Days 1 and 2 (March 7-8) Work Paper - NAESB Gas Electric Harmonization March 7-8, 2016 Meeting – Issues for Discussion

The issues in the following table were identified from the presentation given and discussions that occurred on February 18-19, and will form the basis for our discussions on March 7-8. For each of the issues identified below, the discussion should be guided by the following questions:

1. Is a discussion of this issue within the scope of the Commission’s request that “… gas and electric industries, through NAESB, explore the potential for faster, computerized scheduling when shippers and confirming parties all submit electronic nominations and confirmations, including a streamlined confirmation process if necessary?” and “… natural gas and electric industries, through NAESB, begin considering the development of standards related to faster, computerized scheduling”?
2. Is it an issue that could be pursued where more uniformity or streamlining would meet the Commission’s request?  Would it be economical and efficient to do so?  Should consideration of this issue be postponed until we have more experience and a better understanding of the impact of changing the nominations timeline which is to be implemented April 1?
3. Is this an issue where a national standard is not helpful, and it best addressed by services individually tailored to customer’s needs and reflecting individual inherent operational requirements? Is this an issue (non FERC policy related) where something stands in the way of resolving it? Is this an operational issue or some other matter that falls outside of NAESB’s purview?
4. Other Miscellaneous Topics: Is this issue a topic where tools can be used to address the Commission’s request and uniformity is not helpful or is more detrimental than beneficial?
5. Is it an issue that NAESB cannot take action on in the absence of FERC taking prior action? Is this an issue where the Commission itself could consider addressing the issue (without presuming a conclusion that the Commission would actually decide to introduce policy changes, but still entertaining the possibility that additional action may be warranted after a full record is developed)?
6. This is factual point.

The table following references items discussed on February 18-19 directly referenced in the following presentations:

1. Pipeline Segment: <https://www.naesb.org/pdf4/geh021816w1.pdf> and list of companies in support here
2. PJM: <https://www.naesb.org/pdf4/geh021816w2.pdf>
3. ACES Power: <https://www.naesb.org/pdf4/geh021816w3.pptx>
4. FIS: <https://www.naesb.org/pdf4/geh021816w4.pptx>
5. Skipping Stone: <https://www.naesb.org/pdf4/geh021816w5.pptx>
6. EDF: <https://www.naesb.org/pdf4/geh021816w6.pptx>
7. EnCORE with support from RBN: <https://www.naesb.org/pdf4/geh021816w7.pptx>, <https://www.naesb.org/pdf4/geh021816w11.zip> (Zip file due to size)
8. OATI: <https://www.naesb.org/pdf4/geh021816w8.pptx>

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| NAESB Gas Electric Harmonization Presentation TemplateMarch 7-8, 2016 – Hilton Americas, Houston, Texas |
| # | Presentation/Speakers | Issues |
| 1. | NAESB WGQ Pipeline SegmentSpeaker: Kim Van Pelt  | For the variables mentioned in the presentation, consider and discuss the following issues based on the questions listed on page 8 of this document:1. No-notice needs for capacity to support anticipated usage of services purchased, which may or may not be scheduled (e.g., if no notice is not scheduled, such capacity can be made available to other shippers). This issue is one way to address the potential for greater flexibility. Pipelines forecast the amount of no notice service they expect to provide on a next day basis and then utilize any projected unused capacity on a interruptible basis to serve other shippers including gas fired electric generators with non ratable demand. This is a foundational concept for Order 636.

 There is mixed opinion on all of the following points:  #1. This may or may not be in scope. #2. If scheduling were faster, there could be efficiencies but at what cost? #3. This is a service related issue. #6. This is a statement of fact.1. Non-ratable flexibility, both required to support services purchased and on a best efforts basis. Pipelines that offer no notice service forecast the amount of no notice service they expect to provide on a next day basis and then utilize any projected unused capacity on a interruptible basis to serve other shippers including gas fired electric generators with non ratable demand. This is a foundational concept for Order 636.

