

**Regional Planning Group
Meeting Notes
May 19, 2015**

Misc. Updates

Sun Wook: Status update on the 2015 RTP: ERCOT has been working on developing transmission solutions to address the system issues for the N-1 (P1/P7) and P2/P4/P5 contingencies. We are close to creating secure summer peak cases with transmission solutions. ERCOT will post the secure cases to the MIS website sometime this week or next week. As soon as we complete that, we will continue by studying G-1 + N-1 and X-1 + N-1 conditions.

Sandeep: 2016 LTSA: A workshop was held at April RPG. Identified a list of topics to discuss further. An email was sent out to the RPG a week ago summarizing the topics we want to find experts to discuss. If you have any comments or suggestions on speakers, please reply to the email request I sent out.

Brad Schwarz: PLWG meeting tomorrow; topic: PGRR-42

Prabhu: West Texas Study (WTS) group has created the base cases for 2017 and 2019. Currently working on adding contingencies and making those cases ready for the reliability analysis. The WTS base cases were sent out to West Texas TSPs. Also currently working on 2020 base case, which should be out by end of this month.

An RFP for an oil and gas consultant has been issued. Bid due date is tomorrow. ERCOT will share more information as it becomes available.

Q: Current status of SSO in terms of looking at date for analysis. Is that study progressing?

A: SSR workshop is scheduled for May 29. ERCOT is conducting the SSR/SSO assessment, and we will provide updates to the group following the workshop.

Q: Panhandle export limit heading to Operations guidelines. What's status on that?

A: In progress, working with Operations.

Q: Have you selected the consultant for the Panhandle detail study project?

A: Yes, and we are in the process of finalizing the contract.

Q: What is the scope for the consultant to follow for the project?

A: To evaluate the weak grid issues and review the proposed weighted short circuit ratio (WSCR) and the current WSCR minimum criterion of 1.5.

015 Short Circuit Analysis (Sun Wook Kang)

Q: has there been any issues getting the information you need? Are you getting what you need? Are you making assumptions or is the data available?

A: We are confident we can get the data of the existing facilities from the SPWG database. But, as far as the future transmission solutions, some of the future models might not exist in the SPWG database. For example, ERCOT plans to use certain default values for future transmission lines if the data do not exist

in the SPWG. My understanding is that the SPWG is also using the same types of assumptions for their studies. As presented in the slide, in addition to using certain default values, we will be looking into the RARF or working with TSPs/GOs to obtain data if needed.

Q: ERCOT doesn't have breaker DB, you send to TSPs, and have them compare your short circuit current with their ratings.

A: Yes

Q: When the results are posted, you're going to send out market notice outlining schedule and the response you want from MPs?

A: Yes, we will post the results and send out a market notice.

A: Clarification, not sending market notice, will communicate directly with the affected entities.

AEPSC Lower Rio Grande Valley Project (Brad Meyer)

Q: On the Ajo wind you may not have 100% availability for peak load, how do you dispatch generation available?

A: The wind generation in the Valley (600 MW existing) we dispatch at 10%, in alignment with ERCOT's case assumptions last year.

Q: Just for wind export at Ajo?

A: Lot of numbers mentioned, 800, 600, 888. If we include Baffin, the capacity at Ajo, installed, is 888 (rounded to 890 later on in presentation). The 600 MW I just mentioned is the amount of wind generation in the Valley. Ajo being external to the Valley. 600 MW Coastal wind, but in the Valley itself.

Q: Chart at bottom: does this include synchronous condenser in service? (Charlie DeWitt)

A: Values do, but incremental amount of load that can be served, difference between (two columns on table)

Q: Jeff: 1900 MW, when you hit that limit, how high did you scale the wind?

A: I think 120 MW starting, but I'll get that answer back to you.

Q: Usually ERCOT uses generic transmission limits to handle stability issues, but Ajo uses what justification?

A: from planning, we evaluated how we might integrate solutions that address both constraints at the same time. Do we fix both at the same time and fix some incremental amount of investment.

Q: How will ERCOT determine?

A: From an economic planning perspective.

Q: Wind farms near Ajo, what is POI?

A: AEP owns 345 kV line, double-circuit, wind farms fed radially into Ajo.

Q: AEPs view that they are interconnected?

A: 880 MW is installed capacity, faced with system limits N-1-1. Solutions we looked at were how to improve the export paths and export capability

Q: Questioning what it means to be interconnected. Why is part of Interconnect process, why weren't more facilities required to enable the interconnection?

A: when designed system originally 400 MW, new wind farm installed, now at 880. Can support 1200 MW from a steady-state standpoint, but from stability standpoint is at 305.

Q: You're recommending C+D+F, incremental load serving cap 1300 so takes you up to , so go to slide 29, if you assume generation gets filled, you could go to 2800 load serving cap or you can go up to 3300 , 1100 MW with two SVCs plus the generator.

