50-263 NSP MONTICELLO

PROPOSED CHANGE TO TECH SPECS RE
THE REACTOR PROTECTION SYSTEM

REC'D W/LTR DTD 02/14/92....9202190332

Exhibit A

MONTICELLO NUCLEAR GENERATING PLANT

License Amendment Request Dated February 14, 1992

Evaluation of proposed changes to the Technical Specifications for Operating License DPR-22

Pursuant to 10 CFR Part 50, Sections 50.59 and 50.90, the holders of Operating License DPR-22 hereby propose the following changes to the Monticello Technical Specifications:

1. Elimination of Main Steam Line High Radiation Scram & Associated Vessel Isolation Signal:

Page	Section	Proposed Change
29	Table 3.1.1	Delete item 10, Main Steam Line High Radiation Trip, in its entirety. Renumber remaining items accordingly.
30	Table 3.1.1	Revise Note 9 to delete reference to main steam line high radiation instrumentation.
32	Table 4.1.1	Delete reference to high steam line radiation instrument testing.
34	Table 4.1.2	Delete reference to high steam line radiation instrument calibration. Delete Note 3, which applies uniquely to the main steam line high radiation instrumentation.
37	3.1 Bases	Delete discussion of main steam line high radiation scram function.
49	Table 3.2.1	Delete item 1.e, High Radiation in Main Steam Line Tunnel
62	Table 4.2.1	Delete item 4, "Steamline High Radiation", under "MAIN STEAM LINE (GROUP I) ISOLATION".
63a	Table 4.1.2	Delete Note 6, which applies uniquely to the instrumentation being deleted.
66	3.2 Bases	Delete the third paragraph, which discusses the main steam line high radiation monitor, in its entirety.

Reason For Change/Safety Evaluation:

The main steam line radiation monitor is intended to provide an early indication of gross fuel failures. The function of the monitor is to measure radiation levels external to the main steam lines and provide various alarm and trip functions upon detection of excessive levels. The proposed change would eliminate the main steam line high radiation scram & vessel isolation functions. Elimination of these trip functions offers several benefits, such as:

- Reduction in scram frequency; The plant is vulnerable to unnecessary scrams caused by Nitrogen-16 spikes or other spurious signals that can trip this circuit. This is especially true when reactor scram instrumentation, including the main steam line high radiation monitors, calibration is in progress, since this work involves a half scram signal. Spurious signals affecting the sole remaining channel can result in a full scram signal with a resultant reactor trip.

- Maintaining the availability of the condenser as a heat sink; In addition to causing a reactor protection system trip, the main steam line high radiation signal is used by the Primary Containment Isolation System to initiate a Group I Isolation, which includes closure of the main steam isolation valves. Closure of these valves prevents use of the condenser as a heat sink to facilitate scram recovery.

- Simplification of hydrogen water chemistry control; Hydrogen Water Chemistry injection rates influence Nitrogen-16 levels in the main steam lines, introducing the possibility that system transients could momentarily increase Nitrogen-16 levels to the point that a main steam line high radiation trip could occur.

- Increased operator control over radioactive releases; By eliminating the vessel isolation function, it is possible to allow operators the option of permitting the release of activity via a controlled release path using the Offgas Treatment System. If the vessel is isolated and the mechanical vacuum pump is secured, there is no means to remove activity trapped in the condenser. It is reasonable to assume that this activity could then leak directly to the atmosphere without further treatment.

Elimination of the main steam line high radiation scram & vessel isolation function was recognized as a generic improvement by the BWR Owners' Group, who funded a safety evaluation for this proposal that was issued in May of 1987 as NEDO-31400, titled "Safety Evaluation for Eliminating the Boiling Water Reactor Main Steam Line Isolation Valve Closure Function and Scram Function of the Main Steam Line Radiation Monitor". The report was reviewed by the NRC staff and found acceptable in a letter and accompanying safety evaluation sent to the BWR Owners' Group on May 15, 1991 .

