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 RECIP. NAME RECIPIENT AFFILIATION  
 DENTON, H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards justification for value less than 14.7 psia for min containment pressure based on conservatism in ECCS analysis as discussed on Page 6-9 of SER (NUREG-1038).

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1. The purpose of this document is to provide a comprehensive overview of the current status of the project and to identify the key areas for improvement.

2. The following table provides a summary of the project's progress and the key areas for improvement.

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Project Progress		Key Areas for Improvement	
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
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Carolina Power & Light Company

MAY 13 1985

SERIAL: NLS-85-115

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

SHEARON HARRIS NUCLEAR POWER PLANT  
UNIT NO. 1 - DOCKET NO. 50-400  
MINIMUM CONTAINMENT PRESSURE

REFERENCE: April 23, 1985 letter from A. B. Cutter (CP&L) to H. R. Denton (NRC).

Dear Mr. Denton:

Carolina Power & Light Company hereby submits information (Attachment 1) justifying a value less than 14.7 psia for minimum containment pressure as discussed on page 6-9 of the Shearon Harris Nuclear Power Plant (SHNPP) Safety Evaluation Report (NUREG-1038). Attachment 1 justifies a value of 13.7 psia for minimum containment pressure based on conservatisms in the ECCS analysis. Technical Specification changes as a result of this justification were included in the revised "pen and ink" version of the SHNPP Technical Specifications transmitted via the referenced letter.

Please review the attached information and revise the Safety Evaluation Report, as necessary. If you have any questions, please contact Mr. Gregg A. Sindors at (919) 836-8168.

Yours very truly,

S. R. Zimmerman  
Manager  
Nuclear Licensing Section

GAS/ccc (1351GAS)

Attachment

cc: Mr. B. C. Buckley (NRC)  
Mr. J. Huang (NRC-CSB)  
Mr. G. F. Maxwell (NRC-SHNPP)  
Dr. J. Nelson Grace (NRC-RII)  
Mr. Travis Payne (KUDZU)  
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## ATTACHMENT 1

### SER (NUREG-1038)

"The staff has reviewed the applicant's input parameters used in the minimum containment pressure analysis including initial containment conditions, containment net free volume, passive heat sinks, heat transfer to passive heat sinks, containment active heat removal, and containment purge system operation, and found them all to be acceptably conservative and in conformance with BTP CSB 6-1, with two exceptions. The first exception is that the assumed initial containment pressure used in the analysis (14.7 psia) has not been demonstrated to be conservative. The initial pressure assumption is acceptable, however, if the plant Technical Specifications restrict the normal operating containment pressure to be greater than the value of 14.7 psia that was used in the analysis."

### RESPONSE

The SHNPP ECCS analysis used an initial containment pressure of 14.7 psia. However, under certain circumstances during full power operation, the containment pressure may fall below 14.7 psia. This information justifies applicability of the analysis for operation of SHNPP at containment pressures less than 14.7 psia.

It has long been established that the operational containment gas pressure condition, not the Technical Specification extreme pressure value, is appropriate input information in an Appendix K analysis. Such guidance was originally given in 1974 in Appendix A of "Status Report by the Directorate of Licensing in the Matter of Westinghouse Electric Company ECCS Evaluation Model Conformance to 10 CFR 50, Appendix K." Furthermore, Branch Technical Position CSB 6-1 in NUREG-0800 states that "minimum containment pressure . . . encountered under limiting normal operating conditions should be used."

The Westinghouse ECCS containment pressure model contains a number of built-in conservatisms to offset any uncertainty about the initial containment pressure value of 14.7 psia. For instance, containment wall condensing heat transfer coefficients during blowdown equal five times the value specified by the Tagami correlation. The Tagami correlation was established from tests as a method to define accurately containment wall heat transfer coefficients following a LOCA event. The impact of using the highly conservative five times Tagami coefficients exceeds the effect of any possible uncertainty in initial containment pressure. From existing sensitivity studies the following comparison can be made regarding calculated containment pressure at 200 seconds:

Impact of reducing initial pressure by 1.0 psi = -1.2 psi

Impact of using Tagami instead of 5 times Tagami = 3.8 psi

Margin in calculated pressure = 2.6 psi

Another large conservatism in the ECCS evaluation model is the consideration that spilling streams of accumulator and pumped safety injection water reach thermal equilibrium with the containment atmosphere. In fact, these water streams would heat up only slightly during their fall to the containment floor. In the SHNPP ECCS

containment pressure analysis, the spilling water removes an amount of energy from the atmosphere equivalent to 2 psi worth of containment pressure at 200 seconds. Again, this 2 psi of conservatism in the ECCS containment model acts to balance the potential 1.2 psi reduction in pressure which occurs in the extremely unlikely event that full power operation occurs at 13.7 psia containment pressure. Other examples also exist which illustrate that conservatism present in the ECCS evaluation model is more than adequate to accommodate the assumption of an unusual initial containment pressure conditions. The basis of the ECCS containment pressure analysis submitted is appropriate for SHNPP and is consistent with the established LOCA evaluation model philosophy.

