Northern States Power Company

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June 14, 1995

10 CFR 50
Section 50.54(a)

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

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License No. DPR-42
50-306 DPR-60

Submittal of Proposed Change to Revision 18 of the
Operational Quality Assurance Plan (OQAP)

Pursuant to 10 CFR 50 Section 50.54(a), a copy of a proposed change to Revision 18 to the Northern States Power Company Operational Quality Assurance Plan (OQAP) is submitted for NRC approval.

The proposed change has been internally reviewed and approved. It was concluded that the proposed change does reduce the commitments of NSP's Operational Quality Assurance Plan. The proposed change, the reason for change, and the basis for concluding that the change satisfies the criteria of 10 CFR 50 Appendix B and the USAR are provided as an enclosure. This change to Revision 18 will not be implemented until approval has been obtained from NRC Region III.

This submittal does not contain any new NRC commitments. Please call Mel Opstad at 612-295-1653 or John Mestad at 612-337-2208 if there are any questions.

Milford T. Opstad

for Roger O Anderson
Director
Licensing and Management Issues

c: Regional Administrator-III, NRC
NRR Project Manager (Monticello), NRC
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Enclosure

File: I:\D04560\CORPFILE\QA\OQAP18R1.MPI

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Northern States Power Company
Proposed Change to Operational Quality Assurance Plan, Rev. 18

Pursuant to 10 CFR Part 50, Section 50.54(a)(3), Northern States Power Company proposes the following change to the Operational Quality Assurance Plan.

Proposed Change:

The proposed change would modify the listing of Prairie Island's Chemical and Volume Control System positive displacement charging pumps and motors (herewith known as the charging pumps) in Appendix B, *Prairie Island Structures, Systems, and Components Subject to Appendix B of 10CFR50*, of the Operational Quality Assurance Plan. As a result of this change, the only safety function of these components would be that of maintaining the system pressure boundary.

Reason for Change:

The charging pumps have limited applicability as a component with safety-related functions. This proposed change would result in a more accurate representation of their safety-related function. In addition, this change would benefit Prairie Island in the following ways:

1. Available resources could be focused on maintaining equipment that is more important to the plant safety.

2. Modifications to the charging pump drive mechanisms could be facilitated. This would help improve pump reliability and reduce maintenance.

Basis for Concluding the Change Satisfies the Criteria of 10CFR50, Appendix B, and the USAR Quality Assurance Program Description Commitments:

Appendix B requires identification of "...components that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public." This change better defines the safety-related function of the charging pumps that is relied upon to prevent or mitigate the consequences a of postulated accident.

As shown in the attached safety-evaluation (Prairie Island safety evaluation #251), the change to the charging pump entry in the Operational Quality Assurance Plan, Appendix B, does not impact any analysis or conclusions presented in the Prairie Island USAR or involve an unreviewed safety question.

Attachment 1

Attachment 1 shows the affected pages of the proposed change to the Operational Quality Assurance Plan, Revision 18.

Page(s)	Section
53	Appendix B, section 3

Operational Quality Assurance Plan
Revision 18 Appendix B

1.2 Fuel Assemblies

Fuel assemblies, sub-assemblies, components and materials, including fuel material

2. REACTIVITY CONTROL SYSTEMS

Drive mechanisms including:
- Control rod cluster drive shaft assembly, including latch assembly
- Reactor trip breakers
- Control rods and rod cluster assemblies
- Control rod guide tube
- Control rod drive housing
- Electric modules with safety function
- Cable with safety function

3. CHEMICAL AND VOLUME CONTROL SYSTEM

Regenerative heat exchanger
Letdown heat exchanger
Reactor coolant filter
Volume control tank
Positive displacement charging pump ~~and motor~~ pressure boundary
Seal water filter
Letdown orifices and letdown valves
Excess letdown heat exchanger
Seal water heat exchanger
Boric acid tanks
Boric acid transfer pump
Boric acid filter
Reactor coolant pump seal and bypass orifice
Piping, inboard of isolation valves
Electric modules with safety function
Cable with safety function
Heat tracing

4. INCORE INSTRUMENTATION

Thimble guide tubes
Seal table

5. BORON RECYCLE SYSTEM

Recycle holdup tanks, piping and valves associated with gaseous radioactive waste

Attachment 2

PINGP 279, Rev. 12
(FRONT)
Retention: Life
Document Type: 3.240

SAFETY EVALUATION
(NON–MODIFICATION)

SE No. 251
Addendum 2
Page 1 of 2

All Safety Evaluations for changes and tests required by 10CFR50.59 (except those done under the Modification Process–N1AWI 5.1.X series) SHALL be submitted using this form.

TITLE: Charging Pump Reclassification (19 page review + proposed USAR revision pages attached).

1. DESCRIPTION

(The description should answer the seven questions listed in Table 2 of 5AWI 3.3.2, and be attached to this cover form.)

