

# **SOUTH CAROLINA ELECTRIC & GAS COMPANY**

*COLUMBIA, SOUTH CAROLINA*

## **SALUDA HYDROELECTRIC PROJECT**

*FERC PROJECT NO. 516*

### **MISCELLANEOUS FILING MATERIAL**

#### **EXHIBIT H**

*DECEMBER 2007*

*Prepared by:*

***Kleinschmidt***  
*Energy & Water Resource Consultants*

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**EXHIBIT H**  
**ADDITIONAL INFORMATION**

**1.0 INFORMATION REQUIRED FROM ALL APPLICANTS**

1. The Applicant intends to continue to operate and maintain the project to provide efficient and reliable electric service.
  - a. The Applicant provides for the reliability of its electric system by maintaining an adequate reserve margin of supply capacity, and by maintaining daily operating reserves to balance the risk that some of the Applicant's generation capacity may be forced offline on any given day because of mechanical failures, wet coal problems, environmental limitations, or other unforeseen events. The Applicant is a member of the Virginia-Carolinas Electric Reliability Council (VACAR), an organization which coordinates a regional reserve sharing system allowing its members to pool their reserve generation resources on a prorated basis. This VACAR Reserve Sharing Arrangement (VRSA) provides a formal mechanism for VACAR members to share reserve capacity.
  - b. Saluda Hydro will continue to operate primarily as a reserve generation facility in the SCE&G system. In the event of a loss of generation elsewhere in the Applicant's system, the Project units can be started and brought to full load within 10 to 15 minutes. This allows a rapid response to emergencies on SCE&G's system, and also fulfills all or part of SCE&G's reserve share obligation as a member of VACAR. Providing rapid response to emergencies on SCE&G's system and those to which SCE&G is interconnected helps to insure reliability of electrical service both locally and area-wide. The use of Saluda Hydro for reserve generation is more efficient and reliable than other reserve alternatives such as combustion turbines or diesel powered generators.

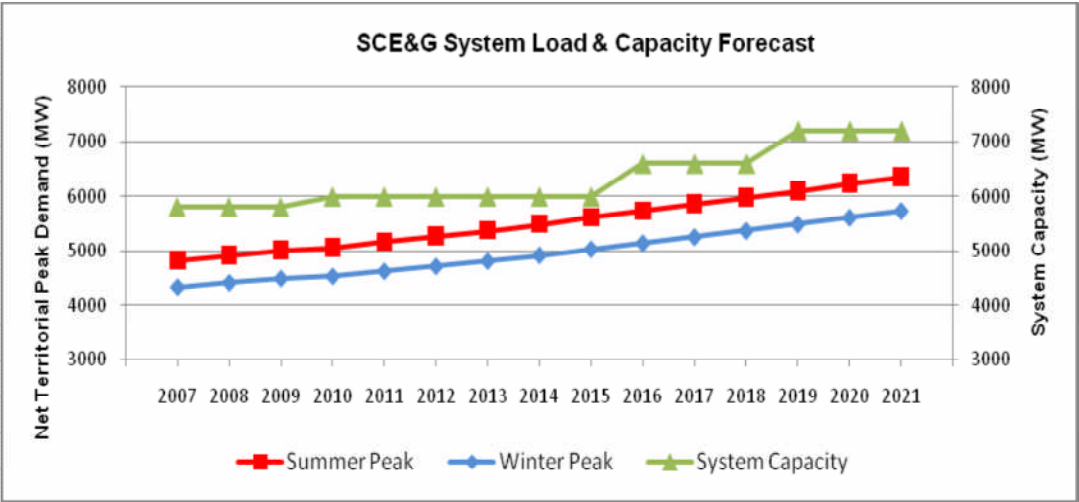
- c. Saluda Hydro provides “black start” capability<sup>1</sup> for a portion of the Applicant’s system, and serves as a backup source of station service power for the nearby McMeekin steam-electric station. Both of these roles enhance the reliability of the Applicant’s system.
  - d. Plans for increasing capacity and generation at Saluda Hydro are limited to replacement of turbine runners with more efficient modern designs. Significantly increasing the hydraulic capacity of the project is not considered feasible at Saluda Hydro, based on the results of a Resource Utilization Study (Kleinschmidt 2005). Potential equipment upgrades were evaluated in a Saluda Hydroelectric Project Upgrade Study (Kleinschmidt 2007). The results of both studies are summarized in Exhibit B.
  - e. The Applicant intends to continue to operate the Project in coordination with upstream and downstream water resource projects in all conditions from drought to extreme floods. Operations at Saluda Hydro will continue to be coordinated with upstream Buzzards Roost Hydroelectric Project (P-1267) in order to efficiently utilize the flows in the Saluda River.
  - f. The Applicant’s plans to continue to operate the Project within its own system, and in coordination with others, as described above, will help to minimize the cost of production by providing economical reserve generation capacity.
2. The Applicant’s need over short and long term for power generated from this project is described as follows:
- a. Saluda Hydro’s primary function will continue to be reserve generation to fulfill the Applicant’s own system reserve requirements, as well as reserve obligations under the existing VACAR Reserve Sharing Arrangement (VRSAR). VACAR has set the regional reserve requirement at 150 percent of the largest unit in the

