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Docket No. 50-305

Wisconsin Public Service Corporation
ATTN: Mr. E. W. James
Senior Vice President
Post Office Box 1200
Green Bay, Wisconsin 54305

Gentlemen:

We have reviewed your revised ECCS Analysis which was submitted for the Kewaunee Nuclear Power Plant on April 1, 1975, in response to the Commission's Order for Modification of License issued on December 27, 1974.

The revised ECCS Analysis was performed using the December 25, 1974 version of the Westinghouse evaluation model. The December 25, 1974 version of the model is acceptable if the peak clad temperature turn-around occurs prior to the reflood rate decreasing below 1.1 inches per second. However, as shown in Figures 14.3-17A, B, and C, the reflood rates remain below 1 inch per second prior to the time that peak clad temperature turnaround occurs. In this case, the March 15, 1975 version of the Westinghouse model must be used.

In order for useto continue our review of your ECCS Analysis, we find that additional information is required. You should perform the ECCS Analysis using the March 15, 1975 version of the Westinghouse evaluation model; and, you should provide the additional information described in Enclosure 1. Enclosure 2 provides the Branch Technical Position EICSB 18 discussed in Section V of Enclosure 1. You should have your submittal to us by July 9, 1975.

Sincerely,

Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Reactor Licensing

Enclosures:
1. Data Required with the ECCS Reanalysis
2. Branch Technical Position EICSB 18

ECCS (2)

cc w/enclosures:
See next page

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Form AEC-318 (Rev. 9-53) AECM 0240 ☆ U. S. GOVERNMENT PRINTING OFFICE: 1974-526-166

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ENCLOSURE 1

Data Required With the ECCS Reanalysis

I. If the largest break size results in the highest PCT:

a. Reanalyze the limiting break.
b. Reanalyze two smaller breaks in the large break region.

II. If the largest break size does not result in the highest PCT:

a. Reanalyze the limiting break.
b. Reanalyze a break larger and a break smaller than the limiting break. If the limiting break is outside the range of Moody multipliers of 0.6 to 1.0 (i.e., less than 0.6), then the limiting break plus two larger breaks must be analyzed.

III. Sensitivity study assuming:

a) Reactor coolant pumps running
b) " " " tripped

or justify the single failure assumption in your analysis

IV. LOCA PARAMETERS OF INTEREST

A. On each plant and for each break analyzed, the following parameters (versus time unless otherwise noted) should be provided on engineering graph paper of a quality to facilitate calculations.

-- Peak clad temperature (ruptured and unruptured node)
-- Reactor vessel pressure
-- Vessel and downcomer water level
-- Thermal power
-- Containment pressure

B. For the worst break analyzed, the following additional parameters (versus time unless otherwise noted) should be provided on engineering graph paper of a quality to facilitate calculations. The worst single failure and worst-case reactor coolant pump status will have been established utilizing appropriate sensitivity studies.

-- Flooding rate
-- Core flow (inlet and outlet)
-- Heat transfer coefficients

-- Reactor coolant temperature
-- Mass released to containment
-- Energy released to containment
-- Containment condensing heat transfer coefficient
-- Hot spot flow
-- Quality (hottest assembly)
-- Hot pin internal pressure
-- Hot spot pellet average temperature
-- Fluid temperature (hottest assembly)

C. The ECCS Analysis filed with the NRC shall identify on each plot the run date, version number, and version date of the computer model utilized for the LOCA analysis. An alternative to this request is to identify in the test of the response the version number, version date, and the inclusive figure number for which the identification applies.

D. A tabulation of times at which significant events occur shall be provided for each break analyzed. Those events provided in the April 1, 1975 submittal shall also be provided with the reanalysis.

V. Provide your response to our concerns on single failures as addressed in the Branch Technical Position EICSB18 from the NRC Standard Review Plan.

VI. As the contents of the borated water storage tank are used to perform the ECCS function, the water level in the containment may flood the valve motors. Perform an evaluation to determine all valve motors that may be submerged and provide the following information.

(A) Whether or not any valve motors will be submerged following a LOCA in the plant being reviewed.

(B) If any valve motors will be flooded:

(i) Identify the valves that will be submerged.
(ii) Evaluate the potential consequences of flooding of the valves for both the short term and long term ECCS functions and containment isolation. The long term should consider the potential problem of excessive concentrations of boric acid in PWR's.
(iii) Propose design changes to solve the potential flooding problem.

BRANCH TECHNICAL POSITION EICSB 18

APPLICATION OF THE SINGLE FAILURE CRITERION TO MANUALLY-CONTROLLED ELECTRICALLY-OPERATED VALVES

A. BACKGROUND

Where a single failure in an electrical system can result in loss of capability to perform a safety function, the effect on plant safety must be evaluated. This is necessary regardless of whether the loss of safety function is caused by a component failing to perform a requisite mechanical motion, or by a component performing an undesirable mechanical motion.

This position establishes the acceptability of disconnecting power to electrical components of a fluid system as one means of designing against a single failure that might cause an undesirable component action. These provisions are based on the assumption that the component is then equivalent to a similar component that is not designed for electrical operation, e.g., a valve that can be opened or closed only by direct manual operation of the valve. They are also based on the assumption that no single failure can both restore power to the electrical system and cause mechanical motion of the components served by the electrical system. The validity of these assumptions should be verified when applying this position.

B. BRANCH TECHNICAL POSITION

1. Failures in both the "fail to function" sense and the "undesirable function" sense of components in electrical systems of valves and other fluid system components should be considered in designing against a single failure, even though the valve or other fluid system component may not be called upon to function in a given safety operational sequence.

2. Where it is determined that failure of an electrical system component can cause undesired mechanical motion of a valve or other fluid system component and this motion results in loss of the system safety function, it is acceptable, in lieu of design changes that also may be acceptable, to disconnect power to the electric systems of the valve or other fluid system component. The plant technical specifications should include a list of all electrically-operated valves, and the required positions of these valves, to which the requirement for removal of electric power is applied in order to satisfy the single failure criterion.

3. Electrically-operated valves that are classified as "active" valves, i.e., are required to open or close in various safety system operational sequences, but are manually-controlled, should be operated from the main control room. Such valves may not be included among those valves from which power is removed in order to meet the single failure criterion unless: (a) electrical power can be restored to the valves from the main control room, (b) valve operation is not necessary for at least ten minutes following occurrence of the event requiring such operation, and (c) it is demonstrated

that there is reasonable assurance that all necessary operator actions will be performed within the time shown to be adequate by the analysis. The plant technical specifications should include a list of the required positions of manually-controlled, electrically-operated valves and should identify those valves to which the requirement for removal of electric power is applied in order to satisfy the single failure criterion.

4. When the single failure criterion is satisfied by removal of electrical power from valves described in (2) and (3), above, these valves should have redundant position indication in the main control room and the position indication system should, itself, meet the single failure criterion.

5. The phrase "electrically-operated valves" includes both valves operated directly by an electrical device (e.g., a motor-operated valve or a solenoid-operated valve) and those valves operated indirectly by an electrical device (e.g., an air-operated valve whose air supply is controlled by an electrical solenoid valve).

C. REFERENCES

1. Memorandum to R. C. DeYoung and V. A. Moore from V. Stello, October 1, 1973.