

Docket No. 50-305

April 30, 1984

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Docket File

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Dear Mr. Giesler:

The Commission has issued the enclosed Amendment No.53 to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant. The amendment consists of changes to the Technical Specifications in response to your application transmitted by letter dated February 22, 1984, as supplemented March 8 and April 4, 1984.

The amendment revises the Technical Specifications related to the undervoltage trip setpoints of the primary and second level undervoltage relays for the Kewaunee engineered safeguards electrical buses.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular monthly Federal Register notice.

Sincerely,

**ORIGINAL SIGNED BY**

Joseph D. Neighbors, Project Manager  
Operating Reactors Branch #1  
Division of Licensing

Enclosures:

1. Amendment No. 53 to DPR-43
2. Safety Evaluation

cc: w/enclosures  
See next page

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CParrish  
4/19/84

ORB#1:DL  
DNeighbors  
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OELD  
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GLinas  
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HE RUBENSTEIN  
MY ADVISOR  
JBR  
4/19/84

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Mr. C. W. Giesler  
Wisconsin Public Service Corporation

Kewaunee Nuclear Power Plant

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

WISCONSIN PUBLIC SERVICE CORPORATION  
WISCONSIN POWER AND LIGHT COMPANY  
MADISON GAS AND ELECTRIC COMPANY

DOCKET NO. 50-305

KEWAUNEE NUCLEAR PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 53  
License No. DPR-43

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Wisconsin Public Service Corporation, Wisconsin Power and Light Company, and Madison Gas and Electric Company (the licensee) dated February 22, 1984, as supplemented March 8 and April 4, 1984, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-43 is hereby amended to read as follows:

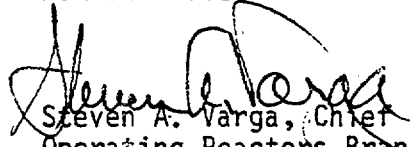
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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 53, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Steven A. Varga, Chief  
Operating Reactors Branch #1  
Division of Licensing

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: April 30, 1984

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 53 TO FACILITY OPERATING LICENSE NO. OPR-43

DOCKET NO. 50-305

Revise Appendix A as follows:

Remove Pages

3.3-5

Table 3.5-1 (page 2 of 2)

Insert Pages

3.3-5

Table 3.5-1 (page 2 of 2)

6. The set points and associated ranges for the undervoltage relays have been established to always maintain motor voltages at or above 80% of their nameplate rating and to prevent prolonged operation of motors below 90% of their nameplate rating. All safeguard motors were designed to accelerate their loads to operating speed with 80% nameplate voltage, but not necessarily within their design temperature rise. Prolonged operation below 90% of nameplate voltage may result in shortening of motor insulation life, but short term operation below 90% of nameplate voltage will not result in unacceptable effects due to the service factor provided in the motors and the conservative insulation system used on the motors.

The primary safeguard buses undervoltage trip (85.0% of nominal bus voltage) is designed to protect against a loss of voltage to the safeguard bus and assures that safeguard protection action will proceed as assumed in the FSAR. The associated time delay feature prevents inadvertent actuation of the undervoltage relays from voltage dips, while assuring that the diesel generators will reach full capacity before the safety injection pump loads are sequenced on.

The safeguard buses second level undervoltage trip (92.5% nominal bus voltage) is designed to protect against prolonged operation below 90% of nameplate voltage of safeguard pumps. The time delay of less than 5 minutes allows the operator time to restore voltage by minimizing or balancing loads on the safeguard buses while maintaining the preferred source of power. Up to 5 minutes of operation of safeguard pumps between 80% and 90% of nameplate voltage is acceptable due to the service factor and conservative insulation designed into the motors.