Q: Do you still meet TPL standards by 2021?

A: Yes in this case

Q: First slide, 345 kV line coming in from Lobo to North Edinburgh follows same ROW as 138 kV line there. Shouldn't have b/c N-1 takes both 138 and 345 kV out.

A: Deciding factor at PUC, they approved the defined line route.

Q: 2 lines coming in from Corpus, what type of structures are those held up by?

A: Single circuit capable h-frames

Q: So you can't add 2nd circuit to them?

A: no

Q: On slide 27, where you say that you get 3500 MW of LSC from your recommendation, that is 1300 more than the current, right? And does that amount assume the synchronous condenser in place as well?

A: Two separate analyses. 3500 does not include synchronous condenser or the cost.

Q: Prabhu: option A: proposed 345 line, two new double-circuit capable lines with only one circuit on each side?

A: Expansion plan, would utilize the second circuit

Q: Prabhu: if you're not considering C or D how would option A work out?

A: Evaluated two separate BOLD lines, looking how we might expand in the future, the cost shows two separate BOLD lines.

Q: Does AEP consider standalone project other than just the synch condenser?

A: We approached it from the perspective of what is the best solution for valley, what kind of incremental costs might we be able to take advantage of?

Q: On option A, you're building 2 separate double-circuit lines with only one line on each circuit. Why?

A: You're right if you're looking at where we're at today. But we're looking at future, looked at 2400 mw of wind, you need to have 2 separate structures. Now have new TPL standards.

Q: Would that cut the cost?

A: Yes, but also cut down on transfer capabilities.

Q: Reliability and economic analysis in tandem. Would you study only projects with signed IA?

A: Jeff: that would be our base case. We'd like to do sensitivity analysis with generation that does not yet have signed agreement.

Q: What does it mean to be interconnected? 300 MW facility, 300, now have 900. First 300 guy connects in and AEP built 345 line to connect. Next 300 connects and 345 can handle it. Third 300 comes in and can no longer get all that power out. What if one person came in at 900 to begin with, what would the requirement be?

A: Don't see difference if it's staged or comes in all at once.

Q: Do you have notice to proceed on the new wind projects?

A: IA for Los Vientos III, IV, and V

Q: Did you consider sync condenser on west side of valley rather than SVCs?

A: We looked at SVCs in the valley

GP&L Greenville 138 kV Tie Project EIR Update (Jesse Boyd)

Comment: The generation resources in Greenville are past 40 years old, and are rarely online. In our steady-state modeling we show these units as online, but those are peak-hour cases..

Panhandle Discussion (Fred Huang)

Q: Assume you're presenting this for feedback?

A: We'll take comments on the scope

Comment: Not sure why we've settled on CREZ evaluation, the use of projects that meet the PG 6.9 and so sticking with 3604 for projects that are that far along, section 6.9 was developed long after CREZ commitments and applied to second part of study. Think there are other projects out there that have made financial commitments that are not included.

Comment: Mariah Wind comment. 600 MW

Response: Jeff: we sent a memo to the commission clarifying what our assumptions would be, and we asked that the Commissioners let us know if you want us to use different assumptions. This is not something that they changed so I feel like it's the direction they've given us.

Comment: Important to recognize that two commissioners were voting for project to be done and chairman asked for more information prior to making decision. Asked for more information on 2nd circuit. Cutting it off of 3604 may be a little bit less helpful. Be possible to have scenario with projects at higher level?

Q: Original CREZ study called for 5 GW to be exported. Wondering if that was the intent—use what's in the queue or going back to original study?

A: When the commission brought up this analysis, ERCOT was a little unsure what they wanted, so we made a proposal to them and feel like they have endorsed that assumption. I don't think they have asked us to look at 5000 MW, I don't think they've asked us to look at everything with IAs.

Comments: what the commission did was ask why used 2% energy curtailment rule.

A: 2% came from what we had used in the 2008 CREZ analysis so that is what we interpreted they were asking us to do.

Q: ERCOT asked the commission to use Planning Guide 6.9, they did not pick and choose with those who have met Planning Guide 6.9 and those who haven't.

A: Jeff: we weren't really suggesting anything here this was just more of the commission asking ERCOT to do this analysis so this was our understanding of what they were asking us to do.

Comment: just suggesting maybe ERCOT could do better than first suggestion, commission is looking for ERCOT to give them more information.

Comment: What I'm suggesting is that you shouldn't make a policy cut, that you should provide them information upon which to make a decision, letting them know there may be additional MW at other levels.

Jeff: What are you suggesting be that level?

Comment: I think this is the group that ought to have that conversation.

Comment: We've got 600 MW SGIA wind, if a or b happened not necessarily related to a project, but does that change an outcome? Trying to make sure there's not a restudy process and another time delay because the situation changes.

