UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

WISCONSIN PUBLIC SERVICE CORPORATION

WISCONSIN POWER AND LIGHT COMPANY

MADISON GAS AND ELECTRIC COMPANY

DOCKET NO. 50-305

KEWAUNEE NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 101
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 licensees) dated August 20, 1992, as supplemented December 17, 1992, 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 Appendix A, as revised through Amendment No. 101, are hereby incorporated in the license. The licensees shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance, and is to be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

John N. Hannon

John N. Hannon, Director
Project Directorate III-3
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of issuance: September 30, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 101

FACILITY OPERATING LICENSE NO. DPR-43

DOCKET NO. 50-305

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change.

REMOVE	INSERT
TS 3.5-1	TS 3.5-1
TS 3.5-2 through TS 3.5-7 (6 pages)	TS B3.5-1 through TS B3.5-4 (4 pages)
TABLE TS 3.5-1 (2 pages)	TABLE TS 3.5-1 (2 pages)
TABLE TS 3.5-3 (2 pages)	TABLE TS 3.5-3 (3 pages)
TABLE TS 3.5-5 (I page)	TABLE TS 3.5-5 (1 page)
TABLE TS 4.1-1 Page 2 of 8 Page 3 of 8 Page 4 of 8 Page 5 of 8	TABLE TS 4.1-1 Page 2 of 8 Page 3 of 8 Page 4 of 8 Page 5 of 8

3.5 INSTRUMENTATION SYSTEM

APPLICABILITY

Applies to reactor protection and engineered safety features instrumentation systems.

OBJECTIVE

To provide for automatic initiation of the engineered safety features in the event that principal process variable limits are exceeded, and to delineate the conditions of the reactor protection instrumentation and engineered safety features circuits necessary to ensure reactor safety.

SPECIFICATIONS

a. Setting limits for instrumentation which initiate operation of the engineered safety features shall be as stated in Table TS 3.5-1.

b. For on-line testing or in the event of failure of a subsystem instrumentation channel, plant operation shall be permitted to continue at RATED POWER in accordance with Tables TS 3.5-2 through TS 3.5-5.

c. If for Tables TS 3.5-2 through TS 3.5-5, the number of channels of a particular subsystem in service falls below the limits given in Column 3, or if the values in Column 4 cannot be achieved, operation shall be limited according to the requirement shown in Column 6, as soon as practicable.

d. In the event of subsystem instrumentation channel failure permitted by TS 3.5.b, Tables TS 3.5-2 through TS 3.5-5 need not be observed during the short period of time (approximately 4 hours) the operable subsystem channels are tested, where the failed channel must be blocked to prevent unnecessary reactor trip.

e. The instrumentation in Table TS 3.5-6 shall be OPERABLE. In the event the limits given in Columns 1 and 2 cannot be maintained, operator action will be in accordance with the respective notes.

BASIS - Instrumentation System (TS 3.5)

Instrumentation has been provided to sense accident conditions and to initiate operation of the engineered safety features.[1] Section 2.3 of these specifications describes the LIMITING SAFETY SYSTEM SETTINGS for the protective instrumentation.

Safety Injection

Safety Injection can be activated automatically or manually to provide additional water to the Reactor Coolant System or to increase the concentration of boron in the coolant.

Safety Injection is initiated automatically by (1) low pressurizer pressure, (2) low main steam line pressure in either loop and (3) high containment pressure. Protection against a loss-of-coolant accident is primarily through signals (1) and (3). Protection against a steam line break is primarily by means of signal (2).

Manual actuation is always possible. Safety Injection signals can be blocked during those OPERATING MODES where they are not "required" for safety and where their presence might inhibit operating flexibility; they are generally restored automatically on return to the "required" OPERATING MODE.

Reactor Trip Breakers

With the addition of the automatic actuation of the shunt trip attachment, diverse features exist to effect a reactor trip for each reactor trip breaker. Since either trip feature being OPERABLE would initiate a reactor trip on demand, the flexibility is provided to allow plant operation on a reactor trip breaker (with either trip feature inoperable) for up to 72 hours. This specification also requires the plant to proceed to the HOT SHUTDOWN condition in accordance with the Kewaunee STANDARD SHUTDOWN SEQUENCE if a reactor trip breaker is bypassed for greater than 8 hours.

