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MINECK,D.L. Iowa Electric Light & Power Co.
RECIP.NAME RECIPIENT AFFILIATION
DAVIS,A.B. Region 3 (Post 820201)

SUBJECT: Responds to violations noted in electrical distribution sys functional insp rept 50-331/91-02.Corrective actions:calibr data sheets for plant instrumentation must now state in applicable units upper & lower bounds of tolerance band.

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Iowa Electric Light and Power Company

May 15, 1991
NG-91-1262

Mr. A. Bert Davis
Regional Administrator
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License DPR-49
Response to Notice of Violation
Transmitted with NRC Inspection
REPORT 91-02

File: A-102, R-10, R-43

Dear Mr. Davis:

This letter and attachment are provided in response to the recent Electrical Distribution System Functional inspection (EDSFI) performed at the Duane Arnold Energy Center.

Attachment 1 responds to the items identified in the Notices of Violation. As requested, Attachment 2 discusses the status of unresolved items and open items identified in your report.

If you have any questions regarding this response, please feel free to contact our office.

Very truly yours,

Daniel L. Mineck
Manager, Nuclear Division

Attachments: 1) Response to Notice of Violation
2) Response to Unresolved Items and Open Items

cc: U. S. NRC Document Control Desk (Original)
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A045

Iowa Electric Light & Power Company
Response to Notice of Violation
Transmitted with Inspection Report 91-02

NRC NOTICE OF VIOLATION 1

"1. 10 CFR 50, Appendix B, Criterion XI, as implemented by the Iowa Electric Light and Power Quality Assurance Manual, requires that tests incorporate the acceptance limits contained in applicable design documents and that test results be documented and evaluated to assure that test requirements have been satisfied.

Drawing No. BECH-M404(24), the design document for standby diesel generator (SDG) fuel quantity level switch settings, requires that day tank low-low alarm level indicating switch Nos. LIS 3207 and LIS 3209 be set to trip at 15 inches of fuel oil (INFO). Also, the calibration data sheets require that SDG day tank level indicating switch Nos. LIS 3208, LIS 3210, LIS 3215, and LIS 3216 be set at 20 +/-1.2, 20 +/-0.3, 18 +/-1.2, and 18 +/-0.3 INFO, respectively.

Contrary to the above:

a. During instrument calibrations in October 1989 and April 1990, switch No. LIS 3208 was set at 25.4 INFO, switch No. LIS 3210 was set at 19.6 INFO, switch No. LIS 3215 was set at 20.5 INFO, and switch No. LIS 3216 was set at 18.6 INFO, which exceeded the calibration tolerance. No evaluation had been performed by the licensee to determine the acceptability of this condition.

b. During July 1990, the licensee set switch Nos. LIS 3207 and LIS 3209 to trip at 6.86 INFO and 4.0 INFO, respectively.

This is a Severity Level IV violation (Supplement I)."

RESPONSE TO NOTICE OF VIOLATION 1

1. Corrective Actions Taken and the Results Achieved

During the fall, 1989 calibration of Standby Diesel Generator day tank level indicating switch LIS3216, the two internal switches in this instrument were left outside the allowable calibration tolerance. We understand that the Region III staff has since concluded the remaining instrument calibrations cited in parts a. and b. of the Violation were performed in accordance with test requirements.

LIS3216 was recalibrated to within specified tolerance on March 4, 1991. We have reviewed the effect of leaving the two internal switches within LIS3216 outside their allowable setpoint tolerances and concluded that there was no impact on SDG operability. One of these switches provides a low level alarm for the fuel oil day tank. At its design value, this alarm actuates when enough fuel remains to operate the SDG for approximately one hour. Following its 1989 calibration, the alarm would have actuated with approximately fifty minutes of fuel remaining. Sufficient time was still available for corrective actions to be taken. The other internal switch within LIS3216 provides a high day tank level alarm and would have initiated at a slightly higher than optimum value. Any overflow from the day tank is piped back to the main oil tank. High tank levels are not an operability or safety concern.