In the May 15, 1991 safety evaluation, the NRC stated that utilities applying for the proposed license amendment were to standardize the main steam line and offgas system high radiation monitor alarm setpoints at 1.5 X the nominal Nitrogen-16 background dose rate. We wish to take exception to this requirement for the following reasons:

- The current setpoint for the Monticello main steam line high radiation alarm is about 1.2 X the nominal full power background dose rate with Hydrogen Water Chemistry in effect. Background radiation levels are significantly affected by changes to the hydrogen injection rate, so the alarm setpoint is based on the nominal injection rate. The alarm setpoint is not changed for short term variations in the hydrogen injection rate, but would be changed if plant chemistry considerations dictated a long term adjustment to the nominal injection rate.

  Monticello plans to continue using the current 1.2 X background alarm setpoint, which is more conservative than the 1.5 X background setting proposed by the NRC. If the setpoint is adjusted in the future, it will not exceed 1.5 X the nominal full power Hydrogen Water Chemistry Nitrogen-16 background dose rate.

- The offgas system radiation monitor alarm and trip settings are currently established at levels that assure that Technical Specification 3.8.B.5.a release limits are met. The Technical Specification limits were established at levels that ensure compliance with 10 CFR Part 20, even assuming that the gaseous effluent was inadvertently discharged directly to the environment with minimal treatment. Further reduction of the alarm setpoints is unnecessary and would only serve to make the system more vulnerable to spurious alarms.

  In addition, Technical Specification 4.6.C.1.a requires that a sample of reactor coolant be analyzed for iodines if the steady state steam jet air ejector radiation monitor reading increases by 25% or 5000 μCi/sec, whichever is greater. In order to satisfy this requirement, control room operators are required to record steam jet air ejector monitor readings every four hours, with instructions to notify the plant chemist if readings fall outside of a pre-determined band. These actions fulfill the intent of the NRC proposed setpoint change by ensuring the desired sampling is performed to assure early detection of fuel failures.

No significant changes to plant operating procedures will be required to implement the proposed change. In the event of a main steam line high radiation alarm, the procedures currently direct operators to confirm a high radiation condition by checking the other main steam line radiation monitors. If high radiation is confirmed, the procedures call for power reduction to stabilize radiation levels. If radiation levels continue to increase, an orderly shutdown is commenced.

In the event of an off gas high radiation alarm, procedures direct

operators to confirm a high radiation condition exists by checking other main steam line and offgas radiation monitors. If high radiation is confirmed, operators are to reduce power as necessary to reset the alarm and refer to the Emergency Classification Guidelines. If the alarm cannot be reset by reducing power, the offgas recombiner system will automatically isolate in 30 minutes causing a reactor scram due to loss of condenser vacuum. If the recombiners are bypassed, the condenser automatically isolates from the offgas stack 15 minutes after receipt of the high offgas alarm.

The intent of these actions is to limit occupational doses and environmental releases in the event of a significant increase in process radiation levels. These actions remain adequate in light of the proposed change. As part of the modification process, operator training requirements and specific procedure changes needed to eliminate reference to the main steam line high radiation scram and vessel isolation functions will be identified. The training and procedure revisions will be completed prior to implementation of the proposed change.

Determination of Significant Hazards Consideration:

The proposed change to the Operating License has been evaluated to determine whether it constitutes a significant hazards consideration as required by 10 CFR Part 50, Section 50.91 using the standards provided in Section 50.92. This analysis is provided below:

a. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

As noted in NEDO-31400, the main steam line high radiation scram signal is not an input in any Monticello Design Basis Accident analysis, therefore elimination of this signal will not increase the probability or consequences of such accidents.

Similarly, the main steam line high radiation vessel isolation function is unnecessary. The isolation function is not considered in the Monticello control rod drop accident analysis and the isolation in no way prevents the accident from occurring, therefore its elimination will not increase the probability of the accident.

The main steam line high radiation vessel isolation function was intended to mitigate a control rod drop accident, but the NEDO-31400 analysis demonstrates that the isolation is actually of little benefit in this regard. The analysis concludes that even without the isolation, calculated radiological release rates for a control rod drop accident are only a small fraction of 10 CFR Part 100 guidelines and are well within the criteria established by

Standard Review Plan Section 15.4.9. Details of the analysis mentioned above are discussed in NEDO-31400.

