

Briefing Paper

Efforts to Harmonize Gas Pipeline Operations With the Demands of the Electricity Sector

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PREFACE

Dear Fellow Commissioners:

I wanted to write this introduction to Ken Costello's briefing paper on Efforts to Harmonize Gas Pipeline Operations with the Demands of the Electricity Sector. Not only has Ken done an excellent job in discussing important basic information necessary to gain a fuller understanding and appreciation of a very important subject; he has also provided you with some background information that I hope you will read and share with your staffs.

As I believe many of you are aware, I have the privilege of serving on both the Board of Directors of the NRRI and the Advisory Committee to the North American Energy Standard Board (NAESB). At the February 2006 NARUC Winter Committee Meetings, NAESB also held an Advisory Board meeting at which time it disclosed the final status report of the NAESB Gas-Electric Interdependency Committee (GEIC), which shortly afterwards was filed with the Federal Energy Regulatory Commission (FERC) on Febr. 24, 2006. It became readily apparent that although NAESB has made much progress in identifying a number of key issues that need to be resolved, the pursuit of achieving more coordination of the gas and electric industries would benefit by having the understanding and the attention of federal and state regulators.

Since the details of this highly important issue can become overwhelming to those of us who have many items on our day-to-day schedules, I asked NRRI and Ken Costello if they could assist in preparing an initial primer on this subject. I wish to thank Ken, Vivian Witkind Davis and the NRRI Board for supporting this effort in a timely fashion.

In addition to this report, the NARUC Committees on Electricity and Natural Gas are sponsoring a joint panel on this subject at the Summer Committee Meetings in San Francisco. The panel has the following description:

The increased use of natural gas for electricity production, especially during critical periods for both gas pipelines and regional power systems is raising the specter of potential serious operational problems for both pipeline operators and power generators. The scheduling rules for power generators, for day-ahead and real time markets, may not synchronize with pipeline capacity nominations. While on the gas side, current pipeline-service offerings may not accommodate the demands of power generators and regional power systems operators. The North American Energy Standards Board (NAESB) has been working on this issue for some time with members from both industries and although progress has been made, some key issues remain to be solved, which may involve policy considerations for regulators to be aware of.

Sincerely,

W. Robert Keating
Commissioner, Massachusetts DTE
Chairman, NRRI Board of Directors

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BACKGROUND

With increased dependency of electric generation on natural gas, more formalized coordination between the two sectors is needed. FERC has called on NAESB to reach consensus on business practices.

With the increased dependency of electric generation on natural gas, various groups, notably the Federal Energy Regulatory Commission (FERC) and industry leaders, have called for more formalized coordination between the two sectors. In a Dec. 14, 2004 letter to the North American Energy Standards Board (NAESB), FERC Chairman Pat Wood highlighted the need for better coordination between gas pipelines and the electric grid.¹ The Chairman said he expected NAESB to propose new business practices by June 2005, with approved standards in place by the winter of 2005-2006. The Chairman emphasized his preference for the participants of the NAESB process to reach consensus on business practices, rather than for FERC to initiate action.

For consensus on business practices, the electricity industry will seemingly need to adjust its operating practices as well.

NAESB is an independent industry-supported entity whose main task is to set business standards.² The Federal Energy Regulatory Commission (FERC) oversees all NAESB activities, with NAESB standards jurisdictional to the wholesale gas or electricity markets, including working papers, submitted to FERC for its review.

One particular concern raised to date is that the scheduling protocols for gas-fired electric generators operating within organized regional power markets may not synchronize with the current NAESB standards for pipeline nominations and scheduling. For example, gas-fired generators frequently have to commit power to

the regional electricity grid before they have the assurance of pipeline capacity. A broader issue, and a potentially more serious one, centers on the willingness of gas pipelines to accommodate the stringent demands of power generators and regional power-system operators. Power generators have argued that their special needs require pipelines to offer them more flexible service than provided to other shippers. Specifically, they want more flexibility on different dimensions of their service: (1) nominations and scheduling (more nomination windows and capacity assurances for intraday nominations); (2) hourly gas flows (more balancing flexibility); and (3) gas diversion and delivery points (more spatial flexibility). Table 1 below lists the major demands of power generators, as articulated in various forums.³

The economic rationale underlying their demands for more flexible pipeline service is that many gas-fired generators operate sporadically and on short notice.⁴ Gas-fired generators differ distinctly from traditional shippers, challenging the pipeline sector in unprecedented ways. Nevertheless, to reach consensus on business practices, the electricity industry will seemingly have to adjust its operating practices as well. One prominent example proposed involves regional power operators advancing their bidding and scheduling timelines so that generators know their power commitments prior to the deadline for timely gas nominations. In the absence of concrete accommodations from both industries, voluntary negotiations will likely fall short of establishing

TABLE 1
“WISH LIST” OF POWER GENERATORS

• Hourly services allowing for variable delivery of gas over the Gas Day with short notice
• Storage and balancing services from different sources
• Flexibility in diverting gas to different delivery points
• Hourly low-cost balancing services and options
• Avoidance of costly imbalance and overrun penalties and fees
• Flexible contractual terms
• More intraday nomination options (with possible “bumping” rights late during the Gas Day)

Source: Author’s construct.

new business practices.

Better coordination between gas pipelines and electric generators offers the hope of improving the performance of both wholesale gas and electric markets. The prevailing view is that the growing reliance on natural gas for new generating capacity can impose greater reliability risk on both the electric power and natural gas networks. As an illustration, short-term problems caused by gas pipeline constraints could seriously affect the security of an electric power system.⁵ With the adoption of nationwide business practices, the reliability of electricity could improve, the predictability of future market operations could increase, and transaction-cost barriers to market trading could diminish. For example, uniform posting of bidding and scheduling timelines across organized wholesale electricity markets in line with pipeline nominations procedures can potentially improve the reliability of electricity service by giving power generators greater assurances of pipeline-capacity availability. As another example, the offering of more flexible pipeline service to power

generators would better accommodate the needs of generators in meeting their commitments to the regional wholesale power markets. Pipelines could also benefit from nationwide business practices, for example, by lowering their operating costs from serving different electricity markets with uniform bidding and scheduling timelines.⁶

Industry observers have acknowledged that current NAESB business practices for gas-pipeline nominations (established about ten years ago after much debate between industry stakeholders) and other aspects of pipeline operations have improved industry performance. Specifically, they have (1) improved the reliability and operational performance of the pipeline network; (2) reduced administrative costs; and (3) facilitated trading and reducing transaction costs for shippers using multiple pipelines.

Over the past few years, NAESB has facilitated meetings with participants of both the gas and electricity

Nationwide business practices could result in improved electric reliability, increased predictability of future market operations, and diminished transaction-cost barriers to market trading.

This paper highlights accomplishments of the NAESB process to date and speculate on why it so far has had limited success.

The paper's major objective is to help the reader grasp the major concerns surrounding the dependency of electricity generators on natural gas.

Power generators have singular characteristics as shippers that make them difficult for pipelines to serve.

industries with the primary purpose of gaining consensus on the development of business practices. This paper highlights the accomplishments to date, pointing to the difficulties of the two industries agreeing on the important issues let alone reaching consensus on specific business practices. This paper speculates on why this process so far has met with limited success.

In February 2006, NAESB filed its final report to FERC. The North American Electric Reliability Council (NERC) also has addressed the gas-electricity interdependency issue from the perspective of electric reliability. This paper provides an overview of their efforts, which to date have mostly identified issues and operational activities for possible development into business practices.

The major objective of this paper is to describe the major concerns surrounding the dependency of electricity generators on natural gas. To achieve this, the paper will discuss in elementary terms how gas pipelines operate in the context of generators receiving gas needed to meet their requirements on a regional electric power system. With this understanding, the reader can better grasp the nature of the concerns surrounding the current gas-electricity interdependency issue.

