| **Chat Transcript from the January 12, 2023 NAESB Gas-Electric Harmonization Forum** |
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| **Time**  | **To**  | **From**  | **Chat**  |
| 9:01am | Hosts and Panelists  | Jonathan Booe  | We are live  |
| 9:02am | Hosts and Panelists  | Diane Burman  | We can all hear you |
| 9:03am | Hosts and Panelists  | Pat Wood  | I’m so glad you can Diane! |
| 9:07am | Everyone  | Joanna Yeo | will this presentation be distributed ? |
| 9:07pm | Everyone  | Joshua Phillips  | This is posted on naesb.org |
| 9:08am | Everyone  | Mike Knowland  | https://www.naesb.org/naesb\_geh\_forum.asp |
| 9:16am | Everyone  | Dick Brooks  | I agree with Chairman Wood, let's focus on addressing the FERC mandate/requested deliverables and put legal concerns on the parking lot for now |
| 9:19am | Everyone | Dick Brooks  | Guidance to improve information exchange between NG and Electric entities would be a good start. |
| 9:26am | Everyone  | Charles Yeung  | Are there any participants on the call today that were trying to buy gas that can speak to Craig's observations? |
| 9:32am | Everyone  | Blair Fink | Cold temps can also coal plants & coal piles freezing. |
| 9:42am | Everyone  | Gurcan Gulen | Craig, do you know whether the production loss was due to problems at the wellhead or due to problems in the midstream? |
| 9:49am | Everyone  | Rachel Hogge  | Thank you, Craig, for sharing this presentation. |
| 9:51am | Hosts and Panelists  | James Campisano  | I can speak to some of the issues we had in the midwest as more of a timing problem. Our generation unit call the regulated utility trading group whom I work for looking for supply @ 6 PM on Friday night (the 23rd). The gas utility was under critical conditions and had all assets being utilized to serve peak day need, and had nothing to spare. The last nomination cycle needs to be entered by 7 PM. It is my understanding they took an outtage since they could not find supply before the deadline. |
| 9:51am | Everyone  | Jonathan Booe  | Thanks for raising your hand, Rob. We will start a queue, and if any attendees have questions or comments for Craig or others, please raise your hand. |
| 9:52am | Everyone  | Jennifer Coffee  | Do we know what level of natural gas storage was contracted for and/or utilized during Uri as compared to Elliott? |
| 9:52am | Everyone  | Rob Jennings  | Craig - thanks for the presentation. Do you have any indication how storage performed? |
| 9:52am | Everyone  | Rob Jennings  | Gas storage  |
| 9:52am | Everyone  | Dennis Kimm | If electric market operator commits gas generator by 0700 on Friday for the holiday weekend (through Tuesday) the problems would be muted (not eliminated). Tell them when they need to run so they know how much gas to buy. You can probably buy gas on Friday morning. You likely can't buy gas Saturday during extreme cold |
| 9:53am | Everyone  | Gurcan Gulen | Thanks for the answer. I asked because it is surprising that wellhead problems would occur this winter but did not happen in the past. It would be great to reach out to producers to get a clear picture of well freeze-offs, etc |
| 9:54am | Everyone  | Catherine Elder  | Yes, thank you Craig  |
| 9:55am | Hosts and Panelists  | James Staggs  | I am not seeing the PJM presentation in the downloads is it possible to get a copy? |
| 9:55pm | Everyone  | Sylvia Munson  | Great presentation showing the whole picture of the issue at PJM. Thank you |
| 9:56am | James Staggs  | Jonathan Booe  | Yes - Craig gave us permission to post the presentation, and we will do so right after the meeting. |
| 9:58am | Everyone  | Catherine Elder  | I am really curious about the compressor station failures -- three on TETCO? |
| 9:59am | Everyone  | Nancy Bagot  | Notably the NERC standards on generator winterization do not address gas supply or transportation issues for power generators as they address equipment readiness of generation facilities. |
| 10:01am | Everyone  | Justin Grady  | Bob Gee's question is a good one. This is just speculation, but perhaps gas prices that have been below most estimates of the cost of producing that gas for nearly the last decade is a contributing factor? |
