

APR 20 1981

Docket Nos. 50-282  
and 50-306

Mr. L. O. Mayer, Manager  
Nuclear Support Services  
Northern States Power Company  
414 Nicollet Mall - 8th Floor  
Minneapolis, Minnesota 55401

Dear Mr. Mayer:

SUBJECT: ORDER FOR MODIFICATION OF LICENSE CONCERNING PRIMARY COOLANT  
SYSTEM PRESSURE ISOLATION VALVES

This letter transmits an Order for Modification of License which revises the Technical Specifications for Facility Operating License Nos. DPR-42 and DPR-60 for Prairie Island Nuclear Generating Plant, Units Nos. 1 and 2. The change is a result of the information you provided in response to our 10 CFR 50.54(f) letter of February 23, 1980, regarding primary coolant system pressure isolation valves. Based upon our review of your response, as well as other previously docketed information, we have concluded that a WASH-1400 Event V valve configuration exists at your facility and that corrective action as defined in the attached Order is necessary.

Attached to the Order for Modification of License is the Technical Evaluation Report (TER) which supports the Order; and the plant Technical Specifications which will ensure public health and safety over the operating life of your facility. We are aware that there may be editorial corrections to the attached TER. Please note that the Technical Specifications correctly delineate the requirements for your facility.

In addition to Event V valve configurations, we are continuing our efforts to review other configurations located at high pressure/low pressure system boundaries for their potential risk contribution to an intersystem LOCA. Therefore, further activity regarding the broader topic of intersystem LOCA's may be expected in the future.

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ORB#3:DL	RAClark	2/9/81
AD:OR:DL	TMovak	2/16/81
ELD	ELD	2/1/81
DD:DL	RPu. je	2/1/81
D:DL	DEisenhut	4/20/81

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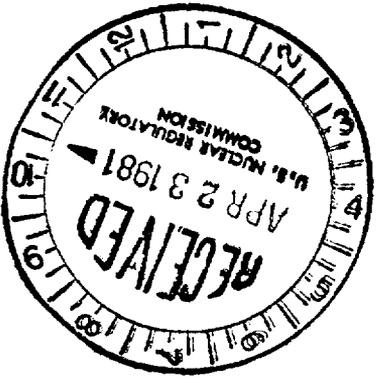
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- Gray Files
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Enclosure:  
Order for Modification  
of License  
cc w/enclosure:  
See next page



Original signed by  
Robert A. Clark  
Robert A. Clark, Chief  
Operating Reactors Branch #3  
Division of Licensing

Sincerely,

A copy of the enclosed Order is being filed with the Office of the Federal Register for publication.

APR 23 1981



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

DISTRIBUTION:  
Docket File  
ORB#3 Rdg  
PMKreutzer

Docket No. 50-282 and 50-306

Docketing and Service Section  
Office of the Secretary of the Commission

SUBJECT: NORTHERN STATES POWER COMPANY, Prairie Island Nuclear Generating  
Plant, Unit Nos. 1 and 2.

Two signed originals of the Federal Register Notice identified below are enclosed for your transmittal to the Office of the Federal Register for publication. Additional conformed copies ( 12 ) of the Notice are enclosed for your use.

- Notice of Receipt of Application for Construction Permit(s) and Operating License(s).
- Notice of Receipt of Partial Application for Construction Permit(s) and Facility License(s); Time for Submission of Views on Antitrust Matters.
- Notice of Availability of Applicant's Environmental Report.
- Notice of Proposed Issuance of Amendment to Facility Operating License.
- Notice of Receipt of Application for Facility License(s); Notice of Availability of Applicant's Environmental Report; and Notice of Consideration of Issuance of Facility License(s) and Notice of Opportunity for Hearing.
- Notice of Availability of NRC Draft/Final Environmental Statement.
- Notice of Limited Work Authorization.
- Notice of Availability of Safety Evaluation Report.
- Notice of Issuance of Construction Permit(s).
- Notice of Issuance of Facility Operating License(s) or Amendment(s).
- Other: Order for Modification of Licenses  
Referenced documents have been provided PDR.

Division of Licensing, ORB#3  
Office of Nuclear Reactor Regulation

Enclosure:  
As Stated

OFFICE	ORB#3:DL					
SURNAME	PMKreutzer/pm					
DATE	4/21/81					



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

April 20, 1981

Docket Nos. 50-282  
and 50-306

Mr. L. O. Mayer, Manager  
Nuclear Support Services  
Northern States Power Company  
414 Nicollet Mall - 8th Floor  
Minneapolis, Minnesota 55401

Dear Mr. Mayer:

SUBJECT: ORDER FOR MODIFICATION OF LICENSE CONCERNING PRIMARY COOLANT  
SYSTEM PRESSURE ISOLATION VALVES

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Attached to the Order for Modification of License is the Technical Evaluation Report (TER) which supports the Order; and the plant Technical Specifications which will ensure public health and safety over the operating life of your facility. We are aware that there may be editorial corrections to the attached TER. Please note that the Technical Specifications correctly delineate the requirements for your facility.

