

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

Contents

Background	2	NERC and NAESB Activities	8
Features of Natural Gas Pipeline Operations	4	Pending Issues	15
		Conclusion	21

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