 There is mixed opinion on all of the following points: #1. In scope/out of scope. For example, for at least one shipper and one pipeline, even when firm non-ratable service is purchased from a pipeline a shipper cannot utilize it outside of business hours.#2. Different pipelines have different tariff filings and offerings under the 636 framework, based on physical characteristics of the pipeline and other things. While standards development could facilitate a market mechanism for a price formation, there would need to be new policy articulated by FERC based on the degree of coordination between gas and electric industries.#5. Different pipelines have different tariff filings and offerings under the 636 framework. While standards development could facilitate a market mechanism for a price formation, there would need to be new policy articulated by FERC based on the degree of coordination between gas and electric industries. 1. Performance of receipt/delivery locations – off-rate (daily/hourly)

 There is mixed opinion on all of the following points:  #6. 1. Redirection of net scheduled flows resulting from nominations can occur through other portions of the pipeline

 There is mixed opinion on all of the following points:  #6. 1. Interdependent capacity changes due to location of receipts/deliveries

 There is mixed opinion on all of the following points:  #6. 1. Impact of weather on supply/demand and compressor efficiencies

 There is mixed opinion on all of the following points:  #6. 1. Pipeline line pack, pipeline storage, and third party storage(including LDC storage) levels/location in relation to supply/demand

 There is mixed opinion on all of the following points:  #6. 1. Gas quality fluctuation – heat content, etc.

 There is mixed opinion on all of the following points:  #6. 1. Backhaul/displacement reliability. Pipelines evaluate historic patterns of backhaul/displacement transactions to determine whether such transactions can be relied upon during evaluation of the following scheduling cycles. Can the backhaul happen? Can you keep relying on it and does it create space for forward haul?

 There is mixed opinion on all of the following points:  #6. 1. Maintenance activities

 There is mixed opinion on all of the following points:  #6. 1. Physical assistance agreed upon between interconnecting parties. OBAs and similar type of arrangement (the implementing devices), seem to be working well.

 There is mixed opinion on all of the following points: #3. In light of the practice in which parties provide collaborative physical assistance, national standards may not be helpful. In light of this collaborative assistance, when un-priced due to the current nature of OBAs, this may also frustrate standardization. On the other hand, when it is priced between pipelines it might not occur as often as under informal arrangements, with potential impacts on reliability. There are complex interactions and potential consequences for these trade-offs. Additionally there are regulations surrounding emergency situations and care should be taken to avoid disrupting those capabilities.#5. In light of this collaborative assistance, when un-priced due to the current nature of OBAs, this may also frustrate standardization. On the other hand, when it is priced between pipelines it might not occur as often as under informal arrangements, with potential impacts on reliability. There are complex interactions and potential consequences for these trade-offs. Additionally there are regulations surrounding emergency situations and care should be taken to avoid disrupting those capabilities. #6. 1. Order of applying reductions (optimization) – location v. segments, order of scheduling segments, timing of the balancing

 There is mixed opinion on all of the following points:  #6. 1. Identification of opportunities for imbalance management

 There is mixed opinion on all of the following points:  #6. 1. Balancing of pools

 There is mixed opinion on all of the following points:  #6. Also mentioned in the presentation as challenges are:1. Flexibility of EPSQ, its level and when it should apply

 There is mixed opinion on all of the following points:  #6. 1. Application of various NAESB versions and support provided by pipelines for several versions

 There is mixed opinion on all of the following points:  #6. 1. Levels of confirmation

 There is mixed opinion on all of the following points: #1. In scope (due to potential for efficiencies). But note that anything that decreases operational control (for example, at the city gate, or at other interconnecting points of parties) may introduce complications and degrade reliability in other parts of the delivery chain. There are other issues similarly raised upstream/downstream with respect to level of services (for example, difference between firm and interruptible services at interconnections).#2. But note that anything that decreases operational control (for example, at the city gate, or at other interconnecting points of parties) may introduce complications and degrade reliability in other parts of the delivery chain. #3.  #6. 1. Nomination errors requiring manual intervention for mismatches during the confirmation process

 There is mixed opinion on all of the following points:  #1. #2. We need to make sure about the implications of compressed time for the amount of time available for scheduling and confirmation and understand the implication for errors and for the basic question of whether further efficiencies occur and whether efficiencies gained are sufficient to create an additional cycle. #6. 1. Manual confirmation processes

 There is mixed opinion on all of the following points:  #1. In scope.#2. Maybe. Let’s see what happens after considerable post April 2016 experience with respect to using that experience to determine the relative benefits of changing timeline vs. adding cycles. Any further scheduling frequency or opportunities outside of grid-wide opportunities are likely to be manual. There are many other considerations that do not involve additional cycles or manual processes. #6. 1. Availability of capacity at interconnection points. There is currently uncertainty as to impact of tighter timeframes on the scheduling of capacity for the later cycles. (At present, the schedules tend to come out early.)