| 10:02am | Everyone  | Justin Grady  | Winterization of gas production facilities isn't free or cheap. |
| 10:02am | Everyone  | Catherine Elder  | but is isn't that costly either |
| 10:04am | Everyone  | Jennifer Coffee  | Question answered, thank you. |
| 10:04am | Everyone  | Rob Jennings  | Thanks Jonathan. |
| 10:05am | Everyone  | Thomas Schroeder  | If the RTO doesn't award generation (provide notice of dispatch) early enough for the generators to use their Firm Transport then it may not have been available (i.e. after the Timely nomination cycle for a particular gas day). Excellent presentation, but it didn't provide the timing associated with dispatching units. If dispatch occurred to late then generators wouldn't be able to secure natural gas even if they had Firm Transport. |
| 10:05am | Hosts and Panelists  | N. Jonathan Peress  | One factor we have observed in California relating to extreme weather and gas/electric coordination is that the organized markets depend far more on gas fired generation today than they did during historic extreme weather challenges. Stated differently, reliability/market operators were able to more easily safeguard reliability during prior equally extreme weather events when they had a more diverse set of generation fuels, and were less dependent on the gas supply chain. |
| 10:06am | Everyone  | Michael Oberleitner  | … very good observations, Dennis  |
| 10:09am | Everyone  | Joshua Phillips  | Good insight on dispatch Thomas, unfortunately even when dispatching and scheduling Firm Transport is possible, the issue of supply / production loss is causing issues. Firm Transport then becomes of no value. |
| 10:09am | Everyone  | Robert Barlow  | Jonathan, Can you make this slide deck available? |
| 10:10am | Everyone  | John Olenick  | You can contract with suppliers to have access to gas supplies through all 5 scheduling cycles on holidays and weekends. Generally that requires paying a demand charge to the supplier regardless of how much late cycle gas supplies are purchased, but it does provide access to gas supplies. |
| 10:10am | Everyone  | Ben Schoene  | LNG and to a lesser extent, industrials, were responsive during Elliot and able to help meet certain of the real time needs. |
| 10:10am | Everyone  | Ben Schoene  | Along the gulf coast  |
| 10:16am | Everyone  | Justin Grady  | Lots of feedback coming back through Chairman Wood's feed. |
| 10:18am | Justin Grady  | Pat Wood  | Justin, still an issue? I’ve been on mute so I may need to dial back in |
| 10:18am | Everyone  | Justin Grady | Nope. All good now. thanks. |
| 10:23am | Everyone  | Donnie Sharp  | Perhaps as more natural gas is needed to meet incremental electricity demand, the electric industry should rally for more capacity. Our country seems to be facing a period where there are very little permits for new capacity, anywhere. The needs of the electric industry should be tantamount to changing the focus from no new pipeline capacity to one of meeting the needs of the electric industry. IE insuring supply and transportation are available during the peak demand periods, and in general moving forward |
| 10:24am | Hosts and Panelists | Kenneth Yagelski  | There was not a singular problem, it was a confluence of issues with production, gathering, transportation, boosting, and equipment at the power generator. |
| 10:26am | Everyone  | James Campisano  | I think it has to be more nuanced than a capacity issue. MidAmerican's generation group holds enough transport to fully utilize its CT in Des Moines, in their case they offered their unit, but didn't think it would get called on due to the abundance of wind available. It was only after MISO started losing resources did they call accept MidAmerican's bid, and at that point it so late in the day there was no way they were going to find what they need to run the unit at any reasonable price. |
| 10:29am | Everyone  | Catherine Elder  | thank you gurcan! |
