

**Final SATS Meeting Notes
Tucson Electric Power Company Service Center
SC-B Auditorium,
November 17, 2009**

Attendees:

Bruce Evans, SWTC
Phil Hutton, Kleinfelder
Joshua Johnston, Western
Andy Meyer, TEP
Gary Trent, TEP
Bill Kipp, Black Forest
Doug Patterson, Black Forest
Cary Deise, USE Consulting
Jerry Carlyle, San Xavier District, Tohono O'odham
Gerald Fayuant, Tohono O'odham
EvaMarie King, SWTC
John Kyei, PDS Consulting
Tom Wray, SunZia
Alistair Rennie, SRP
Jim Tang, CAP

On Phone Bridge:

Lisa Tzot, Tessera Solar
Gary Romero, KRSA
Vincent Thor, APS

1) Welcome and Introductions

Gary Trent welcomed everyone to TEP's offices and reviewed safety procedures for the building.

2) Review Agenda

The agenda was reviewed as sent out. There were no new additions.

3) Review/Approve 10/15/09 Meeting Notes

The notes from the October 15th conference call were reviewed and approved. Bruce will finalize the notes and send them out tomorrow.

5) Review Action Items from 10/15/09 Meeting

- Josh to provide a study map of the areas proposed in the Western TIP. Completed.
- Josh to provide a list of the 8 utilities that are involved in the TIP study effort. Completed. Josh was unable to provide this list for confidentiality reasons.
- Gary to provide the url of the SunZia website. Completed.
- Bruce to forward the above items to the SATS distribution list. Completed.

- Bruce to forward Josh's e-mail on the limiting elements of the Apache-Adams Tap 115 kV line to the group. Completed.
- All to provide 2010 Study Plan ideas to Gary. Ongoing.
- Gary to send 1st draft of SATS Report to SWTC. Completed.
- Gary to send combined draft report to SATS for comments. Completed.

No additional comments to the Action Items were received.

5) SATS 2009 Study Plan Review

This review is the same as presented at the last meeting, but is being re-addressed for the benefit of newcomers at today's meeting. The 2009 Study Plan came from the 2008 SATS Study.

- Present plan & subsequent findings to SWAT, WestConnect and to local stakeholders
 - December 5, 2008 SATS Conference Call
 - January 13, 2008 SWAT Meeting
 - Study Plan Complete
- Revise load forecasts
 - SATS area load forecasts provided in February and March 2009
 - Complete
- Engage SATS in early case building to ensure accuracy of database for 2009 ten year planning cases:
 - Focus on Arizona for ten year planning to include cases for years 1 through 5 plus year ten;
 - Preparation for ACC ten year plans, RMR, BTA and compliance studies;
 - Provide support and documentation to other regulatory agencies such as FERC and Rural Utilities Service (RUS);
 - Complete
- Investigate implications of increased FMI loads in SATS study footprint:
 - Seek input from, and participation by FMI, to address their anticipated plant expansion
 - FMI has nothing to discuss due to the economic downturn
 - TEP received an updated forecast from FMI in June
 - Complete
- Investigate alternative configurations to mitigate high flows on the Winchester 345/230 kV transformer, Apache-Bicknell 230 kV line and 345/230 kV Bicknell transformer caused by EHV system contingencies:
 - Ongoing
- Develop and evaluate alternatives to the two joint Tortolita-North Loop 345 kV proposal based on the SPPR Three Terminal proposal:
 - Deferred to 2010
- Investigate impact of SunZia in coordination with CATS EHV, NM, SWAT RTTF and other entities:
 - Removed from study plan

- Develop and evaluate alternatives for joint SWTC/TEP substation(s) to supply TEP/Trico loads south of Tucson:
 - Deferred to 2010
- Continue Cochise County planning in an effort to comply with ACC recommendations:
 - Agenda Item #7
- May conduct studies to accommodate renewable projects
 - Removed from study plan
- Complete capital cost estimates and economic analysis, including losses;
- Identify potential projects:
 - Ongoing
- Conduct Scenario Sensitivity analysis, such as Load Forecast, Efficiency, Local Renewable Resources, Local & Distributed Generation, and location of external resources:
 - Removed from study plan

John Kyei asked if any transient stability analyses had been done in the studies performed during 2009. Gary replied that they had not; only load flow analyses were done. John suggested to the group that a benchmark Var Margin Study be done, for the benefit of new projects coming on line. Gary suggested this as a potential item for study in 2010.

