Nebraska Public Power District
Nebraska's Energy Leader

50.90

NLS2001008
May 9, 2001

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: Proposed Change to CNS Technical Specifications
Flow Biased High Flux Clamp Reference
Cooper Nuclear Station, NRC Docket 50-298, DPR-46

In accordance with provisions of 10 CFR 50.4 and 50.90 the Nebraska Public Power District (District) hereby submits a request for an amendment to License DPR-46 to change the Cooper Nuclear Station (CNS) Technical Specifications (TS). The proposed change will correct an error introduced into the TS Table 3.3.1.1-1 Function 2.b with Amendment 151 and continued during the conversion to Improved Technical Specifications (ITS) with Amendment 178. This proposed change will also correct a surveillance requirement reference typographical error that was introduced into TS Table 3.3.1.1-1 Function 1.b during the conversion to ITS.

Attachment 1 contains the description of the TS change, basis for the change, attendant 10 CFR 50.92 no significant hazards consideration evaluation, and 10 CFR 51.22 environmental impact evaluation. Attachment 2 identifies the specific changes to the current CNS TS and Bases (provided for information) on marked up pages. Attachment 3 contains the final, clean versions of the affected TS and Bases pages.

These proposed changes have been reviewed by the necessary safety review committees (Station Operations Review Committee and Safety Review and Audit Board) and incorporate all amendments to the CNS Facility Operating License through Amendment 185 issued March 13, 2001. By copy of this letter and attachments the appropriate State of Nebraska official is being notified in accordance with 10 CFR 50.91(b)(1). Copies to the NRC Region IV Office and the CNS Resident Inspector are also being sent in accordance with 10 CFR 50.4(b)(2).

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Should you have any questions concerning this matter, please contact Mr. Michael Boyce at (402) 825-5100.

Sincerely,

John H. Swailes
Vice President of Nuclear Energy

/clb
Attachments

cc: Regional Administrator w/ attachments
USNRC - Region IV

Senior Project Manager w/ attachments
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/ attachments
USNRC

Nebraska Health and Human Services w/ attachments
Department of Regulation and Licensure

NPG Distribution w/o attachments

Records w/ attachments

STATE OF NEBRASKA)
)
NEMAHA COUNTY)

John H. Swailes, being first duly sworn, deposes and says that he is an authorized representative of the Nebraska Public Power District, a public corporation and political subdivision of the State of Nebraska; that he is duly authorized to submit this correspondence on behalf of Nebraska Public Power District; and that the statements contained herein are true to the best of his knowledge and belief.

John H. Swailes

Subscribed in my presence and sworn to before me this 9th day of May, 2001.

NOTARY PUBLIC

ANDREW McMULLEN
GENERAL
NOTARY
COMMISSION
EXPIRES
MAY 6, 2004
STATE OF NEBRASKA

Proposed Change to CNS Technical Specifications
Flow Biased High Flux Clamp Reference

Cooper Nuclear Station, NRC Docket 50-298, DPR-46

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1.0 Introduction

These proposed changes to Cooper Nuclear Station (CNS) Technical Specifications (TS) remove the references in Table 3.3.1.1-1 and the TS Bases to a flow biased high flux clamp and correct an erroneous surveillance requirement reference in Table 3.3.1.1-1 for Function 1.b Mode 5. A Flow Biased High Flux clamp does not exist at CNS. An error was made when incorporating the Average Power Range Monitor (APRM) High Flux Scram allowable value setpoint as part of Amendment 151 to TS in November 1991. This error was then carried over to the present TS during the conversion to Improved Technical Specifications (ITS). The error in Table 3.3.1.1-1 Function 1.b was introduced during the conversion to ITS and is administrative/typographical in nature.