Jeff: 3600 with financial commitment now, and other 3600 not posted financial security, are you suggesting that we put all of that in the study?

Comment: Concur. Commission may not have considered implications of memo and it would be worthwhile to give them alternative decisions.

Mark (Stratus): encourage ERCOT to go back and look closely at video of the meeting b/c it's important to recognize that the Commission agree to use criteria for generators to use... against economic planning criteria. Seems to me if you use same input for CREZ criteria to apply that same batch to same criteria doesn't really yield different answer. Not giving commissioners what they asked for with the study scope outlined here. Go back in record and pick up pieces where we've had prior direction for how the commission makes decision on what generators to include rather than having one study, normal economic planning criteria study and refresh and update of CREZ study, that makes more sense.

Clayton: approved in original CREZ, projects were approved based on assumption that certain amount of wind generation would be available. Stability problem that's lowering it significantly. Commission wanted if we do CREZ and we do stability for full 5 GW then they can evaluate and determine criteria.

Steve Baron (EDF): at open meeting, agree with Jeff that ERCOT had proposed in its filing to include 3604 MW, what's the cost effective way at achieving that. At a minimum, that piece should be performed. There was no discussion from the commission about whether the particulars should be locked in. the

clear intent with CREZ analysis from this proposition was to study, not necessarily full 5 GW but what projects are reasonably in the queue and have made a commitment so the commission has that information to analyze and make a decision. 2% curtailment included financial commitment and signed IAs. Need to have useful number of scenarios for commission to utilize. Makes sense to do these evaluations based on 3604 but also new analysis include additional details, give the commission options.

Brett (Pattern): have a signed IA, given funds to tsp to either do permitting work, engineering work, etc., but not the full x amount with NTP.

Jeff question: Can the TSPs provide a bright line criteria for us to use?

Brad (SU) answer: yes, typically 20%, 40% dates and timelines, pretty easily go back and have good records on it and easy to go back and line out.

Comment: To the extent that we have to do the 3600 and we do separate evaluation with CREZ criteria, one other thing might be a way to get required information is not so much what's committed but what's trigger point for next upgrade.

Comment: Look at doing your base case as proposed in letter, but then evaluating based on whatever that is, then what would be the ability of the panhandle to handle more with more improvements, realizing that improvement would be the second circuit.

Jeff: challenge with that is the capability is very much location-specific.

Jeff: think hearing two proposals. 1. Do three levels of capability analysis, 3600, CREZ scenario 2, something between IAs and some funding, some level of commitment—come up with answer for each for those three capability levels. 2. We do the 3604 figure out what the answer is there and also look at what are the potential next incremental upgrades, adding second circuit, come back and say if you do this, then this is the incremental benefit that you get from doing this upgrade.

Comment: Important to give clear choices back to commission. If you do second suggestion, give commission some actual number of projects out there.

Comment: Section 2.4, assumption #3: are we using Long-term study profiles from AWS TruePower?

A: in economic analysis we are using AWS profiles, this is more the reliability analysis telling us where to set the limit.

Comment: New build wind farms coming on with better equipment and better output. AWS TruePower profiles are not completely accurate.

Q: Why are you assuming the series capacitors are in-service when they are not today?

Jeff: likely the upgrades are going to take 2-3 years to get into place. Optimistic the series capacitors will be in place, but even if it's couple more years down the road. When you do this economic analysis, what

you're looking at is projecting production cost savings and your expectations that you're going to see those savings over an extended period of time. Wouldn't want to muddy that by saying you'll see one outcome, but then have a different outcome because the series capacitors will be in for the rest of the upgrade life. So I think it's appropriate to have series capacitors in service.

Q: Would basecase at 3604 MW eliminate 2% at higher case if you run it with CREZ criteria, looser resource commitment?

Jeff: when we run 3604 MW, we run under both production cost savings test and the 2% wind energy curtailment test.

Q: is every case that has economic test, have the 2% curtailment?

A: no

Q: then in this case, why is it necessary?

A: we believe this is what the commission asked us to do since we did it for CREZ in 2008.

Fred continued the presentation:

Q: schedule: important in ERCOT's view that they complete analysis and give RPG presentation and comment period prior to responding to commissions request? That will stretch out date when you file report with commissions.

A: The proposed guidelines are within this document; vet technical issues at ERCOT before we take any remaining regulatory decisions over to the commission. Try to separate the technical discussion from the underlying regulatory decision.

Q: What would be next steps? Need to come back to RPG or circulate something after you look at this?

A: we will take comments back and internally see what our next steps will be and definitely communicate with RPG along the way.

Q: Fred has been discussing a project where he needed PSCAD models. Was that a market notice?

A: Sent out to each individual project. Purpose to evaluate system strength needs. Sent directly to the Resource Entities.