In addition to Event V valve configurations, we are continuing our efforts to review other configurations located at high pressure/low pressure system boundaries for their potential risk contribution to an intersystem LOCA. Therefore, further activity regarding the broader topic of intersystem LOCA's may be expected in the future.

- 2 -

A copy of the enclosed Order is being filed with the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in black ink that reads "Robert A. Clark". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Robert A. Clark, Chief  
Operating Reactors Branch #3  
Division of Licensing

Enclosure:  
Order for Modification  
of License

cc w/enclosure:  
See next page

Northern States Power Company

cc:

Gerald Charnoff, Esquire  
Shaw, Pittman, Potts and Trowbridge  
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Minnesota Pollution Control Agency  
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Roseville, Minnesota 55113

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Minneapolis, Minnesota 55401

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Prairie Island Nuclear Generating Plant  
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Minnesota-Wisconsin Boundary Area  
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Resident Inspectors Office  
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Welch, Minnesota 55089

Mr. John C. Davidson, Chairman  
Goodhue County Board of Commissioners  
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Red Wing, Minnesota 55066

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Director, Criteria and Standards Division  
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U.S. Environmental Protection Agency  
Washington, D. C. 20460

U. S. Environmental Protection Agency  
Federal Activities Branch  
Region V Office  
ATTN: EIS COORDINATOR  
230 South Dearborn Street  
Chicago, Illinois 60604

Chairman, Public Service Commission  
of Wisconsin  
Hill Farms State Office Building  
Madison Wisconsin 53702

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
NORTHERN STATES POWER COMPANY	)	
	)	Docket Nos. 50-282
(Prairie Island Nuclear Generating	)	and 50-306
Plant, Unit Nos. 1 and 2)	)	
	)	

ORDER FOR MODIFICATION OF LICENSES

I

The Northern States Power Company, (the licensee) holds Facility Operating License Nos. DPR-42 and DPR-60, which authorize the licensee to operate the Prairie Island Generating Plant, Unit Nos. 1 and 2 (the facilities) at power levels not in excess of 1650 megawatts (thermal) rated power. The facilities, which are located at the licensee's site in Goodhue County, Minnesota are pressurized water reactors (PWR) used for the commercial generation of electricity.

II

The Reactor Safety Study (RSS), WASH-1400, identified in a PWR an inter-system loss of coolant accident (LOCA) which is a significant contributor to risk of core melt accidents (Event V). The design examined in the RSS contained in-series check valves isolating the high pressure Primary Coolant System (PCS) from the Low Pressure Injection System (LPIS) piping. The scenario which leads to the Event V accident is initiated by the failure of these check valves to function as a pressure isolation barrier. This causes an overpressurization and rupture of the LPIS low pressure piping which results in a LOCA that bypasses containment.

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- 2 -

In order to better define the Event V concern, all light water reactor licensees were requested by letter dated February 23, 1980, to provide the following in accordance with 10 CFR 50.54(f):

1. Describe the valve configurations and indicate if an Event V isolation valve configuration exists within the Class I boundary of the high pressure piping connecting PCS piping to low pressure system piping; e.g., (1) two check valves in series, or (2) two check valves in series with a motor operated valve (MOV);
2. If either of the above Event V configurations exist, indicate whether continuous surveillance or periodic tests are being performed on such valves to ensure integrity. Also indicate whether valves have been known, or found, to lack integrity; and
3. If either of the above Event V configurations exist, indicate whether plant procedures should be revised or if plant modifications should be made to increase reliability.

In addition to the above, licensees were asked to perform individual check valve leak testing prior to plant startup after the next scheduled outage.

By letter dated March 23, 1980, the licensee responded to our February letter. Based upon the NRC review of this response as well as the review of previously docketed information for your facility, I have concluded in consonance with the attached Safety Evaluation (Attachment 1) that one or more valve configuration(s) of concern exist at the facility. The attached Technical Evaluation Report (TER) (Attachment 2) provides, in Section 4.0, a tabulation of the subject valves.

