

**Regional Planning Group
Meeting Notes
February 16, 2016**

Misc. Updates

- PLWG meeting 2/17
- Lubbock: There was a discussion at the February 11 PUCT open meeting: PUCT staff will open a possible project, ERCOT has built models and started running steady-state analysis. ERCOT is planning to post the start cases today or tomorrow.
- RPG project comments
 - Current schedule is to take the two Valley projects to April BOD for endorsement
 - Q: Are there economic evaluations with those studies to relieve congestion?
 - A: We will be performing an economic analysis on the Valley import project.
- Panhandle Detailed Study (Fred): in process of finalizing the report; will try to have it available soon.
 - Q: How much detail will go into the report? Will we know actual losses and detailed responses not presented in presentation? Will we know system conditions for contingency and all of the details?
 - A: The report will include all the key findings and recommendations. Selected plots and contingency information without showing specific wind machine type and detail contingency definition will not be included in the report.
 - Q: Can you tell us what the action items are for this?
 - A: Jeff: We are still digesting what we've learned in this analysis. From a planning standpoint, the WSCR is a good rule of thumb but probably not sufficient to stand on its own in terms of system-wide criteria. Based on this study, we see the need to perform a detailed analysis any time we see a weak grid condition. In the operations horizon, we feel good that you can use the WSCR as a proxy for a stability limit. Will it always be 1.5? Maybe not, but right now in the Panhandle, based on current study, 1.5 is appropriate.
 - Q: Looking at voltage stability problems as well as oscillation problems associated with the low short circuit ratio; to the extent that there are possible solutions to what was found, how are those going to be addressed?
 - A: Jeff: Weak grid overarching term for the types of issues we see in Panhandle. We will still need to run the studies to determine what the actual issue is (voltage stability, control system instability, etc.) and make a decision on the appropriate limit and potential upgrade solution.
 - Q: What are we going to get from this study?
 - A: The study has shown what the current state of the Panhandle is, evaluated some solutions to the problems in the Panhandle and validated WSCR of 1.5, but we need to do more analysis as conditions change and the study has given us some information on how to do that as we go forward.
 - Q: WSCR is a rule of thumb, do you anticipate the WSCR being used for peripheral decisions such as site conditions of synch condensers. Is that type of analysis fair game?
 - A: Based on the detailed study results, WSCR is a reasonable index for Panhandle region. Synchronous condenser is also studied to show its effectiveness to improve the system responses.

- Q: Synchronous condensers, function of retirement of inertia from synchronous machines. As you retire more plants out of the metropolitan areas will we see weak grid problems in other parts of the system?
 - A: Jeff: We had discussions about, saw January in real time, all units on system were sitting at LSL and there was wind curtailment because of those issues. The market might change the way they commit generation so one of my concerns is that you'll have large metropolitan areas with no synchronous generation committed and could have weak grid issues in those circumstances.
- Prabhu: The Planning Guide states that when you submit an RPG project you're required to send all models to produce the corresponding studies. Please submit all models so that we can get those to everybody.
 - Reminder: those models don't go out via email but do get posted on the MIS secure.

Solar Update

Cathey Carter presented on the ERCOT Solar Penetration Study.

Q: Is this all steady state, not dynamic analysis?

A: Strictly steady state.

Q: What capacity factor did you use?

A: For projects with Interconnection Agreements in all three cases we used 100%, for others 0, 50, and 100%

Q: The RTP case had a 3% capacity factor for the West wind. You moved it up to 12% Why?

A: I wanted to move it up to match what's in the SSWG cases.

Q: Would you look at it with a sensitivity?

A: Not intended to look at deliverability.

Q: Will ERCOT make system improvements outside of the GINR process?

A: Jeff: Upgrades such as what we're studying here, go through the RPG process. This study not part of that process, it's more of an information sharing study, not really intended to recommend specific projects.

LTSA Generation Expansion

Doug Murray gave an update on the 2016 LTSA Generation Expansion.

Q: Why are there nearly 3,000 MW of economic retirements in a year that has 103 scarcity hours?

A: Because the long term model is less detailed (no ramp rates, min up/min down times, etc.) than the short term model there are a lot fewer scarcity hours for generators to use for revenues.

Q: To what extent are scarcity pricing issues modeled?

A: Scarcity conditions are modeled at the current System-wide offer cap (SWOC) of \$9,000. One of the reasons for this discussion is because we don't think the current results are reasonable. We want to show you some of the things the model has done and get some input.

Q: Does your model count for environmental regulations when you take retirement into account?

A: It does consider regional haze, but we are not modeling any carbon constraints (CPP).

Q: Did you discuss gas prices you used?