2.0 Discussion

Average Power Range Monitor (APRM) Functions

The design of the APRM is such that for the worst permitted input Local Power Range Monitor (LPRM) bypass conditions, the APRMs shall be capable of generating a scram trip signal in response to average neutron flux increases resulting from abnormal operational transients in time to prevent fuel damage. The APRM system has six APRM channels each of which uses input signals from a number of LPRM channels. Three APRM channels are associated with each of the trip systems of the Reactor Protection System (RPS). Each APRM channel receives a flow signal representative of total core flow. The trip units for the APRMs supply trip signals to the RPS and the Reactor Manual Control System (RMCS). Any one APRM can initiate a rod block, depending upon the position of the reactor mode switch. The APRM upscale rod block trip setpoint is varied as a function of reactor recirculation flow. The slope of the upscale rod block trip response curve with recirculation flow is adjustable to allow tracking of the required trip setpoint with recirculation flow changes. This provides an effective rod block if core average power is increased above the power versus flow specification at any flow rate. An APRM upscale or inoperative trip actuates its respective trip system in the RPS.

Intermediate Range Monitor (IRM) Functions

The IRM system monitors neutron flux from the upper portion of the Source Range Monitor (SRM) range to the lower portion of the Power Range Monitoring Subsystems. The IRM subsystem has eight IRM channels each of which includes one detector that can be physically positioned in the core by remote control. The detectors are inserted into the core for a reactor startup and are withdrawn after the reactor mode switch is turned to "RUN." The IRM system is divided into two groups of IRM channels. Each IRM channel includes four trip circuits. One trip circuit is used as an instrument trouble trip. It operates whenever the high voltage drops below a preset level, whenever either positive or negative power supply voltage is lost, whenever one of the modules is not plugged in, or whenever the "Operate-Calibrate" switch is not in the "Operate" position. Each of the other trip circuits can be chosen to operate whenever preset downscale or upscale levels are reached.

3.0 Description of Changes

The following is proposed to rectify the errors in TS Table 3.3.1.1-1 and correct the appropriate sections of the Bases.

For Table 3.3.1.1-1 Function 1.b Mode 5 (page 3.3-6), it is proposed to replace "3.3.2.2.13" with "3.3.1.1.13."

For Table 3.3.1.1-1 Function 2.b (page 3.3-6), it is proposed to delete the words "and ≤ 119.0% RTP" from the ALLOWABLE VALUE column.

The following Bases sections will be revised after approval of the requested changes to Table 3.3.1.1-1 in accordance with TS 5.5.10, and are provided here in Attachment 2 for information.

For Bases B 3.3.1.1 function 2.b (page B 3.3-8), CNS will delete the end of the second sentence starting with the words "but is clamped..."

For Bases B 3.3.1.1 function 2.b (continued) (page B 3.3-10), CNS will delete the entire first paragraph.

4.0 Justification

This TS change request is submitted to correct two errors.

The first error was made when incorporating the APRM High Flux Scram allowable value setpoint as part of Amendment 151 to TS which was then carried over to the present day TS during the conversion to ITS with Amendment 178.

A high neutron flux scram setpoint of ≤ 120% rated thermal power (RTP) was part of the CNS original license bases. The separate, explicit delineation of a fixed APRM high flux setpoint, independent of core flow, was introduced into the TS in Amendment 151 in November 1991. This introduced a misleading presentation of two separate upper limit values for the high flux scram function, when in fact, they were the same. This error was later transferred over to the present during the conversion to ITS. The APRM High Flux (Fixed) scram function, Function 2.c, was correctly incorporated into TS Table 3.3.1.1-1 at a value of ≤ 120% RTP during ITS conversion while the flow biased formula upper value of ≤ 119% was erroneously incorporated into function 2.b.

This proposed change will delete the value of ≤ 119% RTP for the implied flow biased high flux clamp (which does not exist at CNS) from Function 2.b while leaving the high flux upper limit, Function 2.c, correctly shown as a fixed setpoint of ≤ 120% RTP. It should be noted that CNS practice has been to set the actual High Flux (Fixed) trip to ≤ 119%, thus conforming with both requirements, fixed and flow biased.

The second error was a typographical error introduced into TS when incorporating Amendment 178 (Improved Technical Specifications) which was then carried over to the present TS. There is no SR 3.3.2.2.13 in TS. TS 3.3.1.1 does include SR 3.3.1.1.13 which is to perform logic system functional testing every 18 months. This is the appropriate SR for Table 3.3.1.1-1 function 1.b. There is no effect on the bases for TS 3.3.1.1.

