March 31, 1997

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Mr. J. W. Hampton
Vice President, Oconee Site
Duke Power Company
P. O. Box 1439
Seneca, SC 29679

SUBJECT: ISSUANCE OF AMENDMENTS - OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 (TAC NOS. M97921, M97922 and M97923)

Dear Mr. Hampton:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 223 , to Facility Operating License DPR-38, Amendment No. 223 to Facility Operating License No. DPR-47, and Amendment No. 220 to Facility Operating License No. DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3, respectively. The amendments are in response to your application dated February 5, 1997.

The amendments revise the Technical Specifications to reflect replacement of the existing source and intermediate range nuclear instrumentation with a new source range and wide range nuclear instrumentation system that provides more channels and continuous coverage from the Source Range to above the Power Range.

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

Sincerely,

ORIGINAL SIGNED BY:

David E. LaBarge, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures:
1. Amendment No. 223 to DPR-38
2. Amendment No. 223 to DPR-47
3. Amendment No. 220 to DPR-55
4. Safety Evaluation

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

March 31, 1997

Mr. J. W. Hampton
Vice President, Oconee Site
Duke Power Company
P. O. Box 1439
Seneca, SC 29679

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Docket Nos. 50-269, 50-270, and 50-287

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1. Amendment No. 223 to DPR-38
2. Amendment No. 223 to DPR-47
3. Amendment No. 220 to DPR-55
4. Safety Evaluation

cc w/encl: See next page

cc:

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

DUKE POWER COMPANY

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 223
License No. DPR-38

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Oconee Nuclear Station, Unit 1 (the facility) Facility Operating License No. DPR-38 filed by the Duke Power Company (the licensee) dated February 5, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as 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 set forth in 10 CFR Chapter I;

   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.

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2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Facility Operating License No. DPR-38 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 223, 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 its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Peter S. Tam for

Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: March 31, 1997

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

DUKE POWER COMPANY

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 223
License No. DPR-47

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Oconee Nuclear Station, Unit 2 (the facility) Facility Operating License No. DPR-47 filed by the Duke Power Company (the licensee) dated February 5, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as 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 set forth in 10 CFR Chapter I;

   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 hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Facility Operating License No. DPR-47 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 223, 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 its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: March 31, 1997

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

DUKE POWER COMPANY

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 220
License No. DPR-55

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Oconee Nuclear Station, Unit 3 (the facility) Facility Operating License No. DPR-55 filed by the Duke Power Company (the licensee) dated February 5, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as 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 set forth in 10 CFR Chapter I;

   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 hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Facility Operating License No. DPR-55 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 220 , 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 its date of issuance and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Peter S. Tam for

Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: March 31, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 223

FACILITY OPERATING LICENSE NO. DPR-38

DOCKET NO. 50-269

AND

TO LICENSE AMENDMENT NO. 223

FACILITY OPERATING LICENSE NO. DPR-47

DOCKET NO. 50-270

AND

TO LICENSE AMENDMENT NO. 220

FACILITY OPERATING LICENSE NO. DPR-55

DOCKET NO. 50-287

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change.

Remove Pages	Insert Pages
3.1-20	3.1.20
3.5-1	3.5-1
3.5-2	3.5-2
3.5-4	3.5-4
3.5-5c	3.5-5c
-----	3.5-5d
3.5-45	3.5-45
3.5-46	3.5-46
-----	3.5-47
4.1-3	4.1-3

3.1.9 Low Power Physics Testing Restrictions

Specification

The following special limitations are placed on low power physics testing.

3.1.9.1 Reactor Protective System Requirements

a. Below 1720 psig shutdown bypass trip setting limits shall apply in accordance with Table 2.3-1.

b. Above 1800 psig nuclear overpower trip shall be set at less than 5.0 percent. Other settings shall be in accordance with Table 2.3-1.

3.1.9.2 Startup rate rod withdrawal hold shall be in effect at all times. This applies to the wide range.

3.1.9.3 Shutdown margin may not be reduced below 1.0%Δk/k as required by Specification 3.5.2.1 with the exception that the stuck rod worth criterion does not apply during rod worth measurements.