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<sup>1</sup> “Black start” refers to the ability to start a generating unit or plant with no external power supplied from the transmission and distribution system, using the power plant’s own internal power sources such as batteries or stored compressed air. Black start capability may be required to restore the electric power system in the event of widespread damage to the transmission and distribution system. Hydroelectric plants need very little power to start generating, and are often utilized as black start resources.

region. The Applicant's prorated share of this reserve requirement is approximately 200 MW. Currently, reserve generation on the Applicant's system is provided by a mix of conventional hydro (non-run of river), pumped storage, and combustion turbine assets. Of these, only Saluda Hydro is not routinely used for peaking power, and it therefore has the highest availability during peak demand periods when reserve generation is most critical. If the license for Saluda were not granted, other reserve generation facilities would need to be built. New reserve generation facilities are subject to site constraints in that they must be interconnected with electric and natural gas transmission facilities, and must be built in locations which are environmentally permissible and not objectionable to the surrounding residents.

b. The graph below shows that total summer and winter peak electric demand on the Applicant's system is forecast to increase by 2 percent per year during the period 2007 – 2021. The Applicants system capacity is planned to increase by 189 MW of peaking generation in 2010, and by 600 MW of new baseload generation in both 2016 and 2019 due to planned additional nuclear units on the existing V. C. Summer Station site. Based on the forecast, the continued availability of Saluda Hydro for reserve generation will be critical to maintaining the reliability of the Applicant's system.



Source: Integrated Resource Plan, SCE&G 2007.

- c. Discussion of increase in fuel, capital, and O&M costs if license is not granted: *This information will be provided in the final application.*
  - d. Effect of each alternative source of power on customers, operation and load characteristics, communities: *This information will be provided in the final application.*
3. Data showing need, reasonable cost and availability of alternate source of power:
- a. Average annual cost of power produced by project: *This information will be provided in the final application.*
  - b. Costs associated with alternative sources of power:
    - i. Generation of additional power at existing facilities: *This information will be provided in the final application.*
    - ii. Restarting deactivated units: SCE&G has no deactivated generation facilities capable of being restarted at this time.
    - iii. Purchase of power off-system: *This information will be provided in the final application.*
    - iv. Construction or purchase and operation of a new power plant: *This information will be provided in the final application.*
  - c. Load management measures such as conservation: The Applicant's Demand Side Management programs are described in Section 10 below.
  - d. Effect on direct providers and their customers of alternate sources: *This information will be provided in the final application.*
4. Use of power for Applicant's own industrial facilities: The Applicant is an investor-owned utility, and has no non-utility industrial facilities to be affected by loss of electricity from the Saluda Hydroelectric Project. Saluda Hydro is capable of providing backup station service power to the adjacent McMeekin steam-electric generating station. Saluda Hydro also provides "black start" capability for a portion of the Applicant's system.

5. Need for Project to foster the purpose of an Indian Tribal Reservation: The Applicant is not an Indian Tribe, and does not need the electricity generated by Saluda Hydro to foster the purposes of a reservation.
6. Impact on the operation and planning of transmission system of receiving or not receiving license:
  - a. Analysis of the effects of any resulting redistribution of power flows on line loading (with respect to applicable thermal, voltage, or stability limits), line losses, and necessary new construction of transmission facilities or upgrading of existing facilities, together with the cost impact of these effects: *This information will be provided in the final application.*
  - b. Analysis of the advantages that the applicant's transmission system would provide in the distribution of the project's power: *This information will be provided in the final application.*
  - c. Detailed single-line diagrams for transmission facilities: *This information will be provided in the final application.*
7. Need for, or usefulness of, modifications to existing project facilities or operations: *This information will be provided in the final application.*
8. The Applicant's financial resources to meet its obligations under a new license are as follows:
  - a. The Applicant has adequate personnel resources to continue to operate and maintain the Saluda Hydroelectric Project in accordance with the provisions of the license. The permanent staff at the plant consists of four operator-repairmen, who are on site eight hours per day, five days per week. In addition, the Applicant can provide additional personnel from its other electric generating facilities in the event of emergencies or major maintenance outages. Saluda Hydro personnel have on-the-job and other in-house training programs to prepare them to safely operate and maintain the plant, including training for



response to environmental and other emergencies. *An organization chart and list of training programs will be provided in the final application.*

