Consumers Power Company

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October 27, 1980

Director, Nuclear Reactor Regulation
Att Mr Dennis M Crutchfield, Chief
Operating Reactors Branch No 5
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-155 - LICENSE DPR-6 -
BIG ROCK POINT PLANT - BWR SCRAM
SYSTEM

NRC letter dated October 1, 1980 requested Consumers Power Company to provide its plans for additional evaluation of the scram system beyond the scope of IE Bulletin No 80-17 and its subsequent supplements. The letter also inquired as to Consumers Power Company's intentions with respect to participation in the BWR Owners Sub-Group for the scram discharge volume.

Our submittals in response to IE Bulletin No 80-17 and its supplements have identified to the Commission that the Big Rock Point scram discharge system is of a significantly different design than that of Browns Ferry 3 and that modifications, in addition to the new atmospheric scram dump tank vent, are not required to assure ability to scram. Consumers Power Company joined the Scram Discharge Volume Sub-Group during the September 1980 general meeting with the intent of utilizing the generic criteria to evaluate the acceptability of the Big Rock Point scram system. Attachment 1 provides the Sub-Group criteria that will be used for the reevaluation. Specific application of some of the generic criteria as described by Attachment 2 is not considered necessary due to the uniqueness of the Big Rock Point design.

Specific responses to the three questions of NRC letter dated October 1, 1980 are as follows:

1) No specific reassessment of the present scram system to confirm conformance with the General Design Criteria (Appendix A to 10CFR 50) has been made. It should be noted that our evaluations with respect to IE Bulletin 80-17 and its supplements have revealed no inadequacies in the scram discharge system even though Big Rock Point was designed and constructed prior to the issuance of the General Design Criteria.

2) As stated above, reevaluation of the scram discharge system will be made using the BWR Owners Sub-Group criteria, except as modified by Attachment 2.

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3) Consumers Power Company intends to provide the results of our reevaluation by December 15, 1980 along with a schedule for implementation for any modifications determined necessary by the reevaluation.

Consumers Power Company has performed a cursory review of Attachment 1 as amended by Attachment 2 and finds that Big Rock Point meets the intent of the criteria without any modifications to the scram discharge system.

David P Hoffman (Signed)

David P Hoffman
Nuclear Licensing Administrator

CC Director, Region III, USNRC
NRC Resident Inspector - Big Rock Point

Attachment 1 - 3 pages
Attachment 2 - 2 pages

CONSUMERS POWER COMPANY
Big Rock Point Plant

BWR Scram System
Response to NRC Letter, dated October 1, 1980

Docket No 50-155
License No DPR-6

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended, and the Commission's Rules and Regulations thereunder, Consumers Power Company submits our response to NRC letter dated October 1, 1980, entitled, "BWR Scram System". Consumers Power Company's response is dated October 27, 1980.

CONSUMERS POWER COMPANY

By R B DeWitt (Signed)
R B DeWitt, Vice President
Nuclear Operations

Sworn and subscribed to before me this 27th day of October 1980.

(SEAL)

Linda K Carstens (Signed)
Linda K Carstens, Notary Public
Jackson County, Michigan
My commission expires June 10, 1981.

Attachment 1

Long-Term Evaluation Criteria For 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 accumulation of water in the scram discharge volume. Susequent 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 criteria 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 work "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 exhausted 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 (ie., pitch, line size, orientation) shall be such that the system drains continously 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.

Attachment 2

Clarifications of Applicability of Attachment 1
To The Big Rock Point Scram Discharge System Long-Term Evaluation

The design of the Big Rock Point scram discharge system is significantly different from the BWR-2 and later designs. A scram dump tank, capable of accumulating discharge water from more than one scram, is provided with both level monitoring and automatic scram instrumentation to assure adequate scram discharge volume. Consumers Power Company's previous submittals in response to IE Bulletin No 80-17 and its subsequent supplements have provided a detailed description of the system and the results of scram tests which prove the system operates as designed in a safe and reliable manner. The long operating history, in excess of seventeen (17) years, of Big Rock Point and the numerous satisfactory operations of the scram system indicate system modifications are probably not warranted and could prove counterproductive. The following provides clarifying positions with respect to Attachment 1 that Consumers Power Company will use in its formal long-term evaluation of the Big Rock Point scram discharge system to assure its continued safe and reliable operation. The clarifying positions are identified in accordance with the format and numbering scheme used by Attachment 1.

Safety Criteria

2. The ability of the scram valves and scram dump tank vent and drain valves shall be evaluated to assure the consequences of any single active failure is bounded by previously analyzed accidents.

3. The scram discharge system instrumentation redundancy shall be evaluated to assure automatic scram capability with sufficient scram dump capacity in accordance with the Functional Criteria of Attachment 1.

5. The input of a trip signal for a removed component is acceptable to meet this criteria.

Operational Criteria

1. The clarification for Safety Criteria 5 applies.

Design Criteria

1. This criteria shall be applied to the scram dump tank which provides the same function as the scram discharge headers in more recent BWR designs.

3. This criteria is currently met by the Big Rock Point design which provides instrumentation taps on the scram dump tank, that acts as both the scram discharge and instrument volumes of more recent BWR designs.

4. The absence of plugging of instrument lines shall be verified by periodic testing which may be accomplished without degradation of system function because of the instrumentation and large scram dump tank capacity provided in the Big Rock Point design.

5. Structural and component design as affected by seismic consideration and adverse environments will be considered under the ongoing Systematic Evaluation Program (SEP) in which Big Rock Point is involved.

10. The clarification for Safety Criteria 2 applies.

Surveillance Criteria

2. The clarification for Safety Criteria 5 applies.

3. It is believed that the intent of this criteria is to perform testing in accordance with item 2 of IE Bulletin No 80-17 and as such will not be applied to Big Rock Point because of its design differences and the potential deleterious effects it can have on the rest of nuclear steam supply system. The scram dump tank design provides a continously monitored and sufficiently large discharge volume to assure scram system operability. This criteria is only considered necessary for more recent BWR designs which utilize scram discharge header piping that do not provide direct measurement capability for the entire scram discharge volume.