FEATURES OF NATURAL GAS PIPELINE OPERATIONS

This section attempts to describe the general features of gas pipeline operations for better understanding the concerns of power generators and

the issues addressed in this paper. As discussed above, these concerns center on the willingness of gas pipelines to provide power generators with required services under a wide range of conditions. Power generators have singular characteristics as shippers that make them more difficult for pipelines to serve. One particular challenge is for pipelines to provide capacity to power generators on short notice, especially during periods of peak demand. Another one is pipelines adapting to the frequent and highly fluctuating changes in gas flow by power generators. In organized electricity markets, the scheduling of electricity by the regional operator may occur one day, one hour, or even as little as five minutes prior to actual generation.

In accommodating the demands of power generators, several pipelines have begun to offer special services. While these services arguably still fall short of satisfying power generators, the electricity industry may have to modify its modus operandi to better harmonize its operations with gas pipelines. For example, organized electricity markets may have to adjust their timelines for bidding and scheduling to better accommodate power generators in nominating pipeline capacity. There is also the unanswered question of whether power generators would be willing to compensate fully pipelines for the additional costs that special services and additional nomination cycles may require. Rational generators would prefer "free riding" the pipeline network by gaining special services without paying the true cost to a pipeline. Some industry

TABLE 2
TIMELINES FOR NOMINATIONS (IN CENTRAL CLOCK TIME OR CCT)

Nomination Deadline	Reporting of Scheduled Gas Flows	Effective Start Time for Gas Flow	Bumping Rights	Elapsed Prorated Scheduled Quantity (EPSQ) Calculation
11:30 a.m. (Timely)	4:30 p.m.	9:00 a.m. (next Gas Day)	-	-
6:00 p.m. (Evening)	10:00 p.m.	9:00 a.m. (next Gas Day)	Permitted	-
10:00 a.m. (Intraday 1)	2:00 p.m.	5:00 p.m. (same Gas Day)	Permitted	1/3 Retention
5:00 p.m. (Intraday 2)	9:00 p.m.	9:00 p.m. (same Gas Day)	Disallowed	1/2 Retention

Source: Author's construct.

observers have noted that electricity generators have received flexible pipeline services at non-compensatory rates, thus forcing other shippers to subsidize them. Business practices for gas pipelines, as an alternative to individual pipelines accommodating power generators on their own, may be justifiable if facilitation of commercial transactions and other efficiency gains are achievable only with national standards. This is a debatable point that FERC will likely address in its response to the NAESB report.

Pipeline Nomination Procedures

Nomination of pipeline capacity refers to the request by a shipper to transport gas from one specified location to another over the Gas Day. (The Gas Day is a 24-hour period, starting at some specified hour, which is uniform across the country, over which gas volumes are scheduled, delivered and balanced.) To rephrase, a nomination is a request for space on the pipeline system to transport gas. Nomination is the process through which pipelines schedule gas for shippers or adjust gas flows during the Gas Day for final delivery. Nomination timelines are

critical for pipelines to align system gas supplies with shippers' demands. Unlike the electricity industry, gas pipelines operate primarily on a day-ahead schedule for safety, security, and efficiency considerations.⁷ Typically, a nomination request includes (1) the effective period for gas flows, (2) the shipper's receipt and delivery points, and (3) the amount of capacity requested. Nominations have the purpose of either scheduling or adjusting the amount of gas ultimately delivered. By scheduling gas, the pipeline commits to transporting the nominated quantity. Table 2 shows the timelines for different nomination cycles. We now turn to a discussion of each nomination cycle in addition to the terms presented in the table.

In accordance with NAESB standards, developed several years ago after much debate between industry stakeholders and approved by FERC, nominations

Nomination timelines are critical for pipelines to align system gas supplies, with shippers' demands; but unlike the electricity industry, gas pipelines operate primarily on a day-ahead schedule.

NAESB standards provide uniform operational practices for the entire North American pipeline network.

fall into the broad categories of timely and intraday or late. (These standards provide uniformity of pipeline operational practices for the entire North American pipeline network.⁸) Timely nominations provide assurances to shippers of receiving the nominated amounts of pipeline capacity, as long as they do not exceed the contract quantities (i.e., the shipper's entitlements), starting on the next Gas Day. Within this nomination window, a pipeline can then adapt its operations to meet the scheduled deliveries. Under NAESB standards, if a firm customer chooses not to nominate her full entitlements during the timely cycle, the pipeline may schedule the un-nominated capacity for another shipper with a lower priority (for example, secondary nominations or interruptible service). Outside the timely cycle, a pipeline schedules nominated capacity only when previously scheduled firm shippers do not use the capacity, which poses a potential problem when the pipeline system faces severe constraints, such as during a cold spell when demands from power generators and retail customers peak simultaneously.

The untimely or late nomination cycles fall within the following sub-groups:⁹ (1) Evening; and (2) Intraday 1 and Intraday 2. In the Evening cycle, the deadline for nominations occurs on the Evening prior to the next Gas Day. For example, shippers must nominate by 6:00 p.m. to have gas flowing at the start of the next Gas Day (say, 9:00 a.m.). During Intraday cycles 1 and 2, the shipper nominates gas during the Gas Day. For example during the Intraday 1 cycle, the shipper has to

nominate by 10:00 a.m. of the same day that it wants gas to flow. During Intraday 2, the shipper could delay nominating gas on the same day (say, 5:00 p.m.). Especially for power generators, scheduling of nominated gas during the intraday cycles is critical, since frequently they do not know how much power to generate until after the timely and Evening cycles. Many power generators would like the ability to nominate hourly, which would not only reduce their daily imbalances but, as argued by some observers, would also provide pipelines with more real-time and accurate information on shippers' gas requirements over the Gas Day.

During the Evening and Intraday 1 cycles, bumping can occur whereby an interruptible shipper whose gas was previously scheduled is unscheduled ("bumped") by shippers with higher priorities (namely, firm shippers). The Intraday 1 cycle allows shippers the first opportunity to change their previously scheduled gas flows after the start of the Gas Day. FERC-approved NAESB business practices do not allow for bumping during the Intraday 2 cycle because of the lack of opportunities for the potentially bumped shipper to nominate gas for the Gas Day.¹⁰

A concept called Elapsed Prorated Scheduled Quantity (EPSQ) protects interruptible shippers such as power generators with scheduled gas flows from having their entire volumes unscheduled when nominations exceed available pipeline capacity. A pipeline uses EPSQ to limit nomination reductions during the intraday

cycles. As an example, assume that an interruptible shipper had scheduled gas for the Gas Day but the pipeline subsequently scheduled more gas during Intraday 1 that resulted in a capacity deficiency. The effective start time for Intraday 1 nominations occurs after the beginning of the Gas Day. Consequently, the pipeline prorates the scheduled reduction in gas flows to interruptible customers based on this start time relative to the end of the Gas Day. To illustrate, if the effective start time for gas flows scheduled during Intraday 1 is 5:00 p.m. with the start of the Gas Day at 9:00 a.m., an interruptible shipper that previously had gas scheduled could have its gas flow reduced by up to two-thirds of the scheduled quantity. The reason for this is that gas has already flowed to the shipper for eight hours, or over one-third of the Gas Day. For Intraday 2, the reduction in previously scheduled gas would fall by less since the effective start time for gas flow would occur later in the Gas Day. If, for example, the effective start time were 9:00 p.m., the shipper's previously scheduled gas flow would decline by one-half.

In sum, if power generators want assurance of receiving pipeline capacity, they should nominate in the timely cycle and have firm transportation rights. In nominating capacity during a later cycle, a power generator or any shipper may have low priority and risks not having gas flow scheduled. This is especially true in the second intraday cycle, when no bumping of interruptible service previously scheduled occurs, even by a shipper with firm capacity.

As discussed above, many gas-fired generators do not know whether they will need capacity until after the timely nomination cycle and often not until the intraday cycle.

