



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 93 TO FACILITY OPERATING LICENSE NO. NPF-62

ILLINOIS POWER COMPANY, ET AL.

CLINTON POWER STATION, UNIT NO. 1

DOCKET NO. 50-461

1.0 INTRODUCTION

In the event that AC electrical power supplying the Clinton Power Station (CPS) is lost, emergency diesel generators (EDGs) are capable of supplying onsite emergency AC power. The operating license for the CPS requires that these EDGs be periodically tested to demonstrate both their reliability and availability to perform their intended safety functions. Testing demonstrates the capability of the EDGs to start, reach rated speed, voltage, and frequency within the required time, and remain synchronized at the rated load. CPS Technical Specification Table 4.8.1.1.2-1 requires that the frequency of testing be performance based. While the frequency of testing is normally required to be once per 31 days, this frequency is increased to once per seven days when the number of failures is greater than or equal to five in the last 100 valid tests or two in the last 20 valid tests. The weekly test frequency must be maintained until seven consecutive failure-free tests have been performed and the number of failures in the last 20 valid tests has been reduced to less than or equal to one.

During the past year, CPS experienced three failures of the Division 1 EDG that were attributed to the undervoltage relays (Westinghouse model CV-2) associated with the output breaker control circuitry. These failures were not identified during actual surveillance tests, but as a result of operator tours of plant equipment. Targets were observed in the undervoltage relays indicating circuit malfunction. Accordingly, these observations represented valid failures of the EDG. The three failures, which occurred on August 3, 1993, June 7 and July 12, 1994, were the sixth, seventh and eighth failures in the last 100 valid tests. In addition, the most recent failure represented the second failure in the last 20 valid tests. The licensee has been conducting weekly tests since June 7, 1994, and will need to conduct a minimum of nine more weekly tests before they can resume monthly testing.

An investigation by the licensee determined that the above failures were attributed to an incorrectly sized current-limiting resistor in the control circuitry. The licensee has subsequently replaced these resistors with those having more appropriate characteristics. In taking these corrective actions, the licensee believes that continued weekly testing is inappropriate and, in fact, could be detrimental to the overall reliability of the EDG. Therefore,

by letter dated August 5, 1994, the licensee submitted an application to modify Technical Specification Table 4.8.1.1.2-1 such that those failures associated with the control circuitry would not contribute towards accelerated diesel generator testing.

The licensee's letter of August 5, 1994, also requested enforcement discretion to immediately terminate accelerated testing of the Division 1 EDG. The staff provided verbal approval to this request on August 8, 1994, followed by a letter dated August 9, 1994. The enforcement discretion would remain effective until the staff completed action on the proposed changes to the technical specifications.

2.0 EVALUATION

On June 7, 1994, during a routine tour of plant equipment, an operator observed relay targets showing in the Division 1 diesel generator A-B and C-B phase undervoltage relays (Westinghouse model CV-2) indicating a circuit malfunction had occurred. There are two CV-2 relays for each of the Division 1 and 2 EDGs which are part of the permissive-to-close circuitry for the output breaker. The CV-2 relays are normally energized in the open position and are designed to deenergize to close after the EDG reaches sufficient voltage to power the safety-related buses. Premature closure of this relay would result in an attempt to load the buses without sufficient voltage. This would result in the EDG stalling and the subsequent failure of the EDG to perform its intended safety function.

An investigation by the licensee determined that the A-B phase CV-2 relay telephone coil had failed due to excessive current as a result of an incorrectly sized current-limiting resistor in the telephone coil circuitry. While the manufacturer's literature implied that the resistor is 2500 ohms, a 1320 ohm resistor was found to be installed in the telephone coil that failed. The lower rated resistor resulted in an excessive current that resulted in coil burnout. Although the EDG was observed in its normal standby mode at the time the targets were observed, guidance found in Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used As Onsite Electric Power Systems at Nuclear Power Plants," determined that this observation represented a valid failure of the EDG. Since this was the seventh valid failure in the past 100 tests, the licensee initiated weekly testing of the Division 1 EDG. The licensee responded by issuing a 10 CFR Part 21 report on June 27, 1994, that identified the undersized resistor in the telephone coil.

Following the EDG failure of June 7, 1994, the licensee ordered new parts to replace the undersized resistors and replaced the Division 1 CV-2 relay with a like-replacement. At the time, it was thought that CV-2 relays should have an operational life of at least two years and the CV-2 replacement relay for the Division 1 EDG should be sufficient until the upgraded resistors arrived. The similar relay for the Division 2 EDG had been replaced in May 1994. The Division 3 EDG that provides power to the high pressure core spray system does not have similar control circuitry.

On July 12, 1994, during a similar plant tour of equipment, the targets were again found showing on the Division 1 EDG. While the investigation identified the B-C phase coil to have failed, the failure mode was identical to the event of June 7, 1994. Since this failure represented the second failure in the past 20 tests, weekly testing would be required until there were seven consecutive successful tests and only one failure in the past 20 tests.

The replacement resistors arrived onsite on July 13 and were installed on the Division 1 EDG that day. Similarly, the replacement resistors were installed on the Division 2 EDG on July 14. Testing verified that the modified relays would remain open while being energized and then close after being de-energized. The licensee also verified that the current through the Division 1 and Division 2 telephone coils was less than the maximum continuous current carrying capability of the coil to preclude coil burnout. By taking these corrective actions, the licensee believes that this failure mode has been eliminated.

