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DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Submits addl info to resolve SER Open Item 10 re estimated noble gas releases through atmosphere relief valves. Design meets criteria in NUREG-0737 & Reg Guide 1.97 for monitoring effluent releases.

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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
ESTIMATING NOBLE GAS RELEASES THROUGH ATMOSPHERIC RELIEF VALVES

Dear Mr. Denton:

Carolina Power & Light Company hereby submits the additional information necessary to resolve Open Item No. 10 of the Safety Evaluation Report for the Shearon Harris Nuclear Power Plant (SHNPP). This open item was identified by the Meteorology and Effluent Treatment Branch and addresses the methodology used for estimating potential noble gas releases through the secondary atmospheric relief valves during a postulated accident. The design of SHNPP meets the criteria established in NUREG-0737 and Regulatory Guide 1.97 regarding monitoring effluent releases from the main steam safety relief valves (SRVs), the secondary power operated relief valves (PORVs) and the atmospheric dump valves (ADVs). The attached SHNPP Plant Emergency Procedure Number PEP-341 "Manual Dose Calculation (Rev. 1)," provides details of the methodology used to determine radiological releases from the atmospheric relief valves (SRVs, PORVs, and ADVs). These secondary releases are determined indirectly using information obtained from the main steam line radiation monitor, the steam pressure monitor, and the steam flow rate instrumentation.

Steam line pressure, steam line flow, and status of the relief valves provide the information necessary to determine the mass of steam released. The main steam line radiation monitors provide a measure of the radioactivity levels in the main steam line. Therefore, the amount of activity released can be determined by multiplying the radioactivity in the main steam by the mass of steam released.

Main steam line pressure indicators (PI-474, 484, 494, 475, 485, 495, 476, 486, 496), with ranges of 0-1300 psig, provide direct indication should over-pressurization occur in the main steam lines (MSLs). The MSL pressures are recorded on a recorder whose range also covers 0-1300 psig. The recorder has one pen per MSL and records MSL pressure as a function of time. This information provides an indication of when the SRVs and/or PORVs are open based on their setpoints. Status lights for the ADVs are provided on the Main Control Board to determine their valve position.

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When the Main Steam Isolation Valves (MSIVs) are closed, the release of steam to the atmosphere with the PORVs and/or SRVs open can be measured by the MSL flow transmitters (FT474, 484, 494, 475, 485, 495). The MSIVs close upon manual actuation or automatically on hi-2 containment pressure, low steam pressure, or high steam pressure rate. Indication of the steam flow in the range of 0-5 MPPH is provided on the Main Control Board (MCB) and the Emergency Response Facilities Information System (ERFIS) computer and is recorded on recorders UR-478, 488, and 498. A description of the main steam line flow monitors is contained in FSAR Table 7.5.1-11, Figure 10.1.0-1, and Section 10.3.2.

When the MSIVs are open, the mass of steam released through either the PORVs, the SRVs or the ADVs would be estimated assuming design rated flow through each open valve.

The activity of the steam in the MSL is monitored by an externally mounted radiation monitor (RE-1MS-3591, 3592, 3593) located on each MSL upstream of the SRV and PORV. Data from the monitor is input to the Radiation Monitoring System Computer. Output from the detectors is measured in mR/hr and converted by the monitoring system to μCi/cc. This output is recorded by the monitoring system microprocessor as 10 minute, 24 hour, and 28 day averages. The range of the monitors is equivalent to that specified in NUREG-0737 (i.e., 10^{-1} to 10^{3} μCi/cc).

FSAR Section 11.5.2.7.2.16 will be revised to incorporate this new methodology in a future amendment. Should you have any questions regarding this submittal, please contact me at (919) 836-6242.

Yours very truly,

S. R. Zimmerman
Manager
Nuclear Licensing Section

JDK/ccc (1807JDK)

Attachment

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