



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

August 2, 2006

Mr. Stephen A. Byrne  
Sr. Vice President Generation and  
Chief Nuclear Officer  
South Carolina Electric and Gas  
MC 196 Palmetto Center  
Columbia, SC 29218

SUBJECT: PRE-APPLICATION SITE VISIT TO V.C. SUMMER SITE TO OBSERVE  
COMBINED LICENSE PRE-APPLICATION SUBSURFACE  
INVESTIGATION ACTIVITIES (PROJECT NO. 743)

Dear Mr. Byrne:

On June 22, 2006, Region II Inspectors conducted a site visit to the V.C. Summer site accompanied by members of the Nuclear Reactor Regulation (NRR) staff. The purpose of the visit was to observe combined license (COL) pre-application subsurface investigation activities being conducted to obtain geotechnical/seismic data to support a COL application for new nuclear power plants. These observations will provide background information for NRC's future review of the expected COL application for the V.C. Summer site.

A summary of the site visit is enclosed, that includes a list of NRC participants and persons with whom discussions were held.

Sincerely,

**/RA/**

Mark S. Lesser, Chief  
Engineering Branch 3  
Division of Reactor Safety

Enclosure: Pre-application Site Visit to V.C. Summer

cc w/encl: (See next page)

August 2, 2006

Mr. Stephen A. Byrne  
Sr. Vice President Generation and  
Chief Nuclear Officer  
South Carolina Electric and Gas  
MC 196 Palmetto Center  
Columbia, SC 29218

SUBJECT: PRE-APPLICATION SITE VISIT TO V.C. SUMMER SITE TO OBSERVE  
COMBINED LICENSE PRE-APPLICATION SUBSURFACE  
INVESTIGATION ACTIVITIES (PROJECT NO. 743)

Dear Mr. Byrne:

On June 22, 2006, Region II Inspectors conducted a site visit to the V.C. Summer site accompanied by members of the Nuclear Reactor Regulation (NRR) staff. The purpose of the visit was to observe combined license (COL) pre-application subsurface investigation activities being conducted to obtain geotechnical/seismic data to support a COL application for new nuclear power plants. These observations will provide background information for NRC's future review of the expected COL application for the V.C. Summer site.

A summary of the site visit is enclosed, that includes a list of NRC participants and persons with whom discussions were held.

Sincerely,

/RA/

Mark S. Lesser, Chief  
Engineering Branch 3  
Division of Reactor Safety

Enclosure: Pre-application Site Visit to V.C. Summer

cc w/encl: (See next page)

☒ PUBLICLY AVAILABLE      ☐ NON-PUBLICLY AVAILABLE      ☐ SENSITIVE      ☒ NON-SENSITIVE

ADAMS: ☒ Yes      ACCESSION NUMBER: \_\_\_\_\_

OFFICE	RII:DRS	RII:DRS	RII:DRP	HQ:NRR		
SIGNATURE	/RA/	/RA/	/RA/	/E-mail/		
NAME	JLenahan	MLesser	BCarrion	JStaretos		
DATE	8/2/06	8/2/06	8/2/06	8/2/06		
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY

DOCUMENT NAME: C:\ADAMS\Cache\ML0621504270.wpd

Combination List:

cc w/encl:

Mr. Charles Brinkman  
Westinghouse Electric Co.  
Washington Operations  
12300 Twinbrook Pkwy., Suite 330  
Rockville, MD 20852

Mr. David Lochbaum, Nuclear Safety  
Engineer  
Union of Concerned Scientists  
1707 H Street, NW, Suite 600  
Washington, DC 20006-3919

Mr. Paul Gunter  
Nuclear Information & Resource Service  
1424 16<sup>th</sup> Street, NW, Suite 404  
Washington, DC 20036

Mr. James Riccio  
Greenpeace  
702 H Street, NW, Suite 300  
Washington, DC 20001

Mr. Adrian Heymer  
Nuclear Energy Institute  
Suite 400  
1776 I Street, NW  
Washington, DC 20006-3708

Mr. George Alan Zinke  
Project Manager  
Nuclear Business Development  
Entergy Nuclear  
M-ECH-683  
1340 Echelon Parkway  
Jackson, MS 39213

Ms. Marilyn Kray  
Vice President, Special Projects  
Exelon Generation  
200 Exelon Way, KSA3-E  
Kennett Square, PA 19348

Mr. Laurence Parme  
Manager, GT-MHR Safety & Licensing  
General Atomics Company  
P.O. Box 85608  
San Diego, CA 92186-5608

Mr. Joseph D. Hegner  
Lead Engineer - Licensing  
Dominion Generation  
Early Site Permitting Project  
5000 Dominion Boulevard  
Glen Allen, VA 23060