Sequence of Pipeline Service

In understanding the differences in the reliability of pipeline service, it is important to categorize service according to the following degrees of firmness:

- **No-notice:** The shipper can receive gas (both nominated and un-nominated) on a daily basis up to its firm entitlements without incurring daily balancing and scheduling penalties. This service, considered “premium firm,” delivers gas on an as-needed basis. For some pipelines, no-notice service includes the combination of firm transportation service and firm storage service.
- **Other primary firm:** The shipper anticipates no interruptions. The shipper may pay an imbalance penalty when taking delivery at a volume above its nominated amount. As with no-notice service, the shipper pays a demand charge to help recover a pipeline's facility costs. Generally, firm pipeline service identifies primary receipt and delivery points and has secondary-point and capacity-release rights. Shippers have the availability of pipeline capacity during the intraday nomination cycles and, as noted above, can “bump” interruptible shippers

If power generators want assurance of pipeline capacity, they should nominate in the timely cycle and have firm transportation rights, but many gas-fired generators do not know whether they will need capacity until after that cycle.

Categories of service by degrees of firmness are important to understanding differences in reliability of pipeline service.

- except for the last cycle.
- **Secondary firm:** The shipper nominates at locations other than the primary points specified in a contract or nominates above its entitlements at specified points. Concerning release or secondary capacity, in Order 637 FERC established rules that give replacement shippers the same nomination rights as primary shippers. For example, recalls of released capacity preclude bumping of replacement shippers who have already scheduled volumes unless they have an opportunity to reschedule on bumped volumes. This is the same right, for example, granted to interruptible customers. In accordance with FERC rules, recalls of released capacity operate under the same nomination and scheduling timeline, in addition to bumping procedures, as firm and interruptible transportation.
- **Interruptible:**¹¹ The shipper expects interruptions on short notice, especially during peak periods. During the Evening and Intraday 1 nomination cycles, higher priority shippers can bump (un-schedule) this service. This service pays no demand charge to the pipeline because pipelines build capacity based on only expected firm service.
- **Overruns:** The shipper, when scheduled by the pipeline and on a daily basis, can receive service above the contract demand volume. Typically, the availability of this service occurs only after the scheduling of firm and interruptible shippers. For this service, the shipper incurs a higher commodity

fee.

- **Imbalance:** The shipper purchases pipeline capacity to true up any differences between actual deliveries and gas flows nominated, on a daily, monthly or seasonal basis.¹² The shipper may pay a penalty for this service when excess deliveries rise above a prescribed tolerance level. For power generators, gas-fired peaking facilities face greater challenges in balancing their loads than generating facilities that provide intermediate or baseload power. The justification for penalties is that they help to avoid abuses by a shipper (for example, in inaccurately nominating capacity) that could jeopardize the operational integrity of a pipeline and result in harm to other shippers.

NERC AND NAESB ACTIVITIES

NERC Recommendations

In 2002, NERC formed a task force to “recommend possible measures to mitigate any negative reliability impacts for any [gas/electricity] interdependency between the two industries.”¹³ The task force highlighted the importance of the operating reliability of the gas-pipeline system as a crucial determinant of overall electric-power operational and planning reliability. The task force offered seven recommendations, approved later by the NERC Board of Trustees in February 2003.¹⁴ The recommendations include: (1)

regional assessments of the effects of gas transportation interruptions on electric reliability; (2) improved communications between pipelines and NERC reliability coordinators; (3) coordination of planned gas pipeline outages with electric system requirements; (4) development of reliability standards accounting for gas-delivery contingencies; and (5) development of standards that consider gas-delivery conditions. NERC groups received assignments to implement these recommendations. To date, NERC has not developed any standards, or taken any action, based on the recommendations.¹⁵ One possible standard would involve explicit accounting for the availability of pipeline capacity when determining regional operational and planning reliability.

NAESB Final Status Report to FERC

In early 2004, responding to the severe cold weather in New England in January of that year,¹⁶ NAESB established a special committee, namely, the Gas-Electric Interdependency Committee (GEIC), to “[review and investigate] possible standards creation and revisions of existing standards related to additional coordination of the interaction between the scheduling of electric and gas transactions.” For the past two years, the committee has engaged in intensive dialogue on the scheduling problems in addition to other issues.¹⁷ In February 2006, the committee finished its work by submitting to FERC a final status report on its progress (in Docket No. RM05-28-000).¹⁸

The report identified six activities that the committee agreed could lead to the development of nationwide business practices, given some additional guidance from the FERC. These six activities evolved from 13 issues, categorized into five groups for possible future action, presented in a June 27, 2005 NAESB report submitted to FERC. Table 3 shows several of these issues along with possible action initiatives, as identified by NAESB participants.

The six activities identified in the February 2006 NAESB report are:

1. The development of standards for pricing of capacity release for pipelines with negotiated-rate authority from FERC
2. The addition of a nomination cycle to allow power generators with firm transportation rights the flexibility to nominate gas in line with their market clearing times
3. The allowance of pipelines to divert gas for primary firm transportation within a pipeline path to another market without having to re-offer that gas as secondary firm transportation
4. The clearing of Regional Transmission Organization/Independent System Operator (RTO/ISO) markets in a timeline that would facilitate timely gas-flow nominations
5. The requirement that power generators offering power into the day-ahead market (that is, the short-term forward market in which generators bid for the right to serve load and load entities bid

NERC has not developed standards from recommendations it approved in 2003 to mitigate negative impacts on reliability from interdependency of the gas and electricity industries.

A NAESB Committee identified six activities that could lead to the development of nationwide business practices.

TABLE 3
MAJOR ISSUES IDENTIFIED BY NAESB PARTICIPANTS

Issue	Specific Concern	Possible Responses
• Gas flows to generators without prior pipeline nomination	• Possible operational problem for pipelines • Jeopardize pipeline reliability for other shippers	• Regulatory and contractual issue • NAESB standard
• Incompatibility of interruptible pipeline service with commitment of generators to supply reliable power	• Increased reliability risk for regional power system	• Regulatory/policy issue • Regional issue • National infrastructure concern
• Firm shipper nominating untimely or at secondary points	• Generators not satisfying commitments to regional wholesale power operator, notwithstanding firm pipeline service	• Regulatory/policy issue • NAESB standard • NERC action • Regional issue
• Different regional timelines for organized wholesale power markets	• Non-uniformity of timelines complicates inter-regional transactions for both electricity and pipeline service	• Regulatory/policy issue • NAESB standard • NERC action • Regional issue
• No guaranteed cost recovery by generators of reserve” pipeline capacity	• Disincentive for generators to contract for firm pipeline capacity	• Regulatory/policy issue • NAESB standard • NERC action • Regional issue • National infrastructure concern
• Rigid short-term pricing of released pipeline capacity	• Holders of firm pipeline capacity less willing to release capacity to the real-time electricity market	• Regulatory/policy issue • NAESB standard • NERC action • Regional issue • National infrastructure concern
• Curtailment of gas to interruptible generators during emergencies	• The social cost of lost electricity generation may exceed the cost of curtailing other gas consumers	• Regulatory/policy issue

Source: Author’s construct

for the opportunity to have their demands satisfied) have appropriate commercial arrangements in place to fulfill their obligations to the regional wholesale power market

6. The definition of certain concepts, including alternative fuel capability, firm transportation service, and must-run generator

Standards for Pricing Capacity Release

Concerning the first activity, the objective is to allow primary holders of pipeline capacity more pricing flexibility, thus giving them increased incentive to release their unused

capacity to the secondary market. One example of this flexibility noted in the NAESB report is a value-of-service form of pricing where the price of release capacity would fluctuate in line with a published electricity price index, such as for real-time peak power. Under this pricing regime, the actual price charged for released capacity can rise above the maximum tariff rate, and possibly far above it, during highly constrained times in the regional electricity market. Purchasers of release capacity might include power generators, who would then have greater assurance that pipeline capacity becomes available when needed to satisfy their obligations

to the regional power-system operator, since the price received by primary holders of pipeline capacity could float to a higher level.