9. The Applicant does not propose to extend the Project to encompass additional lands, therefore notification of adjacent property owners for this purpose is not required.
10. Statement of energy conservation programs and measures: The Applicant is actively involved in a number of Demand Side Management Programs to improve the efficiency of electricity generation and consumption on its power system. These programs can be divided into three major categories: Customer Information Programs, Energy Conservation Programs, and Load Management Programs. These programs in combination are expected to reduce peak system load by 200 – 250 MW during the period 2007 – 2021.

### **1.1 Customer Information Programs**

These programs include annual energy campaigns and a Web-based information initiative. The 2006 Energy Campaign consisted of:

- Weatherline: Provided call-in access to energy saving tips.
- Targeted bill inserts promoting the Low Income Home Energy Assistance Program (LIHEAP).
- Brochures and other printed material containing energy saving tips, available at the Applicant's business offices.
- News releases distributed to print and broadcast media throughout the Applicant's service area.
- Applicant's in-house energy experts conducted several interviews with local media regarding energy conservation.
- Web site link to energy saving tips and other conservation information was included in most of the communication channels mentioned above.
- Weatherization project: Applicant's partners and employee volunteers provided weatherization to low income homes in the service area.
- Speakers Bureau: Applicant's representatives talked to local organizations about energy conservation, and also provided videos produced by the Applicant that highlight energy conservation.

- Energy Awareness Month: The Applicant used the month as an opportunity to promote energy conservation via the local media.

Web-based Information and Services Programs include a Web-based tool which allows customers to access their current and historical consumption data and compare their energy usage month to month and year to year. Over 166,000 customers have registered to use this tool as well as other account related information. There is also a “Manage Energy Use” section of the Applicant's Web site, which features an interactive bill estimator tool, video instruction on weatherization, and other useful content. This site is currently averaging 12,000 visits per year. For business customers, online information includes power quality technical assistance, conversion assistance, new construction information, and expert energy assistance.

## **1.2 Energy Conservation Programs**

The Applicant currently has three energy conservation programs:

- The Value Visit program is designed to assist residential electric customers that are considering an investment in upgrading their home's energy efficiency. An Applicant representative visits the customer's home and guides them in their purchase of energy related equipment and materials, such as heating and cooling systems, duct insulation, attic insulation, storm windows and doors, etc. There is a nominal charge for the program, which is reimbursed to the customer if they implement any suggested upgrade within 90 days of the visit.
- The Rate 6 Energy Saver / Energy Conservation Program rewards homeowners and home builders who upgrade existing homes or build new homes to a high level of energy efficiency with a reduced electric rate.
- The Seasonal Rate Structure varies some electric rates by season to encourage conservation and efficient use during peak usage periods.

### 1.3 Load Management Programs

The Applicant maintains four load management programs:

- The Standby Generator Program for retail customers is a two-tiered program whereby customers agree to run standby generators to release capacity back to the Applicant, where it is used to serve system demand.
- The Interruptible Load Program consists of over 200 MW of interruptible customer load under contract. Participating customers receive a discounted demand charge in exchange for shedding load when requested by the Applicant.
- The Real-time Pricing Rate is a program whereby certain customers receive a high price signal during peak usage periods when capacity is low in the energy market, and is designed to encourage energy conservation and load shifting.
- Time of Use Rates contain higher charges during peak usage periods of the day to encourage energy conservation and load shifting during these periods.