NEDO-31400 has been reviewed and it has been confirmed that Monticello is bounded by the assumptions and conclusions of the analysis with the following exception:

- The analysis for scenario 2 (Control Rod Drop Accident without MSIV Closure) assumes that the augmented offgas treatment system incorporates a charcoal bed of sufficient size to remove essentially all of the iodine that could be transported to the condenser. This assumption is not valid for Monticello because the Monticello augmented offgas treatment system uses charcoal filters considerably smaller than those described in NEDO-31400.

  In order to assess this difference, offsite doses were projected using the Monticello MIDAS computer program, which is also utilized for emergency offsite dose projections and routine release calculations. No credit was taken for the charcoal filters installed at the offgas compressor suction filters, since they could not accommodate the amount of iodine released in a control rod drop accident. In addition, due to their location in the system, the charcoal filters are bypassed when the storage tanks are bypassed.

  Two projections were run assuming an elevated (plant offgas stack) release, stability class F conditions, and a wind speed of 0.5 mph. The source term from NEDO-31400 Table 2 was deemed appropriate for this analysis and was used in both cases. The Monticello offgas system is designed to provide a minimum 50 hour delay time for main condenser offgas, with several hundred hours of hold-up typically achieved. The first projection was run simulating 198 hours of decay time, as would normally be available with the compressed offgas system in operation. The second projection was run assuming zero offgas delay time, which is conservative because the minimum delay time would be 2 hours even with the offgas system storage tanks bypassed and assuming maximum (28 scfm) condenser in-leakage. In both cases the resulting offsite dose projections, provided in Table 1, are insignificant relative to 10 CFR Part 100 guidelines.

TABLE 1
MONTICELLO SPECIFIC ANALYSIS
NEDO-31400 SCENARIO 2 OFFSITE DOSE PROJECTIONS

Offgas Delay Time	Integrated Whole Body Dose (2 hour maximum)	% of 10CFR100 limit (25 Rem)	Thyroid Dose	% of 10CFR100 limit (300 Rem)
198 hours	0.12 mrem	<0.01 %	10 mrem	<0.01 %
0 hours	0.6 mrem	<0.01 %	26 mrem	<0.01 %

The existing main steam line and condenser offgas radiation monitoring instrumentation will remain installed to provide information and alarms to plant operators. In the event either or both of these monitors alarm, the reactor coolant will be promptly sampled to determine possible contamination levels. Other automatic offgas system functions, such as isolation of the recombiner system upon a steam jet air ejector high radiation signal (30 minute built-in delay) or isolation of the offgas system (15 minute built-in delay) if the recombiners are bypassed, and termination of releases from the stack upon Wide Range Gas Monitor high radiation signal, remain unaffected by this modification. These isolations provide assurance that 10 CFR Part 20 limits are not exceeded.

Based on the above discussion, it is concluded that there will be no significant increase in the consequences of a control rod drop accident, were one to occur.

b. <u>The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.</u>

The main steam line high radiation scram and vessel isolation functions were originally intended to mitigate, not prevent, an existing accident scenario. Elimination of these functions will not introduce a new or different accident scenario.

The proposed amendment represents a change to the physical configuration of the plant in that some Reactor Protection System circuits will be modified to eliminate the main steam line high radiation scram and vessel isolation signals. However, these changes are minor and will not affect the remaining scram or vessel isolation functions. In all other respects plant design and operation remain unchanged. We therefore conclude that the proposed amendment will not create the possibility of any new or different kind of accident from any previously analyzed.

c. The proposed amendment will not involve a significant reduction in the margin of safety.

The proposed amendment will result in a net improvement in the margin of safety, since the analysis of NEDO-31400 concludes that the core damage frequency is reduced 0.3% due to a reduction in transient initiating events.

Based on the discussion above, it is concluded that the proposed changes concerning elimination of the main steam line high radiation scram and main steam line high radiation vessel isolation signal do not involve a significant hazards consideration.

