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ACCESSION NBR:8011030596 DOC.DATE: 80/10/24 NOTARIZED: YES DOCKET #
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RECIP.NAME RECIPIENT AFFILIATION
Office of Nuclear Reactor Regulation, Director

SUBJECT: Responds to 801001 ltr re addl design & performance criteria developed by BWR Owners Subgroup.Instrument discharge vols w/four hi level scram instruments & dedicated drain line will be installed.Mods scheduled for completion by May 1981.

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NSP

NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

October 24, 1980

Director of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

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

Response to NRR Letter on BWR Scram System

In response to your October 1, 1980 letter on BWR Scram Systems, our present scram system has been evaluated using the additional design and performance criteria developed by the BWR Owners Subgroup which is attached. The results of the evaluation show that the following planned modifications will provide conformance to these criteria.

1. Two new level instrument volumes will be located as close as practical to the scram discharge headers (one volume for the east group of Hydraulic Control Units (HCU's) and one for the west group). The existing instrument volume and associated drain piping will be removed. The connection from the discharge headers to the new instrument volumes will be sized and configured to meet the criteria.

2. Each volume will be provided with four Hi-level scram instruments connected in one-of-two-twice logic. Alarm and rod block level instruments on each volume will be similar to those on the present volume. Instrument piping will be installed directly off the instrument volume to preclude hydrodynamic or flow effects.

3. Each volume will have a dedicated drain line with redundant drain isolation valves.

4. Independent, dedicated vent lines will be installed on the discharge headers for both the east and west HCU groups. Each vent line will be provided with one active vent valve and a check valve in series.

5. To minimize potential for corrosion product formation and buildup, (thereby minimizing radiation exposure to personnel) new piping and components will be stainless steel wherever practical.

Design and procurement are proceeding. Dependent upon material and component availability, it is our intention to complete all modifications by the end of the next refueling outage which is scheduled to begin in May, 1981.

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Procedures and surveillance schedules will be modified as necessary to comply with the BWR Owners subgroup criteria by the end of the 1981 refueling outage.

The above information is intended as a complete response to your request, including the information which was to be provided by December 15, 1980.

If you have any questions concerning this matter, please call.

L. O. Mayer

L O Mayer, PE
Manager of Nuclear Support Services

LOM/TMP/jh

cc J G Keppler
G Charnoff
NRC Resident Inspector

Attachment

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT

Docket No. 50-263

LETTER DATED OCTOBER 24, 1980
RESPONDING TO NRC REQUEST DATED OCTOBER 1, 1980
FOR INFORMATION ON BWR SCRAM SYSTEMS

Northern States Power Company, a Minnesota corporation, by this letter dated October 24, 1980 hereby submits information in response to NRC request for information concerning BWR scram systems.

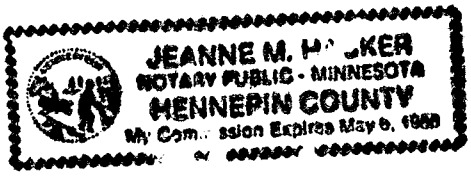
This request contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By L. O. Mayer
L O Mayer
Manager of Nuclear Support Services

On this 24th day of October, 1980, before me a notary public in and for said County, personally appeared L O Mayer, Manager of Nuclear Support Services, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company, that he knows the contents thereof and that to the best of his knowledge, information and belief, the statements made in it are true and that it is not interposed for delay.

Jeanne M Hucker



RETYPED AT NSP
10/27/80

Long-Term Evaluation of

Scram Discharge System

The utilities have reviewed General Electric's evaluation and are following the ongoing INPO/NSAC study on failure of the control rods to fully insert on a scram signal at Brown's Ferry. The utilities agree that at Brown's Ferry there was an undetected accumlation of water in the scram discharge volume. Subsequent testing at some plants has also indicated that under certain conditions the instrumentation may not give consistent level indication due to the piping configuration as it ties into the instrument volume.

Scope

The following is a listing of design and operational cirteria that shall be followed by the utilities in formulating individual design changes. The criteria has taken into consideration the original system criteria, problems experienced in the operation of the system and concerns regarding operability and reliability. Criteria which have been added or changed as a result of this evaluation are denoted by an asterisk (*). For the purpose of this discussion, the word "system" includes all components downstream of the scram exhaust valves. The philosophy for evaluation of the design is that the safety function is of prime concern. The safety boundaries are whatever affects the scram function of the system. The evaluation must show that the safety boundaries considered meet this philosophy.

Functional Criteria

* The scram discharge volume shall have sufficient capacity to receive and contain water exhaustd by a full reactor scram without adversely affecting control rod drive scram performance.

Safety Criteria

1.* No single active failure of a component, or service function shall prevent a reactor scram, under the most degraded conditions that are operationally acceptable.

2.* No single active failure shall prevent uncontrolled loss of reactor coolant.

3.* The scram discharge system instrumentation shall be designed to provide redundancy, to operate reliably under all conditions, and shall not be adversely affected by hydrodynamic forces or flow characteristics.

4.* System operating conditions which are required for scram shall be continuously monitored.

5.* Repair, replacement, adjustment, or surveillance of any system component shall not require the scram function to be bypassed.

Operational Criteria

1. Level instrumentation shall be designed to be maintained, tested, or calibrated during plant operation without causing a scram.

2. The system shall include sufficient supervisory instrumentation and alarms to permit surveillance of system operation.

3. The system shall be designed to minimize the exposure of operating personnel to radiation.

4.* Vent paths shall be provided to assure adequate drainage in preparation for scram reset.

5.* Vent and drain functions shall not be adversely affected by other system interfaces. The objective of this requirement is to preclude water backup in the scram instrument volume which could cause spurious scram.

Design Criteria

1.* The scram discharge headers shall be sized in accordance with GE OER-52 and shall be hydraulically coupled to the instrumented volume(s) in a manner to permit operability of the scram level instrumentation prior to loss of system function. The analysis should show no need for vents or drains. Each system shall be analyzed based on a plant specific maximum inleakage to ensure that the system function is not lost prior to initiation of automatic scram. Maximum inleakage is the maximum flow rate through the scram discharge line without control rod motion summed over all control rods.

2.* Level instrumentation shall be provided for automatic scram initiation while sufficient volume exists in the scram discharge volume.

3.* Instrumentation taps shall be provided on the vertical instrument volume and not on the connected piping

4.* The scram instrumentation shall be capable of detecting water accumulation in the instrumented volume(s) assuming a single active failure in the instrumentation system or the plugging of an instrument line.

5.* Structural and component design shall consider loads and conditions including those due to fluid dynamics, thermal expansion, internal pressure, seismic considerations, and adverse environments.

6.* The power operated vent and drain valves shall close under loss of air and/or electric power. Valve position indication shall be provided in the control room.

7.* Any reductions in the system piping flow path shall be analyzed to assure system reliability and operability under all modes of operation.

8.* System piping geometry (i.e., pitch, line size, orientation) shall be such that the system drains continuously during normal plant operation.

9.* Instrumentation shall be provided to aid the operator in the detection of water accumulation in the instrumented volume(s) prior to scram initiation.

10.*Vent and drain line valves shall be provided to contain the scram discharge water, with a single active failure and to minimize operational exposure.

Surveillance Criteria

1.* Vent and drain valves shall be periodically tested.

2.* Verifying and level detection instrumentation shall be periodically tested in place.

3.* The operability of the entire system as an integrated whole shall be demonstrated periodically and during each operating cycle, by demonstrating scram instrument response and valve function at pressure and temperature at approximately 50% control rod density.