

**Lewis Sumner**  
Vice President  
Hatch Project Support

**Southern Nuclear  
Operating Company, Inc.**  
40 Inverness Parkway  
Post Office Box 1295  
Birmingham, Alabama 35201  
  
Tel 205.992.7279  
Fax 205.992.0341



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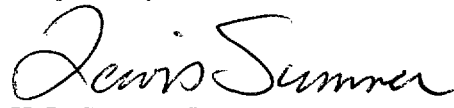
**Edwin I. Hatch Nuclear Plant  
Transmittal of Calculation Summary  
For License Renewal Draft Open Items**

Ladies and Gentlemen:

By letter dated January 24, 2001, Southern Nuclear Operating Company (SNC) transmitted two calculations to the NRC in response to two proposed draft license renewal SER open items. Since one of those calculations contained proprietary information, SNC requested that it be withheld from public disclosure, and that a redacted version would be sent later under separate cover. Upon further evaluation, SNC determined that the redacted version of the calculation would be of little value due to the large amount of redacted material, and that a calculation summary would be more appropriate. This letter transmits the calculation summary for public disclosure.

If you have any questions concerning this information, please contact this office.

Respectfully submitted,

  
H. L. Sumner, Jr.

HLS/JAM

Enclosures: 1. Summary of Calculation No. SSMH 99-004, "Hatch Unit 1 and 2 Torus Life Extension Fatigue Calculation"

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cc: Southern Nuclear Operating Company  
Mr. P. H. Wells, Nuclear Plant General Manager  
Mr. C. R. Pierce, License Renewal Services Manager

U. S. Nuclear Regulatory Commission, Washington, D.C.  
Mr. C. I. Grimes, Branch Chief, License Renewal and Standardization Branch  
Mr. L. N. Olshan, Project Manager-Hatch  
Mr. W. F. Burton, Project Manager-Hatch License Renewal (w/ enclosure)

U. S. Nuclear Regulatory Commission, Region II  
Mr. L. A. Reyes, Regional Administrator  
Mr. J. T. Munday, Senior Resident Inspector-Hatch

**Enclosure 1**

**Hatch Unit 1 and 2 Torus Life Extension Fatigue Calculation**

## Hatch Unit 1 and 2 Torus Life Extension Fatigue Calculation

### I. Purpose

The purpose of this calculation is as follows:

1. Develop an equation for cumulative usage factor (CUF) tracking per loading condition in critical locations in the torus related components (torus vessel, vent system, torus attached piping penetrations).
2. Calculate the current CUF at critical locations.
3. Estimate a 60 year CUF at the critical locations.

### II. Summary of Conclusions

The conclusions of this calculation are as follows:

1. The most limiting location for both Units is the torus vessel.
2. The projected 60-year CUF for the Unit 1 and Unit 2 torus vessel is  $< 1.0$ .

### III. Assumptions

Primary assumptions utilized in this calculation are as follows:

1. Plant data was used to determine significant loading condition event(s) and cycles.
2. This calculation treats all significant initiating event(s) (SIE), regardless of the location of the SIE, as resulting in the same fatigue damage on the most critical locations of the torus.

### V. Methodology

An ASME Section III type fatigue calculation is performed considering defined loading conditions and cycles, stresses from these loading conditions, and the Code allowable number of cycles for these calculated stresses. Actual number of loading cycles was determined by reviewing historical plant data. Future loading cycles were statistically projected based on the historical data. The methods used are based on the current design basis calculations used to document the fatigue usage factors reported in the Hatch Units 1 and 2 PUARs.

Fatigue usage due to accidents and earthquake events is taken directly from the design basis calculations. These events are postulated to happen during the life of the plant. The difference between this usage and the ASME Code allowable of 1.0 is the usage available for normal operating condition loading events.

For each area of concern of both Units, fatigue monitoring formulas are developed in the form:

$$CUF = CUF_{NOC} + CUF_{\text{accident}} + CUF_{eq} < 1.0$$

$CUF_{NOC}$  = normal operating conditions contribution to CUF

$CUF_{\text{accident}}$  = accident contribution to CUF

$CUF_{eq}$  = earthquake contribution to CUF

To determine the areas of the torus shell, torus vent system, and torus penetrations which were to be considered critical locations from a fatigue standpoint, the current fatigue calculations which cover these areas and the PUARs were reviewed. These calculations defined the critical areas for each area of the torus in terms of fatigue.