Mr. Edward L. Quinn  
Longenecker and Associates  
Utility Operations Division  
23292 Pompeii Drive  
Dana Point, CA 92629

Mr. Paul Leventhal  
Nuclear Control Institute  
1000 Connecticut Avenue, NW  
Suite 410  
Washington, DC 20036

Mr. Jay M. Gutierrez  
Morgan, Lewis & Bockius, LLP  
1111 Pennsylvania Avenue, NW  
Washington, DC 20004

Mr. W. Edward Cummins  
AP600 and AP1000 Projects  
Westinghouse Electric Company  
P.O. Box 355  
Pittsburgh, PA 15230-0355

Mr. Gary Wright, Manager  
Office of Nuclear Facility Safety  
Illinois Department of Nuclear Safety  
1035 Outer Park Drive  
Springfield, IL 62704

Mr. Brendan Hoffman  
Research Associate on Nuclear Energy  
Public Citizens Critical Mass Energy and  
Environmental Program  
215 Pennsylvania Avenue, SE  
Washington, DC 20003

Mr. Lionel Batty  
Nuclear Business Team Graftech  
12300 Snow Road  
Parma, Ohio 44130

Mr. Ian M. Grant  
Canadian Nuclear Safety Commission  
280 Slater Street, Station B  
P.O. Box 1046  
Ottawa, Ontario  
K1P 5S9

(cc w/encl cont'd - See next page)

S. Byrne

3

cc w/encl cont'd  
Mr. Glenn H. Archinoff  
AECL Technologies  
481 North Frederick Avenue  
Suite 405  
Gaithersburg, MD. 20877

Dr. Regis A. Matzie  
Senior Vice President and  
Chief Technology Officer  
Westinghouse Electric Company  
2000 Day Hill Road  
Windsor, CT 06095-0500

Mr. Ed Wallace, General Manager Projects  
PBM R Pty LTD  
PO Box 9396  
Centurion 0046  
Republic of South Africa

Mr. Dobie McArthur  
Director, Washington Operations  
General Atomics  
1899 Pennsylvania Avenue, NW, Suite 300  
Washington, DC 20006

Mr. Russell Bell  
Nuclear Energy Institute  
Suite 400  
1776 I Street, NW  
Washington, DC 20006-3708

Ms. Vanessa E. Quinn, Chief  
Radiological Emergency Preparedness  
Branch  
Nuclear and Chemical Preparedness and  
Protection Division  
Department of Homeland Security  
1800 South Bell Street, Room 837  
Crystal City-Arlington, VA 22202-3546

Mr. Ron Simard  
6170 Masters Club Drive  
Suwanee, GA 30024

Ms. Sandra Sloan  
Areva NP, Inc.  
3315 Old Forest Road  
P.O. Box 10935  
Lynchburg, VA 24506-0935

Ms. Anne W. Cottingham  
Assistant General Counsel  
Nuclear Energy Institute  
1776 I Street, NW, Suite 400  
Washington, DC 20006

Mr. David Repka  
Winston & Strawn LLP  
1700 K Street, NW  
Washington, DC 20006-3817

Mr. Robert E. Sweeney  
IBEX ESI  
4641 Montgomery Avenue  
Suite 350  
Bethesda, MD. 20814

Mr. Eugene S. Grecheck  
Vice President, Nuclear Support  
Services  
Dominion Energy, Inc.  
5000 Dominion Blvd.  
Glen Allen, VA 23060

S. Byrne

4

E-Mail:

SCollins  
MDapas  
RBlough  
MGamberoni  
BHolian  
WTravers  
LPlisco  
VMcCree  
CCasto  
JCaldwell  
GGrant  
CPederson  
MSatorius  
BMallett  
TGwynn  
DChamberlain  
AHowell  
tom.miller@hq.doe.gov or  
tom.miller@nuclear.energy.gov  
mark.beaumont@wsms.com  
sfrantz@morganlewis.com  
ksutton@morganlewis.com  
jgutierrez@morganlewis.com

sandra.sloan@areva.com  
mwetterhahn@winston.com  
gcesare@enercon.com  
whorin@winston.com  
[eddie.grant@exeloncorp.com](mailto:eddie.grant@exeloncorp.com)  
louis.quintana@ge.com  
steven.hucik@ge.com  
david.hinds@ge.com  
chris.maslak@ge.com  
mgiles@entergy.com  
patriciaL.campbell@ge.com  
bob.brown@ge.com  
jim@ncwarn.org  
pshastings@duke-energy.com  
ronald.hagen@eia.doe.gov  
murawski@newsobserver.com  
Cary.Fleming@constellation.com  
tansel.selekler@nuclear.energy.gov or  
tansel.selekler@hq.doe.gov  
james1.beard@ge.com  
amonroe@scana.com  
rclary@scana.com  
apaglia@scana.com  
tkkibler@scana.com

