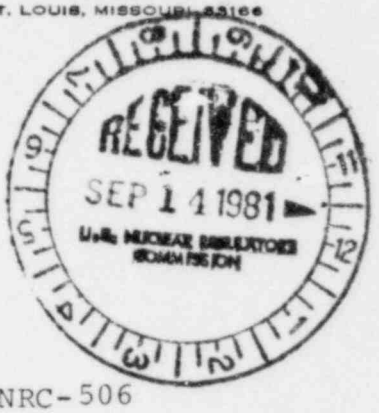
UNION ELECTRIC COMPANY
1901 GRATIOT STREET
ST. LOUIS, MISSOURI

JOHN K. BRYAN
VICE PRESIDENT

MAILING ADDRESS:
P. O. BOX 149
ST. LOUIS, MISSOURI 63166

September 10, 1981



Mr. Harold R. Denton
Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

ULNRC-506

DOCKET NUMBERS 50-483 AND 50-486
CALLAWAY PLANT, UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Reference: September 1, 1981 Letter signed by B. J. Youngblood

The referenced letter transmitted a request for additional information as a result of the review by the Geotechnical Engineering Branch. Draft responses were hand carried to Mr. Gordon Edison, of your staff, on September 8, 1981. This letter serves to formally transmit these responses. This information will be incorporated into a future revision.

Very truly yours,

for John K. Bryan

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STATE OF MISSOURI)
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CITY OF ST. LOUIS)

Robert J. Schukai, of lawful age, being first duly sworn upon oath says that he is General Manager-Engineering (Nuclear) for Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By _____
Robert J. Schukai
General Manager-Engineering
Nuclear

SUBSCRIBED and sworn to before me this 10th day of September, 1981

Barbara J. Pfaff

BARBARA J. PFAFF
NOTARY PUBLIC, STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 22, 1985
ST. LOUIS COUNTY

cc: Glenn L. Koester
Vice President
Operations
Kansas Gas & Electric
P.O. Box 208
Wichita, Kansas 67201

John E. Arthur
Chief Engineer
Rochester Gas & Electric Company
89 East Avenue
Rochester, New York 14649

A. V. Dienhart
Vice President
Plant Engineering and Construction
Northern States Power
414 Nicollet Mall
Minneapolis, Minnesota 55401

Donald T. McPhee
Vice President
Kansas City Power and Light Company
1330 Baltimore Avenue
Kansas City, Missouri 64141

Gerald Charnoff, Esq.
Shaw, Pittman, Potts & Trowbridge
1800 M. Street, N.W.
Washington, D.C. 20036

Nicholas A. Petrick
Executive Director
SNUPPS
5 Choke Cherry Road
Rockville, Maryland 20850

W. Hansen
Callaway Resident Office
U.S. Nuclear Regulatory Commission
RR#1
Steedman, Missouri 65077

Item 241.7C In the FSAR you have not provided sufficient information to define the soil conditions beneath the foundations of the Class IE electrical duct banks and the Category I essential service water system (ESWS) pipelines. We request that you provide the following information in sufficient detail for an independent Staff review of the adequacy of these materials.

(a) Provide plot(s) drawn to scale showing the following information.

(i) Location and routing from one end of the ESWS pipelines and electrical duct banks to the other, clearly identifying the lines.

(ii) Locations and identifications of the borings along the route of the pipelines and duct banks. Indicate the spacing between the borings.

(b) Provide plot(s) drawn to scale showing the following information.

(i) The pertinent boring logs needed to prepare soil profiles along the routes of the duct banks and pipelines. Indicate the height of fill above the ESWS pipelines and electrical duct banks and draw the original and finished grade surfaces. Provide the soil classification and SPT blow count information on the logs.

(ii) Soil stratification, design water table and top of Graydon chert conglomerate on the profile(s).

(iii) Draw the invert and top of ESWS pipelines and electrical duct banks on the profile(s).

(c) Indicate the static soil parameters used in designing the ESWS pipelines and duct banks. Describe how these parameters were obtained and provide the values of these parameters.

(d) In section 2.5.4.7 of the FSAR, you mention that dynamic analysis of buried pipelines and duct banks is described in Section 6.0 of BC-TOP-4A. Tabulate the dynamic soil parameters that were used in the analyses and then describe the method used for obtaining the soil data. Provide the values of these soil parameters and indicate how the variability of the soil parameters was accounted for in your analyses. In section 2.5.4.7 of the FSAR figures 2.5-451 through 2.5-460 were used in

the design of buried pipelines and duct banks. Describe how the data given in these figures were utilized.

(e) In the Callaway FSAR site addendum you have not provided Section 3.7.3.12, "Buried Seismic Category I Piping Systems and Tunnels." Provide the necessary information in this section of the FSAR. Include the site specific soils related information for this section as outlined in Regulatory Guide 1.70.

Responses:

(a) (i) The location and routing of the ESWS pipelines and electrical duct banks is shown on Figure 1 attached.

(ii) The locations and identification of the borings along or nearest the route of the pipelines and duct banks are shown on Figure 1 attached. The boring spacing can be clearly seen from the scale of Figure 1.

(b) (i) Attached Figures 1 and 2 indicate the borings used to prepare the pipeline and duct bank soil profiles. The complete logs of these borings can be found in the boring log section of the figures for Section 2.5 of the FSAR. Figure 2.5-123 of the FSAR shows typical configurations of the fill above the pipelines and duct banks. Also see Figures 3 and 4 of the "Progress Report V. Results of Field Observation of Geotechnically-Related Construction Activities, Callaway Plant, Units 1 and 2, "Volume I, for typical configurations of the pipeline and duct bank fill. Figure 5 of that report shows areas where stabilized Backfill was substituted, as permitted, for Category I Bedding Material.

The soil classification and SPT blowcount information is shown on the pertinent boring logs and also on Figure 2 attached.

(ii) The soil stratification and the top of the Graydon chert conglomerate are shown on Figure 2 attached. As stated in FSAR Section 2.4.13.5, the design water table is Elevation 840' MSL which is equivalent to plant elevation 1999.5.'

(iii) The invert of the ESWS pipelines is shown on Figure 2 attached. The top of the pipelines is approximately 30 inches above the invert elevation. Typically in the main run, the

invert (or bottom) of the duct bank is approximately 1 foot below the pipeline invert.

(c) Static soil parameters used in designing the ESWS pipelines and ductbanks.

Unit weight = 150 pcf

Maximum Groundwater Elevation = 1999'-6"

Maximum Groundwater Elevation = (below pipe)

(d) Dynamic soil parameters used in designing the ESWS pipelines and ductbanks.

Unit weight = 150 pcf

Coefficient of Subgrade Reaction, K = 1000 pci

Coefficient of Friction Between the soil and surface of structure = 0

Compressive Wave Velocity, Cp = 2100 fps

Shear Wave Velocity, C = 860 fps

(e) Refer to Standard Plant FSAR Section 3.7(B).3.12 for this information. The site specific soils related information is provided in FSAR Site Addendum Section 2.5.4 and in the above responses.

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