| **Chat Transcript from the October 21, 2022 NAESB Gas-Electric Harmonization Forum** |
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| **Time**  | **To**  | **From**  | **Chat**  |
| 8:54am | Everyone  | Rachel Hogge  | Good Morning! We can hear everyone just fine. |
| 8:54am | Hosts and Panelists  | Jonathan Booe  | Can we enlarge the document on the screen? |
| 8:54am | Everyone  | Rachel Hogge  | Can we enlarge the document on the screen? |
| 8:55am | Everyone  | Sandra Montes de Oca | Is that better? |
| 8:55am | Everyone  | Rachel Hogge  | much better, thank you! |
| 9:03am | Hosts and Panelists  | Brian Evans-Mongeon  | How will the meeting recording be made available as i will have to step away during the meeting for a portion of it? |
| 9:19am | Everyone  | Dick Brooks  | I agree, additional infrastructure is an imperative, especially in the Northeast. Energy reliability is first and foremost an engineering problem to solve. |
| 9:20am | Hosts and Panelists | Timothy Sherwood  | I think the perspective is that changing priority implies that someone priority has been lowered. Thus contract rights impacted |
| 9:22am | Everyone  | Brian Evans-Mongeon  | I echo the thought on considering additional infrastructure especially as there is a heating transition due to further electrification. |
| 9:23am | Everyone  | Brian Evans-Mongeon  | And I do recognize that the infrastructure could be temporary as the shifting transition to electrification occurs. |
| 9:25am | Everyone  | Nancy Bagot  | Isn't one our primary challenges the inability to add infrastructure, particularly in the Northeast and particularly natural gas facilities? If this concept is about other types of infrastructure that can increase efficiency or capacity, please let us know. |
| 9:28am | Everyone  | Dick Brooks  | Very true Nancy. This also applies to electricity infrastructure, i.e. a Transmission line project planned for Maine was rejected by voters in a referendum. Angie O'Connor (RIP) once said "You can't site a hamster wheel in MA" indicating the challenges of new infrastructure |
| 9:28am | Everyone  | Timothy Sherwood  | Consistent with APGA's comments its important to know that natural gas distribution systems are generally not designed and operated in a manner to allow for curtailment of of non residential loads, since it would mean visiting each meter. Additionally, each facility would have to have a technician come onsite to put the customer back in service resulting in multiday loss of service. |
| 9:31am | Hosts and Panelists  | Brian Fitzpatrick  | You can ignore the raised hand as it was done inadvertently. |
| 9:34am | Everyone  | Timothy Sherwood  | Expanded storage infrastructure in both the market and production areas provide a potentially easier path by effectively creating interstate pipeline capacity and supply availability due to they unique impacts they can have on pipeline hydraulics. |
| 9:37am | Everyone  | Justin Grady  | If a homeowner or business loses heat because of electricity loss, they can turn their heater back on when the power resumes. If they lose heat because of loss of natural gas, their pilot light will have to be manually lit one by one. Many customers will be out for days if not weeks. This is why it WILL ALWAYS make sense to prioritize residential human needs customers for scarce natural gas molecules, transportation, etc. If residential customers lose heat for days or weeks, there will be no workers to man plants for industrial customers. |
| 9:38am | Everyone  | Joshua Phillips  | Were the Intrastate FMs to generators primarily associated with gas production interruption or transport systems? |
| 9:39am | Everyone  | Justin Grady  | Until there is widespread winterization of natural gas production infrastructure, there will continue to be severe declines in natural gas production during severe winter weather events. The 600 lb gorilla in the room. |
| 9:41am  | Hosts and Panelists  | Bobbi Welch  | When it is my turn to speak, will you be unmuting me? I do not see an option to "unmute." Thank you. - Bobbi Welch (audio via telephone) |
| 9:42am | Everyone  | Sandra Montes de Oca | Bobbi, I will promote you to panelist, then you will be able to unmute |
| 9:42am | Hosts and Panelists | Bobbi Welch  | Thank you  |
| 9:42am | Everyone  | Catherine Elder  | Agreed on the winterization in key supply basins -- and I believe that feeds into the FM issue. |
| 9:43am | Everyone  | Timothy Sherwood  | Challenging issue, but looking at the definition of force majeure to eliminate its use when either a non gas fired power plant or gas producers failed to winterize. Sends the wrong price signal. |
| 9:45am | Everyone  | Catherine Elder  | both need to winterize |
