

FOOTHILLS AREA PLANNING GROUP  
Meeting Notes

August 12, 2010  
0900-1200  
Tri-State Office

A. Attendance

Jim Hirning (WAPA)	Mike Rein (PSCo)	Stan Lawrenson (TSGT)
John Collins (PRPA)	Kerry Franklin (PSCo)	Mike Houglum (TSGT)
Jeremy Brownrigg (PRPA)	Bob Johnson (PSCo)	Rocky Ray (TSGT)
Joe Liberatore (WAPA-phone)	Bill Anderson (PSCo)	Mark Graham (TSGT)

B. Meeting Notes and Action Items from the 4-7-2010 and 6-27-2010 Meetings

The 6-27-2010 meeting notes were reviewed and revisions provided.

Action Item No. 1: Bill Anderson (PSCo) will finalize both sets of meeting notes.

C. TOT7 2010 Limits Study

The study is on-hold because WAPA needs to tell PRPA the ratings to use for the termination devices at the Ault Substation, specifically the disconnect switches in the 230kV circuit breaker line-up. There has been uncertainty about the switch ratings - 1200 amps (478.0 MVA) or 1600 amps (637.4 MVA). This was discovered after last year's TOT7 system operating limits were reported. The ratings of the disconnect switches have a significant impact on the TOT7 system operating limit and transfer capability. The Ault-Ft.St.Vrain 230kV branch is the limiting element to TOT7 transfers. The TOT7 owners would like to use the 1433 amp (570.9 MVA) rating as this is the Ault-FSV 30-minute emergency rating; however, WAPA may limit the facility to 1200 amps (478 MVA) with all breakers in-service in the breaker-and-a-half scheme.

Jeremy Brownrigg (PRPA) mentioned that he sent out an e-mail to the Foothills Planning group that described the disconnect switch rating issue and its impact on the TOT7 System Operating Limit. The e-mail also included an Overload Capability data sheet from Southern States (the manufacturer of the disconnect switches). The table was reviewed by the group. PRPA determined that based on a linear approximation of the data points provided in the Overload Capability table, at an ambient temperature of 50° C (122° F) the continuous allowable current for the disconnect switches is 1484 amps which is 50 amps greater than the 30-minute emergency conductor rating of the Ault-Ft.St.Vrain 230kV line (1433 amps). From this it appears that the 1433 amp (570.9 MVA) rating for the disconnect switches is very conservative. It was suggested that the TOT7 owners use the 1433 amp (570.9 MVA) rating. This would set the Ault-Ft.St.Vrain 230kV branch rating to 570.9 MVA. WAPA may be able to issue a temporary overload waiver to allow this rating.

Joe Liberatore (WAPA) joined the meeting via the conference phone. Joe explained that WAPA needs to perform maintenance work (CT's and jumpers) at the Ault Substation and this work is scheduled for September and October. In addition, the Weld CT replacement work is scheduled for the following month in November. WAPA will

determine the best construction window (one week of impact to the site). PSCo System Operations needs PRPA Planning/PSCo Planning to complete the TOT7 studies. Bob Johnson (PSCo) indicated that if the 1433 amp (570.9 MVA) rating for the disconnect switches cannot be used, the TOT7 system operating limit could vary between 100 MW to 150 MW during the construction outage, a very low range. Joe indicated that WAPA plans to eventually upgrade the disconnect switches to achieve a rating of 2000 amps (796.7 MVA). The disconnect switch upgrade would consist of a retrofit (blade jaw reinforcement) to get the rating to 2000 amps (796.7 MVA).

Joe Liberatore (WAPA) discussed the Overload Capability table with the Foothills group. He agrees with PRPA that the 1591 amp (633.8 MVA) rating at a 40°C (104°F) ambient temperature of the disconnect switches as listed in the Overload Capability table should give us confidence to use the 1433 amp (570.9 MVA) rating. Joe said that he would consult with WAPA management to obtain an approval to use the 1433 amp (570.9 MVA) rating for the disconnect switches. He will get an answer back to PSCo and PRPA on the rating verification of the Timberline-Ault 230kV and Ault-FSV transmission 230kV lines. Joe will investigate the facilities and make sure that all equipment for the two lines is rated greater than or equal to 1433 Amps so that it can be used in determining TOT7 limits. The equipment he will investigate are those contained in the Ault #2186 Bay including disconnect switches, breaker CT's, and metering CT's

The Boyd-Harmony 230kV construction outage was discussed. The TOT7 rating will need to be reduced because of the Boyd-Harmony 230kV construction outage in late summer and fall of 2010. If the Ault-Ft.St.Vrain 230kV line rating is not increased, PSCo will be in a bind over import capability. PSCo indicated that it is difficult to manage the TOT7 at low limits (300-400 MW). PSCo will need to carefully monitor and manage the TOT7 power transfer path during the Boyd-Harmony 230kV scheduled line outage and for the CT Replacement work at the Weld Substation. PRPA indicated that the Boyd-Harmony 230kV line maintenance outage starts August 30. The temporary TOT7 system operating limits that apply to this maintenance outage need to be posted. WAPA needs to give verbal verification about the rating of the disconnect switches so the study can be completed and results placed in EMS.

Action Item No. 2: Joe Liberatore (WAPA) will provide a verbal confirmation to PSCo and PRPA on the rating verification of the Timberline-Ault 230kV and Ault-FSV transmission 230kV lines by Monday, August 16.