Containment Spray

Containment sprays are also actuated by a high containment pressure signal (Hi-Hi) to reduce containment pressure in the event of a loss-of-coolant or steam line break accident inside the containment.

The containment sprays are actuated at a higher containment pressure (approximately 50% of design containment pressure) than is Safety Injection (10% of design). Since spurious actuation of containment spray is to be avoided, it is initiated only on coincidence of high containment pressure (Hi-Hi) sensed by three sets of one-out-of-two containment pressure signals provided for its actuation.

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[1] USAR Section 7.5

Containment Isolation

A containment isolation signal is initiated by any signal causing automatic initiation of Safety Injection or may be initiated manually. The containment isolation system provides the means of isolating the various pipes passing through the containment walls as required to prevent the release of radioactivity to the outside environment in the event of a loss-of-coolant accident.

Steam Line Isolation

In the event of a steam line break, the steam line isolation valve of the affected line is automatically isolated to prevent continuous, uncontrolled steam release from more than one steam generator. The steam lines are isolated on Hi-Hi containment pressure or high steam flow in coincidence with Lo-Lo T_{avg} and Safety Injection or Hi-Hi steam flow in coincidence with Safety Injection. Adequate protection is afforded for breaks inside or outside the containment even under the assumption that the steam line check valves do not function properly.

Setting Limits

1. The high containment pressure limit is set at about 10% of the maximum internal pressure. Initiation of Safety Injection protects against loss-of-coolant[2] or steam line break[3] accidents as discussed in the safety analysis.

2. The Hi-Hi containment pressure limit is set at about 50% of the maximum internal containment pressure for initiation of containment spray and at about 30% for initiation of steam line isolation. Initiation of containment spray and steam line isolation protects against large loss-of-coolant or steam line break accidents as discussed in the safety analysis.

3. The pressurizer low-pressure limit is set substantially below system operating pressure limits. However, it is sufficiently high to protect against a loss-of-coolant accident as shown in the safety analysis.

4. The steam line low-pressure signal is lead/lag compensated and its setpoint is set well above the pressure expected in the event of a large steam line break accident as shown in the safety analysis.

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[2]USAR Section 14.3

[3]USAR Section 14.2.5

5. The high steam line flow limit is set at approximately 20% of nominal full-load flow at the no-load pressure and the high-high steam line flow limit is set at approximately 120% of nominal full-load flow at the full-load pressure in order to protect against large steam line break accidents. The coincident Lo-Lo T_{avg} setting limit for steam line isolation initiation is set below its HOT SHUTDOWN value. The safety analysis shows that these settings provide protection in the event of a large steam line break.

6. The setpoints and associated ranges for the undervoltage relays have been established to always maintain motor voltages at or above 80% of their nameplate rating, to prevent prolonged operation of motors below 90% of their nameplate rating, and to prevent prolonged operation of 480 V MCC starter contactors at inrush currents. 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. Prolonged operation of MCC contactors at inrush currents may result in blown control fuses and inoperable equipment; therefore operation will be limited to a time less than it takes for a fuse to blow.

   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 USAR. 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 (93.6% nominal bus voltage) is designed to protect against prolonged operation below 90% of nameplate voltage of safeguard pumps. The time delay of less than 7.4 seconds ensures that engineered safeguards equipment operates within the time delay assumptions of the accident analyses. The time delay will prevent blown control fuses in 480 V MCCs; the MCC control fuses are the limiting component for long-term low voltage operation. The time delay is long enough to prevent inadvertent actuation of the second level UV relays from voltage dips due to large motor starts (except reactor coolant pump starts with a safeguards bus below 3980 volts). Up to 7.4 seconds 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.

   Each relay in the undervoltage protection channels will fail safe and is alarmed to alert the operator to the failure.