2. Corrective Actions to be Taken to Prevent Recurrence

The data sheet used for the calibration of LIS3216 in 1989 stated the acceptable tolerance of the internal switch setpoints only as a percentage of full scale. As a corrective action to prevent recurrence, calibration data sheets for plant instrumentation must now state in applicable units the upper and lower bounds of the tolerance band for each setpoint. Inclusion of this information on the calibration data sheet should reduce errors by providing the technician performing the calibration and subsequent reviewers with acceptance criteria that are more readily understood.

3. Date When Full Compliance Will Be Achieved

Full compliance was achieved with the recalibration of LIS3216 on March 4, 1991.

NRC NOTICE OF VIOLATION 2

"2. 10 CFR 50, Appendix B, Criterion V, as implemented by the Iowa Electric Light and Power Quality Assurance Manual, requires that activities affecting quality be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and be accomplished in accordance with these instructions, procedures, or drawings. It also requires that instructions, procedures, or drawings include appropriate acceptance criteria for determining that important activities have been satisfactorily accomplished.

SDG fuel oil day tank annunciator response procedure (ARP) Nos. 1C08A/B10, 1C08B/B-3, 1C93/B-5, and 1C94/B-5 were required to reflect setpoints of 15 INFO, 15 INFO, 18 INFO, and 18 INFO, respectively, as specified on day tank level setting drawing No. BECH-M404(24).

Procedure No. M-11A-TP, "Overcurrent Relay Test Procedure," Revision 3, established the testing methodology for calibrating overcurrent relays. The setting sheets associated with feeder breaker No. 152-301 required a relay tap setting of 5 Amperes.

Drawing No. E893<097> required 10 Ampere fuses to be installed in positions 52-3401-F1 and 52-3401-F2 of remote shutdown panel No. 1C422C. Advanced information drawing (AID) No. APED-H11-067(2) required 10 Ampere fuses to be installed in positions FF-F19 and FF-F20 of control room panel No. 1C03.

Contrary to the above.

a. Prior to March 1991, the ARP No. 1C08A/B-10 setpoint was 10 INFO, the ARP No. 1C08B/B-3 setpoint was 10 INFO, the ARP No. 1C93/B-5 setpoint was 13 INFO, and the ARP No. 1C94/B-5 setpoint was 13 INFO, which did not reflect the level settings specified on design drawing No. BECH-M404(24).

b. Procedure No. M-11A-TP did not ensure that the overcurrent relay for feeder breaker No. 152-301 was returned to the required tap setting after calibration. Consequently, the relay tap setting was found to be set at 2 amperes instead of the required setting of 5 amperes.

c. On March 7, 1991, fuse Nos. 52-3401-F1 and 52-3401-F2 in the remote shutdown panel were observed to be 6 Amperes and fuse Nos. FF-F19 and FF-F20 in control room panel No. 1C03 were observed to be 5 Amperes.

This is a Severity Level IV violation (Supplement I)."

RESPONSE TO NOTICE OF VIOLATION 2.a.

1. Corrective Actions Taken and the Results Achieved

The affected Annunciator Response Procedures (ARPs) have been modified to be consistent with the level settings specified in the current revision of design drawing No. Bech-M404(24).

2. Corrective Actions to be Taken to Prevent Recurrence

The erroneous values in the ARPs were due to use of a superseded drawing during their development in 1986. Since that time, the group responsible for procedure development has been provided with

controlled, continuously updated drawings to help ensure procedural accuracy.

Following discovery of a ARP discrepancy by our Corporate Quality Assurance department in December, 1990, a comparison of all ARP setpoints with design and plant documentation was initiated and scheduled for completion by July 31, 1991. At the time of the EDSFI inspection in February - March, 1991, this review had not been completed for the procedures in question.