| 10:29am | Everyone  | Donnie Sharp | It is definitely more nuanced to solely a capacity issue. Some of it comes down also to pre-planning based on how the gas system operates (gas day, cycles, etc). Most of us in the gas industry learned that planning in advance is necessary. Since it is difficult to add to supply via purchases during the weekends, gas systems tend to plan in advance and schedule what is planned/estimated to be needed in advance so that we are not caught short during weekends/long holiday weekends. |
| 10:29am | Hosts and Panelists  | Kenneth Yagelski  | We cannot lose sight of the fact that without meaningful transportation capacity and market area storage, there is a physical delay in natural gas being available. Even if you can trade in the short-term, you cannot deliver supply on short notice without impacting the reliability of customers who have timely scheduled supply. |
| 10:30am | Everyone  | Dick Brooks  | Timely information exchange is a critical success factor for G-E harmonizations, IMO |
| 10:30am | Everyone  | Donnie Sharp  | The gas system really isn't designed to provide immediate high demand short term that isn't planned or scheduled in advance. No one to sell it, etc |
| 10:30am | Everyone  | Donnie Sharp  | These are things gas people learned long ago  |
| 10:30am | Hosts and Panelists  | N. Jonathan Peress  | Jonathan and Chairs, I would like to defer my comment to the end off this meeting and frame it around potential next steps. -in particular around the relationship between extreme weather events relating to gas/electric deployment, renewable deployment and electrification, as a present but increasingly amplified consideration in the future relevant to this forum. This is a bit different than the gas supply discussion we are currently having. Plus, I need to step away for a minute. |
| 10:30am | Everyone  | James Campisano  | I agree Donnie |
| 10:31am | Everyone  | Donnie Sharp | Donnie represents APGA |
| 10:31am | Everyone  | James Campisano | MidAmerican Energy here  |
| 10:31am | Everyone  | Jena Hackett | International Paper Company Jenna Hackett  |
| 10:32am | Everyone  | Jean Spencer  | With regard to weekend markets, I hear people say that the gas is already sold by Friday, so there's not much available on the weekend. But wouldn't people's behavior change if there was a seven-day-a-week market? The holiday weekend problem has happened too many times for me to think the lack of a weekend market isn't an issue. |
| 10:33am | Hosts and Panelists  | Catherine Elder  | I'm a consultant; key clients include the California Energy Commission, I've worked on gas supply and transport for 40+ power plants across US and for APPA authored "Implications of Greater Reliance on Natural Gas for Electricity Generation" 12 years ago and the issues haven't changed. |
| 10:34am | Everyone  | Justin Grady | During Winter Storm Uri, there were instances of units in SPP being "committed" in advance, but not "dispatched" early. Gas supplies were then procured well in advance, at costs of up to $600/MMBtu. Then, when those gas units were not dispatched in the DA/RT market at the level that was expected, that gas had to be sold at steep losses in the natural gas market over a holiday weekend. If the gas couldn't be sold, it was just included as part of the monthly cash out on the pipeline, which was a fraction of the original cost. Those losses were never recovered through make whole payments that are meant to make generators whole when they take actions that support reliability. The reason is because the gas wasn't burned to make electricity. This is something that, in my opinion, needs to change. If a generator is "committed" early, then they should be able to recover costs incurred to purchase fuel to the maximum capacity that was "committed" well in advance, regardless of whether that unit is dispatched. |
| 10:34am | Everyone  | Donnie Sharp  | If the demand is there for holiday/weekend trading, a counterparty will be there. But there has to be counterparties ready to adjust their production to meet these needs. Won't be cheap. But if there is a market for it, the market will respond. Eventually |
| 10:34am | Julie Fedorchak | Robert Gee  | Thanks for Speaking up! |
| 10:35am | Everyone  | Donnie Sharp | Justin, sad that your systems do not allow you to recover those costs. It is a cost of doing business. |