TABLE TS 3.5-1 (Page 2 of 2)

ENGINEERED SAFETY FEATURES INITIATION INSTRUMENT SETTING LIMITS

| <u>NO.</u> | <u>FUNCTIONAL UNIT</u>                          | <u>CHANNEL</u>        | <u>SETTING LIMIT</u>  |
|------------|---|-----------------------|---|
| 9          | Safeguards Bus Undervoltage (4)                 | Loss of Power         | 85.0% $\pm$ 2% nominal<br>bus voltage<br>$\leq$ 2.5 second time delay   |
| 10         | Safeguards Bus Second Level (5)<br>Undervoltage | Degraded Grid Voltage | 92.5% $\pm$ 2% of nominal<br>bus voltage<br>$\leq$ 5 minutes time delay |

- (1) Initiates containment isolation, feedwater line isolation, shield building ventilation, auxiliary building special vent, and starting of all containment fans. In addition, the signal overrides any bypass on the accumulator valves.
- (2) Confirm main steam isolation valves closure within 5 seconds when tested.  
d/p = differential pressure
- (3) The setting limits for max radiation levels are derived from the technical specification allowable release rates found in Technical Specification 3.9.b.
- (4) This undervoltage protection channel ensures ESF equipment will perform as assumed in the FSAR.
- (5) This undervoltage protection channel protects ESF equipment from long term low voltage operation.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 53 TO FACILITY OPERATING LICENSE NO. DPR-43

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER AND LIGHT COMPANY

MADISON GAS AND ELECTRIC COMPANY

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NO. 50-305

Introduction

By letter dated February 22, 1984, as supplemented March 8 and April 4, 1984, the Wisconsin Public Service Corporation (the licensee) requested an amendment to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant (KNPP). This change relates to undervoltage trip setpoints for the engineered safeguards electrical buses.

Background

Each of the 4160 V Class 1E buses (1-5 and 1-6) at KNPP has four loss-of-voltage relays providing two channels of protection per bus. Each channel consists of one instantaneous relay in series with a time delay relay. The present setpoint for these relays is  $87.5\% \pm 2\%$  of nominal bus voltage with a time delay of less than or equal to 2.5 seconds. In addition each of the above 4160 V buses has two degraded grid undervoltage time delay relays which provide two channels of protection per bus. The present setpoint for these relays is  $95\% \pm 2\%$  of bus nominal voltage with a time delay of  $6 \text{ sec.} \pm .5 \text{ sec.}$  Actuation of any of the degraded voltage time delay relays will activate a common alarm to notify the operator of the degraded voltage condition. Actuation of both of these relays on a single bus will activate a time delay relay with a delay setpoint of less than or equal to 5 minutes. Actuation of the latter relay after 5 minutes will cause separation of the Class 1E buses from the offsite source which subsequently causes load shedding and diesel generator starting and load sequencing. If the bus voltage recovers within 5 minutes, the system will reset itself.

Offsite power to the two 4160 V Class 1E buses (1-5 and 1-6) are provided via the Reserve Auxiliary Transformer (RAT) and the Tertiary Auxiliary Transformer (TAT) respectively. Power to the RAT is provided from the 138 KV switchyard. Power to the TAT is also provided from the 138 KV switchyard via tertiary winding of the 345/138/13.8 KV Auto Transformer. The generating unit is connected to the 345 KV switchyard via the Main Transformer. During normal power operation, power to the station

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auxiliaries is provided via the Main Auxiliary Transformer which is connected to the unit generator. Safety bus 1-5 feeds two Station Service Transformers (SST) which provide power to two 480 V safety buses 1-51 and 1-52. Safety bus 1-6 feeds two SSTs which provide power to two 480 V safety buses 1-61 and 1-62. Two 138 KV lines (Shoto and E. Krock) supply power to the 138 KV switchyard and two 345 KV lines supply power to the 345 KV switchyard. In addition to the above two 138 KV lines which supply offsite power to the safety equipment, either of the two 345 KV lines can provide the necessary power requirement of safety equipment through the secondary winding of the above mentioned Auto Transformer.