Distribution w/encl:

E-Mail:

J. Starefos, NRR  
C. Munson, NRR  
L. Dudes, NRR  
S. Coffin, NRR  
G. Imbro, NRR  
D. Matthews, NRR  
K. Landis, DRP  
M. Lesser, DRS

PRE-APPLICATION SITE VISIT TO V.C. SUMMER SITE TO OBSERVE  
COMBINED OPERATING LICENSE (COL) PRE-APPLICATION  
SUBSURFACE INVESTIGATION ACTIVITIES  
PROJECT NUMBER 743

Purpose of Visit:

The information gathering visit was conducted on June 22, 2006, by staff of the Nuclear Regulatory Commission (NRC), Region II and the Office of Nuclear Reactor Regulation (NRR). Region II inspectors observed combined license (COL) pre-application subsurface investigation activities conducted to obtain geotechnical and seismic data at the proposed location of new nuclear power plants at the V.C. Summer site. This visit was an on-site observation and information gathering trip in which the staff used the following inspection manual chapter and procedures as guidance:

NRC Inspection Manual Chapter 2502, Construction Inspection Program: Pre-Combined License (pre-COL) Phase  
NRC Inspection Procedure 35004, Pre-Docketing Early Site Permit Quality Assurance Controls Inspection  
NRC Inspection Procedure 45051, Geotechnical/Foundation Activities Procedure Review

Principal Persons Contacted:

K. Browne, Project Manager, Santee Cooper  
R. Clary, General Manager, South Carolina Electric & Gas (SCE&G)  
J. Davie, Principal Geotechnical Engineer, Bechtel  
T. Franchuk, Supervisor, Quality Assurance, SCE&G  
R. Jolly, Senior QA Engineer, Bechtel  
A. Kottenstette, Senior Project Professional, MACTEC  
S. Lindvall, Principal Geologist, William Lettis and Associates (WLA)  
J. Lynch, QA Manager, MACTEC  
A. Monroe, Licensing Engineer, SCE&G  
A. Paglia, Supervisor Licensing and Engineering SCE&G  
C. Sams, Sr. Geologist, MACTEC  
M. Sufnarski, Project Manager, MACTEC  
B. Whorton, Civil/Structural Engineer, SCE&G

NRC Inspectors:

J. Lenahan, Senior Reactor Inspector, RII  
R. Carrion, Reactor Inspector, RII

NRC Accompanying Personnel:

J. Starefos, Senior Project Manager, NRR  
C. Munson, NRR  
S. Samaddar, NRR  
G. Stirewalt, NRR  
M. Valentin-Olmeda, NRR  
M. Plaza-Toledo, NRR  
R. Jackson, NRR

Enclosure

### Background:

By letters of December 5, 2005, and February 10, 2006, South Carolina Electric and Gas (SCE&G) informed the NRC staff that it had selected the V.C. Summer site to be the subject for a COL application, with the intent of submitting the application in the third calendar quarter of 2007. A COL is a combined construction permit and operating license with conditions for a nuclear power facility pursuant to 10 CFR Part 52 Subpart C. SCE&G has contracted Bechtel as a nuclear services provider, with MACTEC Engineering and Consulting, along with William Lettis and Associates (WLA), to conduct the geotechnical site studies required for the COL application.

### Overview of Subsurface Investigation Activities Discussed and/or Observed:

SCE&G plans to use the subsurface investigations described below to provide geotechnical data to determine suitability of the V.C. Summer site for a COL for an AP1000 reactor facility. SCE&G's current subsurface investigation activities included areas which would be the site of cooling towers, yard structures, and the proposed reactor and power block sites.

The scope of the planned site characterization activities includes various field and geotechnical laboratory tests. Field exploration methods addressed in the SCE&G site characterization plan include standard penetration tests, ground water observation wells, seismic downhole velocity measurements (P-S logging), cone penetration tests, and test pit excavation. Proposed geotechnical laboratory tests on soil samples include soil classification, moisture content, direct shear tests, triaxial shear tests, consolidation tests and dynamic tests. Planned testing of rock samples include unconfined compression, with stress-strain measurements, x-ray diffraction, petrographic analysis, and slake durability.

### Drilling and Sampling Observations

Drilling and sampling observations by team members during the June 22, 2006, site trip included locations to be drilled within the site characterization boundary. The team verified that NRC Regulatory Guide (RG) 1.132, "Site Investigations for Foundations of Nuclear Power Plants," was being used as guidance for site investigation activities. The boreholes were being drilled under direction of Bechtel, and their geotechnical engineering subcontractors, MACTEC, and William Lettis & Associates (WLA) using rotary drill rig equipment. The boreholes are planned to be drilled to a depths varying from 40 to 350 feet.