As a corporation organized and existing under the laws of the State of South Carolina, the Applicant must comply with the policies of the South Carolina Public Service Commission (SCPSC) regarding energy conservation. The Applicant files a copy of its Integrated Resource Plan (IRP) with the SCPSC pursuant to Order No. 91-1002. The section of the IRP titled "Demand-side Management at SCE&G" describes many of the Applicant's programs as well as the methodology used by the Applicant to choose cost effective programs that promote energy conservation and load management by the Applicant's customers. *A copy of this section of the IRP from the most recent IRP filing will be provided as part of the final application.*

11. Indian tribes with land on the Project or who would be affected by the Project:

- a. There are no Indian tribes with land within the Saluda Hydroelectric Project boundary. However, during November 2004 through January 2005, 17 federally-recognized Indian Tribes were contacted by mail to see if they wished to be consulting parties for the Saluda Hydroelectric Project. The list of potentially interested tribes was obtained from the State Historic preservation Office (SHPO). In March 2007, follow up phone calls and faxes were made to tribes that had not responded to the initial contact letter. *Contact information for the two consulting party tribes is contained in the Draft Historic Properties*

*Management Plan (S&ME 2007), the final version of which will be included as an appendix to the final application. The responses of the tribes who were contacted are summarized below.*

<b>Indian Tribe</b>	<b>Response/Status</b>
Absentee-Shawnee Tribe	No Response
Catawba Indian Nation	Consulting Party
Cherokee Nation	No Response
Chickasaw Nation	No Response
Choctaw Nation of Oklahoma	No Response
Eastern Band of Cherokee Indians	Consulting Party
Eastern Shawnee Tribe of Oklahoma	Not interested in being a consulting party; however, notify if human remains or funerary objects are found.
Jena Band of Choctaw Indians	No Response
Micosukee Tribe of Indians of Florida	Not interested in being a consulting party
Mississippi Band of Choctaw	Not interested in being a consulting party
Muscogee (Creek) Nation	Not interested in being a consulting party; however, notify of inadvertent discoveries.
Poarch Band of Creek Indians	No Response
Santee Sioux Tribe of Nebraska	No Response
Seminole Indian Tribe	Not interested in being a consulting party; however, they want a copy of final archaeology report.
Seminole Nation of Oklahoma	No Response
Tuscarora Nation	Not interested in being a consulting party; however, notify of any inadvertent discoveries.
United Keetoowah Band of Cherokee	Not interested in being a consulting party; however, notify if human remains or funerary objects are found.

### **Information Required from Existing Licensees**

1. The Applicant has taken measures to ensure safe management, operation, and maintenance of the Saluda Hydroelectric Project, and will continue to do so in the future, as described below.
  - a. Operation During Flood Conditions: The Applicant has developed a computer based Flow Forecasting Model (FFM), which is used to predict inflow to the project, using real-time data provided by the U.S. Geological Survey (USGS) and the National Weather Service (NWS). The FFM is run when flood conditions are expected in the project drainage basin, and the results are used to determine what measures should be taken to accommodate the predicted inflow. Such measures include generation in advance of the arrival of high inflow in order to

lower the reservoir level to allow storage of the flood flow and, in extremely large floods, operation of one or more spillway gates to allow passage of inflow which cannot be stored. Based on the annual flow duration curves presented in Exhibit B, the hydraulic capacity of the powerhouse is exceeded approximately 1 percent of the time. This makes operation of the spillway extremely infrequent, except for annual testing as required by the FERC.

- b. Emergency Action Plan: The Applicant maintains an up to date Emergency Action Plan (EAP) in accordance with FERC requirements. This plan defines responsibilities and provides procedures designed to identify unusual and unlikely conditions that may endanger either the original Saluda Dam or the newly completed back-up dam in time to take mitigating action and to notify the appropriate emergency management officials of possible, impending, or actual failure of either dam. The plan may also be used to provide notification when spillway flood releases create major flooding.

Annual EAP training of project personnel is performed (beginning in 2006, the annual training includes emergency response agency personnel, as required by the FERC Atlanta Regional Office.) An annual EAP drill is conducted which consists of contacting each local emergency responder by telephone to confirm that the notification procedures and contact information are valid. Every five years, a tabletop and functional exercise are conducted at one of the Applicant's high hazard projects, including Saluda, which is intended to mimic in real time the activation of the EAP, with full participation of the emergency responders.

To assist the State and Counties with the notification process during possible impending or actual failure of either dam, the Applicant has installed a siren system for early warning of the downstream residents. The siren coverage area includes the one-hour inundation zone and 1500 feet on both sides of the river from the one-hour boundary to the Columbia Canal diversion dam on the Broad River and Granby Park on the Congaree River. The siren system will be activated by the Applicant after consultation and coordination with the local responder agencies. The Applicant also maintains an emergency information brochure on its company website. This brochure provides evacuation routes,

emergency shelter locations, and directions for tuning to radio and television stations for emergency service announcements for those in the siren coverage area.