2. TECHNICAL SPECIFICATION/LICENSE AMENDMENT OR UNREVIEWED SAFETY QUESTIONS

* YES [ ] (For Technical Specification/License Amendments or unreviewed safety questions, NRC approval is required prior to implementation of the change or test.)
NO [X]

A. Amendment Request Transmittal DATE: ______
* B. NRC Approval Received DATE: ______

3. NAD ANALYSIS AFFECTED (See 5AWI 3.3.2, Table 3) [ ] YES [X] NO NAD Reviewed Addendum 1

PREPARED BY: [signature] DATE: 11/14/94

REVIEWED BY: [signature] DATE: 12-2-94

[signature], R C Peterson DATE: 11-30-94, 11-22-94
DESIGN REVIEW DESIGN STANDARDS REVIEW
(Design & Standards review are "NA" for Procedural changes)

OPERATIONS COMMITTEE REVIEW: DATE: 12/13/94

APPROVED BY: K J Albrecht DATE: 12/19/94
GEN SUPT ENGINEERING (PLANT)

COPY TO: Manager, Power Supply Training - Nuclear (PITC) DATE: ______

COPY TO: Nuclear Support Services @ PI DATE: ______

SAFETY AUDIT COMMITTEE REVIEW DATE: ______

(For Technical Specification/License Amendments or unreviewed Safety Questions, the SAC SHALL review the change prior to implementation).

* NRC QA Plan change approval required

Attachment 2

CHARGING PUMP RECLASSIFICATION

1.0 PURPOSE

The purpose of this Safety Evaluation is to assess the safety classification of the Volume Control System Charging Pumps. Currently the Operational Quality Assurance Plan, Appendix B (Reference 1), indicates that the Pumps and Motors are safety-related. System functions, PINGP commitments to AEC General Design Criteria (GDC) as documented in the FSAR, and other known system capabilities (e.g., use in PINGP Emergency Operating Procedures, Commitments relating to 10CFR50 Appendix R) are addressed to evaluate system and component classification. Classifying the charging system as non-safety related functional will allow the installation of a more reliable variable speed driver in lieu of the present motor/belt drive. Inspection, testing and maintenance practices will be applied to ensure no unexpected failures of the charging pumps occur. During normal and abnormal operations, the charging pumps are used in lieu of the Safety Injection Pumps for reactivity and inventory control; minimizing challenges to the SI System. However, in the event the charging pumps are not available; the SI System (safety related) can perform these functions. This is discussed in further detail below. This Safety Evaluation supersedes SE No. 123.

2.0 BACKGROUND

The Charging Pumps are an integral part of the Chemical and Volume Control System (CVCS). USAR, Section 10.2.3 (Reference 2), indicates the Chemical and Volume Control System performs the following functions:

- Adjusts concentration of chemical neutron absorber for chemical reactivity control.
- Maintains proper water inventory in the Reactor Coolant System.
- Provides required seal water flow for the reactor coolant pump shaft seals.
- Processes reactor coolant letdown for reuse of boric acid and reactor makeup water.
- Maintains proper concentration of corrosion inhibiting chemicals in the reactor coolant.

- Maintains reactor coolant activity within design levels.

- The Charging Pumps are also used to fill and test the Reactor Coolant System (RCS). This is obviously a non-safety related function and will not be evaluated further.

- The CVCS forms part of the RCS pressure boundary and functions in Containment Isolation.

3.0 EVALUATION

3.1 Chemical Reactivity Control

Historically, at the PINGP, the chemical reactivity control function of the charging pumps has been classified as a safety related function based on global commitment to the draft AEC General Design Criteria (Reference 3). The CVCS Design Basis Document (Reference 11) reiterates this classification due to the Configuration Management program directions to DBD authors that equipment specifically required to satisfy GDC functions should be safety related. This practice of assigning equipment to GDC Functionality simply because it may perform that function is considered overly conservative since multiple equipment redundancy often occurs. In this specific instance, the specific design criterion applicable to the CVCS can be satisfied with other redundant safety related equipment.

This section of the evaluation reviews specific PINGP commitments to applicable AEC GDC as documented in the FSAR, Section 1.8 (Reference 4). As part of this evaluation, where appropriate, the 10 CFR 50, Appendix A, GDC (Reference 20) are included in the evaluation to provide more recent licensing perspective. It is noted that the GDC numbering changed from the AEC (Reference 3) to 10 CFR 50.

3.1.1 AEC GDC Criterion 1 provides guidance for classification of systems and components. Components and systems designed to meet GDC criterion are not necessarily required to meet safety related quality standards. GDC Criterion 1 states:

> "Those systems and components of reactor facilities which are essential to the prevention of accidents which could affect the public health and safety or to mitigation of their consequences shall be identified then designed, fabricated, and erected to quality standards that reflect the importance of the safety function to be performed."