A blackout signal which occurs during the sequence loading following a Safety Injection signal will result in a re-initiation of the sequence loading logic at time step 0 as long as the Safety Injection signal has not been reset. The Kewaunee Emergency Procedures warn the operators that a Blackout Signal occurring after reset of Safety Injection will not actuate the sequence loading and instructs to re-initiate Safety Injection if needed.

Instrument OPERATING Conditions

During plant OPERATIONS, the complete protective instrumentation systems will normally be in service. Reactor safety is provided by the Reactor Protection Systems, which automatically initiates appropriate action to prevent exceeding established limits. Safety is not compromised, however, by continuing OPERATION with certain instrumentation channels out of service since provisions were made for this in the plant design. This specification outlines LIMITING CONDITIONS FOR OPERATION necessary to preserve the effectiveness of the Reactor Control and PROTECTION SYSTEM when any one or more of the channels is out of service.

Almost all reactor protection channels are supplied with sufficient redundancy to provide the capability for CHANNEL CALIBRATION and test at power. Exceptions are backup channels such as reactor coolant pump breakers. The removal of one trip channel on process control equipment is accomplished by placing that channel bistable in a tripped mode; e.g., a two-out-of-three circuit becomes a one-out-of-two circuit. The source and intermediate range nuclear instrumentation system channels are not intentionally placed in a tripped mode since these are one-out-of-two trips, and the trips are therefore bypassed during testing. Testing does not trip the system unless a trip condition exists in another channel.

The OPERABILITY of the instrumentation noted in Table TS 3.5-6 assures that sufficient information is available on these selected plant parameters to aid the operator in identification of an accident and assessment of plant conditions during and following an accident. In the event the instrumentation noted in Table TS 3.5-6 is not OPERABLE, the operator is given instruction on compensatory actions.

TABLE TS 3.5-1

ENGINEERED SAFETY FEATURES INITIATION INSTRUMENT SETTING LIMITS

NO.	FUNCTIONAL UNIT	CHANNEL	SETTING LIMIT
8	Containment Purge and Vent System Radiation Particulate Detector Radioactive Gas Detector	Containment ventilation isolation	≤ value of radiation levels in exhaust duct as defined in footnote(3)
9	Safeguards Bus Undervoltage(4)	Loss of power	85.0% ± 2% nominal bus voltage ≤ 2.5 seconds time delay
10	Safeguards Bus Second Level Undervoltage(5)	Degraded grid voltage	93.6% ± 0.9% of nominal bus voltage ≤ 7.4 seconds time delay

(3)The setting limits for max radiation levels are derived from TS 7.4.1, Table E of the ODCM, and USAR Section 6.5.

(4)This undervoltage protection channel ensures ESF equipment will perform as assumed in the USAR.

(5)This undervoltage protection channel protects ESF equipment from long-term low voltage operation.

TABLE TS 3.5-1

ENGINEERED SAFETY FEATURES INITIATION INSTRUMENT SETTING LIMITS

NO.	FUNCTIONAL UNIT	CHANNEL	SETTING LIMIT
I	High Containment Pressure (Hi)	Safety injection[1]	≤ 4 psig
2	High Containment Pressure (Hi-Hi)	a. Containment spray b. Steam line isolation of both lines	≤ 23 psig ≤ 17 psig
3	Pressurizer Low Pressure	Safety injection[1]	≥ 1815 psig
4	Low Steam Line Pressure	Safety injection[1] Lead time constant Lag time constant	≥ 500 psig ≥ 12 seconds ≤ 2 seconds
5	High Steam Flow in a Steam Line Coincident with Safety Injection and "Lo-Lo" T_{avg}	Steam line isolation of affected line[2]	≤ d/p corresponding to 0.745×10^6 lb/hr at 1005 psig ≥ 540°F
6	High-High Steam Flow in a Steam Line Coincident with Safety Injection	Steam line isolation of affected line[2]	≤ d/p corresponding to 4.5×10^6 lb/hr at 735 psig
7	Forebay Level	Trip circ. water pumps	

