

nrc-PDR



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

AUG 2 1979

MEMORANDUM FOR: A. Schwencer, Chief, Operating Reactors Branch #1, 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 those 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.

A handwritten signature in cursive script, appearing to read "G. Lainas".

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

Contact:  
S. MacKay  
X27110

Enclosure:  
As stated

cc w/enclosure:  
See next page

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7908290180

cc w/enclosure:

D. Eisenhut

B. Grimes

S. Hanauer

V. Benaroya

G. Lainas

E. Adensam

E. Reeves

S. MacKay

Y. Huang

D. Christiansen (EG&G)

J. Reece (Consultant)

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ENCLOSURE 1

To PWR licensees for the following plants:

Haddam Neck  
Kewaunee  
Point Beach 1 and 2  
Robinson 2  
Prairie Island 1 and 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 30 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

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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

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1. Provide information that demonstrates that the feedwater system and steam generator water level at your facility have been subjected to those transient conditions most conducive to water hammer that might be expected as a result of normal operation as well as transients and accidents. 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.
  - 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 accommodate all postulated transient and accident conditions.
4. Provide copies of the procedures for governing the control of auxiliary feedwater flow during normal and emergency operations.

5. NUREG 0578, "TMI-2 Lessons Learned Task Force Status Report and Short Term Recommendations," that was forwarded to you on July 25, 1979, includes the recommendation (page A-31) that the flow of auxiliary feedwater be initiated automatically. Regardless of whether such initiation is presently automatic at your facility, please list the signals that will automatically initiate the flow of auxiliary feedwater including the steam generator water level set point. This set point should be above the top of the main feedwater nozzle to reduce the probability of steam generator water hammer.
  
6. 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. If such automation might increase the probability of water hammer in your facility please reconsider the need for modifications to prevent water hammer.
  
7. 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.
  
8. Describe the reporting procedures that will be used to document and report water hammer and damage to piping and piping support systems. Such incidents occurring in safety related systems should be reported to the NRC within 30 days. Since part of the main feedwater piping is used for the delivery of auxiliary feedwater and a water hammer in the feed-

water system can be transmitted throughout the system, all water hammers in the main feedwater system should also be reported.

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