- c. Monitoring Devices: The project structures are monitored using instrumentation (including piezometers, inclinometers, tilt meters, seepage measurement points, and survey monuments) which is read periodically by personnel familiar with the structures and instruments. The applicant maintains a Surveillance and Monitoring Program (SMP) for the project, and files annual Surveillance Reports with the FERC Atlanta Regional Office. Plant maintenance personnel staff the plant five days a week, and are also present for brief surveillance periods on weekend days and holidays. This group performs routine daily surveillance of the dam. Detailed monthly, quarterly, semi-annual, and annual surveillance and reading of instrumentation are done by SCE&G Fossil/Hydro engineering personnel, and maintenance of the dam is performed by SCE&G parks and dams maintenance personnel from another location. All of these groups are responsible for observation and reporting of any problems noticed during their surveillance.

- d. Employee and Public Safety

The Saluda Hydroelectric Project has a good employee safety record. During the period since the current license was issued, there have been 5 work related injuries at the Project, one each in 1986, 1987, 2002, 2003, and 2007. All of the injuries were minor, three requiring first aid only, and the other two requiring only minor medical attention.

The Applicant maintains a Public Safety Plan (PSP) for the Project, which includes warning and caution signs of various types and at various locations at the public access facilities on the reservoir and downstream of the dam in the lower Saluda River. The PSP will be revised based on the ongoing consultation with stakeholders during the relicensing process, and the revised PSP will be filed with the FERC Atlanta Regional Office at a future date.

The Applicant maintains a system of operational sirens and strobe lights along the lower Saluda River to warn recreational users of rising water levels. Additional sirens and strobe lights are being evaluated in consultation with the Safety Resource Conservation Group. Any new sirens and strobes installed subsequent to consultation will be included in the revised PSP.

As a result of recommendations from the Safety Resource Consultation Group, the Applicant has implemented a public website (<http://www.sceg.com/en/my-community/lower-saluda-river/>), which provides information on current and planned generation at Saluda Hydro. This allows recreational users of the lower Saluda River to be better informed about river conditions when using the river.

The Applicant is also developing an automatic notification system which will allow individuals who have signed up for the service to be called by phone when generation is increased at Saluda Hydro. A message will be played and the recipient must confirm receipt of the message by pressing a key on their phone. This system will also provide e-mail notification.

In addition to the Applicant's measures to maintain and improve public safety, the S.C. Department of Natural Resources maintains navigational aids on the reservoir, and conducts law enforcement patrols by boat on the reservoir. The Lexington County Sherriff's Department also patrols the reservoir by boat.

There have been at least 74 incidents involving accidental or criminal death or injury to 83 members of the public within the Saluda Hydroelectric Project during the period since the present license was issued:

<b>YEAR</b>	<b>NUMBER OF INCIDENTS</b>
1987	2
1990	6
1991	2
1992	4
1993	1
1994	1

<b>YEAR</b>	<b>NUMBER OF INCIDENTS</b>
1995	5
1996	6
1997	10
1998	5
1999	2
2000	4
2001	5
2002	4
2003	6
2004	3
2005	4
2006	3
2007	1

Of the 83 people involved in incidents since 1987, 50 drowned in the reservoir or Saluda River; 20 died or were injured as a result of boat or watercraft accidents; 5 were involved in 2 plane crashes; 3 were homicides or apparent suicides; 2 were electrocutions (1 fatal); 1 died for medical reasons while boating, and 2 were found dead of undetermined cause.

2. Description of Current Operation of the Plant:

Saluda Hydro is operated primarily as a reserve generation facility in the SCE&G system. The plant normally operates with one unit on line at minimum gate to provide downstream flow in the Saluda River. In the event of a loss of generation, the remaining Saluda Hydroelectric Project units can be started and brought to full load within 10 to 15 minutes. This allows a rapid response to emergencies on the Applicant's system, and also fulfills the Applicant's reserve share obligation under the VACAR Reserve Sharing Arrangement (VRSA). It should be noted that, in order to be considered a reserve generation asset at any given time, Saluda Hydro must remain on standby and cannot be providing generation for other purposes.

In addition to reserve generation, Saluda Hydro is utilized to manage the reservoir elevation on a seasonal basis. Under the current license, the Applicant has managed the reservoir using monthly target elevations, which are subject to revision by the Applicant's management based on climatic conditions, reservoir level at the time, dam



and reservoir maintenance requirements, or operational considerations. The reservoir is normally maintained between El. 348.5' NAVD88<sup>2</sup> (winter) and El. 356.5' (summer). Occasional drawdowns to El. 343.5' have occurred for project maintenance work or control of aquatic vegetation (primarily hydrilla) in the reservoir. The current license allows operation of the reservoir between El. 343.5' and El. 358.5'. Saluda Hydro units are occasionally dispatched on an economic basis when it is necessary to release water from the reservoir for seasonal or other drawdowns, or to pass inflow from precipitation in the drainage basin. During the relatively infrequent periods when Saluda Hydro is being utilized for reservoir management, the units being so utilized are not available for reserve generation, and other generation assets must be made available to meet the Applicant's obligation under the VRSA.