The team visited the locations of several borings. The team observed performance of geophysical testing and rock coring in some borings. The team also examined the site topography and reviewed characterization of geological features identified during preliminary site exploration work.

Soil sampling operations were not witnessed; however, the team verified that the disturbed and undisturbed samples collected prior to the team's arrival were properly stored and sealed in accordance with ASTM D4220, Standard Practice for Preserving and Transporting Soil Samples. The team reviewed the boring log for boring B-201, which was drilled prior to the team's arrival to a depth of 350'. The team also examined disturbed soil samples collected from a split spoon sampler from Boring B-201. WLA is currently in the process of updating the geologic, geophysical, and seismic data base for the V.C. Summer site.

The team noted that drilling operations are being overseen by MACTEC or WLA geotechnical personnel. The team interviewed two of the rig geologists who provide technical oversight of drilling operations. These individuals classify soil samples, record data on boring logs, and provide assurance that subsurface drilling activities are performed in accordance with applicable procedure requirements and standard geotechnical engineering practices. The team concluded that these individuals were knowledgeable in drilling operations and site geotechnical

procedural requirements. The team also reviewed the qualification and training records for seven MACTEC geotechnical personnel.

The team discussed the methods used to accurately locate the drill holes with the applicant's personnel. A series of surveying monuments has been established on the site and were used to locate and determine the elevation of the borings. Following completion of the exploration activities, the applicant stated that locations and elevations of the completed borings and observation wells will be verified by surveyors. The geotechnical procedures require the survey work to be performed under the supervision of a licensed land surveyor. Survey accuracy is specified at Third Order accuracy, (1:5000) horizontal, and to the nearest 0.1' vertical control.

The team reviewed the procedures listed below and discussed technical aspects of the drilling and testing with the MACTEC and WLA geotechnical engineers supervising the site investigation. The applicant stated that site exploration program will be adjusted as necessary to obtain additional information as the site investigation proceeds. Discussions with the applicant disclosed that ground water elevation in the observation wells will be monitored periodically. The team reviewed the MACTEC quality assurance measures being applied to the work. The team verified that the drilling equipment was in good condition and proper working order. The team reviewed the calibration records for the weights (automatic hammers) used for the standard penetration tests. The team also reviewed the five nonconformance reports which had been identified prior to the NRC visit and reviewed quality assurance surveillance reports.

All drilling and field testing activities appeared to be controlled by adequate procedures and standards, with an appropriate level of supervisory and quality assurance oversight. The team considered all observations of work adequate.

### **Documents Examined**

Specification 24242-000-3PS-C700-00001, Technical Specification for Subsurface Testing and Laboratory Testing for SCE&G COL Project, Rev. 0

Specification 24242-000-3PS-C700-00002, Technical Specification for Monitoring Well Supply for SCE&G COL Project, Rev. 0

Specification 24242-000-3PS-C700-00003, Technical Specification for Determination of Kd Values for Soil and Rock for SCE&G COL Project, Rev. 0

MACTEC Quality Assurance Manual, Rev. 1, dated 6/17/05

MACTEC Quality Assurance Project Document for Summer Nuclear Plant COL, Project number 6234-06-3534, dated 3/29/06, Rev. 0, plus Attachments listed below:

Attachment 1, Surveying

Attachment 2, Drilling and Sampling Procedure

Attachment 3, Cone Penetration Tests

Attachment 4, Downhole test Procedure

Attachment 8, Laboratory Controls and Test Procedures

MACTEC Work Instructions for Boring B-201



Nonconformance Reports

S-001-06, Weight used for calibration of hammer not traceable to NBS

S-002-06, Used triple tube coring system to core rock

S-003-06, SPT hammer calibration not submitted 7 days prior to use

S-004-06, Well OW-627b installed in incorrect location

S-005-06, Two undisturbed samples improperly labeled

Quality Assurance Surveillance Reports

Surveillance numbers 25242-QSSS-06-001, 25242-QSSS-06-002, and 25242-QSSS-06-003

Calibration Records

25242-102-V14-CY00-00011-001, dated May 25, 2006, Calibration of 5-pound (lb) hammer, 10-lb hammer, 25-lb hammer, 50-lb hammer, and CME Auto-Hammer (Serial Number: 219907).

25242-102-V14-CY00-00006-001, dated May 10, 2006, Calibration of mobile B57 Auto-Hammer (Serial Number: 90117).

25242-102-V14-CY00-00013-001, dated May 25, 2006, Calibration of Diedrich D-50 Auto-Hammer (Serial Number: 100), Rig # 102.

25242-102-V14-CY00-00007-001, dated May 10, 2006, Calibration of CME 850 (Serial Number: 190742).