



Carolina Power & Light Company

SERIAL: HNP-93-828
10 CFR 50.90

JUL 27 1993

Letter Number: HO-930129

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT SUPPLEMENT
REACTOR COOLANT SYSTEM PRESSURE-TEMPERATURE LIMITS

Gentlemen:

Carolina Power & Light Company (CP&L) herein supplements a request to amend the Technical Specifications originally submitted on February 26, 1993 regarding the Reactor Coolant System Pressure-Temperature Limits for the Shearon Harris Nuclear Power Plant (SHNPP).

In response to NRC staff questions regarding peak pressure and pressure margin to the Appendix G Pressure-Temperature limits for the mass input event, CP&L is submitting a more detailed explanation of the factors involved in determining the transient peak pressure for the limiting mass input event. Also, the attachment to this letter provides a tabulation of the change in margin between the Pressure-Temperature limits and the transient peak pressure for the current 5 EFPY and the proposed 11 EFPY curves.

The peak pressure resulting from a mass input event will depend on several factors, including type of mass input event, flowrate, initial reactor coolant system (RCS) pressure, and Low Temperature Overpressure Protection (LTOP) system setpoint. For SHNPP, the limiting case mass input event is the inadvertent startup of one charging/safety injection (SI) pump in the SI mode, as noted in the BASES to Technical Specification (TS) 3/4.4.9 and FSAR Section 5.2.2.11. The thermal-hydraulic analysis for the limiting case mass input event does not take credit for letdown flow, residual heat removal (RHR) piping volume, or RHR relief valve operation as a primary method of event mitigation, even though they may be available. SI flowrate is dependent, in part, upon the RCS backpressure. Although the normal RCS pressure during plant modes 4 and 5 when LTOP system is "armed" is approximately 350 psig, the initial pressure assumed in the analysis is a higher pressure associated with the LTOP setpoint. This assumption remains the same for the revised analysis, in support of the Technical Specification Change Request, as for the current TS. The LTOP setpoints have not been revised for the proposed Technical Specification Change Request. The LTOP setpoint at SHNPP is dependent upon the RCS temperature, as noted in Figure 3.4-4 of the TS. As RCS temperature increases, the LTOP setpoint will also increase and will result in a higher peak transient pressure during a mass input event than would be the case at lower temperatures. Likewise, the Appendix G Pressure-Temperature limits are also temperature-dependent and are less restrictive at higher temperatures. As a result, the pressure margin available between the peak transient pressure and the Appendix G Pressure-Temperature limit will also vary.

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The attachment provides data for the mass input event at six representative temperatures and compares the old (current) analyses with the revised analyses.

As stated in CP&L submittal NLS-93-059, dated February 26, 1993, "RCS P-T Limits," the revised analysis has benefitted significantly from less restrictive Appendix G Pressure-Temperature limits and by reducing the conservative mass input flowrate from that obtained with a depressurized RCS to that obtained with a water solid RCS pressurized at the LTOP setpoint. Adverse effects were also considered; namely, the dynamic pressure drop from the beltline location to the pressure sensor¹ and an increased pressure sensor uncertainty. As a result of all of these effects, a net benefit was obtained which, in general, increased the pressure margin available at any given RCS temperature. This increased pressure margin was taken advantage of by extending the Pressure-Temperature limits so that they become effective at lower temperatures but still provide adequate pressure margin.

As part of the original license amendment request CP&L submitted a discussion of the basis for the Company's determination that the proposed changes do not involve a significant hazards consideration. The information provided herein provides greater detail than the original submittal and does not introduce new changes or changes to the scope of the original request. As a result, the Significant Hazards Determination submitted with the original remains valid and bounding.

Please refer any questions regarding this submittal to Mr. L. S. Rowell at (919) 362-2287.

Yours very truly,

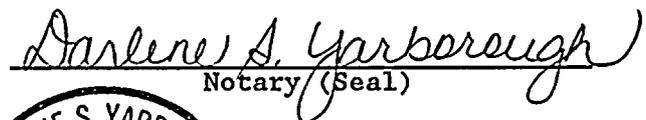


W. R. Robinson

SDC/sdc

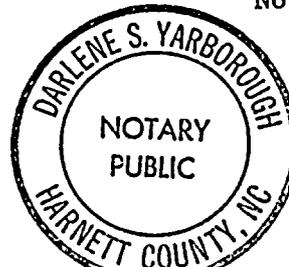
Attachment

W. R. Robinson, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.


Notary (Seal)

My commission expires: 2-5-95

cc: Mr. Dayne H. Brown
Mr. S. D. Ebnetter
Mr. N. B. Le
Mr. J. E. Tedrow



¹ The dynamic pressure drop between the reactor vessel beltline materials and the pressure sensor location is approximately 50 psi when all three reactor coolant pumps (RCPs) and two RHR pumps are in operation. With only two RCPs and two RHR pumps in operation, the dynamic pressure drop is reduced to approximately 26 psi.

SELECTED MASS INPUT DATA

RCS TEMPERATURE (°F)	<u>100</u>	<u>125</u>	<u>150</u>	<u>200</u>	<u>250</u>	<u>325</u>
PORV HIGH LTOP SETPOINT (psig)	380	410	410	410	410	450
CURRENT ANALYSIS						
TRANSIENT PEAK PRESSURE (psig)	463	490	490	490	490	527
(1) LIMITING "APPENDIX G" P-T PRESSURE (psig)	473	502	513	534	769	1664
PRESSURE MARGIN (psi)	10	12	23	44	279	1137
REVISED ANALYSIS						
(3) TRANSIENT PEAK PRESSURE (psig)	489	519	519	519	519	555
(1)(2) LIMITING "APPENDIX G" P-T PRESSURE (psig)	505	547	545	641	986	2250
PRESSURE MARGIN (psi)	16	28	26	122	467	1695
CHANGE (INCREASE) IN PRESSURE <u>MARGIN</u> FROM CURRENT ANALYSIS TO REVISED ANALYSIS (psi)	+6	+16	+3	+78	+188	+558

- (1) The Appendix G P-T limit pressure noted is the maximum pressure allowed by the most limiting of the heatup or cooldown rate for the RCS temperature indicated.
- (2) The Appendix G P-T limits stated above for the new analysis (and proposed TSCR) include the same "built-in" instrumentation errors of -60 psig and +10°F as for the old (current) analysis to enable a direct comparison to be made of the changes. The actual Appendix G P-T curves in the proposed TSCR will not include instrumentation uncertainty. Instrument uncertainties are considered in the analysis as discussed in the previous CP&L submittal and will be reflected in plant procedures.
- (3) The revised analysis has an increased pressure instrumentation uncertainty of 5 psi, which has been included in the transient peak pressure identified above.