- 3 -

The staff's concern has been exacerbated due not only to the large number of plants which have an Event V configuration(s) but also because of recent unsatisfactory operating experience. Specifically, two plants have leak tested check valves with unsatisfactory results. At Davis-Besse, a pressure isolation check valve in the LPIS failed and the ensuing investigation found that valve internals had become disassembled. At the Sequoyah Nuclear Plant, two Residual Heat Removal (RHR) injection check valves and one RHR recirculation check valve failed because valves jammed open against valve over-travel limiters.

It is, therefore, apparent that when pressure isolation is provided by two in-series check valves and when failure of one valve in the pair can go undetected for a substantial length of time, verification of valve integrity is required. Since these valves are important to safety, they should be tested periodically to ensure low probability of gross failure. As a result, I have determined that periodic examination of check valves must be undertaken by the licensee as provided in Section III below to verify that each valve is seated properly and functioning as a pressure isolation device. Such testing will reduce the overall risk of an inter-system LOCA. The testing mandated by this Order may be accomplished by direct volumetric leakage measurement or by other equivalent means capable of demonstrating that leakage limits are not exceeded in accordance with Section 2.2 of the attached TER.

- 4 -

In view of the operating experiences described above and the potential consequences of check valve failure, I have determined that prompt action is necessary to increase the level of assurance that multiple pressure isolation barriers are in place and will remain intact. Therefore, the public health, safety and interest require that this modification of Facility Operating License Nos. DPR-42 and DPR-60 be immediately effective.

## III

Accordingly, pursuant to Section 161i of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Parts 2 and 50, IT IS HEREBY ORDERED THAT EFFECTIVE IMMEDIATELY, Facility Operating License Nos. DPR-42 and DPR-60 are modified by the addition of the following requirements:

1. Implement Technical Specifications (Attachment 3) which require periodic surveillance over the life of the plant and which specify limiting conditions for operation for PCS pressure isolation valves.
2. If check valves have not been (a) individually tested within 12 months preceding the date of this Order, and (b) found to comply with the leakage rate criteria set forth in the Technical Specifications described in Attachment 3, the MOV in each line shall be closed within 30 days of the effective date of this Order and quarterly Inservice Inspection (ISI) MOV cycling ceased until the check valve tests have been satisfactorily accomplished. (Prior to closing the MOV, procedures shall be implemented and operators trained to assure

that the MOV remains closed. Once closed, the MOV shall be tagged closed to further preclude inadvertent valve opening).

3. The MOV shall not be closed as indicated in paragraph 2 above unless a supporting safety evaluation has been prepared. If the MOV is in an emergency core cooling system (ECCS), the safety evaluation shall include a determination as to whether the requirements of 10 CFR 50.46 and Appendix K to 10 CFR Part 50 will continue to be satisfied with the MOV closed. If the MOV is not in an ECCS, the safety evaluation shall include a determination as to whether operation with the MOV closed presents an unreviewed safety question as defined in 10 CFR 50.59(a)(2). If the requirements of 10 CFR 50.46 and Appendix K have not been satisfied, or if an unreviewed safety question exists as defined in 10 CFR 50.59, then the facility shall be shut down within 30 days of the date of this Order and remain shutdown until check valves are satisfactorily tested in accordance with the Technical Specifications set forth in Attachment 3.
4. The records of the check valve tests required by this Order shall be made available for inspection by the NRC's Office of Inspection and Enforcement.

- 6 -

## IV

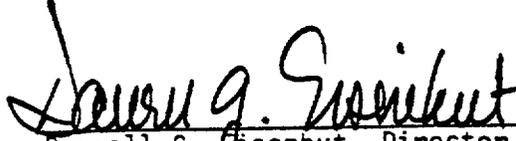
The licensee or any other person who has an interest affected by this Order may request a hearing on this Order within 25 days of its publication in the Federal Register. A request for hearing shall be submitted to the Secretary, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. A copy of the request shall also be sent to the Executive Legal Director at the same address, and to Gerald Charnoff, Esq., Shaw, Pittman, Potts, and Trowbridge, 1800 M Street, N. W., Washington, D. C. 20036 attorney for the licensee. If a hearing is requested by a person other than the licensee, that person shall describe, in accordance with 10 CFR 2.714(a)(2), the manner in which his or her interest is affected by this Order. ANY REQUEST FOR A HEARING SHALL NOT STAY THE IMMEDIATE EFFECTIVENESS OF THIS ORDER.

If a hearing is requested by the licensee or other person who has an interest affected by this Order, the Commission will issue an order designating the time and place of any such hearing. If a hearing is held, the issues to be considered at such a hearing shall be:

- (a) Whether the licensee should be required to individually leak test check valves in accordance with the Technical Specifications set forth in Attachment 3 to this Order.
- (b) Whether the actions required by Paragraphs 2 and 3 of section III of this Order must be taken if check valves have not been tested within 12 months preceding the date of this Order.

