Docket Files

Docket No. 50-298

APR 17 1974

Nebraska Public Power District
ATTN: Mr. J. Pilant, Manager
Licensing and
Quality Assurance
P. O. Box 499
Columbus, Nebraska 68601

Change No. 2
License No. DPR-46

Gentlemen:

By letter dated March 13, 1974, you proposed revision of the Bases of the Technical Specifications (Appendix A) to reflect the installation of more accurate instrumentation for measurement of first stage turbine pressure. The modification provides for measurement of pressure within an accuracy of ± 2%, rather than ± 10% as originally installed. This measurement is utilized to provide for bypass of the Rod Sequence Control System (RSCS) above 20% rated power. We have reviewed this proposal and find it acceptable in that the established limiting conditions for operation, which specify that the RSCS be operable below 20% rated power, will not be affected. (revised pages 100-101 enclosed)

By letter dated April 4, 1974, you proposed modifications to the Technical Specifications (Appendix A) to facilitate required control rod scram time and friction testing, which is required by the Technical Specifications to be performed after initial fuel loading when operating above 800 psi before turbine-generator synchronization (approximately 15% of rated power). At this operating stage, the reactor rod pattern will be in the RSCS B group. The characteristics of the RSCS prevent, at power levels below 20%, movement of the C group rods or of "out-of-sequence" rods such as, in this case, those in the A group with the B group withdrawn. The proposed modification will permit simulation of the full in position of control rods in the B and A_{3-4} groups during scram and friction testing of individual A_{3-4} and A_{1-2} groups below 20% rated power. Additional procedural controls provide further assurance in that the Rod Worth Minimizer is required to be in operation, and checks of the operability of the RSCS to prevent withdrawal of higher worth rods are required. Alternate methods of performing the required tests were considered. Performance of tests at low temperature in a subcritical condition with the vessel pressurized does not accurately simulate actual operating conditions existing during a control rod scram. Experience on a similar plant indicates that the increase of scram times are significantly more sensitive to increased temperature than increased

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pressure so that low temperature tests are not a proper measure of performance. Conduct of tests in a hot, pressurized shutdown condition is impracticable due to rapid system cooldown resulting from cool water introduced into the vessel by the control rod drive system during scrams. The addition to the Bases provides more detailed substantiation for the change. (revised/new pages 96, 96a, 101, 101a enclosed)

Your letter of April 4, 1974, also included a revised "CNS Organization Chart," which reflects the independence between the quality assurance (QA) specialist and the operating organization. This change is approved and incorporated in the Technical Specifications (Appendix A). (revised page 243 enclosed)

The Regulatory staff's experience with other operating boiling water reactors has indicated a requirement for lower trip settings on main steamline radiation monitors and the addition of an alarm signal, in order to provide maximum information and plant protection without incurring unnecessary reactor scrams and system transients. The trip setting is changed from 6 to 3 times normal background at rated power. A requirement for an alarm signal at 1.5 times normal background at rated power is added. (changes reflected in Attachment A enclosed hereto)

Accordingly, pursuant to 10 CFR Part 50, Section 50.59, we have concluded that these changes do not involve a significant hazards consideration and there is reasonable assurance that the health and safety of the public will not be endangered. The Technical Specifications (Appendix A) of License No. DPR-46 are hereby changed as set forth in the enclosed pages, and Attachment A.

Sincerely,

Original Signed by

Voss A. Moore, Assistant Director
for Light Water Reactors, Group 2
Directorate of Licensing

Enclosures:
1. Revised/new pages 96, 96a (new), 100, 101, 101a (new) and 243
2. Attachment A

cc: Mr. Gene Watson, Attorney
Wilson, Barlow & Watson
P. O. Box 81686
Lincoln, Nebraska 68501

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APR 17 1974

cc: (Continued)

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Basdekas
Ippolito
Richings
Ross

*w/NPPD letters dated 3/13/74 and 4/4/74

** see previous yellow

OFFICE	L:LWR 2-1	L:LWR 2-1	L:EI&CS	L:CP	L:LWR 2-1	L:LWR 2
SURNAME	HSmith:mg	EBeckett	Basdekas/Ippolito	Richings/Ross	JStolz	VAMoore
DATE	4/ /74	4/12/74	4/15/74	4/ /74	4/ /74	4/ /74