Jerry Carlyle informed the group that the Tohono O’odham Nation is looking to build a renewable energy project and asked about the study work that was identified in the 2009 Study Plan – specifically the bullet addressing conducting studies to accommodate renewable projects. He asked if an areas had been identified for renewables. Gary replied that the SunZia Project was identified, which is a 460 mile line from New Mexico to Central Arizona. It will be able to accommodate other renewable projects if developers want to interconnect to it. However, it isn’t being studied in SATS; consultants are doing the study work.

Jerry explained that the Nation is looking at a solar plant and are looking at what is available transmission wise to accommodate the plant. The Nation wants to electrify their community and serve their own businesses, casinos, and other interests. They hope to provide jobs for their communities and lower costs to their people. They are looking to contract with entities for study work. When asked about the location of this potential solar plant, Jerry replied that it is near Pima Mine Road and I-19 in the mine tailings area. It is planned to be a 200 MW of solar panels. They are aware that they will need to deal with the land owners in the area.

Gary suggested that TEP and SWTC have facilities in the area that the plant could tie to and explained that the Nation would need to submit an interconnection request, which would yield a System Impact Study. In addition, part of the process of the Large Generation Interconnection Process (LGIP) is to provide a project specific study.

6) Western TIP Update

Joshua said that he did not have any additional information to report and recommended taking this subject off of the agenda. He'll let us know if he has anything to report at subsequent meetings. A better forum for this information is the Colorado River Transmission (CRT) sub-committee meetings.

7) Cochise County Study Update

John reported that the Technical Study Report is done and the Summary Report is mostly done. Some minor comments were received by TEP.

A meeting was held last week to discuss the Summary Report and comments are due by this Friday. For the information of the group, no HV facilities have been proposed for the area.

The next meeting of the group will be December 1st at TEP's offices.

8) SunZia Update

John provided a technical update for the group. For the benefit of new comers, the SunZia Project is composed of 2-500 kV lines originating in New Mexico and terminating at Pinal Central. The lines are designed to carry approximately 3,000 MW of renewables to load centers in Arizona.

SunZia is following the WECC Path Rating Process to establish a 3,000 MW rating for the line. This process was started in July 2007 and in April 2009 a Comprehensive Progress Report (CPR) was developed in which the non-simultaneous rating of 3,000 MW was accepted. The next step is to work on simultaneous issues – can 3,000 MW come in without impacting other facilities? A review group has been set up to study this as part of phase II of the Path Rating Process. A study plan was developed on September 25th and on October 16th the base case study work was completed. The group is now focusing on transient stability studies, which should be complete by June of next year. Completion of the 3-phase rating process is expected by September of next year.

Tom updated the group on the environmental and permitting efforts of SunZia. He explained that the peer review process that is underway as part of phase II of the WECC Path Rating Process will determine which un-protected paths – that is, paths that do not carry an approved path rating through WECC – will get protected. The line will be series compensated.

SunZia just completed its 12th public meeting. These public meetings were hosted by the BLM, which is the lead agenda. Four were held in Arizona and eight were held in New Mexico. The project consists of parallel 500 kV AC lines, but a hybrid case with DC, although not modeled in the base cases, was included in the permitting process. SunZia is seeking the ability to convert the 2nd AC line to DC if it becomes feasible to do so.

The comment period from the public meetings closes on November 27th. After that time, a contractor for the BLM will develop a Scoping Report, which will be sent to cooperating agencies for review. Over 2,400 miles of alternative paths have been studied as part of the process and BLM will screen these routes with the goal to drop them all out. The Scoping Report should be done by August of next year and then there will be another round of public meetings.

The final EIS should be available by January 2011. The Record of Decision or ROD should be issued 90 days after the final EIS. Both of these documents will be published in the Federal Register, at which point a notice to proceed with construction could be issued by the Spring of 2013. Pinal Central, Tortolita and Willow are proposed interconnection points in Arizona. Hidalgo, Luna and Lincoln County are proposed interconnection points in New Mexico.

Tom thanked Gary for providing the BLM SunZia Southwest Transmission Project url to the group and noted that SunZia.net will also take you to BLM's site.