Bases

Technical Specification 3.1.9.2 will apply to the wide range.

The above specification provides additional safety margins during low power physics testing.

Bases

Every reasonable effort will be made to maintain all safety instrumentation in operation. A startup is not permitted unless three power range neutron instrument channels and three channels each of the following are operable: reactor coolant temperature, reactor coolant pressure, pressure-temperature, flux-imbalance flow, power-number of pumps, and high reactor building pressure. The engineered safety features actuation system must have three analog channels and two digital channels functioning correctly prior to a startup. Additional operability requirements are provided by Technical Specifications 3.1.12 and 3.4 for equipment which is not part of the RPS or ESFAS.

Operation at rated power is permitted as long as the systems have at least the minimum number of operable channels given in Column C (Table 3.5.1-1). This is in agreement with redundancy and single failure criteria of IEEE-279 as described in FSAR Section 7.

There are four reactor protective channels. A fifth channel that is isolated from the reactor protective system is provided as a part of the reactor control system. Normal trip logic is two out of four. The minimum number or operable channels required is three. While a bypassed channel is considered inoperable, a channel placed in the tripped condition is considered operable. Thus, only one channel may be placed in bypass at any one time in order to maintain the minimum number of required channels. This results in a trip logic of two out of three. It should be noted that an effective trip logic of one out of two can be achieved by placing one channel in bypass and one channel in the tripped condition.

The four reactor protective channels are provided with key operated bypass switches to allow on-line testing or maintenance on only one channel at a time during power operation. Each channel is provided alarm and lights to indicate when that channel is bypassed. There will be one reactor protective system bypass switch key permitted in the control room. That key will be under the administrative control of the Shift Supervisor. Spare keys will be maintained in a locked storage accessible only to the Station Manager.

Each reactor protective channel key operated shutdown bypass switch is provided with alarm and lights to indicate when the shutdown bypass switch is being used. There are four shutdown bypass keys in the control room under the administrative control of the Shift Supervisor. The use of a key operated shutdown bypass switch for on-line testing or maintenance during reactor power operation has no significance when used in conjunction with a key operated channel bypass switch since the channel trip relay is locked in the untripped state. The use of a key operated shutdown bypass switch alone during power operation will cause the channel to trip. When the shutdown bypass switch is operated for on-line testing or maintenance during reactor power operation, reactor power and RCS pressure limits as specified in Table 2.3-1 are not applicable.

Overlap between the the Source Range and Wide Range verifies proper instrument operation prior to dependency on that instrument.

Power is normally supplied to the control rod drive mechanisms from two separate parallel 600 volt sources. Each voltage source and its associated breakers and SCR control relays comprise a trip system. Thus, the two trip systems and their associated trip devices form a 1-out-of-2 logic used twice which is referred to as a 1-out-of-2x2 logic.

TABLE 3.5.1-1
INSTRUMENTS OPERATING CONDITIONS

FUNCTIONAL UNIT	(A) TOTAL NO. OF CHANNELS	(B) CHANNELS TO TRIP	(C) MINIMUM CHANNELS OPERABLE	(D) Operator Action If Conditions of Column C Cannot Be Met
1. Nuclear Instrumentation Wide Range Channels	4	NA	2	Bring to hot shutdown within 12 hours (b)
2. Nuclear Instrumentation Source Range Channels	4	NA	2	Bring to hot shutdown within 12 hours (b) (c)
3. RPS Manual Pushbutton	1	1	1	Bring to hot shutdown within 12 hours
4. RPS Power Range Instrument Channels	4	2	3(a)	Bring to hot shutdown within 12 hours
5. RPS Reactor Coolant Temperature Instrument Channels	4	2	3(a)	Bring to hot shutdown within 12 hours
6. RPS Pressure-Temperature Instrument Channels	4	2	3(a)	Bring to hot shutdown within 12 hours
7. RPS Flux Imbalance Flow Instrument Channels	4	2	3(a)	Bring to hot shutdown within 12 hours
8. RPS Reactor Coolant Pressure				
a. High Reactor Coolant Pressure Instrument Channels	4	2	3(a)	Bring to hot shutdown within 12 hours
b. Low Reactor Coolant Pressure Channels	4	2	3(a)	Bring to hot shutdown within 12 hours
9. RPS Power-Number of Pumps Instrument Channels	4	2	3(a)	Bring to hot shutdown within 12 hours (h)

