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AUTH.NAME AUTHOR AFFILIATION
FRANZ,J.F. Iowa Electric Light & Power Co.
RECIP.NAME RECIPIENT AFFILIATION
MURLEY,T.E. Office of Nuclear Reactor Regulation, Director (Post 870411

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

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Iowa Electric Light and Power Company

January 27, 1992

NG-92-0121

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No:DPR-49
Response to Generic Letter 91-11:
"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)"
File: A-101b, R-20, A-107c

Dear Dr. Murley:

This letter responds to the subject Generic Letter (GL) 91-11. GL 91-11 requested licensees to evaluate the applicability of Generic Issues (GIs) 48 and 49 to their plants and implement appropriate procedures to address these issues or provide justification that such procedures are not needed.

GIs 48 and 49 address the possibility of violating the single-failure criterion for Class 1E electrical buses. Specifically, GI-48 addresses vital instrument buses (VIBs) and their normal and alternate power supplies. It postulates that with one or more normal or alternate power supplies out of service, a subsequent loss of offsite power could result in a loss of more than one VIB, thus violating the single-failure criterion. GI-49 deals with tie-breakers on Class 1E electrical buses. The concern is that without proper administrative controls tie breakers connecting redundant class 1E buses could be inappropriately closed. With the tie breakers closed the buses would be exposed to a single failure mode.

The Generic Letter stated the Staff's position that licensees must have procedures limiting the time that class 1E buses are

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configured as described in GIs 48 and 49 or justify that such procedures are not needed at their plants. Iowa Electric's response to these issues is given in the Attachment to this letter. Iowa Electric has concluded that such procedures are not needed at DAEC because, in the only area where the issues are applicable, mechanisms are already in place which satisfy the recommendations made in the Generic Letter.

Please contact this office if you have any questions regarding this matter.

This letter is true and accurate to the best of my knowledge and belief.

IOWA ELECTRIC LIGHT AND POWER COMPANY

By _____
JOHN F. FRANZ, Jr.
Vice President, Nuclear

State of Iowa
(County) of Linn

Signed and sworn to before me on this 27th day of January 1992, by John F. Franz, Jr.

_____
Notary Public in and for the State of Iowa

September 28, 1992
Commission Expires

JFF/MD/pjv

Attachment: Generic Letter 91-11 Response

cc: M. Davis
L. Liu
L. Root
R. McGaughy
C. Shiraki (NRC-NRR)
A. Bert Davis (Region III)
NRC Resident Office
Commitment Control No. 910176

Iowa Electric's Response to GL 91-11

GL 91-11 states, concerning GIs 48 and 49, that

> "...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)."

With this objective in mind, each Generic Issue is separately addressed below.

Response to GI-48, "LCOs for class 1E Vital Instrument Buses (VIBs)"

GL 91-11 defines "vital instrument buses" (VIBs) as

> "...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."

At Duane Arnold Energy Center (DAEC) there are three types of ac buses supplying instrumentation and controls: 2 RPS buses, 2 instrument buses, and 1 uninterruptible ac instrument bus. A discussion of each type follows.

Uninterruptible ac: This supplies instrument loads for balance of plant and control room indication that is desirable for continued plant operation. It does not supply ESF systems and does not fall within the VIB definition in GL 91-11.

RPS: This consists of two RPS buses each with one normal power supply. Either bus may be supplied by a single alternate power supply that is interlocked to prevent supplying both RPS buses simultaneously. While these buses would ultimately be supplied by Emergency Diesel Generators upon Loss of Offsite power, no ESF system relies on these buses being energized to be able to fulfill its safety function. In fact, the design of these ESF systems is to "fail-safe" upon loss of power to the RPS buses. Therefore, a loss of both RPS buses does not constitute a single-failure mode for any ESF system and does not violate General Design Criteria.

Instrument ac: There are two Instrument ac buses (see Figure 1). Each bus has three power supplies: an inverter, a regulating transformer, and a backup transformer. The inverter is supplied from station batteries/chargers. Both transformers are supplied

from the same safety-related 480 VAC bus. The instrument ac buses supply power to various control room and other instruments including some instrumentation for ESF systems. These instrument buses are not safety-related, however, and the ESF systems supplied by them would "fail-safe", i.e., initiate to fulfill their safety function, upon loss of the instrument ac buses. There is one intended exception to this design feature in the High Pressure Coolant Injection (HPCI) System Steam Leak Detection (SLD). In this case, a loss of both Instrument ac buses would prevent an isolation of the HPCI system so as to allow it to fulfill its primary safety function of Emergency Core Cooling. This is consistent with plant design basis as described in APED 4600 "Nuclear Safety Criteria for Boiling Water Reactors". Criterion No. 11 under "Reactor Core Cooling Following Coolant Loss" in APED 4600 states:

> "The necessity and requirements for containment integrity or isolation shall not interfere with operation of the cooling systems."