3. Discussion of history of project and record of programs to upgrade operation and maintenance of project:

The Saluda Hydroelectric Project was constructed between 1927 and 1930 by the Lexington Water Power Company, which merged in 1943 with SCE&G.

Construction of the Project began in April 1927 with the Arundel Corporation in charge of construction of the dam. W. S. Barstow & Company, general contractor, was in charge of clearing work, spillway, power plant structures, machinery installations, substations, temporary and permanent housing, and the cableway connecting the dam and intake towers. Hydraulic works design was by J. G. White Engineering Corporation.

Lake Murray came into existence in July 1930, when the reservoir reached an elevation of 298.5 feet NAVD88. In December of 1930 the first electric power was delivered to Duke Power Company. Lexington Water Power Company was a production company only, and as such did not own any transmission lines. The Saluda Project was financed primarily through sales contracts with Carolina Power & Light Company, Duke Power Company and Broad River Power Company, all of whom built their own transmission lines to the Saluda Hydro Plant.

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<sup>2</sup> All elevation references in Exhibit H are given in North American Vertical Datum 1988 (NAVD 88); conversion to traditional plant datum (PD, used in numerous supporting studies for this license application and often erroneously referred to as MSL) requires the addition of 1.50 feet.

When the hydro plant was completed it had four turbines, each capable of producing 32,500 kilowatts (KW). When the dam was built, plans were formulated to later add fifth and sixth turbines. The intake tower and the associated tunnels to carry reservoir water under the dam to the future unit were constructed when the dam was originally built.

In 1931 Lake Murray reached an elevation of 348.5 feet, and in 1933 it reached 358.5 feet.

In 1936 heavy rains and insufficient spillway capacity caused the reservoir to reach its maximum elevation of record of 359.8 feet. As a safety measure the FPC directed that the reservoir be lowered to an elevation of 348.5 feet. After further study, the FPC then allowed the maximum reservoir elevation to be increased to 353.5 feet. This maximum elevation was maintained until the spillway capacity could be increased and better drainage achieved on the downstream face of the dam.

Between 1943 and 1946 two additional spillway gates were added, the spillway discharge channel was enlarged and partially rerouted, and the dam was strengthened by raising the crest elevation by 3 feet and adding rock excavated from the spillway channel to the downstream face of the dam. When these measures were complete, the FPC permitted the increase of the reservoir elevation to its maximum operating level of 358.5 feet. Also at this time, flood protection measures were added to the powerhouse to mitigate damage from high tailwater conditions. These measures included flood walls around the butterfly valve actuators, watertight doors at several locations, and provisions for stop logs at the work bay roll-up door.

In 1943, Lexington Water Power Company merged with SCE&G, in whose service area the Project was located. The project license was transferred to SCE&G on May 29, 1943. The FPC approved the Consolidation in an order issued in July 1943 [3 FPC 1046 (1943)].

Since the late 1950s, Lake Murray has also been used as a source of cooling water for the McMeekin steam electric generating plant. The FPC issued a finding and order on June 15, 1956 [15 FPC 1544 (1956)] approving the use of the Project reservoir (Lake Murray) for supplying circulating cooling water to McMeekin Station. McMeekin Station,

which is located near the Saluda Hydro Plant, was completed and began commercial operation in 1958.

In 1957 and 1958, Saluda Hydro was automated, giving the system dispatcher operational control of the plant.

In November 1966, a brake shoe holder failure on unit 3 generator caused damage to numerous stator coils. Subsequently, all the original asphaltic base coils for the stator were replaced with class B insulated coils. Improvements in the coil materials and design led to the generator capacity increasing to 47,000 KVA (up from 40,625 KVA). With the power factor changed from 0.80 to 0.90, the generator capacity increased to 42.3 MW. Since no modifications to the turbine were made at that time, Unit 3 is limited by turbine horsepower to 32.5 MW.

Engineering studies for adding a fifth generating unit at Saluda Hydro began in 1966. The FPC issued an amendment to the Project License, to include Unit No. 5, in December 1967 and construction began in 1968. The fifth generator, which is larger than the original four and is rated at 67.5 MW, was put into commercial operation during the summer of 1971, making the total generator capacity of the Saluda Hydro Plant 207.3 MW. Computers from the dispatching office in Columbia control all five generating units.