Amendment No. 223 (Unit 1)
Amendment No. 223 (Unit 2)
Amendment No. 220 (Unit 3)

TABLE 3.5.1-1

INSTRUMENTS OPERATING CONDITIONS (cont'd)

NOTES:

(a) For channel testing, calibration, or maintenance, the minimum of three operable channels may be maintained by placing one channel in bypass and one channel in the tripped condition, leaving an effective one out of two trip logic.

(b) When 2 of 4 power range instrument channels are greater than 10% rated power, hot shutdown is not required.

(c) When 2 of 4 wide range instrument channels are greater than 4×10^{-4} % rated power, hot shutdown is not required.

(d) (Deleted)

(e) If minimum conditions are not met within 48 hours after hot shutdown, the unit shall be in the cold shutdown within 24 hours.

(f) 1. Place the inoperable Reactor Trip Module output in the tripped condition within one hour or

2. Remove the power supplied to the control rod trip devices associated with the inoperable Reactor Trip Module within one hour.

(g) (Deleted)

(h) The RCP monitors provide inputs to this logic. For operability to be met either all RCP monitor channels must be operable or 3 operable with the remaining channel in the tripped state.

(i) 1. The power supplied to the control rod drive mechanisms through the failed CRD Trip Breaker shall be removed within one hour or

2. With one of the CRD Trip Breaker diverse features (undervoltage or shunt trip device) inoperable, restore it to OPERABLE status in 48 hours or place the breaker in trip in the next hour.

TABLE 3.5.1-1

INSTRUMENTS OPERATING CONDITIONS (cont'd)

NOTES:

(j) 1. With one SCR Control Relay inoperable in logic channel C or D, restore the inoperable SCR Control Relay to OPERABLE status in 48 hours or remove power from the CRD mechanisms supplied by the inoperable channel's SCR Control Relay within the next hour.

2. With two or more SCR Control Relays inoperable in logic channel C or D, remove power from the CRD mechanisms supplied by the inoperable channel's SCR Control Relay within one hour.

3.5 INSTRUMENTATION SYSTEMS

3.5.1 Operation Safety Instrumentation

Applicability

Applies to unit instrumentation and control systems.

Objective

To delineate the conditions of the unit instrumentation and safety circuits necessary to assure reactor safety.

Specifications

3.5.1.1 The reactor shall not be in a startup mode or in a critical state unless the requirements of Table 3.5.1-1, Column C are met.

3.5.1.2 In the event that the number of protective channels operable falls below the limit given under Table 3.5.1-1, Column C; operation shall be limited as specified in Column D.

3.5.1.3 For on-line testing or in the event of a protective instrument or channel failure, a key-operated channel bypass switch associated with each reactor protective channel may be used to lock the channel trip relay in the untripped state. Status of the untripped state shall be indicated by a light. Only one channel bypass key shall be accessible for use in the control room. Only one channel shall be locked in this untripped state or contain a dummy bistable at any one time.

3.5.1.4 For on-line testing or maintenance during reactor power operation, a key-operated shutdown bypass switch associated with each reactor protective channel may be used in conjunction with a key-operated channel bypass switch as limited by 3.5.1.3. Status of the shutdown bypass switch shall be indicated by a light.

3.5.1.5 During startup when the wide range instruments come on scale, the overlap between the wide range and the source range instrumentation shall not be less than one decade. If the overlap is less than one decade, the flux level shall not be greater than that readable on the source range instruments until the one decade overlap is achieved.

