



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

July 18, 1991

TO: ALL HOLDERS OF OPERATING LICENSES

SUBJECT: RESOLUTION OF GENERIC ISSUES 48, "LCOs FOR CLASS 1E VITAL INSTRUMENT BUSES," AND 49, "INTERLOCKS AND LCOs FOR CLASS 1E TIE BREAKERS" PURSUANT TO 10 CFR 50.54(f) (GENERIC LETTER 91-11)

The staff of the U.S. Nuclear Regulatory Commission (NRC) has completed the evaluation of Generic Issues (GIs) 48 and 49 as part of the resolution of GI-128, "Electrical Power Reliability." GI-48 and GI-49 address vital ac buses and tie breakers that connect redundant safety-related buses. Additional details are provided in NUREG/CR-5414, "Technical Findings for Proposed Integrated Resolution of Generic Issue 128, Electrical Power Reliability."

As a result of its evaluation, the staff concludes that unless licensees provide adequate justification that such provisions are not needed at their specific facilities, all licensees should have appropriate procedures to fulfill the following requirements:

1. Limit the time that a plant is in possible violation of the single-failure criterion with regard to the Class 1E vital instrument buses and tie breakers,
2. Require surveillances of these components, and
3. Ensure that, except for the times covered in Item (1), the plant is operating in an electrical configuration consistent with the regulations and its design bases.

The enclosure to the generic letter provides further guidance.

The staff requires, pursuant to Section 50.54(f) of Title 10 of the Code of Federal Regulations (10 CFR) and Section 182 of the Atomic Energy Act, that you provide the NRC with certification, within 180 days of the receipt of this letter, that you have either implemented the appropriate procedures conforming to the guidance provided in the enclosure to this generic letter or have prepared justification that such procedures are not needed. This certification shall be submitted to the NRC and signed under oath or affirmation. You should retain any justification for not including such procedures in accordance with the document retention programs at your facility.

The actions requested in this generic letter represent new staff positions for some licensees; and thus, this request is considered a backfit in accordance with NRC procedures. Because the electrical configurations and surveillance procedures at some plants may not satisfy established regulatory requirements, this backfit ensures that facilities comply with existing requirements. Therefore, the staff did not perform a full backfit analysis. Instead, an evaluation of the type discussed in 10 CFR 50.109(a)(6) was performed. The report of this evaluation will be available in the Public Document Room along with the minutes of the 163rd meeting of the Committee to Review Generic Requirements.

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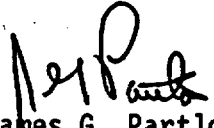
As the resolution of these generic issues is considered a compliance matter, a commitment to evaluate the safety significance as part of the Individual Plant Examination (IPE) program is not an acceptable alternative to responding to this generic letter. However, you may perform plant specific evaluations as part of your IPE program(s) to further evaluate limitations imposed in response to this generic letter. If you elect to do this, your IPE submittal must provide the details defined in Section 2.1.6, Subitem 7 of NUREG-1335, "Individual Plant Examination: Submittal Guidance."

The current Westinghouse, Combustion Engineering and General Electric (BWR/6) standard technical specifications include the requirements contained in this generic letter. The new standard technical specifications now nearing completion as part of the Technical Specifications Improvement Program will also include adoption of the requirements of this generic letter.

This request was previously covered by Office of Management and Budget (OMB) Clearance Number 3150-0011, which expired June 30, 1991. (A request for a clearance extension has been submitted to OMB and is expected to be granted.) The estimated average number of burden hours is 100 person hours per licensee response, including the time required to assess the questions, searching data sources, gather and analyze the data, and prepare the required reports. Comments on the accuracy of this estimate and suggestions to reduce the burden may be directed to Ronald Minsk, Office of Information and Regulatory Affairs (3150-0011), NEOB-3019, Office of Management and Budget, Washington, D.C. 20503, and to the U. S. Nuclear Regulatory Commission, Information and Records Management Branch, Division of Information Support Services, Office of Information and Resources Management, Washington, D.C. 20555.

Please address your response to this generic letter to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, pursuant to 10 CFR 50.4 of the NRC's regulations.

