

APR 14 1982

MEMORANDUM FOR: Robert L. Tedesco, Assistant Director for Licensing
Division of Licensing

FROM: Themis P. Speis, Assistant Director for Reactor Safety
Division of Systems Integration

Malcolm L. Ernst, Assistant Director for Technology
Division of Safety Technology

SUBJECT: LOW POWER OPERATION RISK ASSESSMENT

On several occasions in the past, the Reactor Systems Branch has been requested by the Division of Licensing to provide an SER on the risk of low power operation for various plants. Most recently, we were requested to provide a risk assessment for low power operation for the Virgil C. Summer Nuclear Station. This SER input was requested with an extremely short two-day deadline. This points up the need for establishing some ground rules for this type of activity. Since the need for this work and the information available may vary from case to case, we suggest the following three alternatives.

The first alternative would apply if no special needs exist for the license (e.g., if all the requirements have been met for a full power license but granting of a low power [5%] license would be expeditious). In that case, we suggest that the project manager could include the following generic statement in the SER:

"Risk assessment studies on low power operation (less than 5% of full power) were performed for a sample of five plants over the past two years (TMI-1, Sequoyah, Diablo Canyon, LaSalle and San Onofre). Based on this work, the staff is confident that the relative risk due to low power operation is at least two order of magnitude below the risk of operation at full power for (plant name). There are three major contributors to the substantial reduction in risk for low power testing as compared to equilibrium full power operation. First, there is additional time available for the operators to correct the loss of important safety systems needed to mitigate relatively high risk events, or to take alternate courses of action. Second, the fission product inventory during this time would be very much less than during full power operation. Third, there is a reduction in required capacity for mitigating systems at low power."

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The second alternative would apply if for any valid reason the above SER insert is not adequate and a more definitive risk study is required. We then recommend that you request the applicant to do the relative risk assessment for the plant and it will be reviewed as a combined effort of the Reactor Systems Branch (RSB) and the Reliability and Risk Assessment Branch (RRAB).

As a last resort, if either of the above alternatives cannot be achieved and a low power risk assessment is deemed necessary, at least 30 days notice will be required to the branches involved. It has been agreed that RRAB will take the lead in this study with assistance from the Reactor Systems Branch when needed. The minimum information that we will require from the applicant to perform this review will include:

1. A description of power history for the proposed low power test program;
2. An estimate of the passive system heat losses (vessel and piping heat losses) through the insulation at the low power operating temperature;
3. A full power probabilistic risk assessment (PRA) for an equivalent plant to the one under consideration;
4. Descriptions of any unique plant features that would affect the risk of low power operation.

I am sure you recognize that the quality of the risk numbers generated will be strongly a function of the information and time available.

Original Signed By
Themis P. Speis

Original signed by:

Themis P. Speis, Assistant Director
for Reactor Safety
Division of Systems Integration

Malcolm L. Ernst, Assistant Director
for Technology
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RSB Members

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