Operation of the facility on terms consistent with this Order is not stayed by the pendency of any proceedings on this Order. In the event that a need for further action becomes apparent, either in the course of proceedings on this Order or any other time, the Director will take appropriate action.

FOR THE NUCLEAR REGULATORY COMMISSION

  
\_\_\_\_\_  
Darrell G. Eisenhut, Director  
Division of Licensing

Effective Date: This 20th day of April, 1981.  
Bethesda, Maryland

Attachments:

1. Safety Evaluation Report
2. Technical Evaluation Report
3. Technical Specifications



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

Attachment 1

SAFETY EVALUATION REPORT  
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NOS. 1 AND 2  
PRIMARY COOLANT SYSTEM PRESSURE ISOLATION VALVES  
(WASH-1400, EVENT V)

1.0 Introduction

The Reactor Safety Study (RSS), WASH-1400, identified in a PWR an intersystem loss of coolant accident (LOCA) which is a significant contributor to risk of core melt accidents (Event V). The design examined in the RSS contained in-series check valves isolating the high pressure Primary Coolant System (PCS) from the Low Pressure Injection System (LPIS) piping. The scenario which leads to the Event V accident is initiated by the failure of these check valves to function as a pressure isolation barrier. This causes an overpressurization and rupture of the LPIS low pressure piping which results in a LOCA that bypasses containment.

In order to better define the Event V concern, all light water reactor licenses were requested by 10 CFR 50.54(f) letter, dated February 23, 1980, to identify valve configurations of concern and prior valve test results, if any. By letter dated March 23, 1980, the licensee responded to our request and this information was subsequently transmitted to our contractor, the Franklin Research Center, for verification that the licensee had correctly identified the subject valve configurations.

2.0 Evaluation

In order to prepare the Technical Evaluation Report (TER) it was necessary that the contractor verify and evaluate the licensee's response to our February 1980 letter. The NRC acceptance criteria used by Franklin were based on WASH-1400 findings, probabilistic analyses and appropriate Standard Review Plan requirements. With respect to the verification of the licensee's response to our information request, the Franklin evaluation was based on FSAR information, ISI/IST site visit data, and other previously docketed information. The attached Franklin TER correctly identifies the subject valve configurations.

3.0 Conclusion

Based on our review of the Franklin TER, we find that the valve configurations of concern have been correctly identified. Since periodic testing of these PCS pressure isolation valves will reduce the probability of an intersystem LOCA we, therefore, conclude that the requirement to test these valves should be incorporated into the plant's Technical Specifications.

DDated: April 20, 1981

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TECHNICAL EVALUATION REPORT

**PRIMARY COOLANT SYSTEM  
PRESSURE ISOLATION VALVES**

NORTHERN STATES POWER COMPANY  
PRAIRIE ISLAND UNITS 1 AND 2

NRC DOCKET NO. 50-282, 50-306

NRC TAC NO. 12932, 12933

NRC CONTRACT NO. NRC-03-79-118

FRC PROJECT C5257

FRC TASK 263, 264

*Prepared by*

Franklin Research Center  
The Parkway at Twentieth Street  
Philadelphia, PA 19103

Author: P. N. Noell  
T. C. Stilwell  
FRC Group Leader: P. N. Noell

*Prepared for*

Nuclear Regulatory Commission  
Washington, D.C. 20555

Lead NRC Engineer: P. J. Polk

October 24, 1980

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, or any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for any third party's use, or the results of such use, of any information, apparatus, product or process disclosed in this report, or represents that its use by such third party would not infringe privately owned rights.



Franklin Research Center

A Division of The Franklin Institute

The Benjamin Franklin Parkway, Phila., Pa. 19103 (215) 448-1000

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## 1.0 INTRODUCTION

The NRC has determined that certain isolation valve configurations in systems connecting the high-pressure Primary Coolant System (PCS) to lower-pressure systems extending outside containment are potentially significant contributors to an intersystem loss-of-coolant accident (LOCA). Such configurations have been found to represent a significant factor in the risk computed for core melt accidents.

The sequence of events leading to the core melt is initiated by the concurrent failure of two in-series check valves to function as a pressure isolation barrier between the high-pressure PCS and a lower-pressure system extending beyond containment. This failure can cause an overpressurization and rupture of the low-pressure system, resulting in a LOCA that bypasses containment.