In addition, NRC Regulatory Guide 1.26 (Reference 18) provides guidance on the classification of systems and components. Section C.1.b indicates that systems important to reactor shutdown should be classified as safety related. Similar requirements are also included in ANS-51.1/ANSI N18.2 (Reference 29), which indicates that systems required for chemical addition (boration) and makeup should be safety related. As discussed in detail below, the SI System (where necessary) is capable of performing these functions in lieu of the Charging Pumps. It is recognized that the PINGP is not committed to either of these documents (References 18, 29); however, it is useful to compare designs and capabilities to industry and regulatory guidance.

3.1.2 AEC GDC Criterion 27 - Redundancy of Reactivity Control

At least two independent reactivity control systems, preferably of different principles, shall be provided.

FSAR Response

Two independent reactivity control system, rod cluster control assemblies and boric acid dissolved in the reactor coolant, are employed in the facility.

Details of the construction and operation of the rod cluster control system are included in Sections 3 and 7. Means of controlling the boric acid concentration are included in Section 9.

Evaluation

10 CFR 50, Appendix A, GDC 26 is similar to AEC GDC 27, and provides further detail pertaining to this reactivity control function. Regarding the alternate means to rod control, Reference 20 states:

> "The second reactivity control system shall be capable of reliably controlling the rate of reactivity changes resulting from planned, normal power changes (including xenon burnout) to assure acceptable fuel design limits are not exceeded."

Reactivity control during unit operation and normal shutdown/cooldown operations is considered an operational feature rather than a safety feature. During normal operation, this function will be performed by the charging system. During abnormal events, the charging system will be used; however, a fully qualified system (Safety Injection) is available for reactivity control in the event of a charging system malfunction.

3.1.3 AEC GDC Criterion 28 - Reactivity Hot Shutdown Capability

At least two of the reactivity control systems provided shall independently be capable of making and holding the core subcritical from any hot standby or hot operating condition, including those resulting from power changes, sufficiently fast to prevent exceeding acceptable fuel damage limits.

FSAR Response

The rod cluster control system is capable of making and holding the core subcritical from all operating and hot shutdown conditions sufficiently fast to prevent exceeding acceptable fuel damage limits. The chemical shim control is also capable of making and holding the core subcritical, but at a slower rate, and is not employed as a means of compensating for rapid reactivity transients. The rod cluster control system is, therefore, used in protecting the core from such transients. Details of the operation and effectiveness of these systems are included in Sections 3 and 9.

Evaluation

10 CFR 50, Appendix A, GDC 27 is similar to AEC GDC 28, and indicates the purpose of this requirement is to assure that under postulated accident conditions, including margin for stuck control rods, the capability to cool the core is maintained. 10 CFR 50, Appendix A, GDC 27 further indicates this function of poison addition can be completed by the emergency core cooling systems (SI for the PINGP). Therefore, this function of the GDC (Reference 20) can be satisfied using the SI Pumps.

As noted in the FSAR statement above, the charging system is not capable of compensating for rapid reactivity transients; the control rods fulfill this function. For the slower reactivity transients (e.g., Xenon) the SI Pumps can fulfill the function of boric acid injection. As discussed in AEC GDC 29 (below) the control rods are capable of maintaining subcriticality even with a rod cluster withdrawn (e.g., stuck).

The AEC Safety Evaluation for the PINGP (Reference 5), Section 9.2, states that the SI system is equivalent to the charging system in this respect:

> "Prairie Island has a high-head safety injection pump with a design head capable of delivering boric acid to the reactor at full design pressure if the normal charge line is out of service."

In addition, the bases for Technical Specification 3.2 (Reference 15) and other USAR discussions (Reference 17) for reactivity control indicate the SI Pumps are functionally equivalent to the charging pumps.

It is noted that the PINGP SI Pumps are not capable of delivering against full design RCS pressure; however, if necessary, RCS pressure could be reduced to allow safety injection.

3.1.4 AEC GDC Criterion 29 - Reactivity Shutdown Capability

At least one of the reactivity control systems provided shall be capable of making the core subcritical under any condition (including anticipated operational transients) sufficiently fast to prevent exceeding acceptable fuel damage limits. Shutdown margins greater than the maximum worth of the most effective control rod when fully withdrawn shall be provided.

FSAR Response

As detailed in Section 3, the reactor may be made subcritical by the rod cluster control system sufficiently fast to prevent exceeding acceptable fuel damage limits, under all anticipated conditions even with the most reactive control cluster fully withdrawn.

Evaluation

No credit is taken for boric acid injection. The control rods are used to satisfy this criterion.

3.1.5 AEC GDC Criterion 30 - Reactivity Holdown Capability

At least one of the reactivity control systems provided shall be capable of making and holding the core subcritical under any conditions with appropriate margins for contingencies.

