NRC PDR

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

SEP 4 1979

MEMORANDUM FOR: A. Schwencer, Chief, Operating Reactors Branch #1, DOR
D. Ziemann, Chief, Operating Reactors Branch #2, DOR
R. Reid, Chief, Operating Reactors Branch #4, DOR

FROM: G. Lainas, Chief, Plant Systems Branch, DOR

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON STEAM GENERATOR WATER HAMMER

The enclosed request for additional information should be sent to certain licensees for Westinghouse and Combustion Engineering plants that are not equipped with top discharge devices on the steam generator feedwater spargers and for which there are no plans to modify the feedwater systems to reduce the probability of steam generator water hammer. Those plants are listed in the enclosure. Although a steam generator water hammer has not occurred in the present piping systems of those plants, we require some basis for further assurance that it will not occur in the future, that the capability exists for the detection of water hammer and that the NRC would be notified of such an event.

We have incorporated your comments of August 14, 1979 in the enclosed request for information.

G. Lainas, Chief
Plant Systems Branch
Division of Operating Reactors

Enclosure:
As stated

Contact:
S. MacKay
X-27110

cc w/enclosure:
See next page

1147 330

7910180 136

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cc w/enclosure:
D. Eisenhut
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S. Hanauer
V. Benaroya
G. Lainas
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J. Reece (Consultant)
W. Gammill
R. Vollmer

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ENCLOSURE 1

To PWR licensees for the following plants:

Haddam Neck
Robinson 2
San Onofre 1
Turkey Point 3 and 4
Yankee Rowe
Ft. Calhoun
Maine Yankee
Palisades

Gentlemen:

RE: STEAM GENERATOR WATER HAMMER

In response to our letter of September 2, 1977 regarding steam generator water hammer you indicated that, based on your operating experience, modifications were not necessary to further reduce the probability or consequences of steam generator water hammer at your facility. Although your operating history does not show that such water hammer has occurred in your present piping arrangement, we require further assurance that steam generator water hammer will not occur in the future and that surveillance procedures would be adequate to detect water hammer or damage from water hammer if it were to occur.

Your response to the enclosed request for information, together with previously supplied information, will provide a basis for a determination regarding the need for modifications to your feedwater system to prevent steam generator water hammer. Your response is needed within 60 days so that we may maintain our schedule for evaluating the potential for water hammer at your facility.

Chief,
Operating Reactors Branch #
Division of Operating Reactors

ENCLOSURE 1

REQUEST FOR INFORMATION REGARDING THE POTENTIAL FOR STEAM GENERATOR WATER HAMMER AT PRESSURIZED WATER REACTORS WITH FEEDRINGS THAT DISCHARGE FROM THE BOTTOM

AUGUST 1979

1. Provide information that demonstrates that the feedwater system and steam generator water level at your facility have been subjected to those transient conditions that are conducive to water hammer, i.e., the addition of cold feedwater or auxiliary feedwater to steam-filled feedwater piping and feedring. See NUREG 0291 Page 4 that was forwarded to you on September 2, 1977. Include the following:

   1.1 Describe the expected behavior of steam generator water level as a result of reactor trip from power levels greater than 30% of full power. Include actual plant measurements of steam generator level and other available related data such as feedwater flow and auxiliary feedwater flow.

   1.2 Provide the number and causes of loss of feedwater events during the operational history of the plant. You may refer to material submitted previously.

   1.3 Provide the number and causes of loss of off-site power events during the operational history of the plant.

2. If administrative controls have been adopted to limit the flow of auxiliary feedwater for the purpose of reducing the probability of water hammer, show when they were adopted and give the answers to items 1.1, 1.2 and 1.3 for before and after such controls were established.

3. If administrative controls have been adopted to limit the flow of auxiliary feedwater for the purpose of reducing the probability of water hammer, show that an adequate water inventory and flow will be maintained to accomodate all postulated transient and accident conditions.

4. If auxiliary feedwater flow in your facility is not at present initiated automatically for normal and accident events, present your evaluation of whether automating the actuation of auxiliary feedwater might increase the probability of inducing steam generator water hammer. One of the signals that would automatically initiate the flow of auxiliary feedwater would be the steam generator low water level. This set point should be above the top of the main feedwater sparger to reduce the probability of steam generator water hammer.

5. Describe the means that will be used to monitor for the occurrence of steam generator water hammer and possible damage from such an event. Include all instrumentation that will be employed. Describe the inspections that will be performed and give the frequency of such inspections.

6. Describe the reporting procedures that will be used to document and report water hammer and damage to piping and piping support systems. Such reports were requested in our letter to you dated September 2, 1977.