| 9:47am | Everyone  | Dick Brooks  | I agree with Bob. Same question to TSA, please. |
| 9:48am | Everyone  | Catherine Elder  | Those challenges need to be addressed head on  |
| 9:48am | Everyone  | Timothy Sherwood  | Our interaction with power generators that are not utilizing firm service or limited firm service have indicated that its either unavailable on interstate system, is a unrecoverable cost through their market model, or simply will make them uncompetitive in the bid. |
| 9:48am | Everyone  | Michelle Foss | note - gas production (wellhead) and delivery infrastructure are largely electrified and grid connected. that means outages at large enough scale in the right places will impact deliverability. |
| 9:49am | Everyone  | Gurcan Gulen | Winterization along the gas supply chain can be targeted rather than a blanket request for upstream producers and midstream companies alike. For example, backup generation at compressor station; or such facilities being classified as non-interruptible by ERCOT. A key question is how will the cost of this mandated winterization be paid for? Ratepayers is one answer. |
| 9:49am | Everyone  | Joel Yu | Natural-gas fired back-up power can protect gas delivery infrastructure from electric power outages. Resiliency requirements for gas infrastructure, similar to those that exist for hospitals or other critical facilities, would help drive adoption. |
| 9:49am  | Everyone  | Catherine Elder  | We already paid for it with the price escalation under Uri. ;-) |
| 9:49am | Everyone  | Gurcan Gulen  | Indeed Catherine. But, with forward planning such high payments could be avoided in future Uris... hopefully ;-) |
| 9:51am | Everyone  | Timothy Sherwood  | The FERC rules associated with capacity requests, capcity releases, interconnection requests seem to work relatively well. Not familiar with Texas intrastate system, but adopting FERC like rules may well be helpful  |
| 9:52am | Hosts and Panelists  | Brian Fitzpatrick  | To Joel Yu's comment, I would add that there needs to be a broader focus on how much electric driven gas compression is too much from a reliability perspective.  |
| 9:53am | Everyone  | Dick Brooks  |  The ISO/RTO FERC filings this week on docket AD21-10-000 are very insightful about solutions to paying for essential grid services through market reforms. |
| 10:00am | Everyone  | Michele Richmond | Texas intrastate has essentially no rules on transparency or what constitutes non-competitive or unjust and unreasonable rates. While FERC rules are likely not appropriate here, TCPA has suggested some solutions that would address the issues without making Texas FERC-regulated. Feel free to reach out to me offline to discuss and possibly work together. |
| 10:08am | Everyone  | Dick Brooks  | One of the low hanging fruits that would help Northeast consumers in lowering electricity cost is suspension of the Jones Act. |
| 10:09 | Everyone  | Andrea Chambers  | Industrials also support more transparency for Texas intrastate pipelines in our comments/ |
| 10:11am | Everyone  | Timothy Sherwood  | The need is for a more flexible natural gas grid to serve both LDCs and power generators with back up fuel for compression. Storage expansion and development with the ability to get it to the interstate mainline could have to most impact in the shorter term. Interstate pipelines facilitating using third party storage for short notice / no notice service could help in shorter term as well. |
| 10:16am | Everyone  | Michele Richmond  | I have provided a number of examples. Separation between pipelines and affiliate entities who compete with other entities on the pipeline for transportation and storage contracts is important to ensure true competition and prevent pipelines from advantaging their affiliates in a manner that is anti-competitive. This is the reason that transmission and distribution utilities in the ERCOT market are statutorily prohibited from owning generation or retail in the electric industry. As the conduit for moving power, they would create an unlevel playing field for other market participants and consumers. No such prohibition exists on the intrastate pipeline regulatory front and leads to exertion of market power and anti-competitive behavior. |
| 10:17am | Hosts and Panelists  | Lynne Fowler  | The key difference between natural gas and electricity is that the production of electricity can be ramped up and down hourly while natural gas production cannot be ramped on a daily basis |
| 10:18am | Everyone  | Dick Brooks  | Some of the "grid service" performance characteristics that Patricia mentioned, i.e. ramping energy services, are being addressed in another NAESB work effort for "Grid Services Standards" |