9) Black Forest Southline Project

Doug Patterson and Bill Kipp representing Black Forest Partners were in attendance at the meeting, along with their consultant, Cary Deise of USE Consulting.

Doug presented an overview to the group, which was similar to the presentation that he gave at the WestConnect Annual Planning Workshop last week, but with a few minor changes:

Black Forest:

- Goal: accelerate the use of renewable energy through opportunities in electricity transmission, energy storage, and efficiency
- Principals are experienced investors, entrepreneurs and operators (Google and Goldman alums) from the Southwest
- Firm has access to institutional investors, renewable developers, technology providers, and major private regional landowners.
- Advisors have deep sector knowledge, regulatory expertise and extensive development experience (USE, Stoel Rives, Fontana Energy, and others)
- Formed Western Renewable Transmission Development Company (WRTD) to access renewable resources in the Desert Southwest.
- The Southline Transmission Project will enable development of solar energy in a faster, cheaper, greener way than alternatives.

A map of the area was shown, featuring the conceptual plan of a proposed 250 mile, 345 kV line connecting El Paso to Southeast Arizona. It will collect solar in NM and AZ and get it to Palo Verde, along existing paths. The group is looking at potentially connect with Vail/Greenlee corridor to upgrade and counterflow along the existing paths to the Palo Verde area.

The group feels that the best preferred path is from Afton, NM at the BLM Solar Study area and then head west to Apache. An upgrade of the Apache to Bicknell line will be needed as it proceeds to Palo Verde. Black Forest is proposing a double-circuit 345/230 kV line through this area.

The map shows that the project connects 4 of the largest solar resource WREZ zones which have a potential for solar resources exceeding 25,000 MW.

Benefits of project:

Electrical

- Improves reliability, eases congestion, and enhances security
- Connects major load bases with a bi-directional renewables backbone

Economic

- Cost-efficient way of stimulating renewable generation in the most suitable areas
- Reduces development timelines to meet RPS goals
- Upgrade and counterflow portion decreases new build requirements

Environmental

- Recycles ROW corridors for new build. Black Forest is working on a detailed economic model which will show benefits to upgrading the existing paths.
- Major visual corridors spared
- Transmission and generation construction avoids population centers

Next Steps:

- Upgrade the Apache to Bicknell 230 kV line to 345/230 kV
- Upgrade the Bicknell to Three Points 115 kV line to 345/115 kV
- Add a new 345 kV line from Three Points to Pinal West
- Add a new 345 kV or 500 kV line from Pinal West to Palo Verde

Siting:

Technical Studies (led by USE)

- New 345 kV line originating Afton, terminating Apache
- Apache to Bicknell upgrade 230 to 345 & 230
- Bicknell to 3 Points upgrade 115 to 345 & 115
- 3 Points to Pinal West new 345 (or counterschedule)
- Pinal West to Palo Verde new 345 or 500 (or counterschedule)

Siting

- Finalize BLM ROW application & begin permitting work
- Continue coordination with state and private landowners
- Combine Generation and Transmission siting analysis

Black Forest is working on ideas about the right places to interconnect – is Apache the right place?

Looking to collect approximately 1,000 MW of solar to get to Palo Verde. The timing has not yet been established, but could be 3-4 years out.

At the next meeting, some initial power flow analyses will be shared. Once these are completed, Black Forest plans on going to an open season solicitation process.

10) 2010 Study Plan

This plan is similar to what was discussed on the October 15th conference call.

- Present Plan and subsequent findings to SWAT, WestConnect, and local stakeholders;
- Revise load forecasts;
- Engage SATS in early case building to ensure accuracy of database for 2010 ten-year planning cases;
- Investigate alternate configurations to mitigate high flows on the Winchester 345/230 kV transformer, Apache – Bicknell 230 kV line, and Bicknell 345/230 kV transformer caused by EHV system contingencies;
- Develop and evaluate alternatives to the two joint Tortolita – North Loop 345 kV proposals based on the SPPR Three Terminal proposal;
- Develop and evaluate alternatives for joint SWTC/TEP substation(s) to supply TEP/Trico loads south of Tucson;
- Complete capital cost estimates and economic analysis, including losses;
- Identify potential projects in the SATS footprint.