3. Date When Full Compliance Will Be Achieved

Full compliance was achieved on May 15, 1991 with completion of the procedure modifications.

RESPONSE TO NOTICE OF VIOLATION 2.b.

1. Corrective Actions Taken and the Results Achieved

The overcurrent relay for feeder breaker 152-301 was returned to its required tap setting on February 12, 1991. A field inspection of the safety-related overcurrent relays calibrated by M-11A-TP was also conducted at that time to verify that their tap settings were correct. No other discrepancies were found.

To prevent recurrence, the governing procedure for the relay calibration, M-11A-TP, has been modified to require comparison of the final relay tap setting to design values.

2. Corrective Actions to be Taken to Prevent Recurrence

All planned actions have been completed.

3. Date When Full Compliance Will Be Achieved

Full compliance was achieved on February 12, 1991 with the return of the tap setting on the overcurrent relay to its required value.

RESPONSE TO NOTICE OF VIOLATION 2.c.

1. Corrective Actions Taken and the Results Achieved

It was determined that the incorrectly-sized fuses would not adversely affect the operation of safety-related equipment. The fuses at panel 1C03 were replaced with properly sized fuses on March 6, 1991. Replacement of the fuses in the remote shutdown panel requires a plant outage or entry into a twenty-four hour

Limiting Condition for Operation due to the impact of the power loss on safety system availability. Therefore, the fuses will be replaced during the next plant shutdown.

2. Corrective Actions to be Taken to Prevent Recurrence

As discussed in the December, 1990 meeting with NRC management, and Inspection Report 91-02, Iowa Electric had identified the need for improvement in the area of fuse control. Management guidance has been issued to strengthen controls on fuse replacement in order to provide increased assurance this activity is performed in accordance with design drawings. Development of a long-term program in this area is also underway. At present, the scope will be limited to panel and motor control center fuses. A program plan will be developed by September 30, 1991.

3. Date When Full Compliance Will Be Achieved

Full compliance will be achieved with the replacement of fuses 52-3401-F1 and 52-3401-F2 in the remote shutdown panel during the next plant outage. As previously noted, the currently installed fuses do not represent a safety concern.

Iowa Electric Light and Power Company
Response to Unresolved and Open Items
Transmitted with Inspection Report 91-02

Unresolved Item #1 (2.1.16) Breaker Trip Settings

Past procedural requirements and practice established in-plant trip settings in accordance with the E-105 series drawings. These drawings provide both a current value (amps) and dial setting for each protective device in each breaker. The dial setting value as specified on the drawings is a less reliable means of setting the devices than the current value. Therefore, in-plant settings are established by testing the breakers and adjusting the dial setting to achieve the desired trip current. This practice has been demonstrated to be reliable in that instances of unnecessary or spurious breakers tripping, and failures of breakers to trip, have been rare.

The Iowa Electric Power System Analysis initiative provides the methodology to establish preferred settings for protective breakers. This initiative will provide greater configuration management and optimization of the electrical design. This analytical tool, implemented during subsequent routine maintenance, will optimize breaker settings. Power System Analysis analytical tools to optimize breaker coordination for 480 breakers will be completed this year. Maintenance to 480 VAC breakers will be implemented over the next two refueling outages.

Unresolved Item #2 (2.2.3) DC Contactor Operation

The following comments correspond to Inspection Report Section 2.2.3, subsections a. through e.

a) The calculation (CAL IELP-E-88-05) conservatively determined maximum available motor current under worst case combination conditions of minimum battery voltage (at end of design discharge), maximum ambient temperature of the motor, maximum voltage drop between the battery and motor, combined with locked rotor conditions. These calculations, performed in conjunction with NRC IEB 85-03 on MOVs, established a recommended in-plant maximum seating current (and corresponding torque switch setting) that included additional margins to accommodate repeatability and variance between as tested conditions and calculated performance under design basis conditions. Iowa Electric experience has shown that seating current is a more reliable control parameter than torque switch setting alone. Therefore, the implementation of controls over seating current, rather than torque switch setting alone provides greater assurance of valve performance. The NRC inspection report commented that several valves did not meet acceptance criteria. In each situation where individual valves could not meet the established seating current, or established thrust values, an evaluation was made and the acceptability of the

in-plant setting was confirmed. In addition, where significant performance degradation was noted or design margins did not allow adequate assurance of future performance, modification and/or maintenance activities were initiated and completed to restore margin.

