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

NOV 7 1979

1979 NOV 9 AM 11 49

MEMORANDUM FOR: Neal Moore, Acting Assistant Director for Exports and Imports and International Safeguards, DOIP

FROM: Karl Kniel, Chief, Core Performance Branch, DSS

SUBJECT: RESPONSE TO QUESTIONS RAISED IN THE MEMORANDUM TO KARL KNIEL FROM NEAL MOORE, DATED NOVEMBER 1, 1979

The following responses are provided to the questions raised in the subject memorandum.

Question 1. What functions do the detectors perform in reactor operations and how essential to the safe operation of the reactors are they? What are the consequences of continuing to operate the Tarapur Units with defective probes.

The TIP (Traversing Incore Probe) system is used to calibrate the LPRMs (Local Power Range Monitors). In particular a single TIP is run through a large number of LPRMs in order to assure that their relative readings are known. The LPRMs are combined in particular ways to form the Average Power Range Monitor (APRM) System which is used as a reactor power input to the reactor protection system. The reactor protection system will not assure that the reactor is shutdown in response to severe transients or accidents if the reactor power input is incorrect.

In addition the LPRM outputs are used by the plant computer to obtain the core power distribution during operation. From the core power distribution the core operating parameters, such as minimum critical power ratio (MCPR), maximum linear heat generation rate (MLHGR) and the maximum average planar heat generation rate (MAPLHGR), are determined. Decalibration of only a few of the LPRMs could lead to operation of the reactor in a manner such that the initial conditions assumed for anticipated transients and accidents are violated.

Question 2. Do technical specifications or operating procedures normally dictate how many probes should be maintained as spares for a BWR of the Tarapur Type, or, it not, what would be your judgement for maintaining a stock of spares.

Technical Specifications do not specify any number of probes to be kept as spares. We are not aware of the requirements of the Tarapar operating procedures. However, the Technical Specifications for boiling water

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reactors licensed by NRC require the calibration of the LPRMs once each effective full power month. In the event that a TIP is not operable this calibration cannot be performed and, unless relief from the Technical Specification requirements is obtained from the NRC operation cannot continue. Simple prudence, therefore, dictates that spares be kept. The number would depend on the failure rate of TIPs and the lead time for obtaining replacements.

Question 3. How would the continued operation of a domestic reactor be affected, assuming the existence of conditions similar to those that now exist at Tarapur?

See the answer to Question 2.

Question 4. In your judgement would the export of any or all of the probes be required before March 10, 1980?

If the question is interpreted to mean will Tarapur need any of the probes by March, 1980 the answer is yes, according to the General Electric letter of October 1, 1979. It is our judgement that it is prudent on the part of Tarapur to have at least one spare for each probe, and thus the request for six probes is reasonable.

Karl Kniel, Chief
Core Performance Branch
Division of Systems Safety

cc: W. Brooks
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