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SUBJECT: Forwards addl info re RCS pressure-temp limits Tech Spec change request, per NRC 900416 request.

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Enclosed for the Bureau are two copies of a letterhead memorandum dated and captioned as above.



Carolina Power & Light Company

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APR 20 1990

SERIAL: NLS-90-091

A. B CUTTER
Vice President
Nuclear Services Department

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
RCS PRESSURE-TEMPERATURE LIMITS SUPPLEMENTAL INFORMATION

Gentlemen:

By letter dated March 16, 1990 the NRC staff requested additional information to support their review of the Harris Plant RCS Pressure-Temperature Limits Technical Specification Change Request submitted on June 30, 1989. Attached is the information requested. It provides additional detail and related information. However, it has no impact on the significant hazards consideration contained in the June 30, 1989 submittal.

Please refer any questions regarding this submittal to Mr. Steven Chaplin at (919) 546-6623.

Yours very truly

A. B. Cutter

ABC/SDC

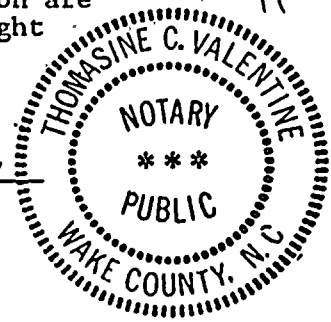
Enclosure

- cc: Mr. R. A. Becker
- Mr. Dayne H. Brown
- Mr. S. D. Ebnetter
- Mr. J. E. Tedrow

A. B. Cutter, 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.

9004300027	900420
PDR	ADOCK 05000400
F	PDC

Thomasine C. Valentine
Notary (Seal)



My commission expires: 1-31-95

Adol
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THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

PHYSICS 311

LECTURE 1

1.1

1.1.1

NRC Request:

Describe the thermal-hydraulic analysis performed in the Power Operated Relief Valve (PORV) setpoint study to prevent a potential violation of allowable Pressure/Temperature (P/T) limits during plant heatup & cooldown. Include the following:

- a) Major assumptions used in the current analysis as well as the analysis presented in the Final Safety Analysis Report (FSAR).
- b) Brief discussion of the method/computer code used in the analysis.
- c) Transient Reactor Coolant System (RCS) pressure at various PORV setpoints.
- d) Comparison of the peak RCS transient pressure with the allowable P/T limits to confirm that Appendix G P/T limits will not be violated.

CP&L Response:

The revised Low Temperature Overpressure Protection (LTOP) setpoints, submitted as part of the June 30, 1989 Technical Specification Change Request, were derived using the same methodology employed in development of the original LTOP setpoints currently described in the FSAR and SER (References 1 through 6). This methodology is documented in the Westinghouse Owner's Group (WOG) Report dated July 1977 and its Supplement of September 1977.

The WOG methodology utilized the LOFTRAN computer code to generate the PORV setpoint overshoot for a bounding envelope of mass and heat inputs. The plant specific PORV setpoints and overshoot were then determined by the licensee performing hand calculations with plant specific parameters and algorithms provided in the WOG report.

In developing the revised LTOP setpoints for the new heatup and cooldown curves, the basic assumptions used and described in FSAR Section 5.2.2.11 were again utilized (References 4, 5 and 6). These included a single failure (i.e., only 1 of 2 pressurizer PORVs is assumed to operate), most limiting heat or mass inputs¹, and a water solid RCS. Only the plant specific parameters, such as the safety injection flow rate, have changed.

The heatup and cooldown curves shown in Figures 3.4-3 and 3.4-2 of Technical Specifications 3.4.9.1 and 3.4.9.2 were derived as a result of applying the guidance of Regulatory Guide 1.99 Revision 2 and compensation factors of -60 psig and +10°F to the "Appendix G" curves. These factors allow for instrument uncertainties. The enable temperature for the LTOP system was also revised to 325°F as a result of utilizing Regulatory Guide 1.99 Revision 2.

¹ Limiting mass input - inadvertent startup of one charging/safety injection pump.

Limiting heat input - inadvertent startup of one reactor coolant pump while the steam generator secondary side is 50°F higher than the primary side.

The results of the analysis indicate margin between the transient Reactor Coolant System (RCS) pressure developed during a postulated LTOP event and the "Appendix G" curves as shown at the following representative temperatures:

At RCS Temperature (°F)	100	125	155	200	325
Limiting HU or CD Rate (°F/hr)*	10 HU	10 CD	30 HU	50 HU	50 HU
Limiting HU or CD Pressure (psig)**	474	495	496	539	1686
High PORV Setpoint (psig)	380	410	410	410	450
Transient RCS Pressure (psig)	463	490	490	490	562
Margin to Limiting HU or CD Curve (psi)	11	5	6	49	1124

* The most limiting of the maximum allowable Heatup (HU) or Cooldown (CD) rate for the RCS temperature indicated, as allowed by proposed Technical Specification 3.4.9.2 and associated Table 4.4-6 for 3 EFPY.

** This is the limiting pressure at a temperature 6°F lower than at the indicated temperature above for the PORV setpoint, to allow for additional temperature instrument uncertainties.

References:

- (1) CP&L letter, M. A. McDuffie to H. R. Denton (NRC), LAP-83-475, October 12, 1983
- (2) CP&L letter, M. A. McDuffie to H. R. Denton (NRC), LAP-83-507, October 27, 1983
- (3) CP&L letter, S. R. Zimmerman to H. R. Denton (NRC), NLS-86-119, April 23, 1986
- (4) Safety Evaluation Report, NUREG-1038, November 1983
- (5) Safety Evaluation Report, NUREG-1038, Supplement No.4, October 1986
- (6) SHNPP Technical Specification Bases 3/4.4.9