Form AEC-318 (Rev. 9-53) AECM 0240 GPO C43 16 81468-1 445-678

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ATTACHMENT A

CHANGE NO. 2 TO THE TECHNICAL SPECIFICATIONS (APPENDIX A)

DOCKET NO. 50-298

Page 29, Table 3.1.1 (Page 2)

first line in column entitled "Trip Level Setting,"

delete: "≤ 6 times normal full power background"

replace with: "≤ 3 times normal full power background"

Page 39, Section 3.1 BASES

delete: "six"

replace with: "three"

Page 50, Table 3.2.A

first line in column entitled "Setting Limit,"

delete: "≤ 6 Times Full Power"

replace with: "≤ 3 Times Full Power"

Page 52, NOTES FOR TABLE 3.2.A

Item 8, Group 1, Isolation Signals, Item 2

delete: "6"

replace with: "3"

Page 52b, NOTES FOR TABLE 3.2.A

Item 8, Group 7, Isolation Signals, Item 2

delete: "6"

replace with: "3"

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SURNAME ➤						A7
DATE ➤						

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Page 63, Table 3.2.D

last entry in column entitled "Setting Limit,"

delete: "6 times normal full power background"

replace with: "3 times normal full power background. Alarm at 1.5 times normal full power background"

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DATE ➔						

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Form AEC-318 (Rev. 9-53) AECM 0240 GPO C43 16 81465-1 520-284

The Regulatory staff's experience with other operating boiling water reactors has indicated a requirement for lower trip settings on main steamline radiation monitors and the addition of an alarm signal, in order to provide maximum information and plant protection without incurring unnecessary reactor scrams and system transients. The trip setting is changed from 6 to 3 times normal background at rated power. A requirement for an alarm signal at 1.5 times normal background at rated power is added. (changes reflected in Attachment A enclosed hereto)

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Sincerely,

Voss A. Moore, Assistant Director
for Light Water Reactors, Group 2
Directorate of Licensing

Enclosures:
1. Revised/new pages 96, 96a (new), 100, 101, 101a (new) and 243
2. Attachment A

cc: Mr. Gene Watson, Attorney
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P. O. Box 81686
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Mr. Ed Vest*
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*w/NPPD letters dated 3/13/74 and 4/4/74

(see attached page for distribution) VOID

OFFICE	LL:LWR 2-1	L:LWR 2-1	L:EI&CS	L:CP	L:LWR 2-1	L:LWR 2
SURNAME	HSmith:ew	EBeckett	Basdekas / Ippolito	Richings / Ross	SBurwell / JStolz	VAMoore
DATE	4/9/74	4/9/74	4/11/74	4/15/74	4/16/74	4/17/74

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cannot be moved with drive pressure. If the rod is fully inserted and then disarmed electrically*, it is in a safe position of maximum contribution to shutdown reactivity. If it is disarmed electrically in a non-fully inserted position, that position shall be consistent with the shutdown reactivity limitation stated in Specification 3.3.A.1. This assures that the core can be shutdown at all times with the remaining control rods assuming the strongest operable control rod does not insert. An allowable pattern for control rods valved out of service, which shall meet this Specification, will be determined and made available to the operator. The Rod Sequence Control System is not automatically bypassed until reactor power is at or above [22%] power. Therefore, control rod movement is restricted and the exercise surveillance test is only performed above this power level. The Rod Sequence Control System prevents movement of out-of-sequence rods unless power is above 20%.

B. Control Rod

1. Control rod dropout accidents as discussed in the FSAR can lead to significant core damage. If coupling integrity is maintained, the possibility of a rod dropout accident is eliminated. The overtravel position feature provides a positive check as only uncoupled drives may reach this position. Neutron instrumentation response to rod movement provides a verification that the rod is following its drive. Absence of such response to drive movement could indicate an uncoupled condition. Rod position indication is required for proper function of the rod sequence control system and the rod worth minimizer (RWM).