5.0 No Significant Hazards Consideration

The District has evaluated each of the proposed Technical Specification changes in accordance with the criteria set forth in 10 CFR 50.92 and has determined that the proposed changes do not involve a significant hazard.

The bases for the determination that the proposed changes do not involve a significant hazards consideration is an evaluation of these changes against each of the criteria in 10 CFR 50.92. The criteria and the conclusions of the evaluation are presented below:

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change is to correct an error in documentation that was introduced during implementation of Amendment 151 and retained in TS during the conversion to ITS as well as an error that was introduced into TS during the conversion to ITS. Neither the design basis nor the functionality of the instrumentation is being physically changed. The Neutron Monitoring system performs a mitigating function and is not an accident initiating system. The actual mitigating function

of the Neutron Monitoring is not changed. Only an implied but non-existent mitigating capability is being removed from TS. This change does not create or modify any accident initiators. Therefore, there is no increase in the probability of an accident previously evaluated.

The APRM system is credited for mitigating the consequences of the Control Rod Drop Accident. The APRM system also provides protection for the reactor to mitigate the consequences of such abnormal operational transients as loss of feedwater heater, pressure regulator failure, or Main Steam Isolation Valve closure. The proposed change will not change the functionality or setpoints for either the APRM Flux-High (Fixed) or the APRM Flux-High (Biased) functions. Additionally, the correction of an incorrect Surveillance Requirement reference does not change how any surveillance is performed. Therefore the consequences of an accident previously evaluated will not be increased.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Since this change in the TS does not involve a physical change to the instrumentation, to the setpoints, or to the design or functionality of the circuitry for reactor scram on APRM Flux-High, fixed or flow-biased, the change does not create a possibility of a new or different kind of accident not previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   The setpoints for the Neutron Flux-High instrumentation are not changed by this proposed TS change. The safety function allowable value setpoint remains at less than or equal to 120% RTP. The formula for the APRM Flux-High (flow biased) is not being changed. Since neither of these is being changed, the margin of safety is not reduced.

6.0 Environmental Impact Evaluation

10 CFR 51.22(c)(9) provides criteria for, and identification of, licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration, (2) result in a significant change in the types or significant increase in the amount of any effluents that may be released off-site, or (3) result in an increase in individual or cumulative occupational radiation exposure. The Nebraska Public Power District (District) has reviewed the proposed license amendment and concludes that it meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(c), no environmental impact statement or environmental assessment needs to be prepared in

connection with issuance of the proposed license change. The basis for this determination is as follows:

1. The proposed license amendment does not involve significant hazards as described previously in the No Significant Hazards Consideration Evaluation.

2. As discussed in the No Significant Hazards Consideration Evaluation, the proposed changes to the CNS TS Table 3.3.1.1-1 do not introduce any new equipment, nor do they require any existing equipment or systems to perform a different type of function than they are presently designed to perform during normal operation. The District has concluded that there will not be a significant increase in the types or amounts of effluents that may be released off-site and these changes do not involve irreversible environmental consequences beyond those already associated with normal operation.

3. The proposed change involves a revision to the Technical Specification requirements for the Neutron Monitoring systems. As discussed in the No Significant Hazards Consideration Evaluation, these changes do not affect plant systems or operation. Thus, the proposed changes do not increase individual or cumulative occupational radiation exposure beyond that already associated with normal operation.

7.0 Conclusion

The District has evaluated the proposed change described above against the criteria of 10 CFR 50.92 in accordance with the requirements of 10 CFR 50.91 (a)(1). This evaluation has determined that the proposed change to the Technical Specifications will not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility for a new or different kind of accident from any accident previous evaluated, or (3) create a significant reduction in the margin of safety. Therefore, the District requests Nuclear Regulatory Commission approval of this proposed change.

8.0 References

1) Letter from Jack N. Donohew (U.S. Nuclear Regulatory Commission) to G. R. Horn (Nebraska Public Power District) dated July 31, 1998, Conversion to Improved Technical Specifications for the Cooper Nuclear Station - Amendment No. 178 to the Facility Operating License No. DPR-46 (TAC No. M98317)

2) NUREG-1433, Rev 1, Standard Technical Specifications General Electric, BWR/4

Mark-Up to show Specific Changes to Existing Technical Specifications and Associated Bases (for information)

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3.3-6

Revised Bases Pages
B 3.3-8
B 3.3-10

Note: Bases are provided for information. Following approval of the proposed TS change, Bases changes will be implemented in accordance with TS 5.5.10, Technical Specification (TS) Bases Control Program.