2. Clarification of Intermediate Range Monitor Scram Instrumentation Functional Test Requirements:

Page	Section	Proposed Change
32	Table 4.1.1	Revise the "MINIMUM FREQUENCY" column to refer the Intermediate Range Monitor channel to note 1 in lieu of note 3.
33	Table 4.1.1	Provide a new Note 1 that reads as follows: "Note 1: Perform functional test prior to every startup."

Reason for Change and Safety Evaluation:

The purpose of this change is to resolve a discrepancy that currently exists in the Technical Specification. Table 4.1.1 currently refers to Note 3 regarding the minimum surveillance frequency for functional testing of the Intermediate Range Monitor trip channel and alarm. Note 3 requires testing of the instrument channel prior to every startup and normal shutdown. However, the Intermediate Range Monitor instrument channels represent a case where the only time a practical test can be performed on the alarm and trip circuit is prior to startup (while the plant is shutdown) due to the circuit configuration.

Table 4.1.1 identifies the Intermediate Range Monitors as category C devices. Category C devices are those which only serve a useful function during some restricted mode of operation, such as startup or shutdown, or for which the only practical test is one that can be performed at shutdown. Both of these qualifiers apply to the Intermediate Range Monitors, but it is the latter qualifier that is of significance in this instance. It is inappropriate for Table 4.1.1 to reference Note 3, since there is no means to test the Intermediate Range Monitor scram function prior to shutdown without lifting leads, which is impractical. A change to the Technical specifications is needed to correct this discrepancy.

The proposed change is consistent with the Standard BWR Technical Specifications, which do not require an Intermediate Range Monitor scram functional test prior to a shutdown.

Determination of Significant Hazards Consideration:

This proposed change to the Operating License has been evaluated to determine if it constitutes a significant hazards consideration as required by 10 CFR Part 50, Section 50.91 using the standards provided in Section 50.92. This analysis is provided below:

a. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed amendment will not increase the probability or consequences of any accident previously analyzed. The Technical Specifications already identify the Intermediate Range Monitor scram instrumentation as Group C, thereby recognizing that a practical test of the Intermediate Range Monitor scram and alarm function can only be performed while the plant is shutdown. The proposed amendment clarifies, but does not change, the intent of the Technical Specification and eliminates the discrepancy created by reference to an inappropriate note.

b. <u>The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.</u>

The proposed amendment represents an administrative change to the Technical Specification and will not involve any changes to equipment or operating procedures. It is therefore concluded that the change will not introduce the possibility of a new or different kind of accident than previously analyzed.

c. <u>The proposed amendment will not involve a significant reduction in the margin of safety.</u>

The performance and reliability of the Intermediate Range Monitor instrument scram function will not be reduced since Reactor Protection System capabilities will continue to be demonstrated in a manner meeting the original intent of the Technical Specifications.

Based on the analysis, we have concluded that the proposed changes involving the Intermediate Range Monitor scram functional test do not involve a significant hazards consideration.

3. Clarification of Bases Section Discussion of Permissible Average Power Range Monitor Bypasses:

Page	Section	Proposed Change
36	3.1 Bases	Revise fifth sentence of first paragraph to read: "This allows the bypassing of one APRM per protection trip system."

Reason For Change and Safety Evaluation:

Monticello was designed and constructed to have 2 Reactor Protection System primary channels (A & B), with each channel further divided into 2 subchannels to provide a 1-out-of-2-twice scram logic. Each subchannel receives inputs from a dedicated Average Power Range Monitor. In addition, each primary channel is served by a third Average Power Range Monitor that is connected to both subchannels. This third Average Power Range Monitor serves, in effect, as an installed spare and is used to maintain the 1-out-of-2-twice logic when one of the other Average Power Range Monitors becomes inoperable or is removed from service for other reasons. To facilitate this, each primary channel is provided with a joystick type switch that permits bypass of one (but only one) Average Power Range Monitor. Refer to Figure A-1 for a simplified diagram of the Average Power Range Monitor scram logic.