The NRC has determined that the probability of failure of these check valves as a pressure isolation barrier can be significantly reduced if the pressure at each valve is continuously monitored, or if each valve is periodically inspected by leakage testing, ultrasonic examination, or radiographic inspection. The NRC has established a program to provide increased assurance that such multiple isolation barriers are in place in all operating Light Water Reactor plants designated by DOR Generic Implementation Activity B-45.

In a generic letter of February 23, 1980, the NRC requested all licensees to identify the following valve configurations which may exist in any of their plant systems communicating with the PCS: 1) two check valves in series or 2) two check valves in series with a motor-operated valve (MOV).

For plants in which valve configurations of concern are found to exist, licensees were further requested to indicate: 1) whether, to ensure integrity of the various pressure isolation check valves, continuous surveillance or periodic testing was currently being conducted, 2) whether any check valves of concern were known to lack integrity, and 3) whether plant procedures should be revised or plant modifications be made to increase reliability.

Franklin Research Center (FRC) was requested by the NRC to provide technical assistance to NRC's B-45 activity by reviewing each licensee's submittal

against criteria provided by the NRC and by verifying the licensee's reported findings from plant system drawings. This report documents FRC's technical review.

## 2.0 CRITERIA

### 2.1 Identification Criteria

For a piping system to have a valve configuration of concern, the following five items must be fulfilled:

- 1) The high-pressure system must be connected to the Primary Coolant System;
- 2) there must be a high-pressure/low-pressure interface present in the line;
- 3) this same piping must eventually lead outside containment;
- 4) the line must have one of the valve configurations shown in Figure 1; and
- 5) the pipe line must have a diameter greater than 1 inch.

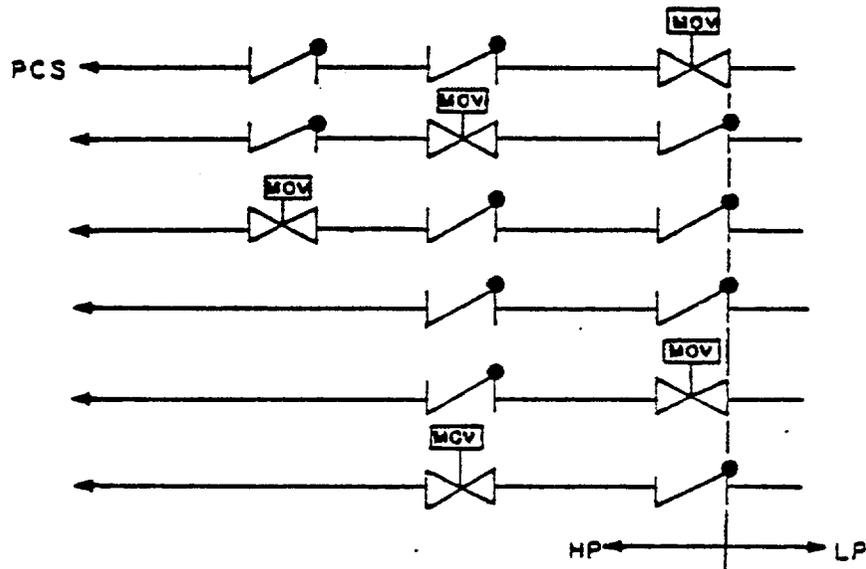


Figure 1. Valve Configurations Designated by the NRC To Be Included in This Technical Evaluation

## 2.2 Periodic Testing Criteria

For licensees whose plants have valve configurations of concern and choose to institute periodic valve leakage testing, the NRC has established criteria for frequency of testing, test conditions, and acceptable leakage rates.

These criteria may be summarized as follows:

### 2.2.1 Frequency of Testing

Periodic hydrostatic leakage testing\* on each check valve shall be accomplished every time the plant is placed in the cold shutdown condition for refueling, each time the plant is placed in a cold shutdown condition for 72 hours if testing has not been accomplished in the preceding 9 months, each time any check valve may have moved from the fully closed position (i.e., any time the differential pressure across the valve is less than 100 psig), and prior to returning the valve to service after maintenance, repair, or replacement work is performed.

### 2.2.2 Hydrostatic Pressure Criteria

Leakage tests involving pressure differentials lower than function pressure differentials are permitted in those types of valves in which service pressure will tend to diminish the overall leakage channel opening, as by pressing the disk into or onto the seat with greater force. Gate valves, check valves, and globe-type valves, having function pressure differential applied over the seat, are examples of valve applications satisfying this requirement. When leakage tests are made in such cases using pressures lower than function maximum pressure differential, the observed leakage shall be adjusted to function maximum pressure differential value. This adjustment shall be made by calculation appropriate to the test media and the ratio between test and function pressure differential, assuming leakage to be directly proportional to the pressure differential to the one-half power.