| 10:35am | Everyone  | Dick Brooks  | @Sue I'm seeing some movement in that direction at ISONE with their new RAA to determine availability of gas units: Resource Capacity Accreditation in the Forward Capacity Market |
| 10:36am | Everyone  | Bill Donahue  | Good Point Jean S. Pipelines take nominations everyday, but gas "markets" choose when to operate and there is no regulatory obligation to be available on weekends/holidays. It hasn't mattered much for gas utilities with storage, but it does matter for generators. |
| 10:37am | Everyone  | Justin Grady | Donnie, my understanding is that that is a national issue. In other words, if the gas isn't burned to make electricity, it can't be collected through wholesale electricity prices. Be glad to be proven wrong if there is a FERC precedent that has allowed this. |
| 10:38am | Everyone  | Donnie Sharp  | Justin, if that's the way the electric industry operates, you need some relief based on the reality of the way the gas system operates. One of the things I hope we can accomplish here |
| 10:38am | Hosts and Panelists  | Blair Fink | Lack of capacity raises the question of 'is there ae need for more gas transmission capability â€¦ new infrastructure?' Coordinated gas & electric new / expanded ROW. This would also be necessary for further electric transmission capacity to allow for future electrification. This is a long term process and needs FERC oversight. |
| 10:39am | Everyone  | Russell Murrell | Agree 100% with John’s comments  |
| 10:39am | Everyone | Dick Brooks  | Correct, the capacity markets aren't compensating resources to commit to be available. |
| 10:39am | Hosts and Panelists  | Gurcan Gulen | Indeed, great comment. If the electricity sector needs the extra gas capacity (production, pipe, storage, etc) they must pay for that extra capacity. |
| 10:41am | Everyone  | Rachel Hogge  | who is this speaking? |
| 10:42am | Hosts and Panelists  | Catherine Elder  | The LDCs know how to do this and generators don't. But generators also can't recover that cost so we're back to the recovery problem. And then that doesn't address the wellhead problem. |
| 10:42am | Everyone  | Bill Donahue  | john Olenick- SW Gas |
| 10:42am | Everyone  | Rachel Hogge  | Thanks Bill! |
| 10:42am | Everyone  | Jim Cordaro  | Jim Cordaro @ Kinder Morgan VP West Region Interstate Gas Pipelines. February 2011 Southwest Cold Weather Event, URI and Elliot all involved significant loss of gas supply from producers and processing plants. Without gas being received into an interstate pipeline, the pipeline cannot transport it to the market. Production wellhead and processing plant supply issues will continue without a way to incentivize those parties to be part of the reliability picture |
| 10:42am | Hosts and Panelists  | Blair Fink | Blair Fink, Georgia PSC |
| 10:43am | Everyone  | Dick Brooks  | Spot on Mr. Chairman, and the capacity markets in NE are failing to provide sufficient compensation to supply resource to ensure their ability to meet obligations. |
| 10:43am | Everyone  | Nancy Bagot | Bob used a very loaded way to describe the LDC comment - it's not a decision to simply not make a financial commitment for generators. There is a lack of compensation for gas not burned on a daily basis -- much less what is essentially a demand charge to cover weekends (for both supply and transportation I assume, as well). |
| 10:44am | Hosts and Panelists  | Gurcan Gulen  | But capacity markets are probably too indirect for $$ to flow from gas-fired plants all the way upstream to gas producers. |
| 10:45am | Everyone  | Bill Donahue  | the alternative to paying the premium for standby supply is natural gas storage. |
| 10:45am | Hosts and Panelists  | Catherine Elder  | But if a generator got a payment couldn't they then enter into the kind of contracts and calls that the LDCs such as SWG have? |
| 10:47am | Hosts and Panelists  | Gurcan Gulen  | They could. But a generator's need for extra gas at any point seems a bit less predictable than an LDC's gas day forecast. The more interruptible and variable resources we add, that variability in gas generation will increase. |
| 10:47am | Hosts and Panelists  | Catherine Elder  | very useful Eversource! good to hear this. |
