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 ZIMMERMAN, S. R. Carolina Power & Light Co.  
 RECIP. NAME RECIPIENT AFFILIATION  
 DENTON, H. R. Office of Nuclear Reactor Regulation, Director (post 851125)

SUBJECT: Submits addl info re basis for reactor coolant pump trip setpoint methodology to resolve SER Confirmatory Item 33, per verbal request. Reactor coolant pumps will remain on for most steam generator tube rupture occurrences.

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NOTES: Application for permit renewal filed. 05000400

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Carolina Power & Light Company

SERIAL: NLS-86-447

DEC 05 1986

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
United States Nuclear Regulatory Commission  
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT  
DOCKET NO. 50-400/LICENSE NO. NPF-53  
REACTOR COOLANT PUMP TRIP SETPOINT

Dear Mr. Denton:

Carolina Power & Light Company (CP&L) hereby submits additional information concerning the basis for the reactor coolant pump (RCP) trip setpoint methodology at the Shearon Harris Nuclear Power Plant (SHNPP). This information is submitted in response to a verbal request for additional information from your staff to resolve Safety Evaluation Report Confirmatory Item No. 33. The NRC reviewer requested that additional information be submitted concerning uncertainties associated with the Westinghouse Owner's Group (WOG) analysis performed to evaluate the acceptability of the alternate RCP trip criteria. This information is provided below.

The design basis Steam Generator Tube Rupture (SGTR) accident for the WOG RCP trip study was defined as a double-ended rupture of one steam generator tube on the outlet side of the generator. The location of the tube rupture on the outlet side of the steam generator results in a conservatively high initial leak rate. The SGTR accident analysis was based on realistic assumptions and expected system availability. The selection of a double-ended tube rupture as the design basis accident and the conservative break flow model in the Westinghouse LOFTRAN program provide assurance that the analysis results will be bounding for the majority of expected SGTR events. It is not necessary to develop a RCP trip criterion which will provide for continued pump operation for all possible SGTRs. If RCP trip should occur for a SGTR, this would not represent a safety problem since the plant safety systems are designed to handle a SGTR with a loss of offsite power and consequently a RCP trip. The objective is to demonstrate that the RCPs will remain on for most of the expected SGTR cases so that the operator can retain normal pressurizer pressure control and will not be required to open the pressurizer PORVs.