| 10:19am | Everyone  | Timothy Sherwood  | Physics of natural gas flows versus need for electric generation supply needs simply require more storage capability all along the pipeline system. For example, more nomination cycles wont meet the physical need given gas moves from wellhead more slower than gas is consumed. |
| 10:24am | Everyone  | Timothy Sherwood  | Everyone only wants firm when they need it, but physical plant is there 24/7 365. As an LDC we contract capacity for the single peak day but pay straight fixed variable rates all year. |
| 10:26am | Everyone  | Catherine Elder  | Q3c is framed from the perspective of changing priority of delivery on the pipelines. I wonder if this should instead be a state and LDC priority of service issue. But wasn't someone saying their LDC didn't have the ability to curtail their large industrial customers? The other suggestion I have is to calculate "Mingen." Mingen is the least amount of gas we need to burn to keep the lights on and a planning target. And then the pipes and the RTO's collaborate to shift generation to where gas is available. Now there may be circumstances where mingen is actually quite high -- like during Uri and even in the September heat storm, I understand that every gas unit that could run did run. (As I recall EPNG had a SOC and SoCal had a curtailment watch but that's more because of the Coolidge explosion last year combined with EG demand from the heat. Gas demand otherwise was relatively low.) Anyway, knowing that requirement is the first step, consistent with realizing that power gen is now a human need. |
| 10:46am  | Everyone  | Theresa Pugh  | The audio is now much more difficult to hear- lots of in and out. It was fine before break. Thanks, Theresa Pugh |
| 10:46am | Everyone  | Andrea Chambers  | I raised my hand  |
| 10:47am | Everyone  | Gurcan Gulen  | No additional comments, Jonathan. The chat already covered what I wanted to say.  |
| 10:48am | Hosts and Panelists  | Michelle Foss | Jonathan where is Q2? not in the comments doc you all sent out. (??) |
| 10:49am | Hosts and Panelists  | Michelle Foss | Sorry – found in agenda  |
| 10:50am | Everyone  | Gurcan Gulen  | Excellent point from Andrea: low probability high impact events are difficult to account for in traditional probabilistic modeling. That is one reason why markets cannot handle them. |
| 10:50am | Hosts and Panelists  | Dale Hinson  | Very good point  |
| 10:52am | Everyone  | Dick Brooks  | Forecasting is a part of the engineering solution for reliability today |
| 10:53am | Everyone  | Gurcan Gulen  | Agreed  |
| 10:53am | Everyone  | Gurcan Gulen | Engineering/design can account for low probability events ahead of time with lower cost (at least, in principle). |
| 10:54am | Hosts and Panelists  | George Danner  | Most forward thinking organizations are simultaneously improving forecasts while insulating the effects of bad forecasts |
| 10:54am | Everyone  | Theresa Pugh | I am not sure where this observation may be useful. It is my experience that many states have incorrect assumptions shat more power plants are "dual fuel" which are no longer dual fuel because they had to remove a storage tank for diesel and do not have any additional gas storage. There are approximately 7 utility plants in NE that have dual fuel but many other utilities are still permitted as dual fuel and that might give incorrect information. For Example, a number of power plants replaced fuel storage tanks with bag houses to meet mercury regulations or other regulations over the last 110-14 years but they did not revise their permits. |
| 10:56am | Everyone  | Timothy Sherwood  | Total daily nominations whenever they occur versus hourly load profile is the real operational challenge. Burning 24 hours of gas in 6 hours potentially impacts system pressures resulting in cascade failure. |
| 10:56am | Everyone  | Theresa Pugh | What about the question of do the nat gas customers (manufacturers and electric) know when there is an outage for repairs/ maintenance how long the pipeline will be out and if under PHMSA or other agency there is a reduction of capacity along that pipeline. Is this disclosed to ALL the customers along that route? |
| 10:58am | Everyone  | Dick Brooks  | G2G. Have a good weekend everyone. Very useful and insightful session. |
| 10:58am | Everyone  | Michele Richmond  | In ERCOT, market design to procure the dispatchable generation required to meet peak net load plus the reserve needed on the system a season ahead would provide the dispatch and revenue predictability and stability to enable gas generators to procure firm gas with firm transport further ahead. Day ahead and real-time dispatch with no mechanism to remarket or store unused fuel and no ability to recoup those costs makes this difficult, particularly for peaker plants. Competitive generators have no ability to recoup the costs of fuel if not dispatched and no ability to recoup anything beyond the actual fuel burned. |