In an early 2006 decision, FERC reversed its former policy by allowing the use of gas-commodity basis differentials in negotiated rate transactions involving primary transportation without the constraint of a revenue cap.¹⁹ FERC reasoned that this policy gives pipelines the ability to negotiate market-based rates, which, according to FERC, is compatible with its objective of enhancing competition in pipeline capacity markets. One logical explanation for allowing this pricing flexibility is the presumption of inefficient allocation of pipeline capacity during periods of high demand when the regulated maximum-allowable rate lies below the gas-price differentials (i.e., basis) between locations. When this condition exists, prices capped at artificially low levels prevent the scarce capacity from going to its highest-valued use. This new FERC policy applies, however, only to primary transportation capacity, as the commission dismissed rehearing requests for clarifying that its policy encompasses capacity release transactions.²⁰ In part, FERC reasoned that capacity release differs fundamentally from primary transportation in that the seller of released capacity does not have to offer its unused capacity to potential buyers who may be willing to pay the tariff rate.

FERC, rather than NAESB and its participants, will have to address this price-flexibility issue, as this clearly

entails a policy issue, specifically regarding the public-interest effect of value-of-service pricing for released capacity.²¹ A major beneficiary of this pricing regime would likely be holders of primary pipeline capacity who have unused capacity to sell during peak periods for a regional electricity sector. Since local gas utilities are major sellers of released capacity, state commissions may want to consider allowing utilities to retain a share of the revenues from released capacity (which, at present, most commissions do not allow), as this would give them added incentives to release the capacity to interested buyers, including power generators.

More “Bumping” Opportunities

The second activity involves increasing the number of intraday nomination cycles and the flexibility of power generators and other shippers with firm transportation arrangements to schedule pipeline capacity later in the Gas Day. In other words, this activity would allow power generators more opportunities to “bump” other shippers during the Gas Day. This is particularly important for electric generators who sell power in the real-time market. Under this activity, those shippers who have higher priority rights can “unschedule” other shippers who take interruptible service. In accordance with current pipeline nomination procedures, bumping rights do not apply during the Intraday 2 cycle. The reason for this, as articulated by FERC and noted above, is that interruptible shippers should have the assurance by late afternoon of the Gas Day of receiving their scheduled gas flows.

FERC, rather than NAESB, will have to address price flexibility.

More “bumping” options would increase the value of firm pipeline service for a shipper by reducing the risk of unavailable capacity during the Gas Day.

Adding another intraday cycle with bumping rights would reduce the likelihood of power generators not having available pipeline capacity when needed to satisfy their commitments to provide power, in the case of an organized electricity market, in the day-ahead or real-time market. (An alternative to adding nomination cycles would be to increase the firmness of pipeline service under existing nomination windows, for example, by expanding bumping rights.) For real-time electricity markets, bumping rights may help greatly to assure the availability of pipeline capacity on short notice. In a real-time market, the system operator maintains system frequency, volatility, stability, and reliability to “balance” the supply and demand sides of the network, that is, to balance marginal supply with overall demand. Since electric power systems have no or minimal storage, unlike the natural gas sector, the system operator has to instantaneously match generation from power plants with demand.

Overall, this activity would increase the value of firm pipeline service for a shipper by reducing the risk of unavailable capacity during the Gas Day. It would also mitigate penalties for imbalances, since nomination quantities should correspond more closely to actual deliveries. In a recent FERC order,²² El Paso Natural Gas Company, among other things, received approval to add late-day nomination cycles that would allow shippers such as power generators more flexibility (although excluding bumping rights) to nominate pipeline

capacity to accommodate unanticipated fluctuations in market conditions during the Gas Day. The merits of a uniform nomination rule across the country allowing for more intraday nominations with greater assurance of available pipeline capacity are not altogether clear. A pipeline-by-pipeline determination by FERC of the benefits of an additional nomination cycle may act as a preferred alternative to a nationwide business practice, since each pipeline faces unique operating conditions and serves shippers with different demand profiles.

Diversion of Gas to Another Market

The third activity would allow shippers to divert gas for “primary firm transportation within a pipeline path without having to re-offer as secondary firm transportation service.” Under this proposal, a shipper would not risk losing nomination rights if they select another receipt or delivery point for their gas.²³ In two recent cases, FERC allowed Texas Eastern and Algonquin to modify gas flows during the intraday nomination cycles (under specified conditions) to a secondary delivery point without the shipper losing firm-service rights.²⁴ Specifically, the two pipelines can schedule intraday nominations through a posted point of restriction where the shipper already has gas scheduled to flow through that posted point under the same contract.

The above three activities, taken together, have the intent of assisting power generators in various ways. First, they would allow firm capacity shippers to divert their gas to different delivery points without the need to

renominate and reschedule their gas. This would increase the value of firm pipeline capacity to power generators by allowing them more flexibility in using different delivery points.²⁵ Second, they would also give shippers such as local gas utilities stronger incentives to release their unused pipeline capacity to power generators. Third, they would increase the value of firm transportation rights by allowing more opportunities for shippers to nominate pipeline capacity later in the Gas Day, with additional bumping rights.

Changes in Electricity Market

Two of the last three activities identified in the NAESB report to FERC would require changes in the operation of organized wholesale electricity markets.²⁶ The first of these involves standardizing the timelines for the scheduling of power in organized electricity markets to accommodate existing gas-nomination timelines. For several years, the United States has had standardized gas-pipeline nomination cycles while regional electricity markets currently have varying scheduling timelines. For example, each regional organized power market has its own timing deadlines for when generators must post their offers into the day-ahead market and when the RTO/ISO posts its schedule. A big concern is the misalignment between the gas nomination timelines and the timelines currently used by regional electricity markets. In all electricity markets, a power generator can assure itself of available pipeline capacity only by nominating within a time window (“timely nomination”) that is prior

to when it knows the RTO/ISO has scheduled its power for the next day. As articulated by one NAESB participant, this leaves power generators with a quandary. They can either nominate pipeline capacity during the timely cycle and risk not being scheduled for generation (which then requires the generator to either resell the scheduled gas or absorb the full cost, resulting in increased risk); or, they can delay nominating pipeline capacity until they are scheduled and then nominate during the intraday cycle without any guarantee of available capacity.

Two possible remedies to this problem include changing the scheduling timelines in the electricity market so that power generators know for certain their obligations in the day-ahead market prior to when they have to nominate pipeline capacity during the timely cycle; and guaranteeing the availability of pipeline capacity once a generator is scheduled for the next day. The first remedy requires adjustments in the operational procedures of electricity markets while the second involves greater assurance by pipelines of available capacity over a later nomination cycle. Participants in the NAESB process have to date failed to reach a consensus on what accommodations each sector should make. Segments of the electricity sector, particularly ISOs/RTOs, have argued that physical constraints and other operating conditions may preclude regional power system operators from unifying and changing their current timelines for posting and scheduling.²⁷ Implicitly, their contention is that regional electricity systems differ as to their physical

Power generators are now faced with a quandary: They can nominate pipeline capacity during the timely cycle and risk not being scheduled for generation, or they can delay nominating pipeline capacity until they are scheduled and then nominate during the intraday cycle but not be guaranteed available capacity.

Two remedies are possible:

- *Change scheduling timelines as power generators know for certain their obligations in the day-ahead market before they have to nominate capacity during the timely cycle*
- *Guaranteeing capacity once a generator is scheduled for the next day*

characteristics, making uniform timelines across regions impracticable and uneconomical.²⁸

A pertinent question is why uniform timelines for gas pipeline nominations and scheduling may be tenable while not for the wholesale power sector. Arguably, the electricity sector should have the burden of demonstrating why a uniform nationwide timeline is a bad idea for its wholesale operations. Naturally, each sector would prefer the other to change its modus operandi, but unless each industry accepts some change to itself, agreement between the two sectors is destined to fail. As an aside, reaching consensus for a uniform timeline in wholesale electricity markets is made complicated by the institutional reality that several stakeholders have input into the planning and operational activities of these markets. For example, the ISO/RTO process involves several parties, each of whom has different interests and preferences for modus operandi.

