

May 7, 1998

Mr. J. S. Keenan, Vice President
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550

SUBJECT: SITE AUDIT FOR ADDITIONAL INFORMATION; GENERIC LETTER 88-20,
SUPPLEMENT 4, "INDIVIDUAL PLANT EXAMINATION OF EXTERNAL EVENTS
(IPEEE) FOR SEVERE ACCIDENT VULNERABILITIES, 10 CFR 50.54(f),"
H. B. ROBINSON, UNIT 2 (TAC NO. M83688)

Dear Mr. Keenan:

As a result of our ongoing review of your submittals dated June 30, 1995, and July 1, 1996, associated with Generic Letter (GL) 88-20, Supplement 4, "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities, 10 CFR 50.54(f)," for the H. B. Robinson Steam Electric Plant, Unit No. 2, we have determined a need for additional information. The needed information is identified in the Enclosure.

The staff proposes to conduct a site audit to review documents containing the needed information. You are requested to identify a 3- to 5-day period in the June or early July 1998 timeframe to support an audit team of four or five NRC staff and contractors.

You are requested to reply regarding suitable dates for an NRC audit within 30 days from the date of this letter.

If you have any questions regarding this request, please do not hesitate to contact me at (301) 415-1428.

Sincerely,
(Original Signed By)
Joseph W. Shea, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosure: As stated

cc w/encl: See next page

NRC FILE CENTER COPY

DISTRIBUTION:

| | | | |
|-------------|----------------|------------------|----------------|
| Docket-File | JChen, RES | LPlisco, RII | MShymlock, RII |
| PBLIC | PDII-1 Reading | MCunningham, RES | |
| OGC | JZwolinski | ACRS | |

FILENAME - G:\ROBINSON\ROB83688.RAI

| | | | | | |
|--------|------------------|-----------------------|------------------|--|--|
| OFFICE | PM:PDII-1 | LA:PDII-1 | (A)PD:PDII-1 | | |
| NAME | JShea <i>JWS</i> | Dunnington <i>STB</i> | PTKuo <i>PKU</i> | | |
| DATE | 5/6/98 | 5/5/98 | 5/7/98 | | |
| COPY | Yes/No | <u>Yes/No</u> | Yes/No | | |

OFFICIAL RECORD COPY

9805080255 980507
PDR ADOCK 05000261
P PDR

Mr. J. S. Keenan
Carolina Power & Light Company

H. B. Robinson Steam Electric
Plant, Unit No. 2

cc:

Mr. William D. Johnson
Vice President and Senior Counsel
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Mr. Mel Fry, Director
N.C. Department of Environment
and Natural Resources
Division of Radiation Protection
3825 Barrett Dr.
Raleigh, North Carolina 27609-7721

Ms. Karen E. Long
Assistant Attorney General
State of North Carolina
Post Office Box 629
Raleigh, North Carolina 27602

Mr. Robert P. Gruber
Executive Director
Public Staff - NCUC
Post Office Box 29520
Raleigh, North Carolina 27626-0520

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
H. B. Robinson Steam Electric Plant
2112 Old Camden Road
Hartsville, South Carolina 29550

Mr. Max Batavia, Chief
South Carolina Department of Health
Bureau of Radiological Health
and Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303

Ms. D. B. Alexander
Manager
Performance Evaluation and
Regulatory Affairs CPB 9
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602-1551

Mr. J. W. Moyer
Plant General Manager
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550

Mr. Milton Shymlock
U. S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

Public Service Commission
State of South Carolina
Post Office Drawer 11649
Columbia, South Carolina 29211

Mr. H. K. Chernoff
Supervisor, Licensing/Regulatory Programs
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550

Mr. T. M. Wilkerson
Manager - Regulatory Affairs
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550-0790

REQUEST FOR ADDITIONAL INFORMATION (RAI)

GENERIC LETTER 88-20, SUPPLEMENT 4,

"INDIVIDUAL PLANT EXAMINATION OF EXTERNAL EVENTS (IPEEE)

FOR SEVERE ACCIDENT VULNERABILITIES, 10 CFR 50.54(f)"

Based on your submittal and response to RAIs received to date (in your July 1, 1996 letter entitled "Response to Request for Additional Information Regarding the Individual Plant Examination for External Events") for the Robinson 2 seismic IPEEE, the staff is unable to conclude at this time that you have met the intent of Supplement 4 to GL 88-20. Your responses to the following seismic RAIs (additional or follow-up to previous RAIs) are necessary in order to complete our review.

1. Your responses A.2.2, A.2.3, and A.2.4, related to soil failures, as provided in your July 1, 1996 letter, are inadequate. Of particular concern is the fact that soil liquefaction and seismically induced deformations of embankments or dams are sensitive to magnitude and strong motion duration. The magnitude used for the soils evaluation has not been determined to be consistent with the review level earthquake (RLE). (The selected magnitude is based on the mean magnitude for the Savannah River site.)