| 10:59am | Hosts and Panelists  | Janice Devers  | I think the problem could be solved by developing a specific tariff service for this need. |
| 11:00am | Hosts and Panelists  | Brian Fitzpatrick  | Under that scenario where a generator is only needed for a few hours, and under critical conditions, ratable take requirements are typically being enforced by the pipelines and will need to bring in equivalent gas volumes equal to their highest hourly peak during those few hours x 24. |
| 11:01am | Everyone  | Michelle Foss  | on Theresa's comment - what is status of dual fueling? we have examples now in ERCOT of generators pursuing that strategy - adding diesel back into mix or expanding storage. relatively simple fix. might require some lenience at EPA/TCEQ but reliability has costs and tradeoffs. might as well be honest about that. |
| 11:01am | Everyone  | Cory Samm | From a perspective of a Midwest generator (historically and currently)- it is not economical to subscribe to firm transportation due to the fact the plant does not get dispatched on a daily basis. Similar to other generators in the Midwest, we are susceptible to fluctuations with MISO needs, high wind generation, increased solar penetration, etc. with many dispatches happening Real-Time throughout the day (although not every day and sometimes not every month). From a Day-Ahead perspective, as many already mentioned, we do not receive those DA awards until later in the day which present a challenge during extreme weather times and throughout the rest of the year. IF MISO dispatched the generation units and maintained a set MW load throughout the duration of the dispatch, then firm transportation could be advantageous, however that is not the case as MISO can move each plants generation load from Min to Max and anywhere in between throughout the dispatch to follow their load demand. I am not suggesting MISO do |
| 11:03am | Hosts and Panelists  | Michael Oberleitner  | ability to ramp up, non-ratably, also depends on the generator purchasing sufficient fuel, in advance, of the spike period. That depends on whether or not the generator was given sufficient incentive to purchase in advance, and/or the ability to find the gas supply in the intra-day market and successfully schedule the fuel - subject to pipe flow rules - in time to meet the spike period generation request. |
| 11:03am | Everyone  | Theresa Pugh  | Again, not sure when/where this question is relevant. But wouldn't the non Texas gas customers have been better off in Feb. 2020 if they had been able to adjust their nomination on Sat or Sun of that 3 day weekends. I have wondered if during 3 day federal or religious holidays it is smart to allow utilities to adjust nomination --especially in the winter season. I think that Dec 28-Jan 2 , 2021 was also a sensitive time in Texas that might have been worse if there were not so many factories closed. It has seemed odd to me that there appears no system for adjusting gas nominations over a 3 day weekend- especially during winter heat season |
| 11:03am | Everyone  | Michele Richmond  | Agree with Cory. Similar issues in ERCOT |
| 11:03am | Everyone  | Theresa Pugh  | You don't have to call on me. No worries. Thanks for letting me listen |
| 11:04am | Hosts and Panelists  | Pat Wood  | Yall cut me off guess that’s a hint to behave! |
| 11:04am | Everyone  | Elder  | Theresa makes a good point on the weekend/holiday nomination issue |
| 11:05am | Everyone  | Jean Spencer  | Agree |
| 11:05am | Hosts and Panelists | Sandra Montes de Oca | Sorry Pat didn’t mean to do that |
| 11:05am | Everyone  | Catherine Elder  | yes, EPNG does offer a peaking tariff and it is expensive. |
| 11:05am | Everyone  | Catherine Elder  | that said, reliability is expensive. ; - ) |
| 11:06am | Everyone  | Gurcan Gulen  | Michele Richmond, question regarding your suggested ERCOT market design change: even if the reselling unused gas is possible, would these reforms be sufficient to secure resiliency of natural gas supply infrastructure during Uri-like events? |
| 11:07am | Everyone  | Catherine Elder  | Hey, was it Michele who talked about FM days in advance of Uri? And was that supply FM? |
| 11:09am | Everyone  | Theresa Pugh  | As a nation we are brining MANY new semiconductor plants. We need to expect this type of manufacturing and others factories that will be VERY sensitive to unexpected outages and voltage support fluctuations. As a nation we are in desperate need for dozens of semiconductor fab plants and they are sensitive to electricity losses. Same with some medical instrumentation manufacturing. I'd like you to understand that this places more emphasis on gas-electricity reliability issues. |
