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MEMO OF TELECON

DATE: November 13, 1987

TIME: 11:30 AM

PERSON CALLING: G. B. Stramback

PERSON CALLED: C. H. Berlinger (NRC-NRR, 301-492-8414)

SUBJECT: Computer Software Error

Carl Berlinger was called in order to inform the NRC of a condition determined to be not reportable but considered to be Germane-to-Safety. This conclusion is based upon GE completing its evaluation as to reportability under 10CFR Part 21.

BACKGROUND

At a BWR-4, utility personnel discovered that plant thermal values were being incorrectly calculated by the plant process computer. The problem was determined to be an error (i.e., an improperly set constant) in the new ARTS* software, which resulted in the process computer not properly utilizing a conservative multiplier when calculating the operating off-rated MAPLHGR* value relative to the MAPLHGR limit (this relationship is MAPRAT*). This resulted in setting thermal limits which were non-conservative with respect to the utility technical specifications for core thermal power less than 96% and core flow less than 80%. Utility personnel reviewed the plant operation during the time the computer problem existed and concluded that actual plant operation did not violate the technical specification thermal limits.

BASIS

Plant operation up to the incorrectly calculated MAPRAT/MAPLHGR limit does not, by itself, represent a safety concern. The technical specification MAPLHGR limit is the most limiting composite of the fuel thermal-mechanical and the loss of coolant accident (LOCA) thermal limits. In the case of this utility the MAPLHGR limit was determined by the limiting fuel thermal-mechanical criteria only. Recent MAPLHGR limit evaluations based on the improved SAFER/GESTR* analysis substantiate the existence of significant margin between the LOCA and the fuel thermal-mechanical MAPLHGR limits. Therefore, the software error would not result in any safety concern or violation of the 10CFR50.46 (LOCA) limits.

If the technical specification MAPLHGR limit had been exceeded and had a transient also occurred, it is possible that the fuel thermal-mechanical design basis could have been exceeded. However, this would not necessarily result in any fuel failure, and the consequences would be within those already analyzed in the FSAR.

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Another thermal limit, the minimum critical power ratio (MCPR) provides the necessary margin of assurance for safe plant operation, even if such operation were accompanied by a power or flow transient. No safety limit (i.e., MCPR, reactor pressure or coolant level) could have been violated as a direct result of this software error.

It is concluded that the error in the process computer software does not affect the MCPR safety limit nor significantly impact the MAPLHGR limit therefore, it does not represent a substantial safety hazard and is not reportable under 10CFR Part 21.

CORRECTIVE ACTIONS

The error occurred in the first ARTS application and, as a result of this experience, procedures have been modified and the verification checklist updated to correct the problem and avoid its reoccurrence. Also, the ARTS package has been incorporated into the standard process computer software specification which ensures that each application is extensively reviewed and verified.

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* ARTS = APRM/RBM Technical Specification Improvement Program
MAPLHGR = Maximum Average Planar Linear Heat Generation Rate
MAPRAT = Ratio to the MAPLHGR Limit
SAFER/GESTR= Set of LOCA Analysis Codes