[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

TABLE TS 3.5-3

EMERGENCY COOLING

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHAMNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
1	Safety Injection						
	a. Manual	2	I	1	-		HOT SHUTDOWN(1)
	b. High Containment Pressure	3	2	2	-		HOT SHUTDOWN(1)
	c. Low Steam Pressure/Line	3	2	2	-	Primary pressure < 2000 psig	HOT SHUTDOWN(1)
	d. Pressurizer Low Pressure	3	2	2	-	Primary pressure < 2000 psig	HOT SHUTDOWN(1)
2	Selected Boric Acid Storage Tank Level	2 sets of 2	1 of 2 in each set	2 per set	1/set		One channel may be inoperable for 72 hours otherwise maintain COLD SHUTDOWN

(1) If minimum conditions are not met within 24 hours, steps shall be taken to place the plant in COLD SHUTDOWN condition.

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TABLE TS 3.5-3

EMERGENCY COOLING

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHAMNELS TO TRIP	MIMIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
3	Containment Spray						
	a. Manual	2	2	2	(2)		HOT SHUTDOWN(3)
	b. Hi-Hi Containment Pressure (Containment Spray)	3 sets of 2	1 of 2 in each set	1 per set	I/set		HOT SHUTDOWN(3)
4	Motor-Driven Auxiliary Feedwater Pumps						
	a. Either Steam Generator Lo-Lo Level	3/loop	2/loop	2/loop	-		Maintain HOT SHUTDOWN
	b. Loss of Main Feed Water(4)	1	1	I			Maintain HOT SHUTDOWN
	c. Safety Injection	(Refer to Item 1 of this table)					

(2)Must actuate 2 switches.

(3)If minimum conditions are not met within 24 hours, steps shall be taken to place the plant in COLD SHUTDOWN condition.

(4)Tripping of both main feedwater pump breakers starts both motor-driven auxiliary feedwater pumps.

TABLE TS 3.5-3

EMERGENCY COOLING

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REDUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
	d. 4 KV Buses 1-5 and 1-6 under voltage	2/bus[5]	1/bus	1/bus[6]			Maintain HOT SHUTDOWN or operate diesel generators
5	Turbine-Driven Auxiliary Feedwater Pumps						
	a. Both Steam Generator Lo-Lo Level	3/loop	2/loop	2/loop	-		Maintain HOT SHUTDOWN
	b. 4 KV Buses 1-1 and 1-2 under voltage	(Refer to Item 13 of Table TS 3.5-2)					

[5]Each channel consists of one instantaneous and one time-delay relay connected in series.

[6]When one component of a channel is taken out of service, that component shall be in the tripped condition.

TABLE TS 3.5-5

INSTRUMENT OPERATION CONDITIONS FOR SAFEGUARDS BUS POWER SUPPLY FUNCTIONS

		1	2	3	4	5	6
NO.	FUNCTIONAL UNIT	NO. OF CHANNELS	NO. OF CHANNELS TO TRIP	MINIMUM OPERABLE CHANNELS	MINIMUM DEGREE OF REOUNDANCY	PERMISSIBLE BYPASS CONDITIONS	OPERATOR ACTION IF CONDITIONS OF COLUMN 3 OR 4 CANNOT BE MET
1	Safeguards Bus Undervoltage	2/bus[1]	1/bus	1/bus[2]	--		Maintain HOT SHUTDOWN or operate the diesel generator
2	Safeguards Bus Second Level Undervoltage	1/bus[3]	1/bus	--	--		When one of the two time-delay relays is out of service, place that relay in the tripped condition

[1]Each channel consists of one instantaneous and one time-delayed relay connected in series.

[2]When one component of a channel is taken out of service, that component shall be in the tripped condition.

[3]Each channel consists of two time-delayed relays connected in series.

