

MEETING NOTES

**SOUTH CAROLINA ELECTRIC & GAS COMPANY
SALUDA HYDRO PROJECT RELICENSING
OPERATIONS TECHNICAL WORKING COMMITTEE**

**SCE&G Training Center
May 21, 2008**

final acg 8-11-08

ATTENDEES:

Alan Stuart, Kleinschmidt Associates
Alison Guth, Kleinschmidt Associates
Bill Argentieri, SCE&G
Bret Hoffman, Kleinschmidt Associates
Bud Badr, SCDNR
Michael Waddell, TU
Jon Quebbeman, Kleinschmidt Associates

John Martin, SCDHEC
Ray Ammarell, SCE&G
Scott Harder, SCDNR
Feleke Arega, SCDNR
Titus Rotich, SCDNR
Jim Cumberland, SCCCL
Mark Giffin, SCDHEC

DATE: May 21, 2008

These notes serve to be a summary of the major points presented during the meeting and are not intended to be a transcript or analysis of the meeting.

DISCUSSION

Bret Hoffman opened the meeting, presented the group with some background information on the hydraulic model, and introduced Jon Quebbeman who was presenting. Bret explained that the purpose of the meeting would be to run through the model with the TWC before it was presented to the RCG's.

Jon began the presentation and explained that, reflecting Dr. Badr's request, they extended the modeled data back until around 1940. Jon pointed out that there are two gages on the river that were used, and roughly 100 square miles of drainage area between the gages. Jon reviewed that there were two approaches for the modeling. He explained that one method was to look at the gages in the upper end of the reservoir and calculate inflows. He noted that the second approach would be to use the mass balance method. Jon pointed out that it appeared that the mass balance method was more accurate, as it accounts for evaporation. He continued to explain that the goal is to determine how much flow is coming into the reservoir and run various scenarios of operation to see how well the model can meet certain guide curves.

Jon reviewed how USGS developed the extended period of record to model data. It was explained that USGS hindcasted data was incorporated into the model. Bret explained Dr. Badr's concerns for incorporating an extended period of record; he noted that model results from the last 16 years would not look as good as the last 60 years due to the extended drought that has been ongoing. Bret

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continued to note that information has been obtained from the RCG groups on desired run scenarios and those requests have been tiered. Dr. Badr questioned how SCE&G's desires were incorporated into the model. Ray Ammarell explained that as long as the plant is available for reserve, their needs are met. Bill Argentieri added that SCE&G's piece of the model is a set amount of acre/feet of water for reserve. It was also explained that the more often SCE&G has to generate for reservoir pool management, the less time it is available for reserve. Dr. Badr asked how the model was going to measure how often plant was available. Jon replied that there are two methods for determining how often the plant was not available; it could be done by counting the recreation days, or if because of previous operations in a drought period the reservoir has dropped below 345', where reserve is not used in the model. Bret added that reserve capabilities were taken care of outside the model by discussing recreation flows with the Downstream Flows TWC.

Jon continued through the presentation and explained that some of the constraints incorporated into the model are up for discussion. He noted that there was a guide curve incorporated for certain years so that the lake level drops down to 350' on January 1st for water quality. Jon also presented the group with the recreation tiers. He explained that Tier 1 is what is maintained as the highest priority for recreation flows.

After a break the group continued to discuss the tier 1 and tier 2 recreation flows. It was explained that tier 1 included the swiftwater rescue training. Jon also reviewed minimum flows with the group.

After lunch and the inputs to the model were discussed, Jon reviewed the model results with the group. It was shown that model results matched up well with the reservoir guide curves. The group viewed curves with 10, 20 and 40 hours of reserve generation. Generally under normal circumstances, all the needs could be met. As the group reviewed the results, they also discussed any changes that should be made to the model. These are outlined below:

- Tier 2 Recreational releases to be cut off 1 foot below guide curve, Tier 2 Recreation releases to be cut off 3 feet below guide curve.
- Elevation 358' should be met by March 1.
- Reserve operations should be stopped at 345' instead of 335'.
- Minimum flows should be cut off at 335'
- The model should be run with zero hours/month for reserve calls
- Flood forecasting should be incorporated into the first band level of operations
- Minimum flows should be cut down to 400 cfs when elevation 350' is met.

Desired Results: frequency and duration of violations.

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The group noted that they were happy with the model and the results and moved on to discuss the low inflow protocol (LIP) and guide curve. Ray provided the group with a presentation on the proposed LIP and guide curve. He explained that SCE&G will strive to operate the Project within the target operating band under normal conditions. Ray also explained that the purpose of the LIP would be to allow for staged reductions in minimum flow and other releases during periods of drought or low inflows to the reservoir. In the presentation, Ray shared many of the LIP definitions with the group and noted that the LIP is structured very similar to what Duke did on the Catawba Wateree. Ray pointed out the three gages that they generally monitor are Saluda River at Chappells, Little River near Silverstreet, and Bush River near Prosperity. The group then looked at the proposed low inflow protocol trigger points and actions. Ray explained that during recovery from a drought, all three LIP triggers must be met for the previous stage before the LIP stage is moved up.

As the group reviewed the LIP, Dr. Badr suggested that the analysis be run based on the last 16 years of data in order to see how it corresponds to what is currently happening in the state. Dr. Badr also suggested that Lake Greenwood low flows be looked at in order to see how they compare in percentile rankings. Ray continued with the presentation and the group discussed that under stage 1 of the LIP there was not much impact to downstream flows. The group continued with discussions and upon completion of the presentation everyone agreed that, in principle, it looked like a good start to the LIP and guide curve. It was noted that this information would be sent out to the group for review and Dr. Badr pointed out that he would like the information sent to Feleke. The group adjourned.