Appropriate Commercial Arrangements

The fifth activity identified in the NAESB report is the requirement that power generators bidding in the day-ahead market must have the “appropriate commercial arrangements” to satisfy their obligations if in fact they are scheduled. For example, generators might be required to hold firm gas-transportation rights.²⁹ This proposal was highly controversial during the NAESB dialogue, as it might impose a high cost to generators, many of whom operate peaking facilities for which firm pipeline transportation would be

uneconomical.³⁰ Requiring minimum contractual arrangements for pipeline service involving power generators can act as a barrier to entry, reducing the number of generators and driving up the long-term price of electricity.³¹ NAESB participants felt that this issue is reliability-related and, thus, falls more appropriately under NERC’s domain.

Development of Definitions

The sixth activity involved developing definitions prior to the establishment of business practices for the Wholesale Electric Quadrant. Identified definitions include alternate fuel capability, usable alternate fuel capability, firm transportation service, firm sales service, firm supply, and “must run” generator. Participants felt that agreement on definitions would enhance the effectiveness of the dialogue by having both the gas and electricity industries speak the same language.

The February 2006 NAESB report to FERC highlighted the need for both industries to agree to changes in their operations if nationwide business practices are to be developed. The report signaled out the critical role FERC can play in giving policy guidance and the need for both industries, especially the electricity sector, to make a greater effort toward the development of business practices. It was apparent from the dialogue that the electricity participants prefer a regional approach to resolving some of the issues, rather than a uniform national approach. As said in the report, while the parties identified six

Electricity participants prefer a regional approach to some issues, rather than a national one.

activities that could lead to business practices, the “lack of industry support” precluded proceeding to the next phase. Overall, the NAESB report echoes the sentiment that FERC will have to offer policy guidance and other input, as it has done in the past in other situations, to advance efforts to develop business practices.

As discussed above, the participants to the NAESB process have so far failed to reach an agreed-upon position, in view of conflicting objectives, on how or whether to establish business practices. In past cases, FERC has deferred to the NAESB process to establish business practices as long as they result from consensus by participants and stakeholders. In instances where parties reached no consensus, FERC has provided policy direction to advance the development of business practices. NAESB now awaits a response from FERC to its report, hoping to receive the policy guidance needed to proceed to the next step of drafting business practices.³²

In a recent decision, FERC approved standards for business practices and electronic communications for wholesale power markets.³³ These standards represent the consensus outcome of participants in the NAESB process. Although the issue at hand pertained only to electricity markets, the Order expressed several statements that could foreshadow FERC guidance on the development of business practices for addressing the gas-electricity interdependency issue.³⁴ First, NAESB and NERC should avoid duplication of activities, with NAESB focusing only on developing standards

for business practices and NERC on developing standards for reliability (as statutory procedures differ for the adoption of business-practice and reliability standards). As stated in the Order, NAESB and NERC standards should complement each other to produce a more efficient and reliable market. Second, FERC can reject NAESB-developed standards because of their vagueness, or because they conflict with FERC policies and existing rules, or because they are duplicates of existing rules. FERC added that proposed business standards should not conflict with FERC policies, and they should respond to an immediate need. Third, although uniformity of standard business practices will benefit the operation of markets, regional variations in operational activities may necessitate exceptions.³⁵

PENDING ISSUES

Basic “Coordination” Issues

The previous discussion identified concerns raised by both gas pipelines and the electricity industry in better harmonizing the operations of both sectors. Usually coordination (“harmonization”) in any context results in efficiency gains that benefit society, with one exception of using coordination to restrict trade or promote anti-competitive behavior.³⁶ Nevertheless, for parties to agree on better coordination both have to perceive benefits for themselves;³⁷ otherwise parties would not reach common ground. Coordination would never occur in a zero-sum outcome since a gain for one party constitutes

A recent FERC decision could foreshadow FERC guidance.

For parties to agree on better coordination, both have to perceive benefits for themselves.

Business practices aim to reduce barriers to a market. In regulated industries broad public-policy issues must also be resolved.

a loss for the other. As an example of a non-zero-sum outcome, the offering of new cost-based services to accommodate electricity generators can improve the financial and operational condition of pipelines in addition to benefiting generators and the electricity industry as a whole.

One approach to achieving a non-zero-sum outcome would be for individual pipelines to propose before FERC new services at compensatory rates. This seems like a perfectly rational approach, and one that has evolved over the past few years, since each pipeline would be responding to market demands. (This approach reflects a non-zero-sum game since the pipeline can profit from offering new services, while the shipper voluntarily purchases a service for which it expects to receive a net benefit.) Alternatives, such as the establishment of nationwide business practices, may be preferable if FERC or the two industries agree that having uniform standards across the country would benefit everyone, relative to an attempt to achieve a better state of affairs on a pipeline-by-pipeline basis.

In the jargon of game theory, coordination between the electricity and gas industries represents a game of mixed interests where the interests of the industries partly coincide and partly conflict. Consequently, it is likely that the different industries rank the outcomes of coordinated activities differently. In other words, consideration of what is the best outcome for one industry may not be the preferred outcome for the other industry. This implies that, even though all the parties involved prefer

coordination to non-coordination, any resolution may not achieve the best solution for all parties. Bilateral trading arrangements illustrate an example of such a situation: although market participants find it optimal to transact a good or service (i.e., coordinate a trade), they disagree over the price—the seller wants to receive the highest possible price while the buyer hopes to pay the lowest possible price. Unless either the seller or buyer has absolute market power, the negotiated price, while acceptable to both, is not the ideal price for either party.

Business practices in other industries aim to reduce barriers that could hamper the operation of a well-functioning market. Particularly in regulated industries, the development of business practices depends on the resolution of broad public-policy issues in addition to the willingness of parties to accommodate other parties in reaching a balanced consensus. Business practices must also not violate antitrust laws, which prohibit trade restrictions and discrimination against certain market participants. Business practices must also be practicable and meet the needs of market participants and stakeholders. In the context of the NAESB efforts, public-policy matters that would seemingly require FERC guidance include: (1) the degree of pricing flexibility for released pipeline capacity; (2) nomination procedures and bumping rights; (3) diversion rights of pipeline capacity; and (4) bidding and scheduling timelines for regional wholesale power markets.

Pipeline owners view new services, sometimes referred to as premium

services, as an additional source of revenue justified by the provision of enhanced services at cost-based rates. Power generators, while professing their willingness to pay for these services, would prefer receiving them at the lowest possible price or at no price. For example, generators obviously would like to receive firm-type service under interruptible-service pricing arrangements, thus avoiding paying high demand charges.³⁸ They might also hope to minimize charges for dramatic hourly swings that require ancillary pipeline services, such as “loan and park” and “line pack.” Certainly from a financial perspective, pipelines would oppose such “free riding,”³⁹ or subsidization, arguing rightly that power generators wanting special services should pay for them at compensatory rates. Other shippers of pipeline service would concur, as they fear being required to subsidize power generators when generators receive customized service below cost. Traditional shippers such as local gas utilities might also have the concern that new services provided to electricity generators would jeopardize the quality and reliability of pipeline service they expect under current service agreements.

Based on the above discussion, one barrier to the development of business practices is the conflicting interests between the two industries regarding the pricing and provision of pipeline service. Pipelines would be more agreeable to business practices that impose additional costs to them as long as they receive full compensation. They may fear that new business practices will increase their cost of

service without proper remuneration, although historically FERC has allowed recovery of additional costs from new business practices on a case-by-case basis. The electricity industry would tend to concur with changes that require them to make adjustments in their operations if they perceive benefits, whatever they might be. Electricity generators may resist new pipeline services intended to accommodate their demand if they perceive the price for such services to be in excess of what they believe is fair. Part of the reason for the current impasse in developing NAESB business practices may be that electricity generators believe they have a right to receive more flexible services, for example additional intraday nomination cycles, while pipelines would argue that these services would require adjustments in their operations and higher costs that rates should reflect.