### 2.2.3 Acceptable Leakage Rates:

- Leakage rates less than or equal to 1.0 gpm are considered acceptable.
- Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered acceptable if the latest measured rate has not exceeded the rate determined by the previous test by an amount

\*To satisfy ALARA requirements, leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.

that reduces the margin between the measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.

- Leakage rates greater than 1.0 gpm but less than or equal to 5.0 gpm are considered unacceptable if the latest measured rate exceeded the rate determined by the previous test by an amount that reduces the margin between measured leakage rate and the maximum permissible rate of 5.0 gpm by 50% or greater.
- Leakage rates greater than 5.0 gpm are considered unacceptable.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Licensee's Response to the Generic Letter

In response to the NRC's generic letter [Ref. 1], the Northern States Power Company (NSP) stated [Ref. 2] that, "Event V isolation valve configurations exist within the Class I boundary of the high-pressure piping connecting the Primary Coolant System (PCS) to low-pressure piping outside containment in the case of the Low-Pressure Safety Injection (LPSI/RHR) system. This configuration is also used to isolate the Safety Injection (SI system) and accumulators from the PCS. SI system piping on the discharge side of the pumps is rated for full PCS pressure."

The licensee further stated, "Leakage rate of isolation valves connecting RHR, SI, LPSI, and the accumulators to the PCS will be measured during the leakage test of the PCS. Continuous surveillance of the LPSI/RHR pressure isolation valves is accomplished with pressure indication and alarm in the control room."

It was discovered by FRC that a crossover piping line between the Loop B cold-leg Accumulator and the Low-Pressure Safety Injection System also contains a valve configuration of concern for Units 1 and 2.

It is FRC's understanding that, with NSP's concurrence, the NRC will direct NSP to change its Plant Technical Specifications as necessary to ensure that periodic leakage testing (or equivalent testing) is conducted in accordance with the criteria of Section 2.2.

### 3.2 FRC Review of Licensee's Response

FRC has reviewed the licensee's response against the plant-specific Piping and Instrumentation Diagrams (P&IDs) [Ref. 3] that might have the valve configurations of concern.

FRC has also reviewed the efficacy of instituting periodic testing for the check valves involved in this particular application with respect to the reduction of the probability of an intersystem LOCA in the Low-Pressure Safety Injection and the Loop B cold-leg Accumulator-LPSI/RHR crossover piping lines for Prairie Island Units 1 and 2.

In its review of the P&IDs [Ref. 3] for the Prairie Island Units 1 and 2, FRC found two following piping systems to be of concern:

The Low-Pressure Safety Injection (LPSIS/RHR) System for Units 1 and 2 is connected directly to the reactor vessel via two separate piping branches A and B. Each branch has a valve configuration of concern consisting of two check valves in series with a motor-operated valve (MOV). The high-pressure/low-pressure interface exists at the upstream side of the MOV.

The crossover line between the loop B cold-leg Accumulator and the Low-Pressure Safety Injection lines contains a configuration of concern consisting of a single check valve in series with a MOV. The high-pressure/low-pressure interface exists also at the upstream side of the MOV. The appropriate valves for both systems are listed below for Units 1 and 2.

#### Low-Pressure Safety Injection/Residual Heat Removal

	Unit 1	Unit 2
<u>Reactor Vessel</u>		
Branch A		
high-pressure check valve	SI-9-6	2SI-9-6
high-pressure check valve	SI-9-4	2SI-9-4
high-pressure MOV, n.c.	32064	32167
Branch B		
high-pressure check valve	SI-9-5	2SI-9-5
high-pressure check valve	SI-9-3	2SI-9-3
high-pressure MOV, n.c.	32065	32168

Loop B, Cold-Leg Accumulator to LPSI/RHR Crossover Line

	Unit 1	Unit 2
high-pressure check valve	SI-6-2	2SI-6-2
high-pressure MOV, n.c.	32066	32169

In accordance with the criteria of Section 2.0, FRC found no other valve configurations of concern existing in this plant.

FRC reviewed the effectiveness of instituting periodic leakage testing of the check valves in these lines as a means of reducing the probability of an intersystem LOCA occurring. FRC found that introducing a program of check valve leakage testing in accordance with the criteria summarized in Section 2.0 will be an effective measure in substantially reducing the probability of an intersystem LOCA occurring in these lines, and a means of increasing the probability that these lines will be able to perform their safety-related functions. It is also a step toward achieving a corresponding reduction in the plant probability of an intersystem LOCA in Prairie Island Units 1 and 2.