The Reactor Protection System is also configured such that some Average Power Range Monitors in channel A share Local Power Range Monitor inputs with Average Power Range Monitors in channel B. Specifically, Average Power Range Monitor 1 (Channel A) receives input from the same Local Power Range Monitors as Average Power Range Monitor 5 (Channel B). Similarly, Average Power Range Monitor 2 (Channel A) receives input from the same Local Power Range Monitors as Average Power Range Monitor 6 (Channel B). As a result, a single Local Power Range Monitor failure could trip both channels of the Reactor Protection System and cause a scram. This has happened twice at Monticello (scram #53 on July 27, 1978 and scram #55 on August 24, 1978). For this reason, unless otherwise needed, one Average Power Range Monitor per primary channel (Average Power Range Monitors 2 & 5, or 1 & 6) is bypassed during normal operation to preclude unnecessary scrams.

The current 3.1 Bases wording could be construed as being all inclusive, implying that the only permissible reasons for bypassing an Average Power Range Monitor are those listed (i.e. for maintenance, testing or calibration). In fact, there are other valid reasons for bypassing an Average Power Range Monitor, such as the case described above, and the system is designed to accommodate these situations. The proposed change to the Technical Specification 3.1 Basis section is intended to clarify that Average Power Range Monitor bypasses need not be limited to the situations currently listed and are acceptable in other cases provided Technical Specification requirements regarding the minimum number of operable channels are maintained.

Determination of Significant Hazards Consideration:

The proposed change to the Operating License has been evaluated to determine whether it constitutes a significant hazards consideration as required by 10 CFR Part 50, Section 50.91 using the standards provided in Section 50.92. This analysis is provided below:

a. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The Technical Specifications and the Updated Safety Analysis Report both discuss that an extra Average Power Range Monitor is installed in each of the Reactor Protection System primary channels to permit bypassing of one Average Power Range Monitor in each primary channel. Both documents state that the Average Power Range Monitor trip feature of the Reactor Protection System is fully functional provided both subchannels serving each primary channel are operable. As designed, the level of redundancy required by the Technical Specification, and therefore the level of protection assumed by an accident analysis, is maintained when one Average Power Range Monitor in each primary channel is bypassed. We therefore conclude that this change does not involve a significant increase in the probability or consequences of any accident previously analyzed.

b. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

The proposed change is limited to clarification of statements made in the Technical Specification 3.1 Bases Section. The proposed amendment does not involve any change to the physical configuration of the plant, nor will plant operating procedures be affected. It is therefore concluded that the proposed amendment will not create the possibility of any new or different kind of accident than previously analyzed.

c. The proposed amendment will not involve a significant reduction in the margin of safety.

The proposed amendment will have no impact on the margin of safety since the design, function and operation of the Reactor Protection System are unchanged, as are the Limiting Conditions for Operation and surveillance requirements currently specified in the Technical Specifications.

A probabilistic risk analysis was performed to verify that the benefits of continuous operation with one Average Power Range Monitor per primary channel in bypass outweighed any increase in

risk. The analysis concluded that the slight increase in risk caused by reducing redundancy in the Average Power Range Monitor scram function was more than compensated for by the reduction in risk associated with avoidance of spurious scrams which could occur if all six monitors were in service. Although the net result is a reduction in core damage frequency, it should be noted that in both cases the risk was very small ($<1 \times 10^{-7}$/year).

It is therefore concluded that a net improvement in the margin of safety results from the practice of routinely bypassing 1 Average Power Range Monitor per Reactor Protection System channel.

Based on the analysis above, it is concluded that the proposed changes regarding clarifications to the Technical Specification Section 3.1 Basis do not involve a significant hazards consideration.

Environmental Assessment

This license amendment request does not change effluent types. There will be no significant increase in effluent amounts since the analysis of NEDO-31400 demonstrates that elimination of the main steam line high radiation scram and vessel isolation functions will have no significant impact on releases resulting from a postulated control rod drop accident. The changes involving clarifications to the Average Power Range Monitor bases and Intermediate Range Monitor scram testing requirements are administrative in nature and have no impact on effluents amounts. None of the changes involve an increase in power level. Therefore, this amendment will not result in any significant environmental impact.