FSAR Response

The facility is provided with the means of making and holding the core subcritical under any anticipated conditions and with appropriate margin for contingencies. These means are discussed in detail in Section 3 and 9. Combined use of the rod cluster control system and the chemical shim control system permit the necessary shutdown margin to be maintained during long term xenon decay and plant cooldown.

Evaluation

For hot shutdown conditions, the control rods are capable of making and holding the core subcritical. After an extended shutdown, to account for xenon burnout, it is necessary to borate. Similar to plant cooldown operations, if the charging pumps are not available, the SI Pumps can perform this function.

3.1.6 AEC GDC Criterion 31 - Reactivity Control Systems Malfunction

The reactivity control systems shall be capable of sustaining any single malfunction, such as, unplanned continuous withdrawal (not ejection) of a control rod, without causing a reactivity transient which could result in exceeding acceptable fuel damage limits.

FSAR Response

The facility reactivity control systems are such that acceptable fuel damage limits are not exceeded even in the event of a single malfunction of either system. An analysis of the effects of possible malfunctions is presented in Chapter 14.

Evaluation

Control Rod malfunctions (e.g., uncontrolled rod withdrawl) are analyzed in the USAR, Section 14. These types of events are terminated by a reactor trip. That is the CVCS is not relied upon to mitigate these events.

Chemical and Volume Control System malfunction is analyzed in the USAR, Section 14; i.e., dilution event. At power, the control rods mitigate the consequences of this potential accident. During shutdown operations, administrative controls prevent inadvertent criticality. These mitigating actions are not affected by a reclassification of the charging pumps. A similar dilution event caused by an SI Pump malfunction is not possible due to borated water supplies (e.g., BAST, RWST).

3.1.7 For reactivity control purposes, various Emergency Operating Procedures (e.g., References 6,7) and Alarm Response Procedures (e.g., Reference 8) assume the charging pumps are operable. This is obviously the preferred mode. However, procedural background information identify that the SI Pumps are an acceptable alternative. It is noted that for these events (if necessary), the control rods could be inserted, fully shutting down the reactor.

References 6,7 pertain to mitigating ATWS events. This is discussed in the USAR, Section 14.8 (Reference 9). Per the USAR discussion plant conditions are stabilized following Turbine Trip, with the Auxiliary Feedwater System providing heat removal capability and an intact Reactor Coolant System and Core. At the point, "the operator could begin shutdown operations through rod insertion, actuation of the safety injection system, or through the BORATE or EMERGENCY BORATE modes of the Chemical and Volume System" [underline added].

In this event, CVCS is the preferred mode of boron addition; however, if the charging pumps are not available, the SI Pumps could perform this function. Per Westinghouse ATWS submittals, the only actions needed to mitigate an ATWS event are Auxiliary Feedwater addition to the Steam Generators and Turbine Trip (Reference 25). The emergency boration ensures the reactor is shutdown, similar to manual trip of the reactor in the subsequent steps. Either action will ensure the reactor is shutdown; thus, the charging pump boration, in this event, is preferred but not required.

Reference 15 (Bases) discusses the availability of boration components for mitigating a Steamline break (MSLB) accident. This is specifically referring to the tanks, piping, valves, etc. associated with the flowpath from the Boric Acid Storage Tanks to the SI Pumps; i.e., charging pumps are not relied upon in the MSLB analysis.

3.1.8 Conclusion:

Based on the above discussion, a qualified system (Safety Injection) is available to satisfy the reactivity control functions for accident mitigation. The charging pumps can perform this reactivity control function and will be used if available; however, the SI Pumps are available to satisfy the GDC.

During cold shutdown conditions the SI Pumps may not be immediately available. Technical Specifications direct any reactivity addition event (e.g., cooldown) or fuel movement to be stopped should a boric acid injection flow path not be available (Reference 15). Thus, adequate administrative controls are provided to preclude an inadvertent criticality event.

Therefore, for reactivity control, it is acceptable to classify the charging pumps as functionally non-safety related.

3.2 RCS Inventory Control

3.2.1 Normal Operation:

During normal operation, the Charging Pump(s) maintain pressurizer level through water addition to the RCS via the normal charging line and the Reactor Coolant Pump seals. The specific function of maintaining pressurizer level to support reactor operation is not a safety related function.

3.2.2 Loss of Coolant Accidents:

USAR, Section 14.6 (Reference 9) states:

"The charging system consists of three positive displacement charging pumps. With one charging pump, the maximum sized rupture of the Reactor Coolant System which can be accommodated by the normal charging system without uncovering the core is equivalent to a leakage rate associated with a RCS pipe rupture of approximately 1/2 inch ID."