In November 1975, the upstream riprap armor between original dam stations 63+50 and 77+00 was replaced by placing new filter, bedding, and a 30 inch layer of armor stone. Spot repairs to the remainder of the upstream armor were made in October 1977.

In 1975 - 1976, the S.C. Department of Transportation (SCDOT) widened the crest of the original dam to 36 feet, in order to improve driver safety on SC Rt. 6.

In 1977, 81 stator coils were replaced by General Electric on the Unit 4 generator.

On May 12, 1980, the Federal Energy Regulatory Commission (FERC, formerly Federal Power Commission) issued an order approving the City of Columbia, SC to withdraw drinking water from Lake Murray at an eventual maximum rate of 100 million gallons per day (MGD) [11 FERC 62,103].

In 1985, 5 stator coils on the Unit 2 generator were replaced by Westinghouse.

Between 1983 and 1995, all of the main step-up transformers were replaced with new or refurbished units.

On June 1, 1984, the FERC issued a new 30 year license for the continued operation of the Saluda Hydroelectric Project (retroactive to the date of the original license expiration, August 4, 1977) [27 FERC 61,332].

On January 23, 1989, the FERC issued an order approving the City of West Columbia, SC to withdraw drinking water from Lake Murray at an initial rate of 6 MGD and an ultimate rate of 48 MGD [46 FERC 62,057].

As the Saluda Hydroelectric Project neared its 60th year of operation, a number of modifications were undertaken to insure its continued safe operation. Among these were removal of the original surge tanks on the Units 1 and 3 penstocks, and improvements to the intake towers and spillway.

In 1988, studies began to determine whether the badly deteriorated surge tanks on Saluda Unit Nos. 1 and 3 could be safely removed. Over the years since the original construction of Saluda Hydro, the electric system in which it operates had changed, alleviating the need for the rapid (about 6 second) wicket gate closure time which the two surge tanks provided for these units. Following analysis and testing that showed they could be safely removed; the tanks were demolished in late 1991, and the Unit 1 and 3 wicket gate closure timing was slowed down to about 25 seconds.

In early 1990 man-doors were installed in the five intake towers to prepare them for epoxy grouting of cracks in the concrete walls between elevations 343.5 and 358.5 feet. The crack grouting was accomplished in the fall of 1990 with Lake Murray at elevation 343.5 feet. Also in the fall of 1990, Spillway Gate Nos. 5 and 6 were painted, gate seals were replaced, and damaged structural members of Gate No. 6 were replaced.

Installation of post-tensioned anchors in the south abutment wall of the spillway was begun in late 1991 and completed in February 1992. This work was done to stop rotation of the wall.

The four original riveted steel spillway gates (Gate Nos. 1 - 4), which were badly deteriorated, were replaced in 1994 with new welded steel gates of similar design. Installation was complete and all four gates tested in December 1994.

On October 28, 1998, the FERC issued an order approving the City of Newberry, SC to expand its existing (since 1955) water withdrawal facility at Lake Murray from the previous capacity of 5 MGD to 10 MGD [85 FERC 62,056].

As a result of two of the articles in the license issued in 1984, two major modifications of the dam have been required. In 1989, a sheet pile wall with top elevation 375.5 was added to the crest of the dam at the upstream side of SC Highway 6, to protect the dam from overtopping in the event of a new, larger PMF. A computer based Flow Forecasting Model (FFM) was developed and is used to predict inflow to the project, using real-time data provided by the U.S. Geological Survey (USGS) and the National Weather Service (NWS). The development of the FFM in combination with the sheet pile crest wall allowed the project to meet current hydrologic safety requirements of the FERC, and raising the embankment further was not required.

In 2002, construction was started on a new backup dam immediately downstream of the original dam, which had been determined to be subject to possible failure during a reoccurrence of the 1886 Charleston earthquake. The new backup dam consists of rock fill embankment sections on the north and south ends, with a roller-compacted concrete gravity section in the center. The original dam remains in place; and during construction, additional material was added to it to provide a base for two additional lanes of SC Highway 6. Construction of the backup dam was completed in 2005.

On November 18, 2003, the FERC issued an order [105 FERC 61,226] extending the term of the 30 year license issued in 1984 (retroactive to 1977) by three years, to expire August 31, 2010. This was done in recognition that the drawdown of the reservoir to El. 343.5 feet, in order to safely construct the backup dam, would delay completion of the various studies required for the new license application.