Table 3.5.6-1
ACCIDENT MONITORING INSTRUMENTATION

	Instrument	(A) Required Operable Channels	(B) Action	(C) Applicability
1.	Containment Pressure Monitor (PT-230, -231)	2 of 2	1	Above hot shutdown
2.	Containment Water Level Monitor Wide Range (LT-90, -91)	2 of 2	2	Above hot shutdown
3.	Containment High-Range Radiation Monitor (RIA-57, -58)	2 of 2	2	Above hot shutdown
4.	Containment Hydrogen Monitor (MT-80, -81)	2 of 2	2	Above hot shutdown
5.	Wide Range Hot Leg Level (RC-LT0123, RC-LT0124)	2 of 2	3	Above hot shutdown
6.	Reactor Vessel Head Level (RC-LT0125, RC-LT0126)	2 of 2	3	Above hot shutdown
7.	Qualified Core Exit Thermocouple Trains	2 of 2 (a)	2	Above hot shutdown
8.	Subcooling Monitors	2 (b)	4	When RCS temperature is > 300°F
9.	Wide Range Nuclear Instrumentation	2 of 4	5	Above hot shutdown

Amendment No. 223 (Unit 1)
Amendment No. 223 (Unit 2)
Amendment No. 220 (Unit 3)

Table 3.5.6-1 (CONTINUED)
ACCIDENT MONITORING INSTRUMENTATION

ACTIONS

Action 1: If one channel is inoperable, the channel shall be restored to operable status within 7 days, or the unit shall be in hot shutdown within the next 12 hours.

If two channels are inoperable, at least one channel shall be restored to operable status within 48 hours, or the unit shall be in hot shutdown within the next 12 hours.

Action 2: If one channel is inoperable, the channel shall be restored to operable status within 30 days, or the unit shall be in hot shutdown within the next 12 hours.

If two channels are inoperable, at least one channel shall be restored to operable status within 48 hours, or the unit shall be in hot shutdown within the next 12 hours.

Action 3: If one channel is inoperable, the channel shall be restored to operable status within 7 days, or a report shall be submitted to the Commission within the next 30 days outlining the cause of the inoperability and the plans and schedule for restoring the channel to operable status.

If two channels are inoperable, at least one channel shall be restored to operable status within 7 days, or the unit shall be in hot shutdown within the next 12 hours.

Action 4: If one of the required channels is inoperable, at least one channel shall be restored to operable status within 30 days or the unit shall be in hot shutdown within the next 12 hours and below 300°F within the next 24 hours.

If two of the required channels are inoperable, at least one channel shall be restored to operable status within 48 hours or the unit shall be in hot shutdown within the next 12 hours and below 300°F within the next 24 hours.

Amendment No. 223 (Unit 1)
Amendment No. 223 (Unit 2)
Amendment No. 220 (Unit 3)

Table 3.5.6-1 (CONTINUED)
ACCIDENT MONITORING INSTRUMENTATION

Action 5: If 3 channels are inoperable, at least one of the inoperable channels shall be restored to operable status within 30 days, or a report shall be submitted to the NRC within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause for the inoperabililty, and the plans and schedule for restoring the instrumentation channel to operable status.

If 4 channels are inoperable, at least one channel shall be restored to operable status within 7 days or the unit shall be placed in hot shutdown within an additional 12 hours

NOTES

(a) 5 of 12 qualified core exit thermocouples must be operable per train for a train to be considered operable

(b) Operable subcooling margin monitors must consist of:

1) One direct indication for 1 of 2 RCS hot legs and one direct indication for the core; or

2) One direct indication for each RCS hot leg.