2. The control rod housing support restricts the outward movement of a control rod to less than 3 inches in the extremely remote event of a housing failure. The amount of reactivity which could be added by this small amount of rod withdrawal, which is less than a normal single withdrawal increment, will not contribute to any damage to the primary coolant system. The design basis is given in subsection III.8.2 of the FSAR and the safety evaluation is given in subsection VIII.8.4. This support is not required if the reactor coolant system is at atmospheric pressure since there would then be no driving force to rapidly eject a drive housing. Additionally, the support is not required if all control rods are fully inserted and if an adequate shutdown margin with one control rod withdrawn has been demonstrated, since the reactor would remain subcritical even in the event of complete ejection of the strongest control rod.

*To disarm the drive electrically, four Amphenol type plug connectors are removed from the drive insert and withdrawal solenoids rendering the rod incapable of withdrawal. This procedure is equivalent to valving out the drive and is preferred because, in this condition, drive water cools and minimizes crud accumulation in the drive. Electrical disarming does not eliminate position indication.

3. The Rod Worth Minimizer and the Rod Sequence Control System restrict withdrawals and insertions of control rods to those listed pre-specified control rod sequences which are established to assure that the maximum individual control rod worth prior to withdrawal shall be less than 1.25% Δk. These sequences are developed prior to initial operation of the unit to limit the reactivity worths of control rods in the core, and together with the integral rod velocity limiters, limit potential reactivity insertion such that the results of a control rod drop accident will not exceed a maximum fuel energy content of 280 calories gram. Ref. Sections III.6.6, VIII.7.4.5 and XIV.6.2 of the FSAR and NEDO 10527 and supplements to NEDO. The peak fuel energy content of 280 calories/gram is below the energy content at which rapid fuel dispersal and primary system damage are assumed to occur.

The Specified sequences are characterized by homogeneous, scattered patterns of control rod withdrawal. The maximum rod worths encountered in these patterns are presented in Figure III-6-3 of the FSAR. When the core is at about 5% power, there are no single operator errors which could lead to possible rod worths which, if dropped at the rate of the velocity limiter could result in a peak fuel enthalpy of 280 cal/gm. Thus, requiring operation of the RWM and RSCS below 10% rated power is conservative from a core physics standpoint. However, a more conservative technical specification limit of 20% rated power will be imposed.

The system operation interlock signal to remove or insert the rod sequence control system above the 20% core thermal power level will be provided by measurement of first stage turbine pressure with a setpoint of 22% power. Instrumentation of sufficient accuracy will be employed to ensure that switching in or out of rod sequence control system takes place above 20% power level.

Functional testing of the RWM and the RSCS prior to each startup will insure reliable operation and minimize the probability of the Rod Drop Accident.

After initial fuel loading and subsequent refueling when operating above 800 psi, all control rods that are fully withdrawn must be scram tested within the constraints imposed by the RSCS System before turbine generator synchronization. To maintain the required reactor pressure conditions, the individually scrammed or inserted rod should be withdrawn back to its original position immediately following testing of each rod. In order to select and withdraw back the scrammed or inserted insequence control rod (also to select and insert a fully withdrawn insequence rod in case of friction testing) it will be necessary to simulate all the insequence withdrawn rods of the succeeding RSCS groups as being at "full-in" position by utilizing the individual rod position simulation switches provided in the RSCS for such purposes. Before turbine synchronization (approx. 15% rated power) the reactor rod pattern will be in RSCS B group. All C rods will be fully inserted and all A_1 & 2 and A_3 & 4 rods will be fully withdrawn. To test A_3 & 4 rods it will be necessary to simulate all withdrawn B rods as being at "full-in" position and for testing A_1 & 2 rods all A_3 & 4 and all withdrawn B rods as being at "full-in" position.