Sincerely,


James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

Enclosures:

1. 10 CFR 50.54(f) Request for GI-48
and GI-49
2. List of Recently Issued,
Generic Letters

See jacket

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RESOLUTION OF GENERIC ISSUES 48, "LCOs FOR CLASS 1E VITAL
INSTRUMENT BUSES," AND 49, "INTERLOCKS AND LCOs FOR CLASS 1E
TIE BREAKERS" PURSUANT TO 10 CFR 50.54(f)

INTRODUCTION

The phrase "vital instrument bus" may be interpreted in various ways depending on the plant. In this document, "vital instrument buses" 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. Tie breakers are devices that cross-connect either redundant Class 1E buses in one unit or Class 1E buses in different units at the same site.

The staff of the U.S. Nuclear Regulatory Commission (NRC) has evaluated the concerns of Generic Issues (GIs) 48, "LCOs for Class 1E Vital Instrument Buses," and 49, "Interlocks and LCOs for Class 1E Tie Breakers." The staff has concluded that these concerns can be generally resolved by the verification or implementation of appropriate administrative controls in plant procedures for the Class 1E buses and tie breakers. For both issues, the primary objective is to verify that plants are not being operated in violation of applicable regulations, such as General Design Criteria 17, 21, 34, and 35 of Appendix A of Part 50 of Title 10 of the Code of Federal Regulations (10 CFR). During its evaluation, the staff identified conditions that indicate that the licensees at some plants may be violating the single-failure criterion for a substantial period. Therefore, these plants may not meet the requirements pertaining to the design-basis events considered in the plant safety analysis report.

BACKGROUND

The NRC initiated GI-48 upon discovering that some operating nuclear power plants do not have any administrative controls governing operational restrictions for their Class 1E 120V ac vital instrument buses (VIBs) and associated inverters. Without such restrictions, the normal or alternate power sources for one or more VIBs could be out of service indefinitely. This condition could prevent certain safety systems from meeting the plant design basis, including loss of offsite power or the single-failure criterion.

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 for the VIBs 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 issue described in GI-49 arose because of an incident that occurred at the Point Beach Nuclear Plant, Unit 2. On June 9, 1980, plant personnel of the Wisconsin Electric Power Company (the licensee) discovered that a tie breaker between the safeguards buses at the plant was improperly left closed after a plant shutdown. The improper electrical lineup probably occurred after a loss-of-ac-power test that was conducted on May 2, 1980, and was attributed to personnel error.

This 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 convenient maintenance of supply buses and equipment without de-energizing plant equipment. The maintenance is normally conducted when the plant is not in operation. These tie breakers require special consideration (such as administrative controls to remove the breakers from their cubicles or otherwise lock them open) because, when closed, they can compromise the independence of the redundant safety-related buses and may prevent loading of both of the emergency diesel generators. These tie breakers could be beneficial under very special conditions (such as a loss of offsite power coincident with a loss of a diesel generator or batteries) by providing the flexibility to supply power across division boundaries.

About 5 weeks elapsed before the licensee discovered the improper closure at the Point Beach plant. With the two breakers closed, the two redundant buses were connected and the independence of the buses was lost. If the plant had lost offsite ac power with the tie breakers closed, interlocks in the circuitry of the diesel generator output breaker would have prevented the automatic closure of each diesel generator output breaker.

The NRC staff's evaluation of the event at Point Beach resulted in the identification of the generic concerns of GI-49 regarding procedural controls to reduce human error of the type that occurred at Point Beach. The staff also noted that the licensee had not implemented tie breaker interlocks to prevent manual paralleling of standby power sources, which are a provision of Regulatory Guide 1.6, Item 4(d).

The proposed resolution does not include recommendations regarding the addition of tie breaker interlocks. The interlocks originally raised as a concern were to help protect against the possibility of an operator committing an error and inadvertently closing a tie breaker between either:

1. Two operating diesel generators that may be out of phase with each other or
2. An operating diesel generator and an incoming feeder line that may be out of phase with each other.

Although such interlocks can increase the assurance for some infrequent situations, the staff believes that adding such interlocks can also adversely affect safety. For example, in some emergency situations (such as a loss of offsite power that coincides with the failure or nonavailability of a divisional diesel generator), an operator may need to cross-connect power (by way of tie breakers) to an opposite division. In such instances, interlocking circuits could inhibit the operator from taking such action. Therefore, the staff concludes that if proper administrative controls that provide assurance that these breakers are normally open are placed on the operation of the tie breakers, then the addition of interlocks need not be pursued.