Table 4.1-1
INSTRUMENT SURVEILLANCE REQUIREMENTS

Channel Description	Check	Test	Calibrate		Remarks
1. Protective Channel Coincidence Logic in the Reactor Trip Modules	NA	MO	NA		
2. Control Rod Drive Trip Breaker, SCR Control Relays E and F	NA	MO(1)	NA	(1)	This test shall independently confirm the operability of the shunt trip device and the undervoltage device.
3. Power Range Amplifier	ES(l)	NA	(1)	(1)	Heat balance check each shift. Heat balance calibration whenever indicated core thermal power exceeds neutron power by more than 2 percent.
4. Power Range	ES	45 Days STB	MO(1)(2)	(1) (2)	Using incore instrumentation. Axial offset upper and lower chambers after each startup if not done previous week.
5. Wide Range	ES(1)	PS	NA	(1)	When in service.
6. Source Range	ES(1)	PS	NA	(1)	When in service.
7. Reactor Coolant Temperature	ES	45 Days STB	RF		
8. High Reactor Coolant Pressure	ES	45 Days STB	RF		
9. Low Reactor Coolant Pressure	ES	45 Days STB	RF		
10. Flux-Reactor Coolant Flow Comparator	ES	45 Days STB	RF		
11. Reactor Coolant Pressure Temperature Comparator	ES	45 Days STB	RF		

Amendment No. 223 (Unit 1)
Amendment No. 223 (Unit 2)
Amendment No. 220 (Unit 3)

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 223 TO FACILITY OPERATING LICENSE DPR-38, AMENDMENT NO. 223 TO FACILITY OPERATING LICENSE DPR-47, AND AMENDMENT NO. 220 TO FACILITY OPERATING LICENSE DPR-55

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNITS 1, 2 AND 3

DOCKET NOS. 50-269, 50-270 AND 50-287

1.0 INTRODUCTION

By letter dated February 5, 1997, Duke Power Company (the licensee), submitted a request for changes to the Oconee Nuclear Station (ONS) Units 1, 2, and 3, Technical Specifications (TS). The requested changes would reflect replacement of the existing source and intermediate range nuclear instrumentation (NI) with a new source range and wide range nuclear instrumentation system that provides more channels and continuous coverage from the Source Range to above the Power Range.

This would be accomplished by incorporating the following TS changes: (1) the various references to Intermediate Range of nuclear instrumentation would be eliminated and replaced with reference to Wide Range instrumentation; (2) the Total Number of Channels that are available would be increased from 2 to 4 and the Minimum Channels that are required to be Operable would be increased from 1 to 2 in Table 3.5.1-1 for both the Source and Wide Range NI; (3) changing the minimum power level specified in Note (c) of Table 3.5.1-1 from 10^{-10} amps on the intermediate range instrument channels to 4 x 10^{-4}% rated power on the wide range instrument channels; and (4) adding entries to Table 3.5.6-1 that specify the Wide Range Nuclear Instrumentation, the number of Required Operable Channels, reference to a new Action Statement, and Applicability.

2.0 BACKGROUND

The purpose of the NI system is to provide the reactor operator with neutron flux indication over the full operating range of the reactor and to provide reactor power inputs to the Reactor Protection System and the Integrated Control System. The original ONS NI design consisted of nine channels divided into three ranges of sensitivity: two source ranges (designated NI-1 & 2), two intermediate ranges (NI-3 & 4), and five power ranges (NI-5 through 9).

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The three ranges were combined to provide continuous measurement and indication of reactor power from <1 counts per second (CPS) up to 125 percent of rated power with a minimum of one decade of overlapping indication with the next higher range. However, the licensee determined that this system did not meet the requirements of Regulatory Guide (RG) 1.97, requiring the design of a new system.

During the development of the NI modification, the licensee decided to upgrade both channels of source range NI and both channels of intermediate range NI by using full range fission chamber detectors manufactured by Gamma-Metrics. As a result, the new system consists of four neutron flux detectors that provide input to four source range channels (designated as Source Range NI-1,2,3,4) and four wide range instrument channels (designated as Wide Range NI-1,2,3,4). The modification did not affect the power range detectors or instrumentation.