Submittals to the NRC have documented the status of NRC Bulletin 85-03 motor operated valves.

b) We know of no errors in drawing BECH-E200 which prevented the proper adjustment of the limitorque torque switches. Torque switches and seating currents of Bulletin 85-03 valves are tightly controlled and a high degree of assurance is maintained that valves are properly set following maintenance and when returned to operable service.

c) The purpose of the calculation was to address specific valves within the scope of the IE Bulletin cited above. Additional valves fall within the scope of Generic Letter 89-10 which was issued subsequent to the subject calculation. Revised calculations are in progress and will be completed by June 30, 1991.

d) The resistance of the thermal overload devices (and contact resistance in general) is a minor contribution to the overall circuit resistance and resultant worst case maximum motor available current. Its exclusion is not significant to the calculations. Additional conservatism (for example a 10% maximum current factor, and the assumption of low battery voltage, maximum ambient temperature, and maximum torque demand) were applied in the calculation to account for minor effects which were not individually quantified. However, as noted during the inspection, this factor will be included specifically in the revised calculations.

e) The calculations were intended to address the Direct Current power available to the motor. The control circuit is a separate circuit that controls the opening and closing of the breaker and has no effect on the amount of current available at the motor terminals. The calculation was not intended to address the control loop. The Power System Analysis initiative being pursued by Iowa Electric will perform calculations of these DC control circuits following completion of the DC Power bus calculations. The two 125VDC systems are supplied from a dedicated battery. Each battery division can be supplied by a redundant charger fed by an essential division 1 AC emergency diesel generator or a division 2 AC emergency diesel generator. A similar arrangement exists for the 250VDC system. The MOV calculations were performed assuming that the batteries have been discharged to minimal terminal design voltage, and AC chargers are unavailable. The battery terminal voltage utilized for the calculations are 105VDC (for 125vdc battery systems) and 210VDC (for 250VDC system). However, as redundant emergency diesel generators and battery chargers are provided by design, it is highly unlikely that the above minimum battery voltages would exist. With these redundant design

provisions, licensing requirements and regulations would not require that voltage drop calculations be conducted at the minimum battery voltages given the AC charger capability. Consistent with defense in depth and conservative design philosophy, however, it is Iowa Electric's intent to maintain this conservatism and additional conservatism.

The commitments made by Iowa Electric during the inspection related to this area are as follows:

The CALC-IELP-E-88-05 will be revised by June 30, 1991 to reflect, in a central location, the Bulletin 85-03 valves, the Generic Letter 89-10 valves, and the controlling current limits. The Power System Analysis provides a mechanism for addressing control circuit voltage drops. This phase of the activity is scheduled following Power Bus calculations and evaluations that are currently in progress. The installation of Design modifications to provide the control room operators immediate indication of thermal overload trip has been instituted on several key valves. Additional valves will also receive this modification in a systematic manner. This activity will continue through 1992.

Unresolved Item #3 (2.3.1 - EDG fuel storage)

A revised engineering calculation will be completed by August, 1991. A revision to the UFSAR will be documented in the next UFSAR update (1992).

Unresolved Item #4 (2.3.2- EDG Air Start Accumulator relief valves)

An evaluation has been completed which demonstrates that the relief valves will not depressurize the diesel generator air accumulators during seismic events.

Unresolved Item #5 (2.3.3- EDG air supply ducting common mode vulnerability)

As noted in our commitment, a documented engineering analysis will be completed by August, 1991.