"Rupture of cross sections up to about the equivalent of a 3/4" connecting pipe will cause expulsion of coolant at a rate which can be accommodated by two of the three charging pumps well before the core is uncovered. Since instrument taps and sample connections are less than 3/4" diameter, protection from rupture of this line is afforded by the charging pumps."

USAR, Section 14.7, pertaining to Small Break Loss of Coolant Accident, states:

"Ruptures of small cross-section will cause loss of the coolant at a rate which can be accommodated by the charging pumps."

This is similar to the discussion in Section 14.6 (elaborated above). Should the charging pumps not be available, the SI Pumps would automatically (e.g., low pressurizer pressure) or manually be started. SI Pumps are capable of coping with breaks of this size up to the largest postulated break in the RCS. The capability of the SI Pumps coping with these small LOCA's (i.e., normally within the capability of a charging pump) was specifically reviewed by NSP Nuclear Analysis Department (Reference 26) and concurred with these conclusions.

3.2.3 Steam Generator Tube Rupture:

The Accident Analysis Design Bases Document (Reference 10) indicates that charging pumps are assumed operating during a steam generator tube rupture scenario. The Safety Injection Pumps are sufficient to, mitigate any potential consequences of this accident. The off-site dose analysis for this event assumes the dose is directly proportional to the volume transferred from the RCS to the SG's. In addition to SI Pump injection, the Charging Pump operation increases the volume transferred from the primary to the secondary during this scenario due to elevated RCS pressure; thus, this is a conservative assumption.

3.2.4 In the Appendix R program at the PINGP, charging pumps 12 and 22 are considered safe shutdown components for inventory control. Generic Letter (GL) 86-10 (Reference 13) provides guidance acceptable to the NRC for satisfying the requirements of 10 CFR 50 Appendix R. Per GL 86-10, components designated as safe shutdown are not required to be considered safety related. Since these pumps are safe shutdown components, any changes (e.g., variable drive) must be carefully considered.

3.2.5 In the SQUG program at the PINGP, for a seismic event, the charging pumps are considered safe shutdown components for inventory control. Generic Letter (GL) 87-02 (Reference 19) provides guidance acceptable to the NRC for satisfying the SQUG program guidance. Per GL 87-02, components designated as safe shutdown are not required to be considered safety related.

3.2.6 The PINGP identified the charging pumps as necessary to cope with a SBO event. Per NRC R.G. 1.155 (Reference 14), equipment that is considered necessary for coping with a SBO event need not be safety related. However, RG 1.155 does contain specific quality assurance guidance for non-safety related equipment credited in the SBO event. Provisions are in effect (Special Items to Consider) to ensure the charging pumps satisfy this guidance.

3.2.7 USAR, Section 14.9 (Reference 9) [containment spray effectiveness evaluation] indicates the charging pumps are assumed to operate during the injection phase of a LOCA. This results in a faster decrease in RWST volume, minimizing the time for containment spray. This assumption is conservative for the purposes of spray evaluation, and does not indicate the charging pumps are required for accident mitigation.

3.2.8 PINGP low temperature overpressurization (LTOP) protection analysis evaluates two possible causes for the pressure excursion; mass and heat input (Reference 21). The mass input analysis assumes one SI Pump injecting between 200 and 310°F; i.e., above 310°F it is assumed the Safety Valves operate to protect the RCS, and below 200°F one charging pump at full flow is analyzed (i.e., both SI Pumps are in pullout). Thus, the use of one SI Pump for reactivity and inventory control above 200°F is within the analysis, and will not result in RCS overpressurization.

3.2.9 <u>Conclusion:</u>

Based on the above discussion, the charging pumps are only required for inventory control during normal operating conditions, shutdown operating conditions, and scenarios which allow use of non-safety related components to mitigate the consequences. For accident mitigation, a fully qualified system (SI) is available in the event CVCS malfunctions. There is no requirement for the charging pumps to operate to perform an inventory control function to mitigate an accident.

3.3 Reactor Coolant Pump Shaft Seal Flow

The charging system provides cooling to the Reactor Coolant Pump (RCP) seals. WCAP 10541 (Reference 12) provides a detailed evaluation of RCP seal performance in a Station Black-Out (SBO) scenario. Section 2.2 states:

> "The RCP seals are normally protected by seal injection flow, with the RCP thermal barrier heat exchanger acting as a backup cooling source when seal injection flow is interrupted. The thermal barrier heat exchanger is cooled by the circulation of component cooling water. Both methods of seal cooling are typically in service when the RCP is running. Although both sources are required for normal operation, pump operation is permitted with the loss of either or both cooling sources for limited prescribed time periods.
>
> "RCP operation is permitted, under Westinghouse guidelines, for twenty-four hours with the loss of either seal injection flow or cooling water flow to the thermal barrier heat exchanger, but not the loss of both."

