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 RICHEY,R.B. Carolina Power & Light Co.
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SUBJECT: Responds to Generic Ltr 88-11 re Reg Guide 1.99, Rev 2,
 "Radiation Embrittlement of Reactor Vessel Matls."

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Carolina Power & Light Company

P. O. Box 1551 • Raleigh, N. C. 27602

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R. B. RICHEY, Manager
Nuclear Services Department

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SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
GENERIC LETTER 88-11 / REGULATORY GUIDE 1.99 REV. 2
RADIATION EMBRITTLEMENT OF REACTOR VESSEL MATERIALS

Gentlemen:

In response to Generic Letter 88-11, Carolina Power & Light Company herein provides the technical evaluation and proposed schedule for implementation of Revision 2 of Regulatory Guide 1.99 (RG 1.99), "Radiation Embrittlement of Reactor Vessel Materials" for the Shearon Harris Nuclear Power Plant (SHNPP). The Generic Letter, dated July 12, 1988, requires licensees to submit an evaluation of using the new RG 1.99 methodology for determining reactor vessel embrittlement and a proposed schedule for implementing any necessary followup actions. CP&L has evaluated the RG 1.99 methodology and expects that its use will require revision of the SHNPP heatup and cooldown pressure-temperature curves. Use of the new methodology may also impact low temperature overpressure protection setpoints. As a result, CP&L is progressing to quantify the impact and revise the appropriate Technical Specification (TS) limits. The expected effects of the new methodology and CP&L's proposed actions are further discussed below.

Evaluation

Carolina Power & Light Company has reviewed RG 1.99 Rev. 2 and performed an in-house evaluation to determine the effect of the new methodology on the SHNPP heatup and cooldown pressure-temperature curves. As anticipated by the Generic Letter, the new methodology is expected to narrow the operating window at SHNPP. The primary cause of the more rapid accumulation of embrittlement is the weighting factor in RG 1.99 Rev. 2 assigned to nickel. Due to the accelerated embrittlement, CP&L has determined that it may be necessary to revise the TS heatup and cooldown pressure-temperature curves and possibly the associated LTOPS setpoints and enabling temperatures. The heatup and cooldown pressure-temperature curves for SHNPP are incorporated in the Technical Specification as Figures 3.4-2, 3.4-3 and Table 4.4-6. The LTOP setpoints are contained in TS Figure 3.4-4.

Actions / Schedule

In order to appropriately implement the RG 1.99 Rev. 2 methodology in a reasonable and deliberate manner, CP&L is planning the following course of actions.

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- o CP&L will submit revised Technical Specifications to incorporate the impact of RG 1.99 Rev. 2 into the appropriate curves and figures in the Technical Specifications. The scope and schedule for this submittal will depend on the extent of the narrowing of the operating window provided by the new curves. As noted by the NRC and supported by our in-house evaluation, the use of RG 1.99 Rev. 2 is expected to make the operating window provided by LTOPS progressively more restrictive in subsequent cycles. Carolina Power & Light will evaluate the impact of the new curves on heatup and cooldown operations and the impact on the LTOP setpoints.

If the revised methodology affects the heatup and cooldown curves but does not severely impact the LTOPS setpoints, (i. e. the setpoints can be adjusted to allow long term continued operation), the revised TS will be submitted by July 1, 1989. This schedule will complete the necessary actions to implement these changes within the schedule specified in the Generic Letter and allows sufficient time to obtain the results of the first reactor vessel surveillance specimen test, which may be used as a verification point for the new curves, as well as provide the six month lead time requested by the staff for review of technical specification change requests.

If however the mechanism for providing low temperature overpressure protection must be significantly revised, CP&L will submit revised Technical Specifications for the necessary changes in time to support completion of all required actions prior to the end of the third refueling outage. The third refueling outage is presently scheduled for mid 1991 (approximately 3 years from the effective date of RG 1.99 Rev. 2). In this case, CP&L will reevaluate the application of LTOPS and determine if there are alternative approaches to providing overpressure protection at low temperatures at SHNPP. Two approaches that will be considered are (1) reliance on the RHR suction reliefs concurrent with the removal of the automatic RHR isolation signal and (2) maintenance of a bubble in the pressurizer during low temperature operations. The provisions of the proposed revision to Standard Review Plan 5.2.2 concerning a fracture criterion and administrative control of the upper end of the pressure-temperature curve for LTOP systems will be considered in CP&L's evaluation.

- o In view of the loss of margin that is expected to occur by using RG 1.99 Rev. 2, CP&L believes that it is prudent to take several short term actions. First, the heatup and cooldown curves will be recalculated based on the current best estimate vessel fluence and the Rev. 2 methodology. It is expected that these interim curves, based on Rev.2 methodology and best estimate vessel fluence, will be more conservative than the existing Technical Specifications limits. If indeed they are more restrictive, CP&L will administratively implement the more conservative limits associated with the interim curves. This action will be completed and appropriate instructions provided to the plant operators by May 22, 1989. Second, the operating window provided by LTOPS will be recalculated and any necessary change implemented via applicable instrumentation calibration procedures as reasonably achievable without resorting to the alternative approaches described above. This action will be completed prior to first entry into Mode 4 that occurs after May 22, 1989.

Summary

In order that conservative operation with respect to the new methodology is established quickly, CP&L commits to the following actions.

- 1) Establish interim curves based on the new methodology and administratively implement them by May 22, 1989.
- 2) If modification of the existing LTOPS setpoints is determined necessary, it will be implemented prior to the first entry into Mode 4 after May 22, 1989.

To ensure that SHNPP will comply with the actions required in Generic Letter 88-11, CP&L will submit proposed changes to the Technical Specifications as follows.

- 3) If the new methodology results in curves which do not significantly impact the operating window, revised TS will be submitted by July 1, 1989.
- 4) If the new methodology impacts the operating window such that significant changes to the LTOPS settings or method is necessary then revised TS will be submitted for staff review in time to support completion of all required actions prior to the end of the third refueling outage (presently scheduled for mid 1991, approximately 3 years from the effective date of RG 1.99 Rev. 2).

Carolina Power and Light believes that this approach provides a reasonable, measured and timely response to implementation of Regulatory Guide 1.99 Revision 2.

Please refer any questions regarding this submittal to Mr. Steven Chaplin at (919) 836-6623.

Yours very truly,


R. B. Richey

RBR/SDC

cc: Mr. W. H. Bradford
Mr. B. C. Buckley
Mr. M. L. Ernst