#### D. Study Plans

- TOT 7 Dynamics

David Silver (PSCo) sent the study plan out. Bob Johnson (PSCo) reviewed the study plan and said the study plan is acceptable. David Silver is waiting on cases from Jeremy Brownrigg (PRPA). David's goal is to complete the study approximately six weeks after receiving the cases from PRPA.

- Foothills Area Voltage Stability

Action Item No. 3: Bill Anderson (PSCo) will send out the study plan for review.

- Greeley Area System Reliability

Mike Rein has developed a study plan and is working with PSCo Transmission and Substation Performance, PSCo Transmission Line Construction and

Maintenance, PSCo Transmission Engineering, and PSCo Substation Engineering to develop the needed facility upgrades in the Greeley Area.

E. Coordinate Facility Ratings (FAC-009)

The NERC FAC-014 Standard to establish and communicate system operating limits was discussed. The purpose of this standard is to ensure that System Operating Limits (SOLs) used in planning and operational reliability studies are determined based on an established methodology. In order to maximize the system operating limits (SOL) on TOT7, possible increases to the ratings of the following facilities need to be determined and the results coordinated:

- Ault terminal of the Ault-Ft.St.Vrain 230kV line
- Ault terminal of the Ault-Timberline 230kV line
- Ault terminal of the Ault-Rawhide 230kV line

F. Foothills Area Projects Status Report

1. Carey 230kV Project

John Collins (PRPA) sent out an e-mail yesterday (August 11, 2010) providing a status report for the project. PRPA decided that they won't prepare a second draft of the interconnection agreement until PSCo decides if it will be a party or not; however, they are willing to talk philosophy with TSGT and PSCo.

Action Item No. 4: Bill Anderson (PSCo) will work with Gerry Stellern (PSCo, Manager-Transmission Asset Management) to get a meeting set up with TSGT with the right personnel and resolve any issues.

2. Timnath 230kV Project

No additional information was provided by PSCo.

3. Weld 230-115kV Transformer No. 3 Project

Mike Rein (PSCo) said the latest in-service date is 2011, a revision from the last projected in-service date of April 2013. WAPA indicated that the project is budgeted in the Fiscal Year (FY) 2011 (October 2010 through September 2011). John Collins (PRPA) mentioned that he hasn't seen the Plan of Service Drawing. The group questioned the transformer installation schedule as the lead time for large power transformers is approximately eighteen months. Concerns were expressed about taking the entire Weld bus out-of-service and what the limitations to TOT7 would be during the construction. PSCo's Weld 230-115kV transformer would be available to serve a limited amount of demand. WAPA sent PSCo the Weld 230-115kV No. 3 Installation Agreement (or Weld Transformer Agreement) and Mike Rein (PSCo) has it. The project is moving forward and WAPA and PSCo will need to do coordination. A substation layout or one-line showing where the third transformer will connect is needed (Plan of Service drawing). The WAPA Weld 230-115kV transformer is presently served with the transfer breaker in the main-and-transfer arrangement at the Weld Substation. WAPA is purchasing the transformer in FY 2011 (October 2010 through

September 2011); however, the projected in-service date in the WAPA budget is 2013.

4. Promontory 230-115kV Park Project and Shiloh Project Alternative

Ron Moulton (WAPA-DSWR Transmission Manager) will make a decision about the Promontory Project based on the Rating Impact Study report that was sent to him. A Rating Impact Study spreadsheet that identifies the cost for each option was included in the report. The Rating Impact Study addresses both the Promontory Project and the Shiloh Project. The Shiloh Project is an alternative to the Promontory Project and would involve the acquisition of new ROW for additional lines and is expected to take several years longer to complete. The Promontory tentative in-service date is 2015.

5. Weld-Whitney 115kV Project

The first phase (of the two phases of the project) is complete. The project is needed to serve TSGT load increases in the area. The WeldLM-Whitney 115kV line is owned by WAPA and is presently rated at 166 MVA. Approximately three miles of the line is strung on 115kV double-circuit towers that are shared with PSCo's WeldPS-Johnstown 115kV line. WAPA has maintenance responsibility of this double-circuit line. TSGT needs to provide Plan and Profile Drawings to WAPA and PSCo. A contingency overload of the line shows up in summer assessment studies.

6. Ault-Cherokee 230kV Project

This project is a Senate Bill 100 Project. The in-service date of the project was pushed out to 2017 from 2016. Planning studies are anticipated to start in the 4Q/2010. PSCo may seek outside project participants. PSCo may determine the congestion costs incurred from TOT7 limitations as part of its economic evaluation of the project. These costs could provide additional justification for the project.

G. Foothills Project Log, Maps, and Drawings

Stan Lawrenson (TSGT) will continue to update the project log as needed. Mike Rein (PSCo) has agreed to assist PRPA in revising the Ten-year Planning Foothills Area Transmission System maps that are distributed annually.

H. Foothills Website

The Foothills Workgroup reporting section of the WestConnect Transmission Planning-CCPG website needs to be updated to include the Foothills Area final meeting minutes for the April 7, 2010 and May 27, 2010 Meetings. In addition, the final study plans need to be added.

I. Next Meeting

A tentative meeting date of Thursday, October 7, 2010 at TSGT offices was proposed. The final meeting date and location will be determined later.