It is also useful to note that, assuming both instrument ac bus inverters are out of service, a loss of offsite power would cause the buses to be deenergized a maximum of 10 seconds before diesel generators begin supplying the buses via the 480 VAC supply to the regulating transformer. Loss of both Instrument ac buses would therefore not violate any General Design Criteria and would not pose a single-failure threat to the way any ESF system is designed to function.

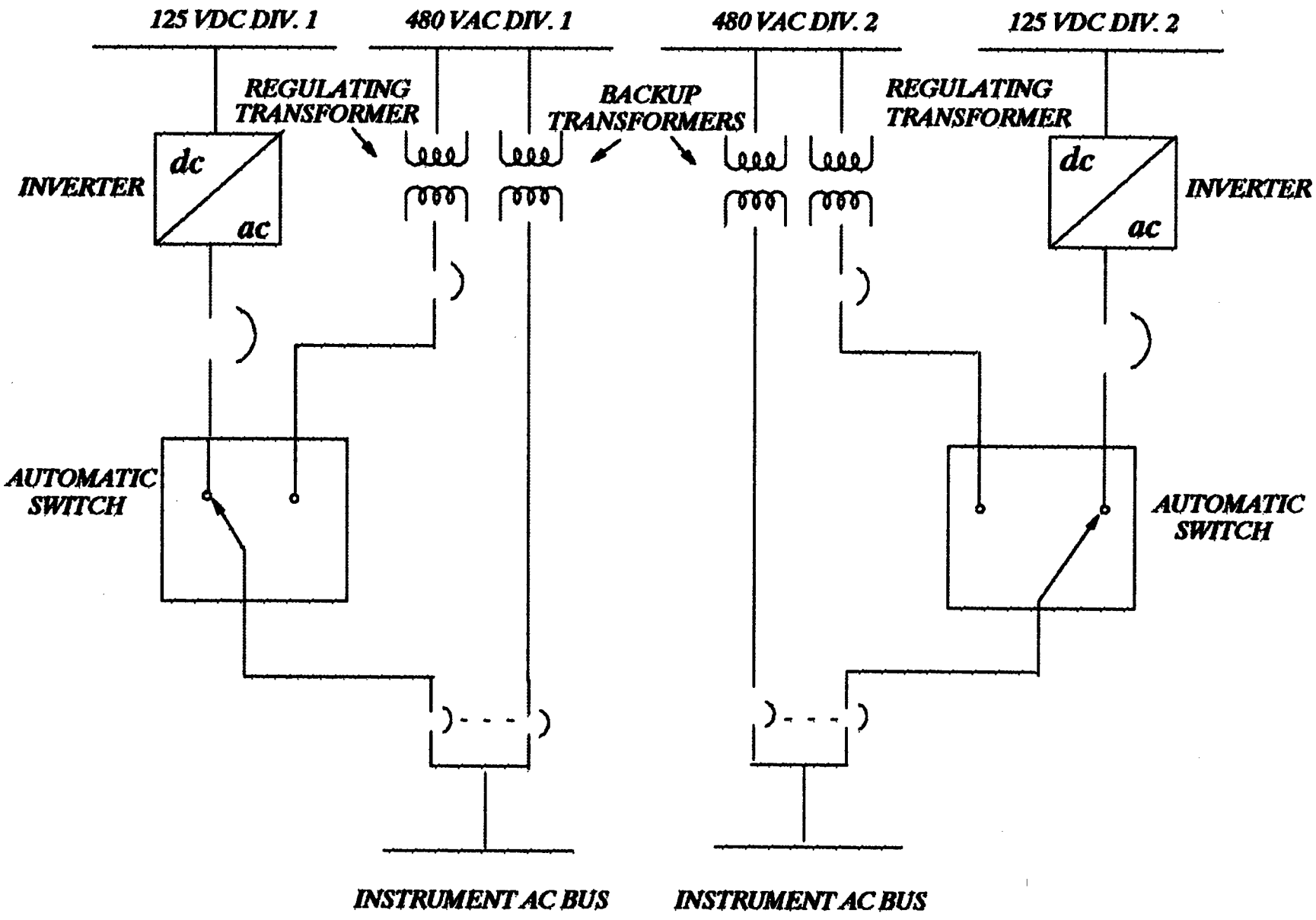
As a result of the above evaluations, the concerns outlined in GI-48 do not apply to the DAEC.

Response to GI-49, "Interlocks and LCOs for Class 1E Tie Breakers"

DAEC has two class 1E 4160 VAC buses each having an associated Emergency Diesel Generator. These buses also have their associated 480 VAC safety-related buses which they supply (see Figure 2). There are no tie-breakers that directly connect these buses. The only possible means of cross-tying the two redundant power divisions is a safety-related 480 VAC "swing bus". This swing bus can be supplied from either of two redundant safety-related 480 VAC buses. This is intended to provide flexibility in supplying power to the Low Pressure Coolant Injection (LPCI) system inject valves. The two tie breakers which supply the swing bus from either power division are electrically interlocked to prevent simultaneous closing of both tie breakers. This provides divisional separation and prevents operator error which might result in cross-tying the two redundant divisions. DAEC is therefore in compliance with the recommended actions of GI-49.