A: Gas prices start at \$3.50 in 2017 and go up to \$5.50/6.00 in 2031

Q: Do you run sensitivity on gas price movements?

A: We have gas price scenario coming up, so we could. We discuss how much sensitivity we should run on each scenario. Short answer is no for the Current Trends Scenario.

Q: I like not assuming fixed retirements at a certain age. Models only show for current trends, another 100 MW of wind. Is that after assuming everything that's already in pipeline for 2016? What did the model show in terms of additional wind?

A: Total wind in the model with or without that 100 is greater than 20,000 MW.

Q: Is the wind and solar being added in same general locations in the model?

A: Yes. The hourly profiles we have for the wind and solar units determine a general location for new units to be built, by ERCOT region or by county. The model will choose the most economic site for each new resource.

Q: Is item #3 in options intended to capture units that run into extreme capex, in low gas price environment. In other words, they may retire early?

A: The only group of units that the model will consider major capex expenses are those needing to comply with regional haze.

Q: Do you have any energy storage built in here?

A: No. We do have a storage scenario coming up.

Q: Solar capacity question. If we're dependent on capacity, does that follow-up with significant transmission improvements?

A: Whole point of LTSA is to look at what generation might be built in scenario characteristics. Then we hand the new builds off to the transmission people and they look at "if this is the future, what do we need to support it?"

Q: Does that generation come before or after the transmission is constructed?

A: See your point, we will site the units where we have transmission, bearing in mind that solar units and wind units that get built may be in areas where there is no transmission.

Q: What are the assumptions with existing nuclear facilities?

A: The four that we have remain at least through 2031 in this model. They have a retirement year of 60 on them. In the next LTSA, if we stick with the fixed retirement regime, we'll start to see those retire and deal with that.

Q: Does it make sense in current trends to try to establish some proxy for the cost of resolving those in the analysis and maybe somehow temper or make more realistic what is going to have to happen as that generation develops out there.

A: Good point, we should probably consider that in at least one of the scenarios. There are some issues we're going to have to financially deal with.

Comment: Encourage ERCOT to pursue Option 3 here and to look at other options.

2016 RTP Update

Sun Wook Kang presented on the status of the 2016 RTP.

Q: Rob Lane: Is ERCOT going to be breaking up the study into the four zones again?

A: Yes.

Q: Reserve number of 2,800 represent responsive reserve?

A: As mentioned in the study scope, this reserve is the outage of two large units.

Q: Are we making sure that the assumptions here aren't the reason for the recommendation?

A: Having discussion at PLWG tomorrow, so if you're interested, attend that meeting.

Q: The amount of generation shown here excludes generation that has not submitted modeling data but has met certain requirements?

A: If there is not sufficient data in the RARF, but they've met all the remaining requirement in Planning Guide 6.9, then we will model the generation by reviewing other resources information such as Interconnection Agreement (IA).

Q: ERCOT reports show that we have 25,000 MW of wind with Interconnection Agreements which exceeds the CREZ design level. Are we going to start building additional 345 kV lines out of West Texas?

A: Jeff: 1. significant amount of wind added in South Texas, so of that 25,000 MW, there's 4,000 or so in South Texas. 2. Not modeling everything that has an interconnection agreement, just those that have met 6.9 save the modeling data requirement. All of that said, if we see problems in the RTP (economic analysis) if we see congestion, then we will look to solve that congestion if it is economic to do so.

Q: What is next on the schedule for this year's RTP?

A: Next step: close to completing study base cases for each region. Post initial base case as well as system violation table sometime in March.

Q: For units that meet 6.9, what's the drop dead deadline for them to make it into your economic assessments?

A: We started to build the case in December so we used the latest GIS report and that goes into the RTP case. This time we also looked at the January GIS report and did not find any additional generation. As we move forward, we will keep an eye on that report so that we can identify if there is any new generation that needs to be included. For the economic assessment the latest date would probably be May or possibly June.

Q: What treatment are you giving to units that have previously met 6.9 but have since allowed their air permits to expire? Are you updating them and taking them out of the case?

A: We will need to consider that because then they would not meet 6.9. The current list has been based on the GIS report. Depending on how they are in the report, that's how they're modeled.

Comment: Suggest ERCOT making direct contact with generators.

Q: I thought you were already in contact with the generators? Isn't that part of the process?

A: The GIS reports that comes out monthly are updated monthly with information that we get from the developers. So, to the extent that they are timely and forthcoming with what is going on with their projects, it will continue to be updated.

Q: Are you waiting for them to provide that information or are you actively pursuing?

A: There are certain aspects in the GIS where we ping them monthly, we also go through information individually such as CODs and if they're close to what we'll see in the next report, then we'll contact them for updated information.

Comment: Status should include status of air permits from TCEQ.