



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

To: A L Chaffer

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## TECHNICAL ISSUE SUMMARY

Date: 7/23/92

### POTENTIAL BWR REACTOR VESSEL LEVEL DEFICIENCIES

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**PROBLEM:** Northeast Nuclear Energy Company (NNECO) informed the NRC that based upon analyses of level oscillations observed during a July 4 Millstone 1 plant cooldown, the wide range reactor vessel level indicators used during accident conditions may be inoperable. (See the drawing on the reverse side.)

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**EVALUATION:** NNECO engineers postulate that the level oscillations are caused by non-condensable gasses coming out of solution as the GEMAC instrument reference legs depressurize. They believe that during a large break loss of cooling accident, non-condensable gasses could come rapidly out of solution and displace much of the water contained in the reference leg. This phenomena would result in an erroneously high vessel level indication, misleading the operators in their performance of Emergency Operating Procedures responses.

The level instrumentation of concern at Millstone 1 is the GEMAC "cold" condensing-pot system which is used during normal power operation as level input for the feedwater system, and during accident conditions to provide reactor vessel level indication to the operators. The vessel level oscillations were not observed in the independent Yarway level measuring instruments used for both reactor water level readout indication during normal power operation and all protective reactor trip functions and ECCS actuation signals. The GEMAC instrumentation at Millstone 1, unlike most BWR's, do not feed any protective or ECCS functions, but do provide vital information to the operators during normal and accident conditions.

An independent consultant for NNECO has calculated that the indicated error could be as much as 20 feet. In contrast, GE and the BWR Owners Group (BWROG) contend that the instrumentation error would be only 4 inches, and thus within the plant design basis. This assumes the reference leg instrumentation is correctly installed, monitored, and maintained per GE Service Information Letter (SIL) 470 of 9/16/88.

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**LICENSEE ACTION:** NNECO has stated that Millstone 1 will not restart until this problem is resolved. They are considering a modification to the GEMAC condensate pots which would include reorienting the pots from a vertical to a horizontal slope and venting the pots to the lower tap of the reference leg.

GE and the BWROG activated the Regulatory Response Group (RRG) on 7/22/92. Their charter is to obtain plant design, installation variances, protective and ECCS functions, and operational experience of reactor vessel instrumentation.

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**NRC ACTIONS:** An NRC Information Notice will be issued ASAP. In addition to resident inspector review, NRR and Region I specialist inspectors will be at Millstone commencing 7/27/92. NRC has called for a meeting with GE and the BWROG on 7/29/92 to discuss the findings of the RRG review.

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**REFERENCES:** Event Notification 23876, 7/15/92 7/22/92 Morning Report

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*M. J. Cooper for*  
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