 There is mixed opinion on all of the following points:  #1.  #2. 1. Computerized scheduling and confirmations for nomination of subscribed services during non-traditional business hours.

 There is mixed opinion on all of the following points:  #1.  #2. 1. It would be desirable to have a set of terminology agreed upon by participants to characteristics shapes, profiles, ratable, non-ratable, and so forth to facilitate discussion.

 There is mixed opinion on all of the following points:  #1.  #2. 1. It was offered that for certain service types the ability to provide a more granular (i.e. 24 hour) take pattern could alleviate/reduce reliance on intraday to achieve that take pattern.

 There is mixed opinion on all of the following points:  #1.  #2. #3. Are there other issues raised in the presentation that should be discussed as part of the questions listed on page 8? |
| 2. | PJMSpeaker: Brian Fitzpatrick | For the items mentioned in the presentation, consider and discuss the following issues based on the questions listed on page 8 of this document:1. Operational risk assessment. Some grid operators take into consideration impacts of gas scheduling and nomination on the electric grid through routine risk assessments.

 There is mixed opinion on all of the following points:  #6. 1. Communication protocols with LDCs, gas generator operators and natural gas marketing companies

 There is mixed opinion on all of the following points:  #6. 1. Improve efficiency of critical information sharing (related to items 1 and 2)

 There is mixed opinion on all of the following points:  #1.  #2.  #3.Are there other issues raised in the presentation that should be discussed as part of the questions listed on page 8? |
| 3. | ACES PowerSpeaker: Dan Buckner  | For the items mentioned in the presentation, consider and discuss the following issues based on the questions listed on page 8 of this document:1. Timing and Processing Times for Day Ahead energy markets are different across electric markets

 There is mixed opinion on all of the following points:  #6. 1. Tight execution windows for gas markets

 There is mixed opinion on all of the following points:  #3.  #6. 1. Generators rely on flexibility for a number of operational issues on the electric side. (Electric systems may require very short periods of gas to address perturbations on the systems and electric systems need to also address forecasting error for flexible systems.) Interruptible services are needed because firm service doesn’t always provide for all of the flexibility attributes. There are no notice services, but they are limited. It is challenging to generators that flexibility elements of services are themselves interruptible.

 There is mixed opinion on all of the following points:  #1. Different view points about it being in scope#2 and #3. Caution may be appropriate about the timing of any NAESB discussions of this issue. #6. 1. Decreasing operational flexibility provided by IT service when providing the possibility of more frequent opportunities for FT and IT through additional nominations/scheduling cycles. The status quo has certain rights and benefits that have been baked into expectations about the amount of flexibility that is available under different services. Changes ahead in either the gas or electric industries may disrupt the flexibility that has worked in the past and may not in the future.

 There is mixed opinion on all of the following points:  #1. #2.  #3.  #6.1. Coordination/timing challenges

 There is mixed opinion on all of the following points:  #1. #6. 1. Forcing pipelines to process quicker may decrease operational flexibility because there may be less time to determine if interruptible transportation is available. Shorter timeframes may inadvertently introduce too much rigidity.

 There is mixed opinion on all of the following points:  #1. #2.  #3.  #6.Are there other issues raised in the presentation that should be discussed as part of the questions listed on page 8? |
| 4. | Fidelity National Information Services (FIS – formerly SunGard)Speaker: Sylvia Munson | For the items mentioned in the presentation, consider and discuss the following issues based on the questions listed on page 8 of this document:1. Use of multiple confirmation methods in addition to traditional confirmations for intraday nominations. There is currently as good definition of CBE in NAESB standards, CBE however, may not be available everywhere but there may also be additional confirmation methods that could benefit from standardization.