Pipelines seemingly have the upper hand, or more leverage, in any negotiations since they provide generators essentially an almost-monopoly or critical service for which substitutes would be costly or infeasible for generators. At the same time, it also seems that the electricity industry would have the most to gain from new business practices. Consequently, it is somewhat surprising that to date certain segments of the electricity sector in the NAESB process were less willing to negotiate.⁴⁰ Perhaps one reason lies with the difficulties of gaining consensus within the electricity sector itself because of conflicting interests among stakeholders, including ISOs/ RTOs, merchant generators, public utilities, consumer groups and state

One barrier to the development of business practices is conflict between the two industries on the pricing and provision of pipeline service.

In the absence of voluntary actions, FERC needs to assume a “backstop” role on behalf of the public interest.

New unbundled services give consumers more choices in meeting their special demands. Criteria for assessing unbundling:

- *Uniqueness of a new service*
- *Consumer preferences*
- *Consumer benefits*

regulators. In addition, the conflicting nature of state and federal regulations may complicate the resolution of issues and the development of business practices.

In the absence of voluntary actions by the two industries, FERC would need to assume a “backstop” role by taking action that it perceives to be in the public interest. As in other contexts and for various reasons, including inertia and the lack of well-defined property rights, socially beneficial coordination or even coordination that would benefit each party directly may fail to materialize. This may well depict the current “impasse” state of affairs with the pipeline and electricity sectors. Either FERC can issue business practices on its own or, which is more likely, instruct the parties to return to the table after providing policy and other forms of guidance. As expressed in the NAESB report, one problem was the unwillingness of the two industries to compromise. A strongly worded FERC response to the report can pressure the parties to negotiate in good faith, with the threat of FERC-mandated rules if they fail to do so. In the past, FERC has articulated its preference for consensus business practices voluntarily developed by industry as long as widespread support comes from participants and stakeholders.

New Pipeline Services and Policy Issues

The offering of new optional services by pipelines (for example, shippers’ rights to vary their deliveries on a daily and hourly basis, and additional

intraday nomination cycles with firm capacity) represents a response to the expressed demands of shippers, especially electricity generators.⁴¹ In other words, these new services reflect value-added services that should benefit certain shippers, for example, by reducing their imbalances.⁴² In large part, these new services intend to respond to the special requirements of electricity generators.⁴³ One view of new services is that they constitute further unbundling of pipeline services that have evolved since FERC Order 636 in 1992.⁴⁴ The unbundling of services, which has permeated almost all regulated industries over the last several years, aims to give consumers more choices in meeting their special demands and to require them to pay the full costs of new services. When done properly, unbundling should lead to better cost allocation for services provided to different consumers by reducing subsidization. For example, unbundling can expose subsidized services as well as the beneficiaries of subsidies. As an illustration, unbundling can more fairly allocate a pipeline’s cost to those shippers whose demand profiles place higher stress on a pipeline’s system. Unbundling represents an economically rational approach to pricing specialized pipeline services by reducing inefficiencies and discriminatory pricing.

Basic criteria for assessing unbundling, or the offering of new services, are as follows: (1) is a new service unique in that it clearly differentiates from traditional service; (2) do consumers prefer new services, or would they prefer those services bundled with other services; and (3) would consumers, on

net, benefit from new services? The question of whether consumers would benefit from unbundling depends on the degree to which they received subsidies from traditional service. While unbundling could certainly help to achieve the longstanding regulatory objective of consumers paying the true cost of service, consumers may have underpaid for traditional service. In other words, by providing stand-alone services, some of which perhaps were previously bundled in traditional service, consumers may be actually paying more for their overall pipeline service. The justification for higher pipeline payments is that some shippers were not paying the full cost of service, resulting in their subsidization by other shippers.

Unbundling in any context is more tenable economically when bundling (for example, traditional service) conceals large cost differences among the different service components that are bundled. Unbundling is also more justifiable when the transaction costs to consumers are minimal. This means that in purchasing more individualized services, the consumer incurs little cost in search and negotiations. Finally, in pricing unbundled services properly, the costs for those services would require measurement with a reasonable degree of accuracy. Otherwise, as noted below, inefficiencies would occur and the service provider could receive “excessive” profits.

Pipelines have argued that new services will help to better satisfy the demands of shippers and avoid subsidization of shippers who take traditional service without paying the true cost. In part,

pipelines have contended that certain shippers have received traditional service but have imposed additional costs on the pipeline system not reflected in the rates they pay.⁴⁵ Some shippers have counter-argued that new services will cause them to pay more for pipeline service even though the value they receive from actual service will not increase.⁴⁶ To say it differently, these shippers have argued that new services will force them to pay for services already embedded in traditional service, but at a higher cost. While other shippers would likely benefit from the elimination of subsidies received by targeted shippers for new services, they may complain that new services, especially when intended to give certain shippers more flexibility, could jeopardize the quality of their pipeline service as well as their flexibility to nominate pipeline capacity during the intraday cycles. For example, flexible service to some shippers in the form of non-uniform hourly deliveries can place stress on a pipeline system, jeopardizing the reliability of pipeline service during critical periods.⁴⁷

In pricing new pipeline services, it is important that FERC have good information on the costs of those services if it hopes to price them correctly. Otherwise, a pipeline could earn excessive earnings from providing new services, which many regard as premium services. As shown in economic studies, firms with some degree of market power will frequently try to upgrade their service, relative to “vanilla service” (as basic services, in unregulated markets, usually have lower markups), so that consumers

In pricing new services, FERC needs good information on costs.

who place high value on those services will pay more than the actual cost to the firm. Unless FERC knows the costs of new services, pipelines could earn “excessive” profits from providing them, as they attempt to exercise their market power.

Summary of the Big Concerns

The dilemma faced by many gas-fired generators is that they operate in an environment where they are unable to sign long-term contracts with electricity consumers. For this reason along with their common operation as peaking facilities, many power generators find it uneconomical to purchase firm transportation service from pipelines. Consequently, they receive low-priority service that places them at risk for receiving pipeline capacity when needed to satisfy their commitments to the regional power system operator. By reneging on their commitment, they are susceptible to a potentially large penalty.⁴⁸ (Organized wholesale power markets have settlement systems that provide incentives for generators to be available and to perform when called upon.) Compounding their problems, if power generators take delivery of gas outside their nomination schedules, they face the risk of paying a large imbalance charge to the pipeline. Large imbalances may result from generators’ actual hourly and daily consumption levels deviating significantly from their scheduled capacity. Compared to other pipeline shippers, power generators face greater exposure to significant intraday operational changes. Under this worst-case (although imaginable) scenario, it is understandable why

gas-fired generators worry about their predicament.

One particularly serious concern revolves around the situation where gas-fired power generators must nominate their firm pipeline capacity over a time for which they do not know if they will need this capacity. Most gas-fired generators do not provide baseload power: they do not operate uniformly across the hours of a day or between days; and frequently they have to operate on short notice. While generators can nominate pipeline capacity outside the timely cycle, they risk not having capacity available when needed. Transactions in the intraday gas-pipeline market tend to have less liquidity and more volatility than the day-ahead market. This problem is more likely to occur in regions with tight pipeline capacity, such as New England. Evidence shows that in New England the majority of gas-fired electricity generators have non-firm commercial arrangements with pipelines, exacerbating the possibility of unavailable pipeline capacity during critical periods. The existence and severity of this potential problem of power generators not receiving pipeline services when needed is region specific, importantly hinging on the availability of pipeline capacity during peak periods.

