NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISSION

DOCKET NUMBER 50-305

FILE NUMBER

## NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

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| TO: Mr Purple | FROM: Wisconsin Public Serivce Corp<br>Green Bay, Wis<br>E W James | DATE OF DOCUMENT 2-20-76<br>DATE RECEIVED 2-23-76 |
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DESCRIPTION

Ltr re our 2-13-76 request.....furnishijg addl info to allow completion of the review of ECCS performance evaluation.....

ENCLOSURE

PLANT NAME: Kewaunee

SAFETY — FOR ACTION/INFORMATION — ENVIRO 2-23-76 ehf

| | SAFETY | | ENVIRO |
|---|---|---|---|
| | ASSIGNED AD : | | ASSIGNED AD : |
| / | BRANCH CHIEF : | Purple (3) | BRANCH CHIEF : |
| / | PROJECT MANAGER: | Neighbors | PROJECT MANAGER : |
| / | LIC. ASST. : | Sheppard | LIC. ASST. : |

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WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 1200, Green Bay, Wisconsin 54305

February 20, 1976

Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



ATTN: Mr. R. A. Purple, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Gentlemen:

REF: Docket 50-305
Operating License DPR-43
ECCS Additional Information

On February 13, 1976, we were requested by telephone to provide additional information to allow completion of the review of ECCS performance evaluation for the Kewaunee Plant. The information requested consisted of:

1. Listing all remotely operated valves which would be submerged post LOCA.
2. Listing all equipment which would be submerged post LOCA.
3. Stating the post LOCA water level in containment.
4. Specifying the cold leg break elevation.

The following provides the requested information.

The lower level of the Kewaunee containment will be flooded post LOCA. Certain remotely operated valves will be submerged; however, none of these valves are required to be operated in a flooded environment. Below each submerged remotely operated valve is listed and the consequence of submerging the valve is addressed:

Motor Operated Valves

1. RHR-1A (8702A) is the residual heat removal system suction valve from reactor coolant loop 1A. Four valves are arranged in a series - parallel arrangement to comprise the suction for the normal residual heat removal system. These valves do not have a post LOCA function and are only employed for normal low pressure heat removal. The motor control centers are located

outside of the containment and shorting of the control wiring located at the valve will not result in inadvertent valve operation. The submerging of these valves therefore would have no effect upon the ECCS analysis or post LOCA performance of the safeguard systems. Valve RHR-1A is the first isolation valve off the "A" reactor coolant loop.

2. RHR-2A (8701A) is the residual heat removal system suction valve in series with valve RHR 1A above, making up one of the parallel valve set for RHR suction. The evaluation provided above applies to valve RHR-2A and for valves RHR-1B and RHR-2B below.

3. RHR-1B (8702B) is the residual heat removal system suction valve from reactor coolant loop "B". (See description of valve RHR 1A above.)

4. RHR-2B (8701B) is the residual heat removal system suction valve in series with valve RHR-1B comprising the second parallel valve set for normal RHR suction.

5. SI-20A (8800A) is the accumulator "A" isolation valve, which will be de-energized and locked during normal operation in accordance to the revised Technical Specification &may be submerged. Since the valve will be de-energized and the accumulators will have completed their intended safety function prior to submergence of the valve operator, there is no impact upon the plant safety by submerging valve SI-20A post LOCA.

6. SI-302B (8803B) is the low head safety injection isolation valve. It could be submerged post LOCA. Valve SI-302B is normally closed during operation and upon safety injection receives an open signal during the initial step of the sequentially loaded safety injection actuation. Valve SI-302B will have completed its opening cycle prior to an accumulation of water in the containment sump. The redundant valve SI-302A (8803A) will not be submerged post LOCA. The motor control center for valve SI-302B is located outside of containment. The shorting of any control wiring within containment will not result in a closure of valve SI-302B due to the design of the control wiring scheme. Therefore, the submergence of SI-302B post LOCA will not result in the closure of valve SI-302B and will not have any effect upon the ECCS performance.

7. BT-2A is the steam generator blowdown isolation valve for generator "A" and it will be submerged post LOCA. The steam generator blowdown isolation valves are closed by a containment isolation signal which is generated by the safety injection signal. The motor control center for BT-2A is located outside of containment. The steam generator blowdown from each generator is isolated post accident by two valves in series, one valve located within containment and the other valve located outside containment near the containment penetration. Valve BT-2A is the isolation valve for steam generator 1A located within containment. The shorting of the control wiring within containment will not result in the opening of valve BT-2A due to the design of the control wiring scheme. The submergence of valve BT-2A will not result in a failure of this valve to perform its intended safety function.