 There is mixed opinion on all of the following points:  #1.  #2.  #6.1. Non bumping Best Efforts nomination opportunities with streamlined confirmations as an intra-cycle nomination subject to operating conditions of the pipeline. True up processes at the end of the gas day are examples of Best Efforts. This may be necessary but not sufficient to effectuate a transaction that can be scheduled.

 There is mixed opinion on all of the following points:  #1.  #2.  #3. 1. Lining up the processes and timeframes that occur within the confirmations/scheduling window to gain efficiency of data exchange.

 There is mixed opinion on all of the following points:  #1.  #2.  #3.1. Level of confirmations: there are a wide range of data elements that are exchanged from a minimum amount to a very large set of data. In the Art of Scheduling pipelines confirm at different level with potential for disparities, greater standardization could produce confirming efficiencies. (For example, confirm at the shipper to shipper level, or if you do it as a lower level of detail it would be driven by model type.) See issue 17 in the first presentation.

 There is mixed opinion on all of the following points:  #2.  #3.  #6.1. We should investigate the need of defining the number of iterations to support confirmation, including on a best effort basis. Defined iterations needed to support confirmations, including best efforts. Taking a look at these issues does not necessarily presume there is a magic number of iterations, in part to changing market conditions and because of respecting the goal of maximizing flow.

 There is mixed opinion on all of the following points:  #1.  #2.  #3.1. Further standardizing methods and processes (for example, standardizing time frames for the different elements of the processes) employed to support confirmations. Standardization could clarify the steps and expectations among parties surrounding default actions that may arise from different time periods in the process.

 There is mixed opinion on all of the following points:  #1.  #2.  #3.1. Addressing the communication of characteristics of the information in the confirmation process could require a fundamental redesign for potential changes to make confirmations more efficient. (Reasonable) commercial confidentiality issues must be respected. Note that some pipeline practices already may include this kind of information in the confirmation process.

 There is mixed opinion on all of the following points:  #1.  #2.  #3.Are there other issues raised in the presentation that should be discussed as part of the questions listed on page 8? |
| 5. | Skipping StoneSpeaker: Greg Lander | For the items mentioned in the presentation, consider and discuss the following issues based on the questions listed on page 8 of this document:1. Some parties seek more opportunities to change the shape of flows over the course of a gas day so that the actual flows may differ from the 1/24th per hour rate (for example, use more nomination cycles and schedules to achieve non-ratable takes, instead of /in addition to using other tools like no-notice and hourly nomination services)

 There is mixed opinion on all of the following points:  #6. 1. Would the ability to reserve current contracted primary FT capacity for use tomorrow, address issues related to inability to use FT contracts to serve intermittent electric generation.

 There is mixed opinion on all of the following points:  #3. #5. 1. A field test for best effort scheduling may be able to give us information as to demand and utility of services supporting non-ratable service.

 There is mixed opinion on all of the following points:  #2. #4. 1. There is an observation that the current set of firm offerings is not meeting the demands of generators in some parts of the country. The suggestion is that it is not necessary to change the existing services, but rather to add new services (for example, one could add a block of capacity, e.g. a seasonal block in which a shipper could take x quantity and y quantity for day). This is similar to the type of offering that some pipelines now offer (e.g. revenue banking). Of course physical capabilities of pipeline systems must be taken into account.

 There is mixed opinion on all of the following points:  #3.  #5. 1. Volumetric service to support electric generation akin to SGS (Small General Service) on a best efforts basis may meet expressed needs.

 There is mixed opinion on all of the following points:  #3.  #5. 1. Intra-cycle capacity releases may improve best efforts scheduling. Conversely best efforts scheduling may improve the effectiveness of existing intraday capacity releases.

 There is mixed opinion on all of the following points:  #3.  #5. 1. Best efforts scheduling could also be applied to day-ahead shaped flows.

 There is mixed opinion on all of the following points:  #3.  #5. Are there other issues raised in the presentation that should be discussed as part of the questions listed on page 8? |
| 6. | Environmental Defense FundSpeaker: Jonathan Peress | For the items mentioned in the presentation, consider and discuss the following issues based on the questions listed on page 8 of this document:1. Episodic analysis of daily flows suggests that more opportunities to schedule may provide additional flexibility to generators and electric consumers benefits.