In conclusion, Iowa Electric finds, after evaluation of DAEC system configuration and design basis, that the recommended actions for resolution of GIs 48 and 49 either do not apply or have been met by plant design features.

Figure 1


125 VDC DIV. 1
480 VAC DIV. 1
480 VAC DIV. 2
125 VDC DIV. 2
REGULATING TRANSFORMER
BACKUP TRANSFORMERS
REGULATING TRANSFORMER
INVERTER
dc
ac
dc
ac
INVERTER
AUTOMATIC SWITCH
AUTOMATIC SWITCH
INSTRUMENT AC BUS
INSTRUMENT AC BUS

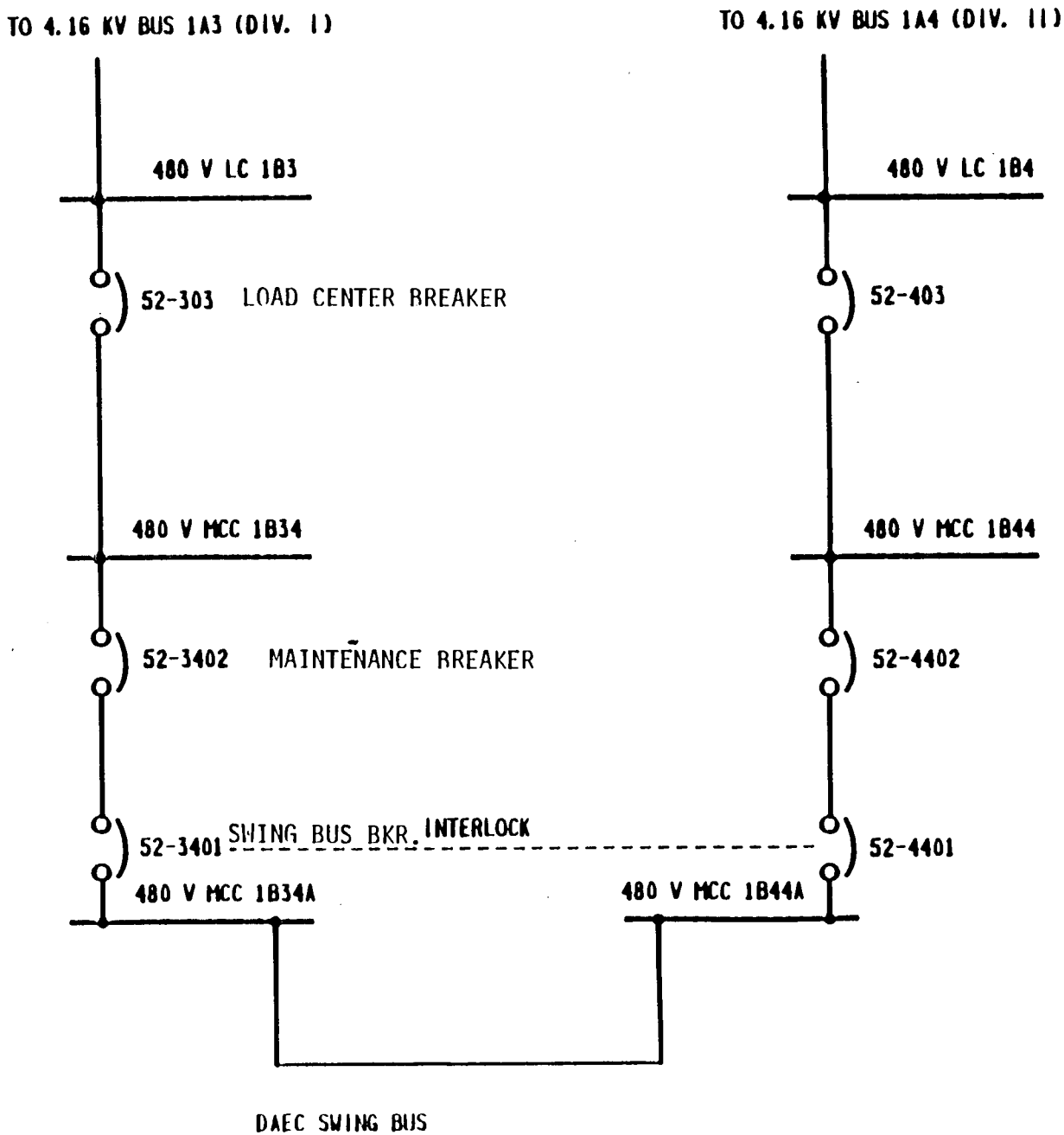

TO 4.16 KV BUS 1A3 (DIV. I)
TO 4.16 KV BUS 1A4 (DIV. II)
480 V LC 1B3
480 V LC 1B4
52-303 LOAD CENTER BREAKER
52-403
480 V MCC 1B34
480 V MCC 1B44
52-3402 MAINTENANCE BREAKER
52-4402
52-3401 SWING BUS BKR. INTERLOCK
52-4401
480 V MCC 1B34A
480 V MCC 1B44A
DAEC SWING BUS

Figure 2