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CRUTCHFIELD,D. Operating Reactors Branch 5

SUBJECT: Discusses proposals reveived to fulfill requlatory requirement re installation of reactor vessel water level sys in response to Generic Ltr 83-12, "Inadequate Core Cooling Instrumentation Sys."

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	NRR/DSI DIR 09	1	1	NRR/DSI/CPB 10	3	3
	NRR/DSI/ICSB 14	1	1	NRR/DSI/RSB 13	1	1
	ORB5 PM	1	1	REG FILES 04	1	1
	RGN1 07	1	1			
EXTERNAL:	ACRS 17	10	10	LPDR 03	1	1
	NRC PDR 02	1	1	NSIC 06	1	1
	NTIS 05	1	1			
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Vice President

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November 29, 1983

Director of Nuclear Reactor Regulation
Attention: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Inadequate Core Cooling Instrumentation System
Generic Letter 82-12
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

In a letter dated March 10, 1983, RG&E acknowledged the regulatory requirement to install a reactor vessel water level system. RG&E has received proposals from Combustion Engineering and Westinghouse for the two types of instruments generically approved by the Staff for use in PWRs for tracking reactor coolant system inventory. A proposal was also received from Technology for Energy Corporation for a gamma thermometer device. In addition, RG&E contracted with Nuclear Projects, Inc. (NPI, the SNUPPS organization) to perform an independent review and evaluation of systems for reactor coolant inventory indication.

One conclusion of the NPI study is that "existing plant instrumentation and procedures are adequate to advise operators of how to respond to voids in the reactor vessel head or distributed through the reactor coolant system." RG&E's investigation of a differential pressure system (dp) similar to that proposed by Westinghouse and a heated junction thermocouple system (HJTC) similar to that proposed by Combustion Engineering, concluded that either system will fulfill the requirement to trend reactor coolant inventory. RG&E's evaluation of a gamma thermometer device similar to that proposed by Technology for Energy Corporation concluded that this device may, in the future, be proven to provide acceptable vessel inventory indication. It may be relatively easy to install, and it may have future application for power monitoring. Uncertainty over potential plant specific installation problems and lack of a completed equipment test and qualification program have prevented us from giving further consideration to this system at this time. Accordingly, the choice

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of system to be installed is limited to those types generally approved by NRC. Because of the conclusion of the NPI study and RG&E's perceived need for a vessel inventory trending instrument, the system choice is based primarily on cost.

Two approaches have been taken to evaluate the total installed costs of the HJTC and dp systems. The first approach has been to contact utilities that have already installed one of these systems, discuss their experiences, identify particular problems, and obtain data on actual installed costs. The second approach has been to obtain firm quotations for equipment supply and other work that suppliers would perform and then to identify additional necessary work and estimate the costs of installation at Ginna.

The costs at other plants that we contacted for installing the Combustion Engineering and Westinghouse systems have ranged from more than two million dollars up to eight million dollars. The upper range cost estimate was for a complete inadequate core cooling system package that included more than just a reactor coolant inventory monitor. Plant specific work at each site (for example, containment penetrations, and reactor vessel head modifications) makes each installation unique, however, the cost estimate for an inventory monitor at Ginna is probably intermediate between the two extremes.

Our plan is to install a differential pressure type instrument to add inventory trending to our accident monitoring capability. The system will monitor from at least the bottom of the hot leg to near the top of the head. Decisions on system details such as where the RCS attachments will be made, transmitter locations, tubing routing and software and display information are yet to be made. Equipment may be purchased from a single vendor (Westinghouse) or may be designed and procured by RG&E.

Vendor delivery of equipment has been quoted as eighteen months. Engineering of the system and coordination of this work with previously scheduled modifications result in an installation during the 1986 refueling outage. Final equipment and system operability testing will be performed following plant startup. Additional information about the instrument and the installation schedule will be available as we proceed with engineering.

RG&E has in service adequate instrumentation for detection of inadequate core cooling, including subcooling margin monitors and core exit thermocouples. Redundant subcooling margin monitors to meet TMI requirements were installed in 1979 and are currently operable. RG&E also plans to upgrade the existing 39 core exit thermocouples to meet NUREG-0737 requirements. This work will be performed during the 1984 and 1985 refueling outages. The long

lead time, and one of the significant cost items for this upgrade, results from the new containment penetrations necessary to support this modification. The existing core exit thermocouple configuration, including three thermocouples in the upper head, is expected to provide indication of upper vessel voiding for all but the most extreme containment environmental conditions which may result from LOCAs. Only large break LOCAs, which have been shown to be precluded by "leak before break" work sponsored by RG&E for the Ginna reactor coolant system, can produce the extreme environmental conditions which might cause the thermocouple cables to fail. Thus, sufficient indication will be available to plant operators to diagnose and mitigate potential inadequate core cooling events, prior to installation of the inventory trending device and upgrade of the core exit thermocouple.

RG&E has chosen to implement a dp type inventory trend monitor to complement our existing inadequate core cooling instrumentation based partly on previous regulatory endorsement of this type of instrument. Please inform us of any open issues or concerns that the staff may have about this system.

Very truly yours,

John E. Maier