Table 3.3.1.1-1 (page 1 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Intermediate Range Monitors					
a. Neutron Flux — High	2	3	G	SR 3.3.1.1.1 SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.5 SR 3.3.1.1.6 SR 3.3.1.1.12 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ 121/125 divisions of full scale
	5[a]	3	H	SR 3.3.1.1.1 SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.12 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ 121/125 divisions of full scale
b. Inop	2	3	G	SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.13	NA
	5[a]	3	H	SR 3.3.1.1.3 SR 3.3.1.1.4 SR ~~3.3.2.2.13~~ 3.3.1.1.13	NA
2. Average Power Range Monitors					
a. Neutron Flux — High (Startup)	2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.6 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ 14.5% RTP
b. Neutron Flux-High (Flow Biased)	1	2	F	SR 3.3.1.1.1 SR 3.3.1.1.2 SR 3.3.1.1.4 SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.12 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ 0.66 W + 71.5% RTP (b) ~~and ≤ 119.0% RTP(b)~~

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(b) 0.66 W + 71.5% - 0.66 ΔW RTP when reset for single loop operation per LCO 3.4.1, "Recirculation Loops Operating."

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2.a. Average Power Range Monitor Neutron Flux-High (Startup) (continued)

The APRM System is divided into two groups of channels with three APRM channel inputs to each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. Four channels of Average Power Range Monitor Neutron Flux-High (Startup) with two channels in each trip system are required to be OPERABLE to ensure that no single failure will preclude a scram from this Function on a valid signal. In addition, to provide adequate coverage of the entire core, at least 11 LPRM inputs are required for each APRM channel, with at least two LPRM inputs from each of the four axial levels at which the LPRMs are located.

The Allowable Value is based on preventing significant increases in power when THERMAL POWER is < 25% RTP.

The Average Power Range Monitor Neutron Flux-High (Startup) Function must be OPERABLE during MODE 2 when control rods may be withdrawn since the potential for criticality exists.

In MODE 1, the Average Power Range Monitor Neutron Flux-High (Fixed) Function provides protection against reactivity transients and the RWM and rod block monitor protect against control rod withdrawal error events. Function 2.a is bypassed when the reactor mode switch is in run.

2.b. Average Power Range Monitor Neutron Flux-High (Flow Biased)

The Average Power Range Monitor Neutron Flux-High (Flow Biased) Function monitors neutron flux to approximate the THERMAL POWER being transferred to the reactor coolant. The APRM neutron flux trip level is varied as a function of recirculation drive flow (i.e., at lower core flows, the setpoint is reduced proportional to the reduction in power experienced as core flow is reduced with a fixed control rod pattern) but is clamped at an upper limit, the Function 2.c, Average Power Range Monitor Neutron Flux-High (Fixed) Function Allowable Value. The Average Power Range Monitor Neutron Flux-High (Flow Biased) Function is not specifically credited in the safety analyses, but is intended to provide protection against transients where THERMAL POWER increases

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

2.b. Average Power Range Monitor Neutron Flux-High (Flow Biased) (continued)

~~No specific safety analyses take credit for the APRM Neutron Flux-High (Flow Biased) Function. Originally the clamped Allowable Value was based on analyses that took credit for the Average Power Range Monitor Neutron Flux-High (Flow Biased) Function for the mitigation of the loss of feedwater heating event. However, the current methodology for this event is based on a steady state analysis that allows power to increase beyond the clamped Allowable Value. Therefore, applying a clamp is conservative.~~

The Average Power Range Monitor Neutron Flux-High (Flow Biased) Function is required to be OPERABLE in MODE 1 when there is the possibility of generating excessive THERMAL POWER and potentially exceeding the SL applicable to high pressure and core flow conditions (MCPR SL). During MODES 2 and 5, other IRM and APRM Functions provide protection for fuel cladding integrity.