### Evaluation

By letters dated February 22, 1984 and April 4, 1984 (References 2 and 4), WPSCO stated that recent testings and voltage analysis have shown that with the E. Krock transmission line and the Auto Transformer unavailable, the Shoto transmission line would be unable to maintain 95% of nominal voltage at 4160 V ESF buses under the minimum grid voltage (133.1 KV). In addition, it is stated in the above letters that with the Shoto line or the 345 KV Point Beach line unavailable, the remaining, transmission lines would be unable to maintain 95% of nominal voltage at 4160 V ESF buses under the minimum grid voltage and peak load condition. In order to prevent separation of the offsite source from the safety buses under the above described conditions, the licensee has requested in Reference 2 to change the setpoints for the loss-of-voltage and degraded grid voltage relays from the present  $87.5\% \pm 2\%$  and  $95\% \pm 2\%$  to  $85\% \pm 2\%$  and  $92.5\% \pm 2\%$ , respectively. To maintain an acceptable voltage at 480 V safety buses 1-51 and 1-61 under the above analyzed conditions, the licensee has proposed (Reference 2) to increase the voltage at these buses by 2.5% by changing the taps of the Station Service Transformers (SST) which supply power to these buses. The licensee states in Reference 4 that any increase in voltage at 480 V safety buses 1-52 and 1-62 would be conducive to an overvoltage condition when these buses are lightly loaded.

The licensee's previous voltage analysis referenced in the Staff's Safety Evaluation Report (SER), dated March 8, 1982 (Ref. 1) indicated that, under maximum loading and minimum grid voltage (134.4 KV) condition, some Class 1E motors thermal overload relays could trip, thereby preventing the motors from performing their safety functions. We discussed the spurious tripping of the overload relays with the licensee on March 9, 1984 via telephone conference. The licensee stated that the thermal overload devices which required replacement due to unacceptable ratings have been replaced and proposed setpoints will not cause unnecessary tripping of these devices. The licensee's statement regarding the above overload relays is documented in Reference 4.

The licensee has stated in Reference 2 that the new setpoints for the undervoltage relays do not alter the technical basis for providing short term operation (less than or equal to 5 minutes) of safeguard motors at or above 80% of nameplate voltage and long term operation at or above 90% of nameplate voltage.

Reference 4 states, except for control room air conditioning compressor motors and internal containment spray (ICS) pump motors that are rated 480 V, the remaining 480 V safeguard motors are rated 460 V. Reference 4 states that A/C compressor motors are rated 480 V  $\pm$  15%. With the proposed setpoint (92.5%) the most limiting buses are 480 V MCCI-52F and MCCI-62J. The analysis shows these buses will experience voltages of 85.8% and 86% of bus nominal voltage respectively. This indicates that A/C compressor motors will operate within their tolerance under the proposed 92.5% setpoint. In addition, Reference 4 states that the voltages experienced at ICS Pump 1A and ICS Pump 1B under the proposed 92.5% setpoint are 88.5% and 89.4% of nameplate rating. However, currents drawn by these pumps under actual loading conditions are 90.5% and 89.7% of full load currents respectively, therefore, motor overheating will not occur.

The voltage analysis was verified by tests (Reference 3) and the correlation between the two showed the assumptions used in the analysis to be acceptable.

Based on the information provided by the licensee we find the proposed degraded grid undervoltage relays setpoints and associated time delays will protect the Class 1E equipment from a sustained degraded voltage condition and are therefore acceptable.

The February 22, 1984 letter was the only submittal which forwarded Technical Specifications. The March 8 and April 4, 1984 letters provided only clarifying information as described herein. The proposed Technical Specifications were not changed by the latter two letters.

#### Environmental Consideration

We have determined that the amendment does 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 amendment involves 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 this amendment.

#### Conclusion

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: April 30, 1984

Principal Contributor:  
John Emami: PSB

REFERENCES:

1. Staff Safety Evaluation Report, Adequacy of Station Electric Distribution System Voltages, dated March 8, 1982
2. Letter, C. W. Giesler to H. R. Denton, dated February 22, 1984
3. Letter, C. W. Giesler to H. R. Denton, dated March 8, 1984
4. Letter, C. W. Giesler to H. R. Denton, dated April 4, 1984