Power generators have expressed strongly their preference for more pipeline services that allow them to revise their nominations on short notice (for example, hourly) to meet their obligations as well as to minimize their imbalances and associated penalties. By definition, imbalances

It is understandable why gas-fired generators worry about their predicament

TABLE 4
ARGUMENTS FOR AND AGAINST UNIFORM BUSINESS PRACTICES

For	Against
Facilitation of market transactions	Insensitive to specific regional conditions (“one size does not fit all”)
Improved market efficiencies from more “seamless” operations	Static in not accounting for market and technological changes over time
Reduction of transactions costs (especially for multi-regional entities)	Potential barrier to entry (high standards prohibitively costly for some providers)
Balancing of the interests of different market participants (assuming voluntary and consensual business practices)	Potentially discriminatory against some market participants (for example, entities underrepresented in the development of business practices)
More predictability for market participants	Added costs from changes to existing operational rules
Lower implementation costs relative to case-by-case approach	“Overkill” approach relative to alternative, more incremental actions for facilitating market transactions

Source: Author’s construct

represent the difference between actual gas deliveries and scheduled nominations, calculated on an hourly or daily basis. With additional nomination windows available closer to actual times, generators would have lower imbalances. To date, it is unclear whether power generators would be willing to pay the additional costs to a pipeline for some accommodations that would tend to drive up its cost of service.

A particular concern is the unavailability of pipeline capacity to power generators at critical times. Since more than anything the reliability of electricity is at issue, this is a matter for NERC. As discussed above, NERC has made recommendations but, as of yet, taken no action.

Finally, the fundamental question arises as to the need to institute nationwide business practices to address the problems identified in

this paper. Table 4 shows the generic arguments for and against standard business practices. While some of the arguments disfavoring business practices may not pertain to the ongoing efforts of NAESB, any evaluation of business practices must weigh the costs against the benefits. For example, the identified problems may not require nationwide business practices if individual regions can address those problems more effectively and at lower cost. The FERC response to the NAESB report should provide some indication of the commission’s position on the appropriateness of nationwide business practices, relative to alternate actions, to address the issues laid out in the report.

CONCLUSION

While participants in the NAESB process obviously concur that efforts to develop business practices are worthwhile, they have yet to reach

The fundamental question is whether nationwide business practices are needed.

If FERC finds resolution of the issues is critical but the NAESB process stalls, even after policy guidance, a regulatory initiative is almost inevitable.

agreement on important issues. The guidance that FERC will inevitably provide in the coming months in its response to the NAESB report will help direct future activities toward the development of business practices. The possibility exists that parties will not reach agreement, raising the question of what will transpire over the next few or several years in addressing the legitimate problems identified in this paper. As discussed above, one possible future course of action is for pipelines to continue their efforts to provide new services (targeted mostly at electricity generators) with FERC approval. Eventually over time, which could be several years, pipelines could satisfy power generators by giving them the flexibility and services they desire and for which they are willing to pay. FERC might also conduct generic dockets or other proceedings to address some of the same issues identified in the NAESB report. Finally, FERC could enact new rules governing regional electricity markets that would function similarly to nationwide business practices.

A FERC initiative to improve the coordinated operations of the two industries may require more time and costs to achieve. Yet, it is conceivable that this FERC action may evolve, since the NAESB process may stall by failing to take the next step of developing business practices. Reaching agreement on several of the issues raised in the NAESB report and then developing business practices will require a good-faith effort by both the natural gas and electricity sectors. If FERC believes that resolution of these issues is critical and in the public

interest but NAESB participants fail to reach agreement on business practices, even subsequent to policy guidance, then it is predictable that a regulatory initiative will come to fruition.

Notes

¹ Chairman Pat Wood, III, Letter to Mr. Michael Desselle, Chairman and CEO, North American Energy Standards Board (NAESB), dated Dec. 14, 2004.

² The predecessor to NAESB, the Gas Industry Standards Board (GISB), changed its name in 2002 to encompass electricity-industry activities.

³ Non-gas generation facilities, such as baseload coal-fired plants, tend to have higher certainty of dispatch and more uniformity of hourly and daily generation. This is especially true when compared to gas-fired facilities that function as peaking units, which is presently the case for many if not most gas-fired facilities. Coal-fired facilities also have larger inventories of fuel at the plant site to provide assurances against coal disruptions caused by transportation and other bottlenecks.

⁴ Typically, organized regional power markets rely on gas-fired generation in the short term to satisfy sudden changes in electric load.

⁵ The North American Electric Reliability Council (NERC) defines security as the ability of the system to withstand sudden disturbances (that is, contingencies), which encompasses the inability of a generator to receive natural gas.

⁶ Some observers consider uniform business practices as more of a short-term option to assure the timely deliverability of natural gas to electricity generators. Longer-term remedies would include increased supplies of natural gas, fuel diversity in electricity generation, and increased pipeline/storage capacity.

⁷ Because gas cannot flow instantaneously from supply regions and storage fields to market areas, transportation arrangements need to be made in advance to ensure gas is physically deliverable at required times, pressures and locations.

⁸ The standards that were developed took into account the effect on pipeline operators, shippers and the gas market. Safety was also another factor considered in developing the uniform nomination standards. Compromises among NAESB participants took place in developing the standards. FERC Order 587C (March 1997) directed the natural gas industry to undertake efforts to draft intraday nomination windows.

⁹ The untimely nomination cycles allow shippers to vary their scheduled quantities of gas from earlier load projections because of weather conditions and for other reasons.

¹⁰ In Order No. 587-G, FERC determined that bumping of interruptible shippers by firm intraday nominations can occur during the Evening and Intraday 1 cycles but not during the Intraday 2 cycle. FERC reasoned that interruptible shippers should have the assurance by late afternoon of the Gas Day of receiving their scheduled gas flows.

¹¹ Typically, unused firm gas transportation reverts to the pipeline, which sells it as interruptible transportation service. In other words, a pipeline inherits interruptible service from customers who fail to exercise all of their firm transportation rights. Rates for interruptible service, which is sometimes referred to as “best efforts” service, can be substantially lower than rates for firm service.

¹² Some shippers, such as local gas utilities, balance their load by using system line pack, and a combination of pipeline services that include no-notice, storage and peaking. Line pack refers to stored gas in a pipeline system resulting from increased compression. Frequently, this source of gas for a limited time provides incremental gas to meet peak demands.

¹³ North American Electric Reliability Council (NERC), *Gas/Electricity Interdependencies and Recommendations*, prepared by the Gas/Electric Interdependency Task Force of the NERC Planning Committee, June 15, 2004, 1.

¹⁴ *Ibid.*, 3.

¹⁵ NERC, *2005 Long-Term Reliability Assessment*, September 2005.

¹⁶ One noted industry observer remarked that “There were incompatibilities in the ‘time-lines’ with which the spot gas and spot electricity markets operated and this hindered

efficient arbitrage of gas between electricity and end-use sectors. For example, gas supply arrangements had to be made several hours before the day-ahead market and the specification of day-ahead schedules for the electricity market operated. The gas market also had much less intraday flexibility than the electricity market.” (Paul L. Joskow, “Supply Security in Competitive Electricity and Natural Gas Markets,” revised unpublished paper, December 29, 2005, 46.) The analyst also remarked that “The growing linkages between gas and electricity markets means that the performance of both markets can be affected adversely by market and regulatory imperfections in the other market as well as its own market. Market design, regulatory and reliability policies therefore need to be compatible across both liberalized gas and liberalized electricity markets” (at 47). Since the January 2004 cold snap, ISO New England, among other things, has revised the timing of electricity market operations during cold weather events to better synchronize with natural gas markets. Specifically, in extreme cases, it will shift the day-ahead energy market timeline to allow for *early commitment of gas generators in anticipation of possible natural gas supply or transportation constraints and operable capacity shortages on the bulk power system*. The recent experiences in New England have shown that power generators have strong incentives under existing ISO rules to resell their gas in the open market, rather than converting the gas into electricity, during critical winter periods.