EDSFI OPEN ITEMS

Open Item 1 (2.1.2,2.1.3)

The Iowa Electric perspectives regarding this area are summarized below.

1) Testing of Diesel Generators is required by the Technical Specifications at required frequencies and for required durations. DAEC Technical Specifications are typical of those for other facilities.

2) During diesel generator testing, a Diesel is paralleled to the system grid. During this period of time, the ability of the diesel to respond in an optimum manner to grid perturbation and to loading sequences is degraded. DAEC is similar to other facilities in this aspect.

3) Defense in depth Design and Licensing philosophy provided for two (2) 100% capacity, redundant Emergency Diesels. Testing of the Diesel Generators is not conducted simultaneously. This aspect is similar to most facilities.

4) Loss of offsite power during testing, coupled with a LOCA, represents a very low frequency of occurrence. The availability of the midwest power grid is good. Testing is suspended when tornadoes threaten the facility. These factors further reduce the risk of the scenario.

5) Two redundant degraded voltage relays are provided on each essential AC bus and are designed to disconnect offsite power from the essential AC buses in the event voltage is less than 92.5 percent for a period of greater than 8-8.5 seconds. The hypothetical concern postulates that the diesel (while in the test mode, parallel to the grid) continues to supply adequate voltage to both its essential bus, and the second essential bus by backfeeding from offsite supply transformers. The offsite supply transformer in this instance would be inducing voltage from a secondary winding to the primary winding to the second secondary winding. To remain in this configuration without offsite power, all 4 degraded voltage relays would need to fail. It is extremely unlikely that all of the four degraded voltage relays would fail to trip and eliminate the condition. However, were any of the four not to trip on degraded bus voltage, the fact that voltages were being maintained at acceptable levels demonstrates an acceptable situation in terms of maintaining adequate electrical power during a hypothetical emergency condition.

The design, testing, and licensing of the DAEC emergency diesel generators and emergency bus system and protective relaying meets requirements for nuclear facilities. Defense in depth and redundancy are essential elements of this design. The discussion and hypothetical scenarios contained within the inspection report represent conditions beyond that for which the facility was

designed or licensed. The DAEC design and operating practices, in our view, do not represent a weakness.

Open Item 2 (2.1.4)

The NRC expressed concern over the lack of secondary surge protection for 4kv motors and load center transformers. In response to this concern the following information and position was provided to the NRC:

> ANSI/IEEE Std. 141-1986, section 4.6.3.3 states that typical surge exposure for dry-type transformers is through another (supply) transformer. This is the configuration at DAEC. The Startup Transformer supplies the 4160 VAC switchgear which feeds the dry-type load center transformers. ANSI/IEEE Std. 141-1986 states that for transformers of this configuration, arresters are generally not required at the dry-type transformers.
>
> Similarly, metal-clad switchgear is also addressed by ANSI/IEEE Std. 141-1986. When the only exposure of the metal-clad switchgear to lightening is through a power transformer and the transformer has adequate lightening protection, generally there is no necessity to provide arresters on the sheltered side of the transformer connected to the switchgear. Ref: ANSI/IEEE Std. 141-1986 Section 4.3.6.2.
>
> Following the review of the surge protection design we feel it is adequate for protection from lightening strikes.

In addition, it is noted that multiple safety systems in redundant safety trains are not typically tested, or running at the same time. Therefore, were a surge to occur, it is highly unlikely that 4KV motors would experience, or be damaged by, surges such that multiple redundant safety trains would be simultaneously damaged. There are no current plans to evaluate this item further.

Open Item #3 (2.1.8)

Regarding the sizing of the neutral grounding resistor, Iowa Electric committed to revise calculation BECH-EC-7C to account for capacitance effects by August, 1991.

Open Item #4 (2.1.13)

Regarding Cable Tray covers on low level signal instrumentation cables, cable tray covers will be installed where warranted on appropriate trays.