In February 2006, repairs were completed on the upstream face riprap armor on the southern portion of the original dam, where wave action is most severe due to the long fetch and orientation with regard to prevailing winds. The armor repairs encompassed

3,000 linear feet between original dam stations 45+00 and 75+00. A 200 linear foot section between stations 53+00 and 55+00 was completely excavated and new filter, bedding, and armor stone placed. The remaining 2,800 linear feet received additional armor stone and was graded to a uniform slope.

On June 9, 2006 [115 FERC 62,265] (revised by FERC order dated March 22, 2007 [118 FERC 62,210]), the FERC issued an order approving Saluda County for a municipal water withdrawal of up to 15 MGD.

4. Summary of generation lost over last 5 years due to unscheduled outages, including cause, duration and corrective action: *This information will be provided in the final application.*
5. Discussion of record of compliance with terms and conditions of existing license, including list of all incidents of non-compliance, their disposition, and documentation relating to each incident:
  - a. The Applicant has made a significant effort to comply with all articles in the existing license, as well as with the FERC's Rules and Regulations, and any directives from the Atlanta Regional Office. When necessary, the Applicant has requested additional time to complete work in progress. The Applicant has not been cited for non-compliance during the term of the current license. The following items provide specific compliance information for several key license articles.
  - b. Article 5 (Within 5 years of license issuance, acquire title in fee or the right to use in perpetuity all lands necessary for the project operation): The conditions of this article have been met.
  - c. Article 8 (Install stream flow and water level gages): The Applicant compensates the USGS to maintain the following gages:
    - 02166501 - Saluda River at Lake Greenwood tailrace
    - 02167000 - Saluda River at Chappells
    - 02167450 - Little River near Silverstreet

- 02167582 - Bush River near Prosperity
  - 021677037 - Little Saluda River at Saluda
  - 02168500 - Lake Murray near Columbia
  - 02168504 - Saluda River below Lake Murray
  - 02169000 - Saluda River near Columbia
  - 02169500 - Congaree River at Columbia
- d. Article 13 (Reimbursement for use of Project water): The Applicant has water purchase contracts in place with the municipal water users listed in Section 3 above, and in Exhibit C.
- e. Article 17 (Construct and maintain recreational facilities): All recreational facilities required in the current license have been constructed and maintained in good order.
- f. Article 18 (Provide public access to project water and lands for recreational use): The Applicant has provided public access to Project lands and waters as required.
- g. Article 19 (Take reasonable measures to prevent soil erosion): The Applicant has obtained all required Federal, State, and local permits, including sediment and erosion control permits, when performing construction, maintenance, or operation of the project.
- h. Article 20 (Clearing of land and disposal of material): The Applicant has complied with the requirements of this article.
- i. Article 24 (Consultation with SHPO Prior to Future Construction): Prior to the construction of the Saluda backup dam in 2002 -2005, the Applicant conducted a cultural resources survey of the project area, and entered into a programmatic agreement with the SHPO and the FERC. All requirements of the programmatic agreement have been fulfilled.
- j. Article 25 (Tailrace fishing facility study): This study was filed with the FERC as required. A tailrace fishing platform was not required. Access to the lower Saluda River for boating and fishing has been made available to the public.

- k. Article 26 (Perform new Probable Maximum Flood study): This study was filed with the FERC as required. A sheet pile crest wall was added to the dam, and a computer based Flow Forecasting Model was developed and implemented.
  - l. Article 27 (Perform seismic hazard study): This study was performed as required, and led to the construction of the Saluda backup dam.
  - m. Article 28 (Annual charges): The Applicant pays annual charges for the project as stipulated.
  - n. Article 29 (Project amortization reserve account): The requirements of this article have been met.
  - o. Article 30 (Use and occupancy of Project lands and waters).
  - p. Article 31 (Develop and file annual operating plan to enhance water quality in the lower Saluda River): This article was amended to the license by FERC order dated July 15, 2004. The Applicant has entered into a settlement agreement with two non-governmental organizations (NGOs) which requires the Applicant to take action to improve water quality (specifically dissolved oxygen) in the project tailrace and lower Saluda River.
6. Discussion of any actions taken that affect the public: *This information will be provided in the final application.*
7. Summary of ownership and operating expenses that would be reduced if project license were transferred: *This information will be provided in the final application.*
8. *Statement of annual fees paid under Part I of the Federal Power Act for use of Federal or Indian lands within the project boundary:* There are no Federal or Indian lands located within the Saluda Hydroelectric Project boundary, therefore no annual fees are paid for such.