| 11:12am | Everyone  | Ronnie Hensley  | Theresa Pugh - We have nominations being made on weekends and holidays. We have 5 cycles, 365 days a year. |
| 11:14am | Everyone  | Ronnie Hensley  | To be more clear, we schedule those cycles on the weekend and holidays just like we do on a normal workday. |
| 11:14am | Everyone  | Theresa Pugh  | Thank you Mr. Hensley. But is that the case all over the country? I thought I heard that KS, MN and other non- Texas states would have liked to have revised their nomination order in Feb 2020. Perhaps I was misinformed. |
| 11:14am | Everyone  | Rachel Hogge  | In response to Theresa Pugh's nominations concern: There are five nomination cycles each day, 365 days. Customers are able to modify their nominations within those cycles any/every day. |
| 11:14am | Everyone  | Michele Richmond  | Catherine, yes generators had firm contracts for which they received force majeure notices many days before Uri. There is no requirement for the gas contracted for to be replaced and penalties were applied in some cases for the pipeline short that was no fault of the generator. In contrast, the generators awarded bids in the electric market were required to purchase replacement power at the real-time price if unable to produce the contracted MWs when fuel was not delivered. Many tried to obtain replacement fuel at the spot prices and paid dearly if they were able to. Wholesale power market prices in ERCOT are capped and during Uri, did not cover the costs of replacement fuel and penalties. Lack of transparency forced generators to blindly attempt to purchase fuel and provided no ability to see what was happening on the pipes in terms of capacity and flows, where the outages were and who else might have had gas available at a better price. |
| 11:15am | Everyone  | Catherine Elder  | But not robustly and there is little liquidity … Joshua is making the same point. |
| 11:17am | Everyone  | Michele Richmond  | Gurcan Gulen, the ERCOT market design changes won't address whether the natural gas infrastructure is winterized, whether workers are present in the field to make sure the gas isn't freezing at the wellhead and does not address the ability to FM a firm contract. So it addresses only the ability to potentially make firm contracts for transportation and storage more economic for gas generators in ERCOT. |
| 11:17am | Everyone  | Ronnie Hensley  | Theresa, that is the case for all Interstate pipelines, all over the country. |
| 11:19am | Everyone  | Thomas Anderson  | Steel producers require firm supply because interruption in gas supply is catastrophic. The value of gas is dwarfed by the potential tens of millions of losses in pstell and damage to assets if gas supply is suddenly curtailed or worse cut. |
| 11:19am | Everyone  | Theresa Pugh  | Glass manufacturing too |
| 11:19am | Everyone  | Timothy Sherwood  | Winter storm Uri was a circumstance when everyone needed max capacity. Efficiency in capacity release would be unlikely to address the results of the Uri event |
| 11:20am | Everyone  | Kimberly Van Pelt  | Will you increase the size of the mathematical example? TY |
| 11:21am | Everyone  | Gurcan Gulen  | Thanks Michele for the clarification. It is important for us to differentiate the need to fix "every day" gas-power harmonization and what is needed to avoid high cost of Uri-like events. Electric market design changes cannot help with the latter in my view. |
| 11:22am | Everyone  | Sandra Montes de Oca  | Michael's slides have been posted and are in the comment section |
| 11:24am | Everyone  | Elizabeth Mallett  | The compiled comments can be accessed at the following link: https://naesb.org/pdf4/geh102122w3.docx |
| 11:26am | Everyone  | Jean Spencer  | In Southern California, parties agreed to a curtailment order to balance the needs of different types of customers with the need to quickly shed load in an emergency. Curtailment starts with a proportion of electric generation load, goes to less-sensitive noncore customers, then more sensitive noncore customers (e.g. refineries), then the remaining EGs, then core. https://www.socalgas.com/for-your-business/energy-market-services/curtailments#:~:text=Curtailments%201%20Order%20of%20Curtailment%20In%20the%20event,Curtailment%20Transfer%20Process%20...%207%20Curtailment%20Notice%20 |
| 11:29am | Everyone  | Catherine Elder  | Jean is pointing to more detail here around what I was getting at when I mentioned maybe Q3c is more a state and LDC issue. Of course, the CA LDC's are giant systems compared to most in the US … but is the old requirement under the NGPA that states establish a priority of service order now totally defunct? |