APRM SCRAM LOGIC (SIMPLIFIED DIAGRAM)

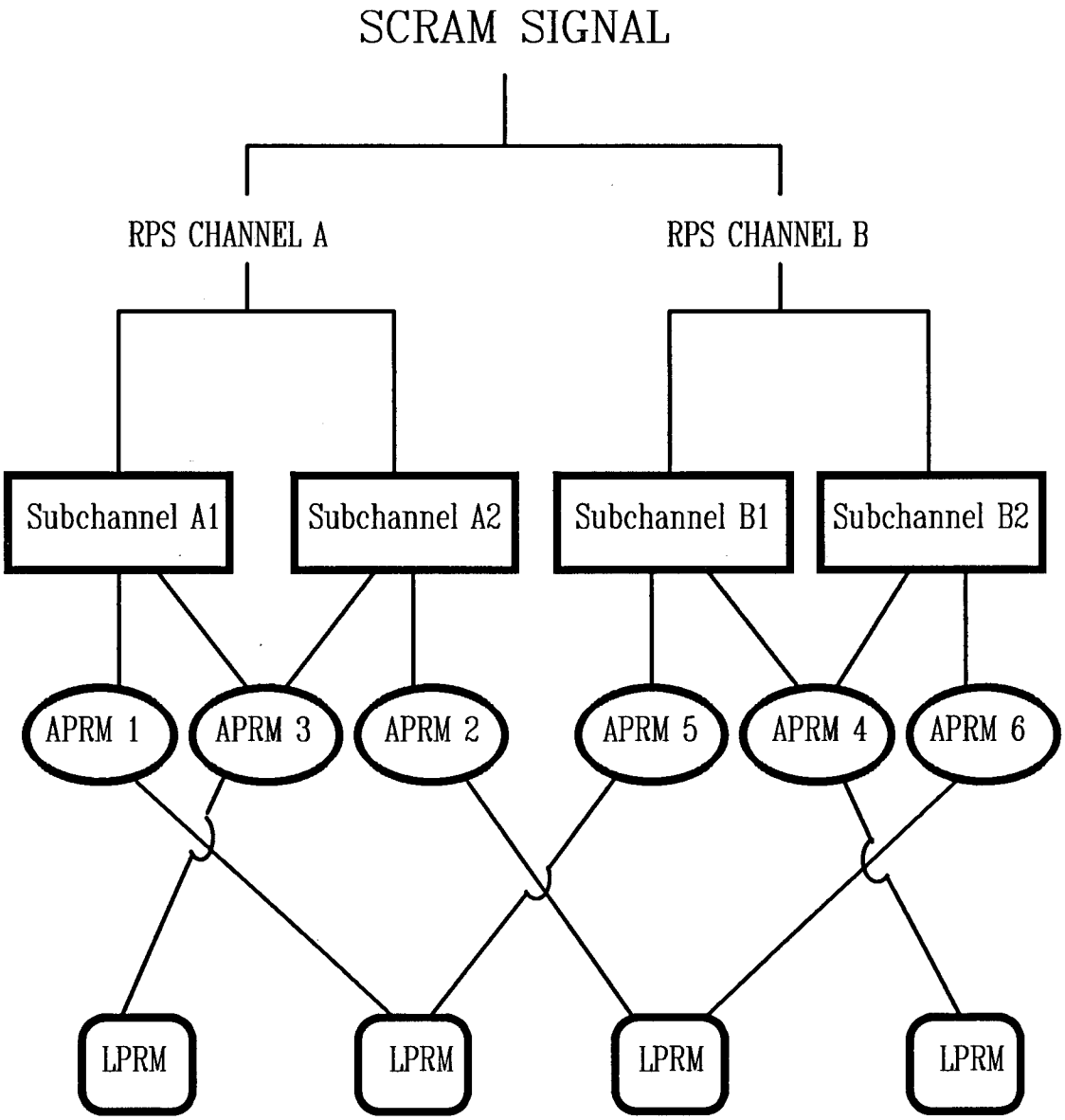

Exhibit A
Figure A-1