2.c. Average Power Range Monitor Neutron Flux-High (Fixed)

The APRM channels provide the primary indication of neutron flux within the core and respond almost instantaneously to neutron flux increases. The Average Power Range Monitor Neutron Flux-High (Fixed) Function is capable of generating a trip signal to prevent fuel damage or excessive Reactor Coolant System (RCS) pressure. For the overpressurization protection analysis of Reference 6, the Average Power Range Monitor Neutron Flux-High (Fixed) Function is assumed to terminate the main steam isolation valve (MSIV) closure event and, along with the safety/relief valves (SRVs), limits the peak reactor pressure vessel (RPV) pressure to less than the ASME Code limits. The control rod drop accident (CRDA) analysis (Ref. 7) takes credit for the Average Power Range Monitor Neutron Flux-High (Fixed) Function to terminate the CRDA.

The APRM System is divided into two groups of channels with three APRM channels inputting to each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. Four channels of Average Power Range Monitor Neutron Flux-High (Fixed) with two channels in each trip system arranged in a one-out-of-

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Clean Copy of Proposed Changes to Technical Specifications and Associated Bases (for information)

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B 3.3-9
B 3.3-10

Note: Bases are provided for information. Following approval of the proposed TS change, Bases changes will be implemented in accordance with TS 5.5.10, Technical Specification (TS) Bases Control Program.

Table 3.3.1.1-1 (page 1 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Intermediate Range Monitors					
a. Neutron Flux — High	2	3	G	SR 3.3.1.1.1 SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.5 SR 3.3.1.1.6 SR 3.3.1.1.12 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ 121/125 divisions of full scale
	5[a]	3	H	SR 3.3.1.1.1 SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.12 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ 121/125 divisions of full scale
b. Inop	2	3	G	SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.13	NA
	5[a]	3	H	SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.13	NA
2. Average Power Range Monitors					
a. Neutron Flux — High (Startup)	2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.3 SR 3.3.1.1.4 SR 3.3.1.1.6 SR 3.3.1.1.8 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ 14.5% RTP
b. Neutron Flux-High (Flow Biased)	1	2	F	SR 3.3.1.1.1 SR 3.3.1.1.2 SR 3.3.1.1.4 SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.12 SR 3.3.1.1.13 SR 3.3.1.1.15	≤ 0.66 W + 71.5% RTP[b]

(continued)

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

(b) 0.66 W + 71.5% - 0.66 ΔW RTP when reset for single loop operation per LCO 3.4.1, "Recirculation Loops Operating."

BASES

APPLICABLE SAFETY ANALYSES,LCO, and APPLICABILITY

2.a. Average Power Range Monitor Neutron Flux-High (Startup) (Continued)

The APRM System is divided into two groups of channels with three APRM channel inputs to each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. Four channels of Average Power Range Monitor Neutron Flux-High (Startup) with two channels in each trip system are required to be OPERABLE to ensure that no single failure will preclude a scram from this Function on a valid signal. In addition, to provide adequate coverage of the entire core, at least 11 LPRM inputs are required for each APRM channel, with at least two LPRM inputs from each of the four axial levels at which the LPRMs are located.

The Allowable Value is based on preventing significant increases in power when THERMAL POWER is < 25% RTP.

The Average Power Range Monitor Neutron Flux-High (Startup) Function must be OPERABLE during MODE 2 when control rods may be withdrawn since the potential for criticality exists.

In MODE 1, the Average Power Range Monitor Neutron Flux-High (Fixed) Function provides protection against reactivity transients and the RWM and rod block monitor protect against control rod withdrawal error events. Function 2.a is bypassed when the reactor mode switch is in run.

2.b. Average Power Range Monitor Neutron Flux-High (Flow Biased)

The Average Power Range Monitor Neutron Flux-High (Flow Biased) Function monitors neutron flux to approximate the THERMAL POWER being transferred to the reactor coolant. The APRM neutron flux trip level is varied as a function of recirculation drive flow (i.e., at lower core flows, the setpoint is reduced proportional to the reduction in power experienced as core flow is reduced with a fixed control rod pattern). The Average Power Range Monitor Neutron Flux-High (Flow Biased) Function is not specifically credited in the safety analyses, but is intended to provide protection against transients where THERMAL POWER increases slowly, and to provide protection for power oscillations which may result from reactor thermal hydraulic instability.