| 10:49am | Everyone  | Gurcan Gulen | Ultimately, we are increasing the need for more pipe/storage capacity at more locations to serve that volatile gas demand from generators. |
| 10:50am | Everyone | Justin Grady  | This isn't just a capacity market issue, as SPP is an RTO comprised of vertically integrated, fully rate regulated load serving entities (whether IOUs, Coops, Munis, etc.) Of course vertically integrated utilities can get cost recover from their customers, but the question is, if utilities incur costs that support reliability for the entire region, should they get cost recovery from only their customers, or from all customers in the region. --Justin Grady--Kansas Corporation Commission Staff. |
| 10:52am | Everyone  | Dick Brooks  | Dual fuel units Gas/Oil saved the NE Grid on 12/24. |
| 10:53am | Everyone  | Roy Harvey  | According to the ISONE COO's report on the 12/24 event, "Oil-fired generation operated at high levels throughout the day as many dual-fuel generators switched to burning fuel-oil; ~29% of the regions energy demand was met by oil-fired generation." |
| 10:54am | Everyone  | Mark Spencer | While DF and oil-only is valuable for resiliency, the ability to add DF capability is near impossible for an air permitting standard point. |
| 10:56am | Everyone  | Catherine Elder  | Good for PJM |
| 10:57am | Everyone  | Michael Oberleitner  | wonder what the FT capacity cost estimate was in that calculation. East Coast FT is not cheap. |
| 11:02am | Hosts and Panelists  | Richard Delaney  | Will the recording be available post call? I had to drop for another meeting |
| 11:02am | Hosts and Panelists  | Catherine Elder  | I forget how much/little gas TVA has on its system but it would be interesting to hear their experience and how much of their rolling blackouts were related to freeze offs of either production or compressor stations. |
| 11:05am | Hosts and Panelists  | Rob Jennings  | Michael O - to your question, brattle's final CONE report shows a range of $10-16 million/year for firm gas in PJM |
| 11:06am | Hosts and Panelists  | Rob Jennings  | for a CC, and i think they assume 1,100 MW |
| 11:11am | Everyone  | Gurcan Gulen  | Great comment, Dick. Reforming capacity markets towards compensating "value to the grid" sounds promising. |
| 11:14am | Hosts and Panelists  | Dick Brooks  | Thanks @Gurcan; We've written about this issue in the past and suggested a capacity market design proposal to address this mismatch: https://github.com/rjb4standards/Presentations/raw/master/2021-0224-Filing-TechDesign.pdf |
| 11:14am | Everyone  | Jennifer Coffee  | What is the percentage breakdown of electric consumption in PJM during peak demand times? (Breakdown between LDCs, generators, industrial, etc?) |
| 11:16am | Hosts and Panelists  | Brian Fitzpatrick  | Jennifer, is your question asking for electric or gas consumption? |
| 11:17am | Everyone  | Donnie Sharp  | Jonathan / Pat, I stepped out when I heard we were taking a break and walked back to hear the tail end of a request for information on the SE part of the country during the holiday weather. I work for an LDC in Huntsville Alabama, and also represent the APGA (American Public Gas Association). If I can help, please respond with the question. Thanks |
| 11:20am | Everyone | Jennifer Coffee  | \*Apologies, I meant natural gas consumption, not electric. |
| 11:26am | Everyone  | Jonathan Booe  | Donnie - Just before the break Pat noted that we have heard from those in organized markets concerning the impact of Elliott, but we have not hear from those in the SE footprint. |
| 11:26am | Hosts and Panelists  | Nancy Bagot  | I'm sure this has been asked but can the PJM presentation be posted? |
| 11:29am | Everyone  | Nancy Bagot  | Thank you! And thank you for the discussion - I think it is well worthwhile to spend so much time on Elliott as we hopefully have some clear anecdotes and soon data on the how the systems interact or fail to interact. |
| 11:30am | Everyone  | Jean Spencer  | One topic that has not yet been discussed is the extremely high gas prices in the West, which are being passed on to electric customers. |
| 11:31am | Everyone  | Russell Murrell | good to hear, thanks Donnie |
