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June 29, 1983

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Director of Nuclear Reactor Regulation  
Attention: Mr. G. W. Knighton, Chief  
Licensing Branch No. 3  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

SUBJECT: Waterford SES Unit 3  
Docket No. 50-382  
Response to NRC Questions  
Depressurization and Decay Heat Removal

Reference: Letter dated March 27, 1982 from Tedesco (NRC) to Maurin (LP&L)

Dear Sir:

In the referenced letter the NRC requested that LP&L respond to a series of 14 questions concerning the depressurization and decay heat removal capability of Waterford 3.

Because of the extensive nature and scope of the questions LP&L and other interested utilities supported a CE Owners Group study to develop responses to the questions. The Owners Group effort addressed two distinct areas: 1) a generic performance evaluation of depressurization and decay heat removal, and 2) a plant specific assessment of the potential change in risk associated with adding PORVs. Several of the NRC questions were outside the scope of the Owners Group study. These questions (6a, 6b, 12, 13a, 13c and 13d) are addressed in a separate report.

Enclosed please find seven copies of the following documents:

1. CEN 239, "Depressurization and Decay Heat Removal, Response to NRC Questions", June 1983
2. CEN 239 Supplement 2, "Probabilistic Risk Assessment of the Effects of PORVs on Depressurization and Decay Heat Removal, Waterford Steam Electric Station Unit 3", June 1983
3. "Depressurization and Decay Heat Removal, Waterford 3 Response to NRC Questions 6a, 6b, 12, 13a, 13c, 13d", June 1983

The enclosed responses to the NRC's questions indicate the following for the depressurization and decay heat removal capability of Waterford 3:

- o The existing auxiliary pressurizer spray (APS) provides a safety-related method for rapid depressurization enabling effective decay heat removal using the steam generators consistent with the recommendations of NRC Branch Technical Position RSB 5-1.

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- o The rate of reactor coolant system depressurization can be more effectively controlled by the APS than with PORV's.
- o The APS provides a performance level comparable to PORV's for mitigating steam generator tube rupture (SGTR) events and for minimizing primary-to-secondary leak rate. As many as three tubes could be simultaneously ruptured in each steam generator and the plant could be cooled to shutdown cooling entry conditions using the safety grade APS without exceeding off-site dose limits.
- o The addition of PORV's would have a minimal impact on core damage frequency. The results of the probabilistic risk assessment for Waterford 3 indicate that core damage frequency would decrease by  $1.1 \times 10^{-6}$  per year for manually actuated PORV's and that core damage frequency would increase by approximately  $1.5 \times 10^{-7}$  per year for automatically actuated PORV's. These values are very small compared to the NRC safety guideline of  $10^{-4}$  core melts per year.
- o For the total loss of feedwater event the operator has significantly more time to regain the steam generators as heat sinks, either by restoring emergency feedwater or by initiating steam generator depressurization, than by initiating "feed and bleed" in order to prevent core uncover.
- o The firewater pumps (with minor piping and flange modifications) and the condensate pumps at Waterford 3 can be aligned to deliver feedwater to the steam generators to facilitate steam generator cooldown during certain postulated low probability scenarios, beyond the plant design bases, involving the extended loss of both main feedwater and emergency feedwater. Utilization of the condensate and firewater pumps for this purpose, in the unlikely event of extended loss of both the main feedwater system and the safety grade three pump emergency feedwater system, would decrease core damage frequency as indicated in the response to Question 8 in CEN 239 Supplement 2.
- o The initial cost of design and installation of PORV's at Waterford 3 is estimated to be approximately \$2.28 million. Replacement power cost will total \$11.7 million to \$32.7 million depending on the number of PORV actuations over the plant lifetime.

In summary, the results of the information developed in response to the NRC's questions indicate that the existing capability of Waterford 3 for depressurization and decay heat removal is adequate and comparable to the capability that could be provided by the addition of PORV's, and that from cost/benefit and offsite dose analyses, there appears to be no clear benefit or incentive to justify the addition of PORV's for Waterford 3.

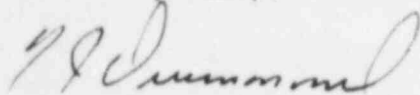
In Supplement 3 to the Waterford SER the following license condition was identified:

"LP&L must respond to rapid depressurization capability prior to fuel load or provide a justification for safe operation of the plant in the interim."

In letter W3P82-2630, dated September 9, 1982, LP&L provided the required justification for safe operation. We consider that the enclosed information satisfies the remaining requirement of the subject license condition.

Should you have any questions or comments in this matter please contact me or Mike Meisner at (504) 363-8938.

Yours very truly,



F. J. Drummond  
Project Support Manager-Nuclear

FJD/MJM/ssd

Enclosures

cc: W. M. Stevenson, E. L. Blake, J. Wilson (NRC), C. Liang (NRC), G. L. Constable