UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C 20555

May 27, 1992

NRC INFORMATION NOTICE 92-40: INADEQUATE TESTING OF EMERGENCY BUS UNDERVOLTAGE LOGIC CIRCUITRY

Addressees

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to a safety problem that could result from the use of an undervoltage logic test method that fails to verify the de-energization of the emergency safety busses. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

In November 1991, an NRC electrical distribution functional inspection team at the LaSalle County Nuclear Station discovered that the surveillance testing method used for the loss of offsite power test was not testing the capability of the undervoltage logic circuitry to de-energize the emergency bus. This deficiency affected all six of the electrical divisions for both nuclear power units. The undervoltage circuitry automatically opens the emergency bus feed breakers from the offsite power system to isolate the emergency bus when a loss of voltage is sensed. This circuitry also initiates load shedding, starts the emergency diesel generator (EDG), re-energizes the emergency bus, and sequences the necessary emergency loads onto the emergency bus.

This test deficiency is significant because the failure of the normally closed feed breaker to open automatically in response to a loss of offsite power would prevent the emergency diesel from automatically re-energizing the emergency bus and also would result in the emergency bus remaining connected to a degraded offsite power source.

In conducting an internal lessons learned program for the Byron and Braidwood stations, the Commonwealth Edison Company (the licensee) determined that it was performing inadequate tests of its undervoltage logic circuitry in a manner similar to the LaSalle Station tests.

Discussion

The technical specifications for the LaSalle County Nuclear Station require the licensee to simulate a loss of offsite power and to verify the de-energization of the emergency busses. The licensee was simulating a loss of offsite power by manually opening the emergency bus main feed breaker. By simulating a loss of offsite power in this manner, the licensee did not demonstrate that the undervoltage logic circuitry would automatically de-energize the emergency bus in response to an undervoltage condition. Thus, the licensee did not test the capability of two undervoltage relay contacts to trip the normal bus feed breaker from the main station transformer and the unit tie breaker. These breakers provide an EDG output breaker closure permissive. If a feed breaker failed to trip open automatically, it would prevent the EDG output breaker from closing automatically and also result in the emergency bus remaining connected to a degraded offsite power source.

After discovering this problem, LaSalle personnel successfully tested all of the affected undervoltage logic circuits. The licensee simulated the loss of offsite power by opening the undervoltage relay potential transformer test switches and verifying that the appropriate breakers had tripped. The licensee satisfactorily tested the capability of the logic circuits to shed loads from the emergency busses, the capability of the EDGs to start automatically, and the capability to energize the emergency safety loads with the emergency busses.

The Byron and Braidwood staff also revised their testing method and successfully tested the capability of their undervoltage logic circuitry to automatically de-energize the emergency busses.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical contact: David S. Butler, RIII
(708) 790-5796

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
92-39	Unplanned Return to Criticality during Reactor Shutdown	05/13/92	All holders of OLs or CPs for nuclear power reactors.
92-38	Implementation Date for the Revision to the EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents	05/12/92	All holders of OLs or CPs for nuclear power reactors, non-power reactors and materials licensees authorized to possess large quantities of radioactive material.
92-37	Implementation of the Deliberate Misconduct Rule	05/08/92	All Nuclear Regulatory Commission Materials Licensees.
92-16, Supp. 1	Loss of Flow from the Residual Heat Removal Pump during Refueling Cavity Draindown	05/07/92	All holders of OLs or CPs for nuclear power reactors.
92-36	Intersystem LOCA Outside Containment	05/07/92	All holders of OLs or CPs for nuclear power reactors.
92-35	Higher Than Predicted Erosion/Corrosion in Unisolable Reactor Coolant Pressure Boundary Piping Inside Containment at A Boiling Water Reactor	05/06/92	All holders of OLs or CPs for nuclear power reactors.
92-34	New Exposure Limits for Airborne Uranium and Thorium	05/06/92	All licensees whose operations can cause airborne concentrations of uranium and thorium.
92-33	Increased Instrument Response Time When Pressure Dampening Devices are Installed	04/30/92	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

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After discovering this problem, LaSalle personnel successfully tested all of the affected undervoltage logic circuits. The licensee simulated the loss of offsite power by opening the undervoltage relay potential transformer test switches and verifying that the appropriate breakers had tripped. The licensee satisfactorily tested the capability of the logic circuits to shed loads from the emergency busses, the capability of the EDGs to start automatically, and the capability to energize the emergency safety loads with the emergency busses.

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Original Signed by
Charles E. Rossi

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Attachment: List of Recently Issued NRC Information Notices
Document Name: 9240.IN
*SEE PREVIOUS CONCURRENCES

		D/DOEA:NRR	*C/OGCB:DOEA:NRR	*RPB:ADM
		CERossi	CHBerlinger	TechEd
		05/20/92	05/15/92	04/13/92

*OGCB:DOEA:NRR	*EB:DRS:RIII	*C/EB:DRS:RII	*D/DRS:RIII	*C/SELB:DST:NRR
DCKirkpatrick	DSButler	MRing	HMiller	FRosa
04/10/92	05/04/92	05/04/92	05/04/92	04/24/92

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The technical specifications for the LaSalle County Nuclear Station require the licensee to simulate a loss of offsite power and to verify the de-energization of the emergency busses. The licensee was simulating a loss of offsite power by manually opening the emergency bus main feed breaker. By simulating a loss of offsite power in this manner, the licensee did not demonstrate that the undervoltage logic circuitry would automatically de-energize the emergency bus in response to an undervoltage condition. Thus, the licensee did not test the capability of two undervoltage relay contacts to trip the normal bus feed breaker from the main station transformer and the unit tie breaker. These breakers provide an EDG output breaker closure permissive. If a feed breaker failed to trip open automatically, it would prevent the EDG output breaker from closing automatically.

After discovering this problem, LaSalle personnel successfully tested all of the affected undervoltage logic circuits. The licensee simulated the loss of offsite power by opening the undervoltage relay potential transformer test switches and verifying that the appropriate breakers had tripped. The licensee satisfactorily tested the capability of the logic circuits to shed loads from the emergency busses, the capability of the EDGs to start automatically, and the capability to energize the emergency busses with the emergency safety loads.

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Document Name: UVTEST.IN

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