Experience from past earthquakes has shown soil failures, including soil liquefaction and slope instabilities, to be a significant concern. Robinson is a deep soil site. The submittal characterizes the top fifty feet of soil at the Robinson site as containing various beds of moderate to dense sands interspersed with layers of relatively weak to moderate strength silty sands, sandy silts, and silty clays. The submittal has indicated, from an initial iteration of liquefaction evaluation, that localized liquefaction lenses are likely to occur for a Mw 5.5 earthquake producing RLE motions; and based on an updated liquefaction analysis a "statistically insignificant number of data points" indicated liquefaction. Thus, for an analysis based on higher magnitudes (for instance, Mw 6.0) significant liquefaction may be possible. Also, as indicated in response A.2.4, an "equivalent static" factor of safety of Lake Robinson Dam, for SSE input (0.2g), was earlier assessed as being 1.08. For RLE motions, the factor of safety would likely be below unity, with resulting transient and permanent deformations. Again, considering higher magnitudes (e.g., Mw 6.0), it is likely that significant displacements of the dam would result. Furthermore, the treatment of submerged slopes and dispersal of lake sediments was based on "extrapolation of the soil boring logs" to conclude that the lakebed sands are not susceptible to liquefaction. However, no justification was provided in the response.

Earthquake experience has also identified seismically induced breaks of piping buried in soft soil or soils that have experienced liquefaction to be a significant concern. This possibility, and the increased susceptibility associated with deterioration of piping (which the IPEEE indicates has been observed at Robinson 2 for buried service water piping) for the various possible site soil characteristics and beyond-design-basis magnitudes, have not been adequately addressed in Response A.2.3. The evaluation of the potential, and effects, of seismically induced failures of buried piping (e.g., service water piping and fuel oil transfer lines) founded in soil should be performed for critical (i.e., the most susceptible) soil conditions/locations subjected to RLE motions.

Enclosure

The submittal has concluded that there are no concerns pertaining to soil failures at Robinson 2, and that, with respect to all soil failure modes and all earth structures, a high confidence, low probability of failure (HCLPF) in excess of the 0.3g RLE exists. As noted above, these findings have not been reasonably justified. It is important that a comprehensive assessment of potential soil failures at the Robinson site be conducted in order to better assess their significance. It is important that such an assessment address the concerns identified above. Additional guidance is given below.

To ensure that the investigation of soil failures (particularly for analyses of liquefaction susceptibility, dynamic instability, etc.) is relevant to RLE motions, a consistent earthquake magnitude should be used. Alternatively, sensitivity investigation for various magnitudes (e.g., Mw 5.5, 6.0, etc.) can be performed. The magnitude and extent of liquefaction-induced soil shear strains at the plant site, within the slope and foundation materials of Lake Robinson Dam, and along submerged embankments, should be assessed based on the critical observed soil properties. Loss of soil strength and consequential reductions in lateral resistance of foundation pile systems of essential structures should be assessed. Impacts of the potential for pipe breaks and of differential soil settlements/displacements on essential structures and components, for representative critical cases, should be examined. Seismic-induced stresses in buried piping, accounting for deterioration in piping materials, should also be investigated for critical soil characteristics/locations.

With this background, please provide your related findings as to whether or not there are any soil failure issues of concern for Robinson 2, with respect to the RLE. Please discuss fully the data (soil properties, seismic capability characteristics of structures or components, plant configuration, dam configuration, slope configurations, earthquake characteristics, etc.), the methodological details, and the results of your soil failure assessments which support your specific findings and conclusions.

2. In your July 1, 1996 letter, you did not provide the requested information for RAI A.2.9 related to capacity calculations. Please provide HCLPF calculations, completed screening evaluation work sheets (SEWSs), walkdown notes/checklists and photographs for the following components:

Motor Operated Valves RHR-750 and RHR-751
Diesel Fuel Oil Storage Tank, RWST, CST
Service Water Pumps
125 VDC MCCs A & B

3. The seismic IPEEE identified a significant potential concern associated with combined failures of two low-capacity motor-operated valves (having cast-iron yokes) that may lead to an interfacing-systems LOCA (ISLOCA) outside containment. An estimate of the frequency of this seismically induced ISLOCA was made in the IPEEE submittal; however, the approach used for calculating this frequency was not provided in sufficient detail. No specific modifications have been proposed with respect to the two MOVs. The licensee originally committed to implement (by December 1998) related procedural enhancements in accordance with severe accident management guidelines.

Subsequently, it was determined that such procedural enhancements were unnecessary. Please identify and justify what actions, if any, will be taken to mitigate the ISLOCA concern. If procedural actions are being considered, evaluate the effectiveness of these actions. Identify what operator actions would be required, where the actions would need

to take place, and the failure rates associated with such actions (in consideration of the potential for seismically induced failures that may interfere with such actions).

In your July 1, 1996 letter, Response A.2.6 states "We will perform a walkdown of the HBRSEP, Unit No. 2 containment heat removal systems and their anchorages, including the fan coolers, and report the findings." Please submit this report, and describe the walkdown approach and the observed configuration of containment heat removal systems.