#### 4.0 CONCLUSION

It has been determined that the Low-Pressure Safety Injection/Residual Heat Removal System in Prairie Island Units 1 and 2 incorporates valving in one of the configurations (identified in Figure 1) designated by the NRC as a valve configuration of concern. Moreover, based on the previously docketed information and drawings made available for FRC review, FRC found that the crossover line between the Loop B cold-leg Accumulator and the Low-Pressure Safety Injection/Residual Heat Removal system lines also incorporates a valve configuration of concern. Thus, if the licensee's review of the valving configuration contained in this crossover line confirms FRC's finding, then valve configurations of concern exist in two systems of Prairie Island Units 1 and 2, incorporating the valves listed in Table 1.0.

If NSP modifies the Plant Technical Specifications for Prairie Island Units 1 and 2 to incorporate periodic testing (as delineated in Section 2.2) for the check valves itemized in Table 1.0, then FRC considers this an acceptable means of achieving plant compliance with the NRC staff objectives of Reference 1.

Table 1.0

Primary Coolant System Pressure Isolation Valves

<u>System</u>	<u>Check Valve No.</u>		<u>Allowable Leakage*</u>
	Unit 1	Unit 2	
Low-Pressure Safety Injection/ Residual Heat Removal			
<u>Reactor Vessel</u>			
Branch A	SI-9-6 SI-9-4	2SI-9-6 2SI-9-4	
Branch B	SI-9-5 SI-9-3	2SI-9-5 2SI-9-3	
Loop B, Cold-leg Accumulator to LPSI/RHR Crossover Line			
	SI-6-2	2SI-6-2	

\*To be provided by the licensee at a future date in accordance with Section 2.2.3.

5.0 REFERENCES

1. Generic NRC letter, dated 2/23/80, from Mr. D. G. Eisenhut, Department of Operating Reactors (DOR), to Mr. L. O. Mayer, Northern States Power Company (NSP).
2. Northern States Power Company's response to NRC's letter, dated 3/17/80, from Mr. L. O. Mayer (NSP) to Mr. D. G. Eisenhut (DOR).
3. List of examined P&IDs:

Pioneer Service & Engineering Company Drawings of Prairie Island  
Unit 1

- X-HIAW-1-7, (Rev. B)
- X-HIAW-1-31, (Rev. 10)
- X-HIAW-1-38, (Rev. C)
- X-HIAW-1-39, (Rev. E)
- X-HIAW-1-44, (Rev. E)
- X-HIAW-1-45, (Rev. B)

Pioneer Service & Engineering Company Drawings of Prairie Island  
Unit 2

X-HIAW-1001-3, (Rev. E)

X-HIAW-1001-4, (Rev. C)

X-HIAW-1001-5, (Rev. E)

X-HIAW-1001-6, (Rev. D)

X-HIAW-1001-7, (Rev. B)

X-HIAW-1001-8, (Rev. A)

Pioneer Service & Engineering Company Drawings of Prairie Island Unit  
1 and 2

X-HIAW-1-105, (Rev. 5)

X-HIAW-1-123, (Rev. C)

NF-39238, (Rev. K)

ATTACHMENT 3

ATTACHMENT TO ORDER FOR MODIFICATION OF LICENSE  
DATED

FACILITY OPERATING LICENSE NOS. DPR-42 AND DPR-60

DOCKET NOS. 50-282 AND 50-306

Revise Appendix A Technical Specifications as follows:

Remove Pages

TS-i  
TS.3.1-21

Insert Pages

TS-i  
TS.3.1-21  
TS.4.3-1  
TS.4.3-2

TECHNICAL SPECIFICATIONSTABLE OF CONTENTS

<u>TS Section</u>	<u>TITLE</u>	<u>PAGE</u>
1.0	Definitions	TS.1-1
2.0	<u>Safety Limits and Limiting Safety System Settings</u>	TS.2.1-1
2.1	Safety Limit, Reactor Core	TS.2.1-1
2.2	Safety Limit, Reactor Coolant System Pressure	TS.2.2-1
2.3	Limiting Safety System Settings, Protective Instrumentation	TS.2.3-1
3.0	<u>Limiting Conditions for Operation</u>	TS.2.1-1
3.1	Reactor Coolant System	TS.3.1-1
3.2	Chemical and Volume Control System	TS.3.2-1
3.3	Engineered Safety Features	TS.3.3-1
3.4	Steam and Power Conversion System	TS.3.4-1
3.5	Instrumentation System	TS.3.5-1
3.6	Containment System	TS.3.6-1
3.7	Auxiliary Electrical Systems	TS.3.7-1
3.8	Refueling and Fuel Handling	TS.3.8-1
3.9	Radioactive Effluents	TS.3.9-1
3.10	Control Rod and Power Distribution Limits	TS.3.10-1
3.11	Core Surveillance Instrumentation	TS.3.11-1
3.12	Shock Suppressors (snubbers)	TS.3.12-1
3.13	Control Room Air Treatment System	TS.3.13-1
3.14	Fire Detection and Protection Systems	TS.3.14-1
4.0	<u>Surveillance Requirements</u>	TS.4.1-1
4.1	Operational Safety Review	TS.4.1-1
4.2	Inservice Inspection Requirements	TS.4.2-1
4.3	Primary Coolant System Pressure Isolation Valves	TS.4.3-1
4.4	Containment System Tests	TS.4.4-1
4.5	Engineered Safety Features	TS.4.5-1
4.6	Periodic Testing of Emergency Power System	TS.4.6-1
4.7	Main Steam Stop Valves	TS.4.7-1
4.8	Auxiliary Feedwater System	TS.4.8-1
4.9	Reactivity Anomalies	TS.4.9-1
4.10	Radiation Environmental Monitoring Program	TS.4.10-1
4.11	Radioactive Source Leakage Test	TS.4.11-1
4.12	Steam Generator Tube Surveillance	TS.4.12-1
4.13	Shock Suppressors (snubbers)	TS.4.13-1
4.14	Control Room Air Treatment System	TS.4.14-1
4.15	Spent Fuel Pool Special Ventilation System	TS.4.15-1
4.16	Fire Detection and Protection Systems	TS.4.16-1

## H. Primary Coolant System Pressure Isolation Valves

### Specification

1. During hot shutdown, startup, or power operation the integrity of each pressure isolation valve listed in Specification 4.3.A shall be individually demonstrated, except as specified in (2) below.
2. In the event that integrity of any pressure isolation valve specified in 4.3.A cannot be demonstrated, both of the following shall be done:
  - (a) At least two other operable valves in each high pressure line having a non-functional valve must be placed in, and remain in the closed condition within 4 hours. These valves may include check valves for which the leakage rate has been verified, manual valves or automatic valves. Manual and automatic valves shall be tagged as closed to preclude inadvertent valve opening.
  - (b) An orderly shutdown shall be initiated by placing the affected reactor in the hot shutdown condition within the next 6 hours and in the cold shutdown condition within the following 30 hours.

### BASIS

This specification provides for actions to be taken in the event of failure or excessive leakage of a check valve which isolates the high pressure reactor coolant system from the low pressure RHR system piping.

## 4.3 PRIMARY COOLANT SYSTEM PRESSURE ISOLATION VALVES

Applicability

Applies to the surveillance performed on the primary coolant system pressure isolation valves to verify operability.

Objective

To increase the reliability of primary coolant system pressure isolation valves thereby reducing the potential of an intersystem loss of coolant accident.

Specification

Periodic leakage testing of each of the following valves shall be individually accomplished prior to resuming power operation after each time the plant is placed in the cold shutdown condition for refueling, each time the plant is placed in a cold shutdown condition for 72 hours or more if testing has not been accomplished in the preceding 9 months, and prior to returning the valve to service after maintenance, repair, or replacement work is performed:

<u>System</u>	<u>Valve Number</u>		<u>Maximum Allowable Leakage (*) (**)</u>
	<u>Unit No. 1</u>	<u>Unit No. 2</u>	
Low-Pressure SI to Upper Plenum	SI-9-6	2SI-9-6	$\leq$ 5 gpm
	SI-9-4	2SI-9-4	$\leq$ 5 gpm
	SI-9-5	2SI-9-5	$\leq$ 5 gpm
	SI-9-3	2SI-9-3	$\leq$ 5 gpm
RHR to Loop B Accumulator Inj Line	SI-6-2	2SI-6-2	$\leq$ 5 gpm

To satisfy ALARA requirements, leakage may be measured indirectly (as from the performance of pressure indicators) if accomplished in accordance with approved procedures and supported by computations showing that the method is capable of demonstrating valve compliance with the leakage criteria.

NOTES:

- \* 1. Leakage rates less than or equal to one gpm are acceptable.
- 2. Leakage rates greater than one, but less than or equal to five gpm are considered acceptable if the latest measured rate has not exceeded the previous measured rate by an amount which reduces the margin to five gpm by 50% or more. Otherwise the leakage rate is considered unacceptable.
- 3. Leakage rates greater than five gpm are considered unacceptable.

\*\* Minimum differential test pressure shall not be less than 150 psid.

Basis

The requirements for RCS pressure isolation valves provide added assurance of valve integrity thereby reducing the probability of gross valve failure and consequent intersystem LOCA which bypasses containment.