrical Power Reliability." Wisconsin Public Service Corporation's (WPSC) response to the recommendations of GL 91-11, with regard to resolving GI-48 and GI-49, is discussed below.

**GI-48 "LCOs for Class 1E Vital Instrument Buses"**

NRC Staff Position and Recommendations

The term "vital instrument buses" (VIB) refers to the AC buses that provide power for the instrumentation and controls of the engineered safety features (ESF) systems and the reactor protection system (RPS), and are designed to provide continuous power during postulated events including the loss of normal offsite power. In the evaluation of GI-48, the NRC staff determined that some operating nuclear power plants do not have administrative controls governing

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restrictions for their Class 1E 120 VAC VIBs and their associated inverters. The NRC also determined that without such restrictions, the normal or alternate power sources for one or more VIB could be out of service indefinitely, which is a condition that could prevent certain safety systems from meeting the plant design basis.

Specifically, the VIBs may be subjected to power failure modes that may not have been considered during the safety analysis of the plant. For example, this situation could result from removing one or more of the normal or alternate power sources from service for repair or maintenance. Without restrictions, more than one VIB could be connected to an offsite alternate power source. The loss of the alternate power source would then cause the simultaneous loss of more than one VIB, at least until the diesel generators picked up the loads.

The NRC staff has determined that this concern can generally be resolved by verifying or implementing appropriate administrative controls to govern operational restrictions on the VIBs and their associated inverters.

#### WPSC Implementation

The operability and surveillance requirements for the electrical systems at the Kewaunee Nuclear Power Plant (KNPP) are covered by plant Technical Specifications (TS) 3.7 and 4.6 respectively. Refer to the attached simplified one line diagram for the following discussion. This sketch shows the safeguards DC power system for the KNPP from the Train A and B batteries and chargers, down to the VIBs.

Train A VIBs, BRA-113, BRA-113 extension and BRA-114, are powered from inverters BRA-111 and BRA-112 respectively. Train B VIBs, BRB-113, BRB-113 extension and BRB-114, are powered from inverters BRB-111 and BRB-112 respectively. The four inverters receive a normal 480V AC input from associated 480V AC ESF Motor Control Centers (MCCs) 1-52C or MCC-162C.

The two 125V DC buses, BRA-102 and BRB-102, supply various DC loads and four inverters through BRA-104 and BRB-104. DC buses BRA-104 and BRB-104 provide a stand-by source of power to the four inverters. The four inverters automatically transfer to the DC supply on low voltage on the normal AC input.

An alternate source is available from AC distribution cabinet BRA-105 for inverters BRA-111/112 and from cabinet BRB-105 for inverters BRB-111/112. The inverter is automatically switched to supply loads through a static transfer switch after the loss of the first two input sources or on an instrument bus distribution system fault.

Both the safeguards AC and DC electrical systems are required to be operable prior to reactor critical operation in accordance with the existing KNPP TSs. Therefore, the GL concern that the normal or alternate power sources for one or more VIBs could be out of service indefinitely is prohibited by the existing TSs during power operation.

However, based on the issues raised by this GL, WPSC feels that it is prudent to augment our existing TSs with the following administrative controls:

#### Conditions For Operation

The reactor shall not be heated above 200°F unless the following conditions are satisfied:

- Instrument buses BRA-113, BRA-113 extension, BRA-114, BRB-113, BRB-113 extension and BRB-114 are energized from their associated inverters, and
- Instrument inverters BRA-111, BRA-112, BRB-111 and BRB-112 are connected to and capable of being supplied by the associated DC source.

#### Action

- Two inverters may be disconnected from their DC bus for up to 24 hours as necessary for the purpose of performing an equalizing charge on their associated battery.
- When the reactor is heated above 200°F, one inverter may be taken out-of-service with the associated instrument bus(es) powered from the alternate source for a period of seven days. If the inverter is not restored to service within seven days, then within one hour action shall be initiated to perform a plant shutdown using normal operating procedures.

#### Surveillance

- When the reactor is heated above 200°F and the supported equipment is required to be operable, once a month it will be verified that the instrument inverters are supplied by either the normal, alternate, or standby source and indicated voltage on the VIBs is acceptable.

The conditions for operation will ensure that the VIBs which provide power for the instrumentation and controls of the ESF and RPS are energized by their respective inverters. In turn the inverters are connected to and are capable of being energized by a safeguards DC

power supply. The action statement with an allowed outage time of seven days was selected to ensure adequate time to diagnose and perform maintenance on the inverter without incurring an unnecessary plant transient associated with a shutdown. In the event a plant shutdown is required, the final plant mode would correspond to the supported equipment operability requirements.

Implementation of these administrative controls in combination with the existing TSs will resolve this concern for the KNPP.

#### **GI-49 "Interlocks and LCOs for Class 1E Tie Breakers"**

##### NRC Staff Position and Recommendations

The concern is limited to manually actuated tie breakers that can connect either normally independent, redundant Class 1E AC or DC buses at one unit or Class 1E buses in different units at the same site. These tie breakers permit maintenance of supply buses and equipment without de-energizing plant equipment. These tie breakers require special consideration because, when closed, they can compromise the independence of the safety-related buses.

The NRC staff has determined that this concern can generally be resolved by verifying or implementing appropriate administrative controls to prevent the improper electrical line up.

##### WPSC Implementation

In response to this GI, WPSC reviewed the safeguards AC and DC power systems for tie breakers between redundant safety-related buses. KNPP is a single unit site; therefore, this concern is limited to devices that can cross-connect redundant buses and compromise the independence of the buses.

Based on this review, four instances were found where the closure of manual tie breakers could potentially connect independent, safety-related buses. To preclude this possibility, administrative controls will be established to prohibit cross-connecting these buses when the supported equipment must be operable.

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January 29, 1992  
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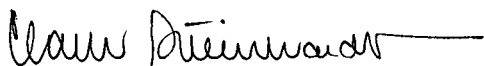
Specifically, the following buses will be verified to not be cross-connected prior to entering the mode of operation for which the supported equipment must be operable:

125V DC Cabinets BRA-102 and BRB-102  
4160V AC safeguards buses 1-5 and 1-6  
480V AC safeguards buses 1-51 and 1-61  
480V AC safeguards buses 1-52 and 1-62

When the supported equipment is required to be operable, once a month it will be verified that the buses are not cross-connected.

Implementation of these and administrative controls in combination with the existing TSs which provides the operability requirements for the above listed safeguards buses will resolve this concern for the KNPP.

Sincerely,



C. R. Steinhardt  
Senior Vice President - Nuclear Power

SLB/cjt

Attach.

cc - US NRC - Region III  
Mr. Patrick Castleman, US NRC

Subscribed and Sworn to  
Before Me This 29<sup>th</sup> Day  
of January 1992  
Deanne M. Stein  
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