ABSTRACT

This paper examines a structural change in the natural gas industry that would lead to significant economies of cost and reliability, namely gas pooling arrangements among pipeline companies. In order that gas pooling be able to confer economic benefits, it must be practicable and workable. The study indicates that this is the situation. In addition, gas pooling confers substantial benefits on the participants. An analysis of specific benefits is undertaken. These benefits are then compared with the disincentives to horizontal integration of the industry. The conclusion of the study is that thoughtful and consistent regulatory policies to encourage gas pooling are in the public interest.

The rapid inflation of natural gas prices has led to calls for regulatory reform and for changes in the industry's structure. The field price of new gas has been deregulated and end-use customers are being allowed to purchase gas directly from the producers. Mandatory contract carriage is being proposed for the pipeline network. Structural changes that have not been closely examined are those that encourage the horizontal integration of the pipeline companies as a means to lower the costs of service and make gas more competitive with alternative fuels. Perhaps the economic characteristics of transporting natural gas explain this failure: First, the indivisibilities of the network are such that duplication of the throughput capacity would burden customers with higher than necessary costs of service. Second, the tendency for increasing returns would be lost if we allow the entry of a competing supplier. Third, the physical qualities of natural gas are such that a different mode of transport is not feasible or practicable. Fourth, some pipeline company has to serve as the "supplier of last resort" for this essential service in markets where customers are sparse and costly to serve.

For the above reasons, it is sensible to think of the pipeline network in terms of one supplier. But this approach to regulatory planning is not an accurate description of the natural gas pipeline industry. Rather what one can find is numerous interconnections, regional diversity and access to different field sources of supply. This description parallels that of the electric power industry. There, horizontal integration has led to industrial coordination through pooling to facilitate economic dispatch and scale economies. Regulatory policy needs to look at the question whether gas pooling is an appropriate response to the changing structure of the industry. The purpose of this paper is to examine the gas pooling proposal from an economic benefit-economic cost approach. The feasibility of
physical interconnection is discussed in the first section. The benefits of gas pooling are delineated in section II, while costs are taken up in section III. The final section provides conclusions.

I. The Horizontal Integration Structure Today

At the start of 1981, the interstate natural gas pipeline companies reported assets totaling $48.8 billion. Sales of natural gas to ultimate consumers and to the other gas utilities amounted to 17.3 trillion cubic feet and 5,274,757 natural gas consumers were served. The pipeline companies received total gas operating revenues of $45.3 billion during that year. The transmission network itself was 192,418 miles long. With the completion of a nationwide system of pipelines and with the major pipelines crossing or following each other's routes with increasing frequency, the opportunities for interconnection and horizontal integration have been expanded.

In order that gas pooling be able to confer economic benefits, it must be practicable and workable to interconnect. The feasibility of interconnection is supported by the transportation practices of the industry historically. An examination of respective company flow charts for winter heating seasons reveals that substantial sales of natural gas are made by one pipeline system to other pipeline systems. Significant numbers of physical interconnections already designed into the individual networks make these kinds of sales possible. This author found that coincidental peak pipeline deliveries relative to total coincidental peak deliveries average 32 percent for a sample size of twenty-five percent of the industry.

In other words, one-third of the peak throughput of the gas transportation system already depicts interconnected or pooled gas.

Included in the pooled transactions are sales of gas from one pipeline to another and deliveries that do not represent a change of ownership. There are two tariffed forms of gas pooling that are not subject to a sales transaction. They are transportation gas (T series) and exchange gas. Transportation gas is simply natural gas transported for other pipelines over the system in which ownership of the gas by the transmitter is not present. Exchange gas is where one pipeline company receives a certain volume of gas at one delivery and then is required to satisfy the exchange balance by deliveries back to the original pipeline company or one of its customers usually at a different geographical point. These exchange amounts should balance over a period of time.

From 1975 through 1980, the pipeline industry's volume of exchange gas rose 69 percent from 3.6 trillion cubic feet to 6.1 trillion cubic feet. Over the same period, transportation gas increased 138 percent from 2.4 Tcf to 5.7 Tcf. The message of these statistics is clear: the natural gas pipeline industry is moving rapidly towards a broadly interconnected grid system. Interconnection for deliveries of natural gas is feasible and practicable. In fact without gas pooling transactions, the industry would be unable to meet a substantial portion of its customer's maximum demands. Gas pooling arrangements are necessary to the