The Component Cooling Water System supply to the RCP thermal barrier heat exchangers is considered functionally safety related. In addition, the Component Cooling Water System is capable of withstanding a single active failure and still maintaining RCP thermal barrier cooling. With only seal cooling, and not seal injection, a small amount of RCS fluid could leak past the RCP seals; however, this volume is well within the SI Pump capacity. PINGP operating procedures (References 23, 24) allow unrestricted RCP operation without seal injection if seal leakoff flow and CC Flow to the RCP remain within acceptable values.

Therefore, the charging pumps are not required to be safety related to complete this function as they are backed up by safety related systems.

3.4 Reactor Coolant Letdown

The charging pumps provide water to the regenerative heat exchanger to pre-heat charging water and to cool the letdown water. In addition, a charging pump must be running to open a letdown orifice isolation valve. This letdown function is not assumed in any accident analysis nor is it a function of other NRC requirements. The CVCS Design Bases Document (DBD) (Reference 11) indicates this function is non-safety related. If a means of letdown is necessary and this path is not available, other safety related means are provided (e.g., RCS Vents).

3.5 Corrosion inhibiting chemicals in the Reactor Coolant

The CVCS DBD (Reference 11) indicates this is a non-safety related function.

3.6 Reactor Coolant Activity

The CVCS DBD (Reference 11) indicates this is a non-safety related function.

3.7 Containment Isolation

The VC System has four specific containment penetrations (11 through 14). Penetrations 11 and 14 are protected by Remotely Operated Valves, one on either side of Containment, that trip closed on a SI signal.

Penetrations 13 (A and B) is protected by a check valve on the inside of Containment and a local manual operated valve outside of Containment. Penetration 13 is a Class 3 Penetration (incoming lines). Regarding Class 3 penetrations, the USAR, Section 5.2.2 states:

> "Incoming lines connected to closed systems outside the containment are provided with at least one check valve located near the Containment Vessel on the inside and a manually operated (local or remote) isolation valve outside the Containment Vessel."

USAR, Section 10 (Reference 2) further discusses this configuration and elaborates:

> "The seal water injection lines and header are connected to a closed system outside containment. This closed system serves as the second containment isolation barrier. However, there are manually operated needle valves in the seal water injection lines which may be closed to provide a second isolation barrier outside containment."

Penetration 13 is classified as a Group II penetration, which are discussed in the USAR, Appendix G. Regarding these penetrations, Appendix G states:

> "The leakage through seats from this group ultimately enters the volume control tank, which is designed to withstand 75 psig and operates normally as a gas-tight system. The volume control tank would normally remain in a pressurized condition following a loss-of-coolant-accident, and could be vented to the Waste Gas System, if necessary.

Thus, the second barrier is the closed system outside of containment, and it is considered acceptable to credit the local isolation valves for additional redundant isolation capability. As discussed in the above USAR statement, it was not a requirement for VCT to always be pressurized, this was considered the normal condition. It is noted, that although the charging pumps do not receive a SI signal, they would most likely be operating during this scenario; i.e., a charging pump is normally operating during plant operation, and could be manually loaded on the EDG if off-site power is lost. With a charging pump operating, the header pressure would be much greater than containment pressure; thus, valve leakage would be into containment. Reclassifying the charging pumps implies that pump operation cannot be relied upon during an accident scenario; thus. to maintain the closed system outside of containment, a new boundary must be established. To limit the boundary which could be exposed to containment atmosphere, the closed system will now be defined at the check valves at the suction side of the Charging Pumps. To ensure the integrity of this boundary, these check valves are included in a valve leak test program.

Penetration 12 is protected by a check valve on the inside of Containment and a remotely operated Control Valve and a locally operated manual valve on the outside. The configuration in the USAR, Table 5.2-1 does not recognize the normally closed manual bypass valve, which should also be included as a containment isolation valve. The manual valve and the Control Valve (CV) are in series. The CV fails open on a loss of Instrument Air to the operator. Thus, crediting this valve for containment isolation purposes is not considered prudent. Without taking credit for the CV, this configuration is similar to the seal injection lines discussed above; i.e., closed system outside of containment with a local valve which can be closed if necessary. Based on establishing the new closed system boundary discussed above, this configuration is considered acceptable.

3.8 Electrical Malfunction and Isolation

Auxiliary contacts in the charging pump control circuit operate letdown orifice isolation valves, control room annunciators, charging pump speed alarms, computer indication, and the associated pump room unit cooler. A malfunction in the pump control circuit could result in a spurious signal. Of these auxiliary contacts, only the letdown orifice isolation valves are of concern; i.e., the other contacts are associated with indication and unit cooler operation is not required for charging pump operability (Reference 22). A spurious signal to the letdown orifice isolation valve(s) could result in the valve opening, initiating an unintentional letdown of the RCS. At the Pressurizer low level setpoint, redundant contacts safety related) open in the valve(s) control circuitry closing the isolation valve and stopping the letdown flow. In addition, if containment isolation is necessary, an associated contact closes the isolation valve regardless of the charging pump auxiliary contact positions. To avoid an associated circuit malfunction, the auxiliary contacts in the letdown orifice isolation valve control circuit will remain classified safety related.