| 11:34am | Everyone  | Donnie Sharp  | Thanks Russell. Definitely utilized the storage we have contracted with Pine Prairie |
| 11:38am | Hosts and Panelists  | Candice Duhon  | What organization was Paul with? |
| 11:42am | Everyone  | Gurcan Gulen  | Craig's black line is only for 3 days. Similar gaps might have occurred in previous winters at different days. |
| 11:42am | Everyone  | Gurcan Gulen | The real issue is how "extreme" are such events are "extreme" going forward. |
| 11:43am | Everyone | Gurcan Gulen | That is, do we need to change our probability distributions for future weather forecasts? |
| 11:43am | Everyone | Gurcan Gulen | I'd be interested to hear if LDCs are making such adjustments in their gas day calculations. |
| 11:43am | Everyone  | Catherine Elder  | yes to Gurcan and recognize that what we perceive to be extreme events will occur more often |
| 11:44am | Everyone  | Roy Harvey  | John Kemp at Reuters has a nice graph showing that 12/24 had more than 3 sigma above the average heating degree days, a 12-year event. |
| 11:46am | Everyone  | Justin Grady | One thing we learned during Winter Storm Elliott is that wind generation can play an interesting reliability role during extreme winter weather events, in which wind chill is a major contributing factor to heating loads. During Uri there was not much wind, supply, but during this storm, for SPP in particular, Wind showed up big time. |
| 11:46am | Everyone  | Catherine Elder  | I wanted to back up Jean's point, which really goes to the way generators buy daily spot gas and don't hold firm transportation so we just pass through those high daily spot prices to electricity prices. To me, this points again to some change needed in how generators are compensated, a point made many times before. Makes me cheer for PJM again. |
| 11:47am | Everyone  | Catherine Elder  | NO! njp may not retire |
| 11:47am | Everyone  | Sylvia Munson | Congratulations Jonathan!! |
| 11:48am | Everyone  | Andreas Thanos  | Jonathan may have retired in the Big Easy, but like the rest he will be around for a long time |
| 11:48am | Everyone  | Sue Tierney  | Jonathan, Congratulations! You are too young to retire! |
| 11:49am | Everyone  | Dick Brooks  | I agree, Jonathan |
| 11:50am | Everyone  | Gurcan Gulen  | Fully agree with Jonathan |
| 11:50am | Everyone  | Ronnie Hensley  | Congratulations Jonathon! |
| 11:51am | Everyone  | Mark Spencer  | Back to the ISO-NE scarcity event, my understanding is that the operating reserve deficiency peaked at ~600 MW and lasted for ~2 hours. A hypothetical 10 heat rate peaker would have needed ~12,000 dtm to entirely avoid the region's scarcity event. For context, nominations on Algonquin summed at the Citygates were adjusted downward by ~250,000 dtm at the end of gas day compared to timely nominations; AGT allows nominations throughout the gas day. Presumably this ~250k dtm was held in reserves by the LDCs to meet their state-mandated performance requirements and was not released in time for use to address the scarcity event in the electric market. This is not an indictment of LDCs but illustrates the difference in performance requirements and compensation mechanisms between the different markets. This analysis may not parlay directly to PJM and Uri, but I suspect in certain regions of PJM we would observe the same. |
| 11:51am | Everyone  | Dick Brooks  | REA would participate in the panel that Jonathan proposes  |
| 11:53am | Everyone  | Gurcan Gulen  | Great comment, Mark Spencer. Perhaps, there are lessons for the power sector from the LDCs and how they are regulated??? |
| 11:53am | Everyone  | Rachel Hogge  | Congratulations Jonathan! |
| 11:54am | Everyone  | James Staggs  | Very informative discussions |
| 11:54am | Everyone  | Findlay Salter  | Will this session be recorded and shared? |
| 11:54am | Hosts and Panelists  | Brian Fitzpatrick  | Jennifer, I don't have that information at hand but of course those numbers can become a bit distorted given the breadth of the PJM footprint during peak events. Having said that, a rough approximation would be 50% LDC/30% Power/20% IND |
| 11:54am | Everyone  | N. Jonathan Peress  | Thanks all. As you can see, I will remain engaged on these important matters |