| 11:32am | Everyone  | Timothy Sherwood  | Dominion  |
| 11:32am | Everyone  | Catherine Elder  | Thank you dominion  |
| 11:33am | Everyone  | Timothy Sherwood  | Dominion's analysis seems to indicate that markets may not want to assume that gas supply that is not guaranteed is guaranteed when setting up dispatch of generation |
| 11:35am | Everyone  | Theresa Pugh  | I have another meeting to turn to. THank you for letting me listen. I would like to attend in future. I do not have all the technical expertise that you all have. BUt I do have a somewhat unique perspective having worked for utilities and manufacturers- especially since we are in process of building so many new factoires that are sensitive to any burps in electricity or long-term outages. If my math is right- we are facing 15 new semiconductor plants. Even a few seconds of problems can ruin an entire line run of fab chips. Many thanks. |
| 11:37am | Hosts and Panelists  | Michael Oberleitner  | Yes, Tim. due to pipeline realities, regardless of FT, if we don't get sufficient LMP price to procure sufficient fuel, ramping up post ID3, may or may not be possible if there is a spike in MW demands... |
| 11:37am | Everyone  | Joshua Phillips  | Is there a market monitor for the gas market similar to RTOs that ensures market manipulation is avoided? |
| 11:38am | Everyone  | Catherine Elder  | There is -- or used to be -- a market watching group at FERC. |
| 11:38am  | Everyone  | Christopher Burden | FERC Monitors |
| 11:39am | Everyone  | Joshua Phillips | Is FERC able to monitor intrastate transactions?  |
| 11:40am | Hosts and Panelists  | Andreas Thanos  | Good point  |
| 11:40am | Everyone  | Timothy Sherwood  | Demand certainty as the day unfolds undoubtedly allows LDCs to better understand their supply demand balance. Additionally, some resources may be made available to the market if the value exceeds the opportunity cost for the customers they serve. |
| 11:40am | Hosts and Panelists  | Brian Fitzpatrick  | To Marji's point, PJM does have relationships with key LDC's within the system footprint that serve gas generation to address interruptions/service to those generators...but not specifically focused on the LDCs overall capacity portfolio. |
| 11:42am | Hosts and Panelists  | Andreas Thanos  | Why is it that everyone expects gas consumers to assume an additional risk in order to maintain the current status quo of the electric universe? |
| 11:45am | Hosts and Panelists  | Pat Wood  | Andreas, what additional risk on gas customers are you specifically referring to? |
| 11:49am | Hosts and Panelists  | Brian Fitzpatrick  | Yes, FERC Order 787 does allow for sharing non public information between ISO/RTO and interstate pipelines |
| 11:50am | Everyone  | Timothy Sherwood  | There is a difference between understanding expected flows and the actual rights that capacity holders have via contract. Particularly the way an interstate pipeline must operate to preserve no notice delivery rights to those contracting for them. |
| 11:51am | Everyone  | Catherine Elder  | I have to agree that I have read many more than one interstate pipeline's critical notice that was completely obtuse as to what the heck it meant. It is interesting that SPP is seeing that, too. SPP's footprint means they have a lot of pipes to deal with. |
| 11:54am | Hosts and Panelists  | Michele Richmond  | The issue is the entities elevated other entities into human needs |
| 11:56am | Hosts and Panelists  | Brian Fitzpatrick  | In terms of communication protocols, PJM has built a very strong relationship with the interstate pipelines serving generation on our system and for the most part it is functioning very well. But to reiterate the points addressed by Josh Phillips, there could be improvements to the consistency of certain critical notices, in particular location of the impact area. One suggestion could be the development of a centralized real time interstate pipeline map that all interstate pipeline notices would immediately go to and display the OFO region(s), ratable take requirement region, force majeure...much like a traffic map that displays congested roads. Interested parties could subscribe to view which portions of the system that are interested in.  |
| 12:00pm | Hosts and Panelists  | Michael Oberleitner  | Tim - Dominion agrees with your assertion about the difference between understanding expected flows and contractual rights of FT shippers... |
| 12:00pm | Everyone  | Heather Polzin | Need to leave for another meeting at 1. |
| 12:01pm | Everyone  | David Huff | Really great meeting and ideas shared! |