The new NI is designed to meet the qualification requirements of RG 1.97, which is defined as a Category 1, Type B variable. This variable requires redundant instrumentation that is seismically and environmentally qualified, electrically independent, physically separated, and powered from safety-related power sources. Also, at least one channel should be displayed on a direct reading indication or recording device, and be capable of monitoring flux in the range of 1E-6 percent up to 100 percent of full power. The licensee has determined that the new wide range NI system meets all of this criteria. The licensee has also determined that the error associated with the new detector's signal accuracy is relatively small. The testing that has been performed was designed to ensure that the actual response of the new detectors would be as expected. The response of the new detectors correlated almost perfectly with the output of the original detectors over each of the three original ranges.

The original source and intermediate range channels provided signal inputs to the Integrated Control System (ICS), as does the new system. However, the new system uses a simpler startup rate inhibit signal set at 2 decades per minute to prevent control rod withdrawal that is in effect at all times, rather than a startup rate inhibit signal that is dependent on power level that was used in the original system. The new inhibit signal is generated by the wide range NI; whereas, the signal for the original system was generated by the source and intermediate instruments. The power range channels continue to provide inputs to the reactor protection system needed to mitigate overpower transients resulting from control rod withdrawal accidents. As a result, the licensee has determined that the new system does not affect the ability of the Reactor Protection System to properly maintain reactor thermal power in compliance with the TS.

During startup, verification of overlap using the new NI is accomplished by comparing the Source and Wide Range indications in the same manner that was used for the Source and Intermediate channels.

3.0 EVALUATION

To implement the design change described above, the licensee proposed the following TS changes:

a) TS 3.1.9.2 and associated Bases: reference to generation of the rod withdrawal hold (i.e., the signal that inhibits rod withdrawal) would be changed from "both the source and intermediate ranges" to "the wide range" since the signal is now generated by the Wide Range NI.

b) TS 3.5.1.5 and associated Bases would be changed to require overlap to be measured between the source and wide range instruments rather than the source and intermediate instruments.

c) Table 3.5.1-1 would be changed to show that the total number of wide range channels is 4 (rather than 2 intermediate range channels) and the minimum number of channels that are required to be operable would be changed from 1 to 2. Similarly, the total number of source range channels would be changed from 2 to 4 and the minimum number of operable channels would be changed from 1 to 2. These changes are more restrictive and consistent with NUREG-1430, Revision 1, Babcock and Wilcox Improved Standard TS (STS). In addition, Note (c) would be changed to reflect the new criteria that if 2 of the 4 wide range instrument channels are greater than 4×10^{-4}% rated power, hot shutdown is not required. This power is equivalent, with conservatism, to the present intermediate range specification of 10^{-10} amps.

d) Table 3.5.6-1: In response to a RG 1.97 commitment, the Wide Range Nuclear Instrumentation would be added to the instrumentation required for accident monitoring. The table would specify that 2 of the 4 channels are required to be operable. Action 5 would be added which would be applicable above the Hot Shutdown condition. Action 5 would require that if 3 channels are inoperable, at least one shall be restored to operable status within 30 days or a report to the NRC must be submitted within 14 days. The report must contain the information stated in Action 5. In addition, if 4 channels are inoperable, at least one must be restored within 7 days or the unit placed in the Hot Shutdown condition within an additional 12 hours. These proposed changes are consistent with the STS.

e) Table 4.1-1 would be changed to reflect that the surveillance requirements apply to the Wide Range instrumentation rather than the Intermediate Range instrumentation.

The changes to the NI TS described by the licensee in this TS submittal have been reviewed by the staff and found to be acceptable in that they adequately reflect the design change and requirements for monitoring neutron flux for all reactor conditions from low in the source range to above the top of the power range. Also, there has been no loss of reactor protection capability or functionality resulting from the conversion from the Source and Intermediate range NI to the Source and Wide Range NI and they are consistent with the STS.

In addition, disussions with the licensee and the Resident Inspector staff has determined that the operators find the system to be an improvement over the system it replaced and fully capable of providing the desired response during reactor operation.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and the surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (62 FR 8796 dated February 26, 1997). Accordingly, the amendments meet 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 amendments.

6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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