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
6. Pressurizer Water Level	Each shift	Each refueling cycle not to exceed 18 months(a)	Monthly	(a) Only if test indicates calibration required
7. Pressurizer Pressure	Each shift	Each refueling cycle not to exceed 18 months(a)	Monthly	(a) Only if test indicates calibration required
8. a. 4-KV Voltage and Frequency	Not applicable	Each refueling cycle not to exceed 18 months	Monthly	Reactor protection circuits only
b. 4-KV Voltage (Loss of Voltage)	Not applicable	Each refueling cycle not to exceed 18 months	Monthly	Safeguards buses only
c. 4-KV Voltage (Degraded Grid)	Not applicable	Each refueling cycle not to exceed 18 months	Monthly	Safeguards buses only
9. Analog Rod Position	Each shift(a)(b)	Each refueling cycle not to exceed 18 months(c)	Each refueling cycle not to exceed 18 months	(a) With step counters (b) Following rod motion in excess of 24 steps when computer is out of service (c) Only if test indicates calibration required
10. Rod Position Bank Counters	Each shift(a)(b)	Not applicable	Each refueling cycle not to exceed 18 months	(a) With analog rod position (b) Following rod motion in excess of 24 steps when computer is out of service

*Reference TS 4.1.d

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMEMT CHANNELS

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
11. Steam Generator Level	Each shift	Each refueling cycle not to exceed 18 months(a)	Monthly	(a) Only if test indicates calibration required
12. Steam Generator Flow Mismatch	Each shift	Each refueling cycle not to exceed 18 months(a)	Monthly	(a) Only if test indicates calibration required
13. Charging Flow	Each shift	Each refueling cycle not to exceed 18 months	Not applicable	
14. Residual Heat Removal Pump Flow	Each shift (when in operation)	Each refueling cycle not to exceed 18 months	Not applicable	
15. Boric Acid Tank Level	Daily	Each refueling cycle not to exceed 18 months	Monthly	
16. Refueling Water Storage Tank Level	Weekly	Annually	Not applicable	
17. Volume Control Tank Level	Each shift	Each refueling cycle not to exceed 18 months	Not applicable	

*Reference TS 4.1.d

TABLE TS 4.1-1

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AMD TEST OF INSTRUMENT CHANNELS

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
18. a. Containment Pressure (SIS signal)	Each shift	Each refueling cycle not to exceed 18 months(b)	Monthly(a)	(a) Isolation Valve Signal (b) Only if test indicates calibration required
b. Containment Pressure (Steamline Isolation)	Each shift(a)	Each refueling cycle not to exceed 18 months(a)(b)	Monthly(a)	(a) Narrow range containment pressure (-3.0, +3.0 psig excluded) (b) Only if test indicates calibration required
c. Containment Pressure (Containment Spray Act)	Each shift	Each refueling cycle not to exceed 18 months(a)	Monthly	(a) Only if test indicates calibration required
d. Annulus Pressure (Vacuum Breaker)	Not applicable	Each refueling cycle not to exceed 18 months(a)	Each refueling cycle not to exceed 18 months	(a) Only if test indicates calibration required
19. Radiation Monitoring System	Daily*	Each refueling cycle not to exceed 18 months	Monthly	Includes only channels R11 thru R15, R17, R19, R21, and R23
20. Boric Acid Make-Up Flow Channel	Not applicable	Each refueling cycle not to exceed 18 months	Not applicable	
21. Containment Sump Level	Not applicable	Not applicable	Each refueling cycle not to exceed 18 months	

* Reference TS 4.1.d

TABLE TS 4.1-1

MIMIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

CHANNEL DESCRIPTION	CHECK	CALIBRATE	TEST	REMARKS
22. Accumulator Level and Pressure	Each shift	Each refueling cycle not to exceed 18 months	Not applicable	
23. Steam Generator Pressure	Each shift	Each refueling cycle not to exceed 18 months	Monthly	
24. Turbine First Stage Pressure	Each shift	Annually(a)	Monthly	(a) Only if test indicates calibration required
25. Portable Radiation Survey Instruments	Monthly*	Annually	Quarterly	
26. Protective System Logic Channel Testing	Not applicable	Not applicable	Monthly	Includes auto load sequencer
27. Deleted				

* Reference TS 4.1.d

Amendment No. 59,64,80,98,101