Cables (power and control) associated with the charging pumps are labeled and routed as safety related (i.e., color coded and trained). The cables are routed with cabling associated with other safety related components. Based on the present routing, a failure in a charging pump cable could (worst case) only impact one train of safety related function. In addition, it is noted that cable routing is reviewed for Appendix R separation requirements. Therefore, this configuration is considered acceptable.

The charging pumps are powered from safety related Motor Control Centers. Therefore, for isolation purposes, the associated breaker must remain safety related to allow reclassifying the motor and associated control circuits. In addition, DC Fuses in the control circuitry must also remain safety related for isolation purposes.

3.9 USAR Revisions

Attached are the proposed USAR Revisions resulting from this reclassification of the charging pumps. The basis for each of these changes is addressed in the above evaluation. This section will note the changes and refer to the applicable discussion section:

Affected USAR, Sections:

1.2.5, 3.1.2.4, 3.1.2.6, 10.2.3.1.a, 10.2.3.5, 14.8.3.1

Revision

Added discussion/clarifying information to note that the Safety Injection Pump can fulfill the function of the charging pumps for reactivity control.

Justification

See Section 3.1

Affected USAR Sections:

4.3

Revision

Added clarifying information pertaining to the acceptability of RCP operation without seal injection, provided CC is available to the thermal barrier heat exchanger.

Justification

See Section 3.3

Affected USAR Sections:

7.2, 7.8.5.1.c, 7.8.5.2, 14.6.1, 14.7.2

Revision

Add discussion of the capability of the Safety Injection Pumps to satisfy the inventory/makeup function.

Justification

See Section 3.2

Affected USAR Sections:

Table 12.2-1

Revision

Deleted Charging Pumps from Class I component list.

Justification

Conclusion of this evaluation.

4.0 CONCLUSIONS

In conclusion, based on the above discussion, this evaluation is summarized in the responses to the following questions.

1. May the proposed activity increase the consequences of an accident previously evaluated in the USAR or in a pending USAR submittal?

No. As discussed above, the charging pumps are not credited for mitigation purposes in any accident analysis. For accident mitigation, if boration is necessary, a fully qualified system (Safety Injection) is available. Thus, re-classifying the charging pumps to functionally non-safety related does not increase the consequences of an accident previously evaluated in the USAR.

2. May the proposed activity increase the probability of occurrence of an accident previously evaluated in the USAR or in a pending USAR submittal?

   No. Accident occurrence probabilities are not increased by reclassifying the pumps as non-safety related functional. A CVCS malfunction accident is analyzed in the USAR. With the pumps classified as non-safety related functional, the means to mitigate this event are not affected. RCP seal cooling function is backed up by the Component Cooling System to the thermal barrier. As discussed above, it is possible for a charging pump control circuit failure to cause the letdown orifice isolation valve(s) to spuriously open; however, the resultant RCS letdown would be stopped at the pressurizer low level setpoint. Therefore, re-classifying the charging pumps to functionally non-safety related does not increase the probability of occurrence of an accident previously evaluated in the USAR.

3. May the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the USAR or in a pending USAR submittal?

   No. As discussed above, the charging pumps are not credited for mitigation purposes in the accident analyses. Charging pump failure will not affect the ability of safety related equipment or systems to mitigate an accident and cannot cause safety related equipment to fail. Since the charging pumps will maintain their present use status, declassifying the charging pumps to non-safety related will not increase the assumed challenges to the SI System. Thus, re-classifying the charging pumps to functionally non-safety related does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the USAR.

4. May the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the USAR or in a pending USAR submittal?

   No. Reclassifying the charging pumps does not affect any consequences relating to the malfunction of equipment important to safety. A CVCS malfunction accident is analyzed in the USAR. Reclassifying the charging pumps does not change the operator actions assumed to mitigate this malfunction. The Safety Injection pumps are capable of mitigating any inventory related events. The Component Cooling

System is capable of providing RCP seal cooling (thermal barrier) in the event of a loss of seal injection. Therefore, re-classifying the charging pumps to functionally non-safety related does not increase the consequences of a malfunction of equipment important to safety previously evaluated in the USAR.

5. May the proposed activity create the possibility of an accident of a different type than previously evaluated in the USAR or in a pending USAR submittal?

   No new accident types are created. Charging pumps failure is already addressed in the USAR. Reclassifying the charging pumps does not functionally affect any other safety related systems. RCS pressure boundary and Containment Isolation capability are not impacted by this reclassification. Thus, re-classifying the charging pumps to functionally non-safety related does not create the possibility of an accident of a different type than previously evaluated in the USAR.