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The simulation of already withdrawn group A_{34} and/or group B rods as being "full-in" to perform the individual rod tests as outlined in this procedure does not violate the intent of the RSCS since (1) the higher worth C group rods cannot be withdrawn during the performance of this test (the restraints of the RSCS System will remain in effect until 20% rated power has been achieved and the test procedure will require that this be verified); (b) no group B rods can be selected either for withdrawal or insertion during the time that an A_{12} or A_{34} rod is fully inserted or is simulated as being in the fully inserted position; and (c) all rod position simulation switch operations will be verified by a second independent check. Experience at other plants indicates that scram times at operating temperature are slower than at lower temperatures. Therefore, it is desirable to perform scram time tests at pressure and temperature approaching operating conditions.

The Rod Worth Minimizer and the Rod Sequence Control System provide automatic supervision to assure that out of sequence control rods will not be withdrawn or inserted; i.e., it limits operator deviations from planned withdrawal sequences; ref. Section VIII.7.4.5 of the FSAR. They serve as a backup to procedural control of control rod worth. In the event that the Rod Worth Minimizer is out of service, when required, a second licensed operator or qualified employee can manually fulfill the control rod pattern conformance functions of this system. In this case, the RSCS is backed up by independent procedural controls to assure conformance.

The effectiveness of RSCS in limiting peak fuel enthalpy has been positively evaluated only up through the first refueling outage. Thus a complete RSCS re-evaluation will be required subsequent to the first refueling outage.

4. The Source Range Monitor (SRM) system performs no automatic safety system function; i.e., it has no scram function. It does provide the operator with a visual indication of neutron level. The consequences of reactivity accidents are functions of the initial neutron

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.3.B (cont'd.)	4.3.B (cont'd.)
c. Whenever the reactor is above 20% rated power, control rod patterns and the withdrawal or insertion sequences shall be established such that the maximum worth of any operable control rod, including an allowance for a selection error, is less than 0.0125 ΔK.	c. Proper RWM annunciation of the selection error of at least one out-of-sequence control rod in each fully inserted group shall be verified.
d. If Specifications 3.3.B.3.a through .c cannot be met the reactor shall not be started or if the reactor is in the run or startup modes at less than 20% rated power, it shall be brought to a shutdown condition immediately.	d. The rod block function of the RWM shall be verified by withdrawing the first rod as an out-of-sequence control rod no more than to the block point. When required, the presence of a second licensed operator or qualified employee to verify the following of the correct rod program shall be verified.
	e. Prior to the start of control rod withdrawal towards criticality, and prior to obtaining 20% rated power during shutdown, the capability of the Rod Sequence Control System to properly fulfill its function shall be verified by attempting to select and move a rod in each of the out-of-sequence groups. A second licensed operator or other qualified employee shall verify the conformance to Specification 3.3.A.2.d before a rod may be bypassed in the Rod Sequence Control System.
[4.a. During initial fuel loading or subsequent refuelings the restraints imposed by Rod Sequence Control System groups A_1 & $_2$ & A_3 & $_4$ may be bypassed to perform the required shutdown margin demonstration. *]	[4.a. Prior to control rod withdrawal for startup or during refueling, verify the conformance to Specification 3.3.A.2.d before a rod may be bypassed in the Rod Sequence Control System. *]
[b. The restraints imposed by Rod Sequence Control System groups A_{34} and B may be bypassed by simulating that the rods are in the "full-in" position to permit the scram and friction testing of the control rod drives as specified in Surveillance requirement 4.3.C and the initial Startup Test Program as described in Amendment 32 of Cooper FSAR.	[b. The requirements for scram testing, per specification 3.3.C.1 and friction testing of the control rods which require that groups A_{34} and/or B of RSCS to be bypassed are: 1. The RWM operable as per Specification 3.3.B.3.]

* Change is only the number of the paragraph.

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LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
	2. After selection for testing of either the A_{12} or A_{34} rods and the proper RSCS group(s) have been bypassed, the rod block function must be verified by attempting to withdraw a C rod no more than one notch.
	3. A second licensed operator or other qualified employee shall verify the conformance to procedures and this specification.
5. Control rods shall not be withdrawn for startup or refueling unless at least two source range channels have an observe count rate equal to or greater than three counts per second.	5. When a limiting control rod pattern exists, an instrument functional test of the RBM shall be performed prior to withdrawal of the designated rod(s) and daily thereafter.