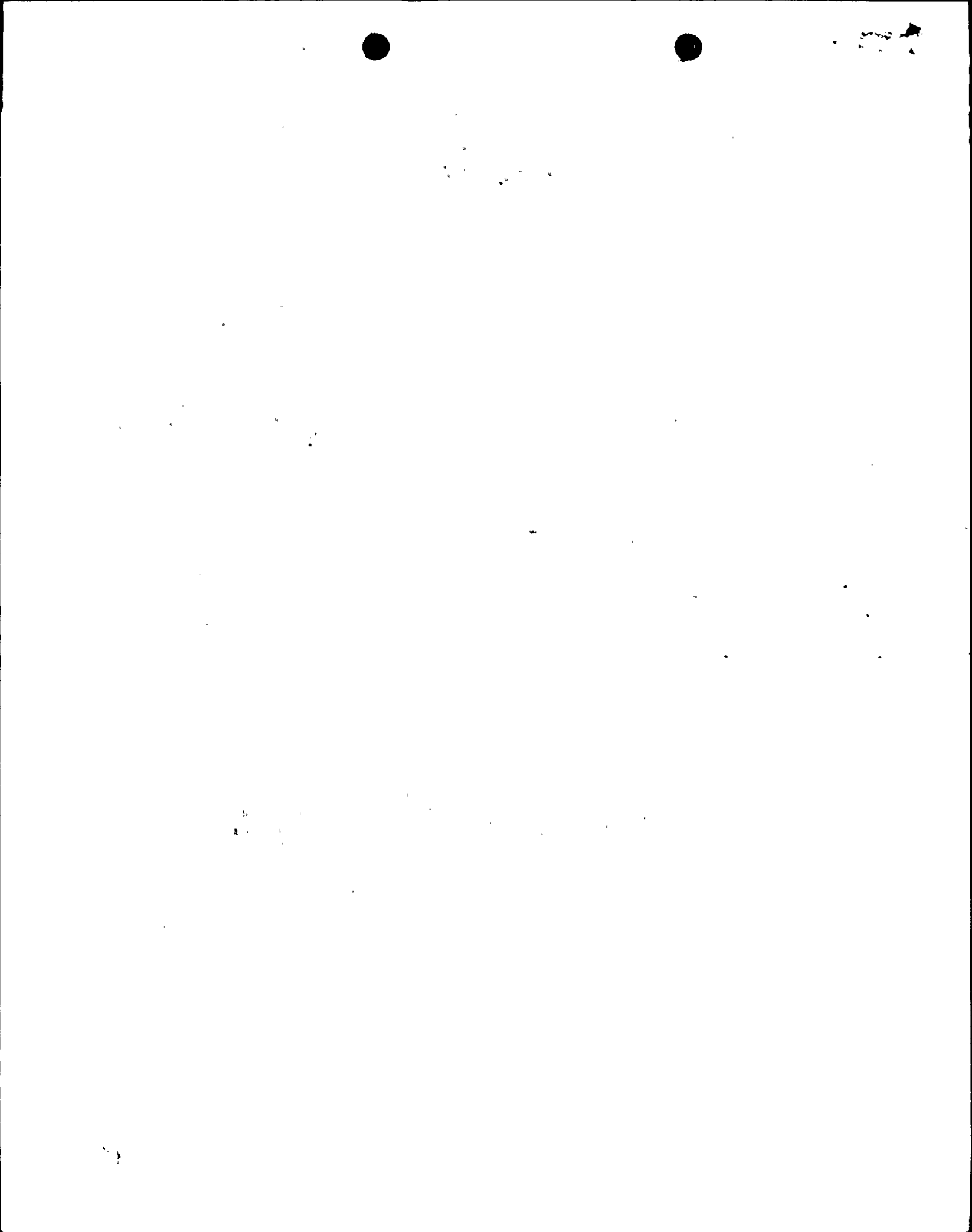
The major assumptions utilized in the WOG SGTR analysis and the corresponding SHNPP actual values are presented below:

<u>WOG</u>	<u>SHNPP</u>
1. 3-Loop Plant	3-Loop Plant
2. High Pressure Safety Injection	High Pressure Safety Injection
3. SG Tube ID = .664 in	SG Tube ID = .664 in
4. No Load T <sub>avg</sub> = 557°F	No Load T <sub>avg</sub> = 557°F
5. RCS Flow = 292,800	RCS Flow = 292,800
6. AFW Flow = 1520 gpm	AFW Flow = 1520 gpm
7. SI Flow (Beaver Valley Flow Curve)	SI Flow (SHNPP SI Flow Higher)

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As shown above, the major assumptions used in the WOG SGTR analysis were actually SHNPP specific values with the exception of safety injection (SI) flow. The Beaver Valley Plant SI flow was chosen for conservatism since lower SI flows produce lower final pressure results.

The results of the WOG SGTR analysis indicate that for SHNPP, the minimum RCS pressure for SGTR will be equal to 1543 psia.

Based on the similarity of the major assumptions used in the WOG analysis to the actual SHNPP values and the use of the LOFTRAN program for modeling break flow, which produces conservatively high break flow rates, the WOG SGTR analysis results in conservative RCS conditions which accurately model SHNPP. The SHNPP minimum RCS pressure for SGTR of 1543 psia is sufficiently separated from the SHNPP RCP trip criteria setpoint of 1360 psig to assure that unnecessary trips of the RCPs will be minimized.

If you have any questions on this subject or require additional information, please contact me.

Yours very truly,



S. R. Zimmerman  
Manager

Nuclear Licensing Section

JHE/bmc (5081JDK)

cc: Mr. B. C. Buckley (NRC)  
Mr. G. F. Maxwell (NRC-SHNPP)  
Dr. J. Nelson Grace (NRC-RII)  
Mr. W. C. Lyon (NRC-PARS)