Gary noted that the TEP forecast could change. However, the SWTC forecast will not change. The hope is to have all final forecasts by January.

Case building for the 2010 studies will begin, using the WestConnect 10 year plans. These may need to be re-done once the ACC 10 year plans are submitted. The plan will be to send out a case round-robin for review or ask someone to volunteer to compile the cases.

Cary Deise asked about incorporating the Southline Project into the studies. It may help with bullet item #4 – investigating alternate configurations to mitigate flows on the Winchester and Bicknell transformers and flows on the Apache to Bicknell 230 kV line. However, it was decided that Cary will work with Black Forest to do their own studies. The addition of the Southline Project could be studied as a sensitivity. John proposed that the WestConnect base cases be used because all major projects that have been proposed for the Southwest are in them – such as a 2013 or 2105 case. Cary stated that he would prefer using a detailed SATS case first and that EHV analyses can be done at a later date.

Gary is open to suggestions for other projects to study in the area. John suggested making the study of function of EHV scheduling instead of a study that is load-driven.

As an action item, Gary will set up an interim conference call to discuss items to put into the 2010 Study Plan. John's idea of a Var Margin Study will be discussed on the call.

John envisions an upper level study with flows on the EHV system – maximum flow without a violation and no remedial action schemes. He stated that as large EHV projects come on line, it will be important to know how they will impact the system – that is, how they will either help or hurt you. This analysis should be done before the projects come on-line. As an example, you may have a 20% var margin at Winchester, but a P-V analysis of 5% will not tell you this. A better study is to use the Q-V analysis.

It was also suggested that the 2010 Study Plan could look at the Tohono O'odham Nation needs.

Once all items are identified, they can be prioritized. Gary will take the notes of this meeting and reformulate the study plan for the conference call.

11) SATS 2009 Report

Gary asked for an action item for comments on this report to be sent to him as soon as possible. Sections of the draft Report were reviewed:

- 2) Introduction. If individuals would like to be added to the list of participants, please contact Gary.
- 3) Study Scope. No comments
- 4) Load Forecast. A comment to add in actual system peaks will be considered.
- 5) Power Flow Case Development. No comments
- 6) FMI Load Impacts. No comments
- 7) Study Results
 - a. 7.1 2010 Heavy Summer. SWTC criteria is not listed and will be provided to Gary. May need to add in a drawing of the two Saguro to Tortolita 500 kV lines to better explain the limiting condition.

Josh suggested that the new rating for the Apache to Adams Tap line be footnoted and not mentioned several times in the text. He and EvaMarie accepted an action item to provide language to Gary for the report.

- b. 7.2 2011 Heavy Summer. Same comments as 7.1
 - c. 7.3 2012 Heavy Summer. Same comments as 7.1. The 138 kV line overloads are the main issue. Change the wording of the text to change seven overloads, and not six. Seven are listed.

- d. 7.4 2013 Heavy Summer. Voltage deviations and overloads on SWTC 115 kV and 230 kV buses. EvaMarie accepted an action item to provide mitigation procedures to Gary.
- e. 7.5 2014 Heavy Summer. Same comments as 7.4. Add clarification that in 2013 the PC to Tortolita 500 kV Project added a third transformer at Tortolita. Some 138 kV lines will need to be reconductored.
- f. 7.6 2019 Heavy Summer. Additional voltage deviations on SWTC and TEP buses.

12) Additional Items

No additional items were added for discussion.

13) Action Items

- a. Gary to set up an interim conference call in December to discuss items that need to go into the 2010 Study Plan for SATS – including a Var Margin Study.
- b. Josh and EvaMarie to provide language for the Apache to Adams Tap line rating for draft 2009 SATS Study Report.
- c. EvaMarie to provide mitigation procedures for voltage deviations in 2013, 2014 and 2019 for draft 2009 SATS Study Report.
- d. All to provide comments on draft 2009 SATS Study Report to Gary as soon as possible.

14) Next Meeting Agenda

- Review/Approve Meeting Notes
- Approve Study Report
- Cochise County Update
- Southline Project Update
- SunZia Project Update

15) Next Steps/Meeting(s)

The next SWAT meetings will be held on February 16th and 17th.

The next SATS meeting will be held on January 21st, at TEP's offices