8. BT-2B, steam generator blowdown isolation valve for steam generator "A", will be submerged post LOCA. The evaluation for valve BT-2A is also valid for valve BT-2B.

Air-Operated Valves

1. RC-534, the drain valve from reactor coolant drain pump suction header to containment sump "A", will be submerged. This valve has no impact upon the evaluation of the ECCS performance.

2. LD-301, the excess letdown control valve, will be submerged post LOCA. This valve has no impact upon the evaluation of the ECCS performance.

3. LD-302, the excess letdown flow path selector valve, will be submerged post LOCA. This valve has no impact upon the ECCS performance.

4. LD-4A, LD-4B and LD-4C, the letdown orifice isolation valves, will be partly submerged post LOCA. These valves have no impact upon the ECCS performance.

5. CVC-11, the charging line isolation valve, will be submerged post LOCA. This valve has no effect upon the ECCS performance.

6. PR-40, the pressurizer relief tank drain isolation valve, will be submerged post LOCA. This valve has no effect upon the ECCS performance.

The following addresses other equipment submerged post LOCA and its relationship to the ECCS analysis.

Pumps

1. The reactor coolant drain pumps (two pumps) will be submerged post LOCA. These pumps do not have a post LOCA function and are isolated from the environment by two containment isolation valves which are closed by a containment isolation signal.

2. Reactor cavity sump "C" pump may be submerged post LOCA. This pump is not required post LOCA. The purpose of this pump is to remove condensation from below the reactor vessel and to remove water due to the vessel-refueling pool seal leakage during refueling.

3. The containment sump "A" pumps (two pumps) will be submerged post LOCA. These pumps do not have a post LOCA function and are isolated from the environment by two redundant containment isolation valves. The float control switches for these pumps will most likely short to ground upon being submerged in a boric acid solution and the pumps will be inoperative.

4. The refueling cavity filtration pump will be submerged post LOCA. This pump has no post LOCA or normal operation function. The refueling cavity filtration pump is only employed during refueling to filter the refueling pool and remove particulate from the water. During normal operation, this pump is stored on the containment lower level.

Heat Exchangers

1. The regenerative heat exchanger for chemical and volume control charging and letdown will be submerged post LOCA. This heat exchanger is not affected by being submerged in the post LOCA condition.

2. The excess letdown heat exchanger will be submerged post LOCA. This heat exchanger has no effect upon the ECCS performance.

Tanks

1. The reactor coolant drain tank will be partly submerged post LOCA. The tank supports are designed to restrain an empty submerged tank. This tank is enclosed in a concrete cubical which would restrain the movement of the tank in the event that it were not anchored to the floor. The submergence of this tank has no effect upon the ECCS performance.

2. The pressurizer relief tank will be partly submerged post LOCA. The supports of the tank are designed to prevent movement of the tank post LOCA. This tank submergence has no effect upon ECCS performance.

The water level post LOCA was calculated assuming:

A. The entire reactor coolant system volume is discharged to the containment.

B. The entire volume of the refueling water storage tank is injected (275,000 gal.)

C. Both accumulators and one completely full boric acid tank is injected.

D. No water collects in the reactor cavity sump.

E. The pressurizer relief tank remains in place and does not float.

F. The water in containment post LOCA is heated to 260$^{o}$F and is saturated with steam.

G. A total of 4% of the 592' elevation floodable floor cross section is occupied by unfloodable volume such as pillars, supports, equipment, etc. (The support walls, tanks and biological shield walls were considered in determing floodable floor cross section.)

The resultant maximum water level post LOCA is 7.88 ft above the 592' floor.

The reactor coolant system major components are sketched on Figure 1.2-8 of the FSAR. This figure indicates the center line of the reactor vessel nozzles at an elevation of 617' 10-1/2". The maximum possible containment sump water level post LOCA is 599' 10-1/2" or 18' below the center line of a cold leg double ended break.

On February 10, 1976, we submitted a letter addressing rod bow as it affected the Kewaunee Plant. On February 13, 1976, we were requested to provide additional clarification of the available margin between the assumed $F_Q \times P_{Rel}$ limit of the ECCS analysis and the maximum $F_Q \times P_{Rel}$ predicted value for CAOC operation at the 11.5 ft core elevation. The margin available to accommodate a rod bow penalty at the 11.5 ft elevation is 3.5%, which is in excess of the projected rod bow effect in this region of the core.

Very truly yours,

E. W. James
Senior Vice President
Power Supply & Engineering

EWJ:sna