6. May the proposed activity create the possibility of a different type of malfunction of equipment important to safety than any previously evaluated in the USAR or in a pending USAR submittal?

   No. Charging pumps are not considered important to safety as they are not credited for mitigation purposes in any accident analysis and other qualified functionally redundant systems (SI, CC) are available. Reclassifying the charging pumps does not functionally affect any other safety related systems. Therefore, re-classifying the charging pumps to functionally non-safety related does not create the possibility of an accident of a different type than previously evaluated in the USAR.

7. Does the proposed activity reduce the margin of safety as defined in the basis for any Technical Specifications?

   No. The bases for Technical Specification 3.2 states that there are two sources of borated water available for injection to the core through 3 different paths. By reclassifying the charging pumps, two of the three paths rely on non-safety related charging pumps as the injection force. The third path (SI Pumps) is in itself redundant; i.e., a single failure cannot disable both trains of SI. Therefore, even if the non-safety related charging pumps failed to operate, at least one train of SI is available. Thus, for this function, the charging pumps are an <u>additional</u> redundant system to the SI Pumps. The Technical Specifications do not associate a margin of safety with this level of redundancy. Thus, re-classifying the charging pumps to functionally non-safety related does not reduce the margin of safety as defined in the basis for any Technical Specifications.

8. Does the proposed activity involve a change in the technical specifications

incorporated in the license?

Charging pump operability requirements are discussed in the Technical Specifications. This evaluation does not affect these requirements.

The "Objective" of Technical Specification 3.2 states:

> "To define those conditions of the chemical and volume control system necessary to assure safe reactor operation and safe COLD SHUTDOWN."

As discussed in the bases for this Technical Specification, and elaborated on in this evaluation, the SI Pumps are an acceptable means to meet this objective. Therefore, the charging pumps are not required to be classified as safety related to also satisfy this objective. Therefore, this activity does not involve a change in the technical specifications.

Prior to implementation of this safety evaluation, the Operational Quality Assurance Plan (Reference 1) needs to be revised to indicate the charging pumps are safety related pressure retaining only. This revision requires NRC approval.

REFERENCES

1. Northern States Power Company, "Operational Quality Assurance Plan," Revision 16.
2. USAR, Section 10, " Plant Auxiliary Systems," Revision 10.
3. AEC General Design Criteria, Draft, dated July 10, 1967.
4. FSAR, Section 1.8.
5. AEC Safety Evaluation of the Prairie Island Nuclear Generating Plant, Units 1 & 2, dated May 31, 1973.
6. FR-S.1, "Response to Nuclear Power Generation/ATWS," Revision 6.
7. FR-S.2, "Response to Loss of Core Shutdown," Revision 3.
8. C47.38, "Alarm Response Panel 47513," Revision 14.
9. USAR, Section 14, "Safety Analysis," Revision 10.
10. DBD-TOP-01, "Design Bases Document for the Accident Analysis Topical DBD," Revision 0.
11. WCAP-13709, "Design Bases Document for the Northern States Power Company Prairie Island Nuclear Generating Plant Chemical and Volume Control System," Revision 0.
12. WCAP-10541, "Reactor Coolant Pump Seal Performance Following a Loss of All AC Power," Revision 2, dated November 1986.
13. NRC Generic Letter 86-10, "Implementation of Fire Protection Requirements," dated April 24, 1986.
14. NRC Regulatory Guide 1.155, "Station Blackout," dated August, 1988.
15. PINGP Technical Specifications, Section 3.2 and Associated Bases, "Chemical and Volume Control System," Revision 91.
16. 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979."

REFERENCES (continued)

17. USAR, Section 7, "Plant Instrumentation and Control Systems," Revision 10.

18. Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing components of Nuclear Power Plants," Revision 2.

19. NRC Generic Letter 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, Unresolved Safety Issue (USI) A-46," dated February, 1987.

20. 10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants," 1-1-91 Edition.

21. USAR, Section 4, "Reactor Coolant System," Revision 10.

22. ENG-ME-059, "Appendix R - Charging Pump Room Cooling," dated November 1, 1993.

23. Operating Procedure C3, "Reactor Coolant Pump," Revision 18.

24. Operating Procedure C12.1 AOP1, "Loss of RCP Seal Injection," Revision 0.

25. Westinghouse Letter No. NSP-80-3, "ATWS Report - December Submittal to NRC," dated January 14, 1980.

26. NSP Internal Correspondence, from K. Higar to S. Thomas, "Review of SE No. 251, Charging Pump Reclassification, Addendum 1," dated March 2, 1994.

27. USAR, Section 5, "Containment Systems."

28. USAR, Appendix G, "Containment System Evaluation."

29. ANS-51.1/ANSI N18.2-1973, "Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants."