

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATED TO AMENDMENT NO. 58 TO FACILITY OPERATING LICENSE NO. DPR-24 AND AMENDMENT NO. 62 TO FACILITY OPERATING LICENSE NO. DPR-27

WISCONSIN ELECTRIC POWER COMPANY

POINT BEACH NUCLEAR PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-266 AND 50-301

Introduction

By letter dated December 3, 1981 (Reference 1), Wisconsin Electric Power Company requested a revision to Technical Specification table 15.3.5-1 to change the setpoint of degraded grid voltage protection relays. This revision would change the time delay for tripping the degraded off-site power source from 13.6 seconds \pm 5% to less than 60 seconds at 0-95% of voltage setting of 3675 volts \pm 2% (88% of 4160 volts). An interim approval of this request was granted to Wisconsin Electric Power Company by our letter dated December 4, 1981 as supplemented by amendments 57 and 61 issued December 21, 1981 subject to a satisfactory response to our questions. The licensee has responded to our questions in his letter dated December 30, 1981 (Reference 2) and has requested a change to the voltage setpoint and associated time delay from 3675 volts \pm 2% to 3762 volts \pm 2% (90.4% of 4160 volts) with a time delay of 30 seconds.

Background

The licensee's degraded grid voltage protection relay setpoint of 13.6 seconds + 5% time delay for 88% of 4160 volts was initially approved by our safety evaluation report dated January 30, 1981. Subsequent to the installation of these relays, the licensee started a reactor coolant pump during the plant start-up and caused the off-site source to trip. The high starting current of a reactor coolant pump degraded the bus voltage below the relay setpont value for a period longer than 13.6 seconds, tripping the degraded grid voltage protection relay. The voltage recovery above the setpoint takes approximately 22.5 seconds.

Originally, the 88% of 4160 volts setpoint was considered adequate to protect motors of 90% voltage rating because of its service factor. In response to our questions, the licensee has proposed to raise this setpoint to 3762 volts + 2% (minimum 88.6% of 4160 volts).

8201250169 820106 PDR ADOCK 05000266 P PDR

Discussion and Evaluation

It is undesirable to have the degraded grid voltage relays operated for normal plant evolutions and such was never intended by the staff. The proposed time delay of 30 seconds is sufficient to ensure that voltage drops caused by routine starting of plant equipment will not cause these relays to trip.

At Point Beach Units, the undervoltage protection for class 1E equipment is provided by the following sets of undervoltage relays that disconnect the off-site source of degraded power from the class 1E buses.

- Loss of voltage relays arranged in 1-out-of-2 logic on each redundant 4160 V class IE bus and trips the respective Lus.
- (2) Degraded voltage relays arranged in 2-out-of-3 logic on each redundant 4160 V class lie bus and trips the respective bus.
- (3) Single non 1E relay mounted in non 1E switchgear and trips off-site source to both 4160 V class 1E buses.
- (a) Existing Setpoints of the Undervoltage Relays
 - Loss of voltage relays are set at 2450 volts + 3% (minimum 2450 -73.5 = 57% of 4160 volts) to trip in approximately 1.2 seconds at 90% of voltage setting.
 - (2) Degraded voltage relays are set at > 3675 volts + 2% (minimum 3675 - 73.5 = 86.6% of 4160 volts) to trip in approximately 13.6 seconds at 95% of voltage setting.
 - (3) Single non 1E relay is set to trip in 13.6 seconds at 78% of 4160 volts and takes 2.6 seconds to trip at 0 volts.
- (b) Revised Setpoints of the Undervoltage Relays

Degraded voltage relays setpoint is proposed to be set at 3762 volts $\pm 2\%$ (minimum 3762 - 75 = 88.6% of 4160 volts) to trip in less than 30 seconds.

- (c) Equipment Ratings (Reference 2 and 4)
 - Motors powered by the 4160 volts bus are rated at 4000 volts and those powered by the 480 volts bus are rated at 460 volts.
 - (2) All safety related motors are rated to start and accelerate their load with 80% terminal voltage, run continuously at 90% to 110% of terminal voltage and have a one minute rating of 75% terminal voltage, i.e., 72% of respective bus voltage.

- (3) Pick up and drop out ratings of a representative starter are 72.5% and 52.5% of nominal bus voltage, i.e., 480 volts.
- (4) Motors have a service factor of 1.15.

11.1.1

(d) Minimum Expected Voltage on Class 1E Equipment (Reference 2)

- (1) 4kV motors have 95.9% voltage on their terminals.
- (2) 460 V equipments have 91% voltage on their terminals.

The evaluation of voltage relay settings, equipment ratings and minimum expected voltages on equipment terminal indicate that the 4kV motors are adequately protected for bus voltages above 75% of nominal. However, with the 88.6% of 4160 volts setpoint of degraded voltage relay, the 460 volt motors could be continuously running with terminal voltages as low as 87% of their voltage rating (3% below the name plate rating).

Also, if the bus voltages degrade to and stay at some value between 72% of nominal and the trip setting of loss of voltage relays, the running motors may stall and contactors may not be able to pick up during the 30 seconds fixed time delay provided with the degraded voltage relays. This range could adequately be protected if proper functioning of the non-class IE relay, set at 78% of nominal bus voltage, is guaranteed, i.e., the relays made class IE or the setpoint of loss of voltage relays could be raised above the stalling motor voltages.

The licensee has committed to evaluate various options to provide adequate protection of all class IE equipment from undervoltages including the voltage range discussed above. The licensee has requested a period of six months for this evaluation and submittal of an acceptable modification to the technical specification.

We have determined that during the interim period of six months there is minimal likelihood that the non class IE relay will be needed and will not function, or that the above mentioned undervoltages will render class IE equipment inoperable or excessively overstressed. We therefore, find this technical specification change to be acceptable for the interim period pending the licensee's further evaluation and submittal.

Environmental Consideration

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendments do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the amendments do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of

Date: January 6, 1982

T. Colburn G. Holahan

References

·." . . *

- Wisconsin Electric Power Company letter (C.W. Fay) to the NRC (H. Denton), dated December 3, 1981.
- Wisconsin Electric Power Company letter (C.W. Fay) to the NRC (H. Denton), dated December 30, 1981.
- 3. Memorandum for Paul S. Check, DSI to Tom Novak, DL, dated January 30, 1981.
- Wisconsin Electric Power Company letter (C.W. Fay) to the NRC (H. Denton), dated January 17, 1980.