The licensee's letter of August 5, 1994, identified the failures of June 7 and July 12, 1994, as well as a failure on August 3, 1993, as all being caused by the undersized current-limiting resistor of the telephone coils. As of August 5, 1994, the licensee stated that there would need to be a minimum of nine more successful tests of the Division 1 EDG before a monthly test frequency could be resumed. The licensee stated that weekly testing would not be productive because the EDG is manually loaded and the CV-2 relay would not be tested. Technical Specifications only require introducing a loss-of-offsite power signal (and thus testing of the CV-2 relay) once every 18 months. The licensee pointed out that the past three failures were all identified during operator tours of plant equipment and that such tours occur once per shift. The licensee further stated that unnecessary testing of the diesel generators can have a long-term detrimental effect on the EDG, such that its overall reliability can be reduced.

The staff concurs that the failure of the CV-2 relay cannot be revealed by surveillance testing required by Technical Specification Table 4.8.1.1.2-1 because CV-2 relay is not in the circuit during the monthly testing. Since the licensee has replaced the resistors with those having more appropriate design characteristics, the staff also concurs that the identified failure mode should not recur. In addition, the once per shift tours should be able to continue to identify other failures if they occur again. Finally, the staff desires to eliminate unnecessary diesel generator testing, because it can cause unnecessary wear or degradation of the EDG. Therefore, the staff finds the licensee's proposal to exclude these three individual test failures from contributing towards an accelerated test schedule to be acceptable.

3.0 EXIGENT CIRCUMSTANCES

The Commission's regulation, 10 CFR 50.91, contains provisions for issuance of amendments when the usual 30-day public notice period cannot be met. One type of special exception is an exigency. An exigency is a case where the staff and licensee need to act promptly and the staff has determined that the amendment involves no significant hazards considerations.

Under such circumstances, the Commission notifies the public in one of two ways: by issuing a Federal Register notice providing an opportunity for hearing and allowing at least two weeks for prior public comments, or by issuing a press release discussing the proposed changes, using the local media. In this case the Commission used the former approach.

The licensee has identified the events of August 3, 1993, June 7 and July 12, 1994, as representing valid failures for the Division 1 EDG. While Technical Specification Table 4.8.1.1.2-1 requires the test frequency of the Division 1 EDG to be increased from monthly to weekly, such testing would not test the CV-2 relay. Due to recent failures, Technical Specifications would require weekly testing until the first week of October 1994 (assuming no additional failures are encountered). As previously stated, the staff desires to eliminate all unnecessary testing of the EDGs as it can contribute to an overall degradation in the EDG. Since the staff considers such testing to be unnecessary, prompt action is required to eliminate this requirement.

The licensee submitted the request for amendment on August 5, 1994. It was noticed in the Federal Register on August 16, 1994 (59 FR 42080), at which time the staff proposed a no significant hazards consideration determination. In its letter of August 5, 1994, the licensee requested that the amendment be issued promptly. The licensee stated that such action would be necessary to preclude unnecessary testing of the Division 1 EDG and that such testing could result in an overall degradation of the EDG. Due to time constraints, sufficient time was not available to permit the customary 30-day public notice in advance of this action.

Accordingly, pursuant to 10 CFR 50.91(a)(6), the Commission has determined that an exigent situation exists in that failure to act in a timely way will result in unnecessary and excessive testing of the Division 1 EDG which can contribute to an overall degradation of the EDG. Further, the Commission has determined that the exigent situation is not due to the failure of the licensee to act in a timely manner.

There were no public comments in response to the notice published in the Federal Register.

4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards considerations if operation of the facility in accordance with the amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

This amendment has been evaluated against the standards in 10 CFR 50.92. The Commission has made a final determination that the amendment does not involve a significant hazards consideration because:

The proposed change to the Technical Specifications does not alter the current plant design or operation. The proposed change simply permits the licensee to exclude three failures of the Division 1 EDG from contributing towards an accelerated test schedule. The licensee has taken corrective actions by replacing the undersized current-limiting resistors. This should eliminate this failure mode from recurring and restore the reliability of the EDG. Additional testing as required by the existing Technical Specifications will not provide meaningful results and may, in fact, contribute towards a long term reduction in the overall reliability of the diesel generator. Resumption of the normal monthly testing requirements combined with the above corrective actions provide sufficient assurance that the Division 1 EDG will remain capable of performing its intended function. Therefore, the proposed change will not result in a significant increase in the probability or the consequences of any accident previously evaluated.

The proposed change will permit the licensee to resume a monthly test schedule for the Division 1 EDG. This change does not alter the current plant design or operation. Therefore, no new failure modes are introduced and the proposed change to the Technical Specification will not create the possibility of a new or different kind of accident from any accident previously evaluated.

As previously stated, the proposed change will permit the licensee to resume monthly testing of the Division 1 EDG. Therefore, the only margin of safety that could be affected by this proposed change would be the reliability of the EDG. However, following the corrective actions taken by the licensee in replacing the undersized current-limiting resistors, accelerated testing as currently required by the technical specifications would not provide any additional assurance of reliability. Rather, increased testing leads to additional cycling and degradation of the EDG which, in the longer term, can lead to an overall reduction in reliability of the EDG. The corrective actions combined with the monthly surveillance tests provide sufficient assurance of the reliability of the Division 1 EDG. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based upon the above considerations, the staff concludes that the amendment meets the three criteria of 10 CFR 50.92. Therefore, the staff has made a final determination that the proposed amendment does not involve a significant hazards consideration.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types,

of any effluent that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The staff has made a final determination that this amendment involves no significant hazards consideration. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that because the requested changes do not involve a significant increase in the probability or consequences of an accident previously evaluated, do not create the possibility of an accident of a type different from any evaluated previously, and do not involve a significant reduction in a margin of safety, the amendment does not involve a significant hazards consideration that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: September 2, 1994