(continued)

BASES

APPLICABLE SAFETY ANALYSES,LCO, and APPLICABILITY

2.b Average Power Range Monitor Neutron Flux-High (Flow Biased) (Continued)

The APRM System is divided into two groups of channels with three APRM Channel inputs to each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. Four channels of Average Power Range Monitor Neutron Flux-High (Flow Biased) with two channels in each trip system arranged in a one-out-of-two logic are required to be OPERABLE to ensure that no single instrument failure will preclude a scram from this Function on a valid signal. In addition, to provide adequate coverage of the entire core, at least 11 LPRM inputs are required for each APRM channel, with at least two LPRM inputs from each of the four axial levels at which the LPRMs are located. Each APRM channel receives a flow signal representative of total recirculation loop flow. The total recirculation loop drive flow signals are generated by two flow units, one of which supplies signals to the trip system A APRMs, while the other supplies signals to the trip system B APRMs. Each flow unit signal is provided by summing up the flow signals from the two recirculation loops. The instrumentation is an analog type with redundant flow signals that can be compared. Each required Average Power Range Monitor Neutron Flux-High (Flow Biased) channel requires an input from one OPERABLE flow unit. If a flow unit is inoperable, the associated Average Power Range Monitor Neutron Flux-High (Flow Biased) channels must be considered inoperable.

The terms for the Allowable Value of the APRM Neutron Flux-High (Flow Biased) trip are defined as follows: S is the setting in percent rated power; W is the two loop recirculation flow rate in percent rated flow (rated loop recirculation flow rate is that recirculation flow rate which provides 100% core flow at 100% power); ΔW is the difference between two loop and single loop effective drive flow at the same core flow. ΔW equals zero for two recirculation loop operation.

The Average Power Range Monitor Neutron Flux-High (Flow Biased) Function is required to be OPERABLE in MODE 1 when there is the possibility of generating excessive THERMAL POWER and potentially exceeding the SL applicable to high pressure and core flow conditions (MCPR SL). During MODES 2 and 5, other IRM and APRM Functions provide protection for fuel cladding integrity.

(continued)

BASES

APPLICABLE SAFETY ANALYSES,LCO, and APPLICABILITY

2.b Average Power Range Monitor Neutron Flux-High (Flow Biased) (Continued)

The Average Power Range Monitor Neutron Flux-High (Flow biased) Function is required to be OPERABLE in MODE 1 when there is the possibility of generating excessive THERMAL POWER and potentially exceeding the SL applicable to high pressure and core flow conditions (MCPR SL). During MODES 2 and 5, other IRM and APRM Functions provide protection for fuel cladding integrity.

2.c. Average Power Range Monitor Neutron Flux-High (Fixed)

The APRM channels provide the primary indication of neutron flux within the core and respond almost instantaneously to neutron flux increases. The Average Power Range Monitor Neutron Flux-High (Fixed) Function is capable of generating a trip signal to prevent fuel damage or excessive Reactor Coolant System (RCS) pressure. For the overpressurization protection analysis of Reference 6, the Average Power Range Monitor Neutron Flux-High (Fixed) Function is assumed to terminate the main steam isolation valve (MSIV) closure event and, along with the safety/relief valves (SRVs), limits the peak reactor pressure vessel (RPV) pressure to less than the ASME Code limits. The control rod drop accident (CRDA) analysis (Ref. 7) takes credit for the Average Power Range Monitor Neutron Flux-High (Fixed) Function to terminate the CRDA.

The APRM System is divided into two groups of channels with three APRM channels inputting to each trip system. The system is designed to allow one channel in each trip system to be bypassed. Any one APRM channel in a trip system can cause the associated trip system to trip. Four channels of Average Power Range Monitor Neutron Flux-High (Fixed) with two channels in each trip system arranged in a one-out-of-

(continued)

Correspondence Number: NLS2001008

The following table identifies those actions committed to by the District in this document. Any other actions discussed in the submittal represent intended or planned actions by the District. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the NL&S Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

COMMITMENT	COMMITTED DATE OR OUTAGE
None	