 There is mixed opinion on all of the following points:  #1.  #6. 1. There could be benefits that flow from better matching efficiency of gas scheduling to the provision of ancillary services (e.g., addressing short term imbalances, frequency regulation, flexible capacity) by gas generators. Because scheduling of gas is a process and electric ancillary services are products, it would be helpful to analyze what components of the scheduling process could be helpful in accommodating the provision of ancillary service.

 There is mixed opinion on all of the following points:  #1.  #2.  #3. #5.1. As the electric system continues to evolve into a peakier and a more renewable grid, the need for enhanced scheduling and flexibility from the gas transportation system will grow.

 There is mixed opinion on all of the following points:  #1.  #2.  #5.Are there other issues raised in the presentation that should be discussed as part of the questions listed on page 8? |
| 7. | Coalition of Energy Technology Firms – EnCORE Partners, RBN Energy for supportSpeakers: George Danner with support from Rick Smead  | For the items mentioned in the presentation, consider and discuss the following issues based on the questions listed on page 8 of this document:1. How to support through efficient scheduling, a better coordination of gas supplies, transport services, ISOs and RTOs needs and needs of power generators. Using simulation to recreate “The Art of Scheduling” tools of software models could support more efficient and effective decision making.

 There is mixed opinion on all of the following points:  #4. 1. Through efficient nominations and scheduling, addressing service interruptions in the supply chain. Using simulation to recreate “The Art of Scheduling” tools of software models could support more efficient and effective decision making.

 There is mixed opinion on all of the following points:  #4. 1. How to address less time to validate nomination data that would not lead to errors or legal risks. Using simulation to recreate “The Art of Scheduling” tools of software models could support more efficient and effective decision making.

 There is mixed opinion on all of the following points:  #4. 1. How to address tighter deadlines that hamper gas controllers ability to account for shifts in volume. Using simulation to recreate “The Art of Scheduling” tools of software models could support more efficient and effective decision making.

 There is mixed opinion on all of the following points:  #4. 1. By adding more schedules, are tools available or currently in use that support both the gas controllers and the gas fired generators? Using simulation to recreate “The Art of Scheduling” tools of software models could support more efficient and effective decision making.

 There is mixed opinion on all of the following points:  #4. 1. Need for role playing. Using simulation to recreate “The Art of Scheduling” tools of software models could support more efficient and effective decision making.

 There is mixed opinion on all of the following points:  #4. 1. Compress confirmations by expediting verification of nominations. Using simulation to recreate “The Art of Scheduling” tools of software models could support more efficient and effective decision making.

 There is mixed opinion on all of the following points:  #4. Are there other issues raised in the presentation that should be discussed as part of the questions listed on page 8? |
| 8. | OATI, Inc.Speakers: Jerry Dempsey and Sheldan Perry  | For the items mentioned in the presentation, consider and discuss the following issues based on the questions listed on page 8 of this document:1. Can eTag be applied to the gas industry to mimic the significant number of transactions processed on the power grid that use eTag in short processing windows, and if so, can it result in a streamlined scheduling process for natural gas?

 There is mixed opinion on all of the following points:  #1. #2. #4. 1. Are there “lessons learned” in the electric industry that can benefit the gas industry as it considers the feasibility of modifying the scheduling process to make it more efficient?

 There is mixed opinion on all of the following points:  #4. Are there other issues raised in the presentation that should be discussed as part of the questions listed on page 8?Overarching points:* Because no votes were taken (by design), nothing in this report reflects a consensus view of NAESB members.
* Because changes will be introduced after April 2016, it would be useful to gain insights from that new experience before considering what, if any, changes are needed.
* Regarding questions on whether an issue is or is not in scope:
	+ - By definition, if we’re reporting on an issue someone thought it was in scope
		- But the scope from FERC and the Board may be narrower.
* The list of issues originated in individuals’ presentations, but the subsequent summary phrasing and discussion of those issues does not necessarily reflect the original presenter’s point of view.
* The meeting notes for each day’s session reflect the summary as prepared by the NAESB staff. Because no votes were taken on any matters during these meetings, the meeting notes should not be viewed as consensus statements. Participants have had the opportunity to provide comments on the sessions’ meeting notes, and any comments should be considered part of the record of discussions. The white board notes from the February session were the facilitators notes and do not reflect consensus from the meeting participants.
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