¹⁷ The GEIC replaced the NAESB Gas-Electric Coordination Task Force. The task force, formed in 2003, filed interim and final reports with FERC in 2004 that identified several issues for discussion. The work of the task force led to requests for particular standards. These standards included: (1) a uniform definition of the Energy Day for both gas pipelines and organized wholesale electricity markets (RO4016); (2) scheduling and timelines for the day-ahead electricity market (RO4020); and (3) daily communications between gas pipelines and organized electricity markets (RO4021). NAESB submitted communications standards to FERC in 2005 for its consideration. These standards involve situations where: (1) power generators have scheduled gas flows; (2) power

generators have non-scheduled gas flows; and (3) extreme demand conditions affect needed gas flows. NAESB withdrew standards for the other two items (RO4016 and RO4020) with the submittal of the final status report to FERC on February 24, 2006.

¹⁸ NAESB, *NAESB Final Report on the Effects of the Gas-Electric Interdependency Committee*, submitted to FERC, February 24, 2006. Previously (in June 2005), NAESB submitted a preliminary report to FERC.

¹⁹ FERC, Natural Gas Pipeline Negotiated Rate Policies and Practices, Docket No. PL02-6-001, *Order on Rehearing and Clarification*, issued January 19, 2006.

²⁰ FERC, Natural Gas Pipeline Negotiated Rate Policies and Practices, Docket No. PL02-6-003, *Order Dismissing Rehearing Requests and Denying Requests for Clarification*, issued March 23, 2006.

²¹ FERC Order 637 waived until September 30, 2002 price caps on capacity-release sales of less than one year. After the two-year pilot, FERC favored returning to price caps on capacity release, notwithstanding evidence showing an increase in available peak capacity and allocation of capacity to consumers who value it most highly.

²² FERC, *Order on Technical Conference*, Docket Nos. RP05-422-000 and RP05-422-007, issued March 23, 2006.

²³ Operational limitations on a gas pipeline system provide the reason for restrictions on shippers using alternative delivery points.

²⁴ FERC, *Tariff Revision – Scheduling Intraday Nominations Through a Posted Point of Restriction*, Docket Nos. RP06-69-000 and RP06-70-000, November 22, 2005.

²⁵ One benefit to power generators would be a reduction in their storage requirements.

²⁶ In most organized regional power markets, the system operator conducts two distinct markets, the day-ahead and real-time market. (Exceptions include the CAISO and ERCOT, which do not have a day-ahead market.) An auction mechanism typically establishes the required pre-scheduling, with scheduling financially binding on generators and loads. Commitments are physical in nature, as violation of commitments can disrupt power system integrity. In most of these markets, deviations from schedules for the day-ahead market are settled against the real-time prices.

²⁷ It is unknown whether other segments of

the electricity industry, such as merchant generators and public utilities, hold the same position.

²⁸ On the benefit side, uniformity of regional timelines for bidding by, and scheduling of, power generators could promote economical short-term power transactions as well as more efficiently allocate available transmission capacity.

²⁹ A generator might compensate for interruptible service by purchasing storage capacity. Traditionally, pipeline shippers use storage to balance seasonal demands through injections, storage and withdrawal. This reduces the need for additional pipeline capacity to meet peak requirements, improves supply reliability, and dampens price spikes that occur in tight supply conditions. The role of storage has evolved over the last few years, becoming more of a marketing service that includes parking, swaps, transportation exchanges and gas loans. These services add flexibility and provide arbitrage opportunities.

³⁰ As long as electric generators are able to purchase low-cost interruptible service during high profit-margin periods, namely, periods of high spark spreads, which typically occur during the summer months when pipeline capacity is abundant, they will be content to continue with non-firm pipeline service. On the other hand, if pipeline capacity during the summer months start to get tight, with the more-than-remote possibility of interruptions, electric generators may contemplate purchasing firm pipeline service.

³¹ Requiring power generators to have firm contracts would likely induce pipelines to expand their capacity, which would help to avoid the reduction of available firm service to other shippers.

³² Whether the iterative process between FERC's desires and policy guidance and NAESB activities will result in the development of business practices is presently an open question. The feedback loop between these two entities may not produce an "equilibrium" outcome of business practices, especially if NAESB participants do not reach consensus and FERC fails to take the initiative in developing business practices on its own.

³³ FERC, *Standards for Business Practices*

and Communication Protocols for Public Utilities, Docket No. RM05-5-000, Order 676, issued April 25, 2006.

³⁴ On other occasions, FERC has articulated its preference for NAESB, and its predecessor, the Gas Industry Standards Board (GISB), to develop business standards with industry-wide consensus because of the industry's first-hand knowledge of its operations and the fact that the industry must operate under those standards.

³⁵ More tangential, the Order also stated that: (1) because of changing industry and market developments, NAESB standards may change over time; and (2) individual regulated entities can develop "upgraded" standards relative to the minimally acceptable NAESB standards as long as they do not "affect consumers' ability to utilize the standard procedure or adversely affect the rights of those not a party to the revision to meet the minimum standards criteria established (at 39-40)."

³⁶ Generically, coordination implies parties working together to achieve some common goal. Usually, it requires each party to make compromises and adjustments to existing practices to reach this goal.

³⁷ Coordination frequently derives results from the "reciprocity" principle: "You do something differently to benefit me and I will do something to benefit you, and we can both be better off." As an example, changed operational practices can improve both pipeline and electric power operations and reliability.

³⁸ Some natural-gas industry observers have contended that especially in regions with surplus pipeline capacity, electricity generators and other shippers have in effect been receiving firm service at interruptible rates. Of course, as pipeline capacity becomes more constrained, interruption during peak periods may become more than a remote possibility.

³⁹ "Free riding" here refers to a shipper receiving the benefits of special services without having to pay for them. When these services impose higher costs on a pipeline system, all shippers ultimately pay for them.

⁴⁰ The February 2006 NAESB report stated that the committee members opined that: "[T]he organized electric markets, such as the ISOs and RTOs and their stakeholder groups, may not be interested in working

within NAESB to create the needed business practices. It is anticipated that their [preferred] approach would be regional solutions developed individually."

⁴¹ One good example of a flexible service was the recent FERC approval of a service proposed by El Paso Natural Gas Company (in Docket Nos. RP05-422-000 and RP05-422-007), called hourly enhanced entitlement nominations (HEEN). This service will allow firm transportation shippers to nominate pipeline capacity late during the intraday cycle for entitlements not nominated in earlier nomination cycles. HEEN should help shippers, especially power generators, to avoid large overrun and scheduling charges. In these dockets, El Paso Natural Gas Company proposed new services, some of which shippers seriously challenged. Pending is a rehearing of the commission's Order.

⁴² One benefit to shippers could include the offering of firm hourly-and-daily flexible service, rather than on an as-available basis.

⁴³ The new service offerings also intend to minimize operational problems that exist under traditional bundled service.

⁴⁴ In past cases, FERC has reasoned that with a growing menu of options for unbundled pipeline capacity service, customers should rely on private contracts, prudent planning and the market to the maximum extent practicable to secure their capacity needs. Following FERC Order 637, pipelines have increasingly offered new services customized for electricity generators. Nevertheless, many generators still purchase inexpensive interruptible service and are unwilling to pay for new services.

⁴⁵ For example, pipelines have argued that shippers with variable hourly deliveries impose a "reliability" cost on their systems.

⁴⁶ One of their arguments is that either they acquire the new service or incur high penalty costs from taking traditional bundled service. Since the latter option is prohibitively costly, as some shippers have contended, they have no choice but to take the new service.

⁴⁷ This stress threatens the operational integrity of the pipeline system, which can adversely affect safety and the ability of the pipeline to meet existing contractual entitlements.

⁴⁸ In a recent Order involving ISO-NE,

FERC approves of potentially large penalties imposed on generators who fail to satisfy their commitments during “designated periods of system stress (i.e., Shortage Events).” (Federal Energy Regulatory Commission, *Order Accepting Proposed Settlement Agreement*, Docket Nos. ER03-563-030 and ER03-563-055, issued June 16, 2006.)

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