At recently licensed Westinghouse, Combustion Engineering and General Electric (BWR/6) plants, licensees have resolved the concerns described in GI-48 and 49 by implementing the Standard Technical Specifications.

RECOMMENDED ACTION

Ensure that your plant has procedures that include time limitations and surveillance requirements for

1. Vital instrument buses (typically 120V ac buses),
2. Inverters or other onsite power sources to the vital instrument buses, and
3. Tie breakers that can connect redundant Class 1E buses (ac or dc) at one unit or that can connect Class 1E buses between units at the same site.

If plant procedures do not include time limitations and surveillance requirements for all of these items, ensure that you have adequately evaluated the basis for such a position. The evaluation should address existing regulations and plant design bases, and should specifically demonstrate that adequate consideration has been given to the possibility of loss of offsite power that coincides with a worst-case additional single failure. In addition, the analysis should consider the time delay required for the emergency generators to pick up loads, because in typical plants, if an inverter serving a vital instrument bus is not available, a loss of offsite power will cause numerous actuations because of the delay time while the diesel generators are starting. Therefore, the analysis should also consider malfunctions that do not always have a preferred failure mode, (e.g., instrumentation or controls that initiate a switch of emergency core cooling from injection to recirculation or initiate isolation of the steam generators). If the alternate power sources for the vital buses cannot receive power from the diesel generators, the evaluation should include this condition.

To ensure that you continue to meet the plant design bases, new or revised procedures should be evaluated in accordance with the criteria contained in 10 CFR 50.59.

LIST OF RECENTLY ISSUED GENERIC LETTERS

Generic Letter No.	Subject	Date of Issuance	Issued To
91-10	EXPLOSIVES SEARCHES AT PROTECTED AREA PORTALS	07/08/91	TO ALL FUEL CYCLE FACILITY LICENSEES WHO POSSESS, USE, IMPORT OR EXPORT FORMULA QUANTITIES OF STRATEGIC SPECIAL NUCLEAR MATERIAL
88-20 SUPP. 4	INDIVIDUAL PLANT EXAMINATION OF EXTERNAL EVENTS (IPEEE) FOR SEVERE ACCIDENT VULNERABILITIES - 10 CFR 50.54 (f)	06/28/91	ALL HOLDERS OF OLs AND CPs FOR NUCLEAR POWER REACTORS
91-09	MODIFICATION OF SURVEILLANCE INTERVAL FOR THE ELECTRICAL PROTECTIVE ASSEMBLIES IN POWER SUPPLIES FOR THE REACTOR PROTECTION SYSTEM	06/27/91	ALL HOLDERS OF OLs FOR BWRs
91-08	REMOVAL OF COMPONENT LISTS FROM TECHNICAL SPECIFICATIONS	05/06/91	ALL HOLDERS OF OLs OR CPs FOR NUCLEAR POWER REACTORS
91-07	GI-23 "REACTOR COOLANT PUMP SEAL FAILURES" AND ITS POTENTIAL IMPACT ON STATION BLACKOUT	05/02/91	ALL POWER REACTOR LICENSEES AND HOLDERS OF CPs
91-06	RESOLUTION OF GENERIC ISSUE A-30, "ADEQUACY OF SAFETY-RELATED DC POWER SUPPLIED," PURSUANT TO 10 CFR 50.54(f)	04/29/91	ALL HOLDERS OF OLs
91-05	LICENSEE COMMERCIAL-GRADE PROCUREMENT AND DEDICATION PROGRAMS	04/09/91	ALL HOLDERS OF OLs AND CPs FOR NUCLEAR POWER REACTORS
91-04	CHANGES IN TECHNICAL SPECIFICATION SURVEILLANCE INTERVALS TO ACCOMMODATE A 24-MONTH FUEL CYCLE	04/02/91	ALL HOLDERS OF OLs OR CPs FOR NUCLEAR POWER REACTORS
91-03	REPORTING OF SAFEGUARDS EVENTS	03/06/91	ALL HOLDERS OF OLs OR CPs FOR NUCLEAR POWER REACTORS AND ALL OTHER LICENSED ACTIVITIES INVOLVING A FORMULA QUANTITY OF SPECIAL NUCLEAR MATERIAL (SNM)