

COMMENTS ON ELECTRIC TRANSMISSION ISSUES

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(NOTE: The statements presented here do not in any way reflect the opinions of any one other than the author.) This paper discusses the potential for using the nation's electrical transmission system as a transportation system for fuels. The advantages of transporting fuel by wire are economic benefits to the individual systems through fuel savings and possible deferral of new capacity and increased reliability through greater diversity of fuel sources for electric generation. There are obstacles to ready implementation of increased use of the electric transmission system. These include the lack of a pricing system for transmission rates and lack of assured paths of delivery. The change in the energy picture may require more rapid development of this area, and it offers sufficient promise so that it should not be overlooked.

The purpose of my discussion is to describe in an abbreviated fashion the existing electric transmission system and its potential as a transportation system for energy. The electric transmission system or grid that exists on a regional basis throughout the United States constitutes a transportation network for energy in the form of electricity. It is less often described as an alternate transportation network for fuels, but its uses in this context could significantly affect both transportation and energy policy. Two examples will illustrate my point. During the 1973-1974 Arab Oil Embargo, New England's electric supply was particularly affected because of its reliance on imported oil. Even if the United States had more than adequate domestic oil supplies, there would have been a delivery problem since the conventional transportation facilities were not in place to provide for a drastic switch in the source of New England's oil supply. One alternative selected to meet New England's need was the transmission of coal-generated electricity from the Midwest. This transmission was called coal-by-wire. The magnitude of these transactions was not great, for reasons that I shall elaborate on further in the text.

A second example to illustrate my point was the severe winter conditions experienced by the Midwest in 1977-78. At that time, coal piles stockpiled for electric generation froze and trains and barges were

unable to deliver coal to the generating plants. At that time, nuclear and oil electric generation units from the East Coast delivered fuel by wire to the Midwest, in significantly larger quantities. You will note that both my examples relate to unusual situations, that is, an extraordinary situation called for unusual responses.

The issue I would like to probe is whether the grid that provides electricity on a fuel-by-wire basis in the unusual case can be used and called upon on a more regular, every-day basis in order to help our nation's energy situation. In my opinion, the benefits of being able to transact more fuel-by-wire arrangements are sufficiently attractive to warrant their serious consideration. For example, if fuel could be transported by wire, there would be a greater range of fuels available to individual electric systems. The advantage of diversity to any single electric system is evident. No single fuel source is immune today from potential disruption on a major scale, for example, nuclear plant shutdowns, strikes, or embargo. The advantage of diverse fuel sources is that a utility can obtain reliability without building a complete, back-up system for its current generation system.

There are also economic advantages to diversity. One potential savings that immediately comes to mind are savings in the cost of fuel. That is, if one region has lower cost fuel than another, then this information can be traded between regions to permit the higher cost regions to cut back on their production and utilize the lower cost fuel available from other regions in the form of delivered electricity. Other savings are available in terms of the size and number of electric generating plants that need to be considered. For example, if inter-regional transfers were available on a long-term, dependable basis, a utility or pool might decide to defer certain of its construction to take advantage of more economically-priced fuel elsewhere. Conversely, a utility that could take advantage of economies of scale if it had a larger demand might well advertise for a joint-participant in a unit far beyond its normal area, or if not joint participation, a sale of its excess capacity until its own system were able to absorb the full output of the plant. Yet another example is seasonal or peak-time diversity in which utilities take advantage of their differences in location to exchange energy economically.

All of the above considerations have impelled some utilities in some parts of the country to

engage in economy energy transfers, joint ownership and construction of plants, and seasonal exchanges of energy. However, there is a serious question whether enough utilities are engaging in enough of these transactions--and at the level most consistent with our national objectives. Moreover, the shortage of capital and the emphasis on conserving fuel and improving the use of our facilities would seem to call for some examination of why such fuel-by-wire transfers are not more frequent and massive and whether greater effort in this area should be made.

There are several factors that contribute to the relative paucity of fuel-by-wire transactions:

1. There are no rules presently to govern prices for these transactions. The rates are subject to Federal Energy Regulatory Commission (FERC) jurisdiction and are generally called conservation rates, although economy transactions is another term that encompasses some of these transactions. The FERC is presently involved in a rulemaking proceeding to establish rules for these transactions, but there does not appear to be any urgency in these proceedings. A key question, of course, is the amount of compensation to those utilities providing the electricity and the transmission service. For example, should costs be the criterion? a portion of the savings? or market price? In the 1973-74 Arab Embargo, the rates to the New England Pool for transmission services by the intermediate systems were so high that these sales were quickly terminated in favor of high-priced spot purchases of oil to be burned in New England's generating units.

2. The utilities resemble a collection of baronies of the medieval period in some respects. Each utility is responsible to its own set of regulators, constituencies, shareholders, and each operates within its own larger sphere of influence, e.g., its pool or with neighboring utilities. However, in the past, there has really been little attempt to foist national objectives onto the individual systems at the cost of their autonomy. Rather, local economies and technology have dictated movements towards coordination, and these have been relatively gradual shifts over a long period of time.

The fast pace of events relating to energy appear to have caught up with the system, however. The pressing need to use available resources now to alleviate everyone's fuel problems have spurred Congress to take a more affirmative step to make transfers of fuel--using the facilities of our nation's electric utilities--a reality. Specifically, I am referring to current legislative efforts authorizing the Secretary of the Department of Energy to order utilities to sell non-oil generated electricity to displace oil-generated electricity. The current bill sponsored by Senator Jackson is typical.

I think those in the transportation industry will have much to teach those of us in the electric utility field about the need for "through" rates to facilitate transfers. In most cases in the electric utility industry, rates through other systems must be negotiated on a system-by-system basis, and not one electron can flow until a contractual path is established between the supplier and the recipient. To make things more complicated, however, electrons don't behave like rail cars. Electrons wander over the system and--in light of the interconnected nature of the electric system--transactions between A, B, and C could affect D, a non-party to the contract. That is, while the contractual flow of power may be from A through B to C, the actual electrical flow of much of the power could be through D. Thus, I think you can appreciate the difficulty a system faces in attempting to secure an alternate source of

fuel that requires transportation over many systems--if each system had to be renegotiated.

New England has managed to avoid this transaction-by-transaction bargaining through the operation of a centrally dispatched pool called NEPOOL. Within the pool, I think it fair to say that economic transfers are made with assurance of deliveries over the many systems operating within the area. Such is not the case for the bulk of the United States, and that brings us to the question of how many more of these transactions can be facilitated. In this regard, I note that the state and local regulatory bodies, in some cases, have far more siting authorization than does the federal government. As to new electric generating plants and new transmission lines, there must be a balance struck between what the individual utility needs and encouraging more common use of those facilities for a larger constituency that may transcend local and state boundaries.

Key to the greater use of existing electric transmission facilities are the availability of transmission paths over the grid and the availability of reasonable rates, based on costs. Given these two elements, utilities and regulatory bodies could and would have available the necessary ingredients to evaluate fuel transfers on an economic basis. Likewise, competing fuel suppliers could judge the alternatives they could provide.

Even this brief discussion would not be complete without some mention of the environmental issues, both pro and con, that underlie any policy change. Obviously, the greater use of existing facilities in the manner I have described may present some environmental problems--but they might also present an opportunity to relieve environmental problems at a local level. Moreover, transfers of energy along the scale I have discussed may require modification of existing facilities, including greater interconnection capacity between the electric regions of this country. This is one area in which actual federal ownership of key interconnecting areas might be considered.

In any event, I think the possibilities presented by our existing facilities are exciting and present a more realistic option to modify our existing, oil-dependent electric systems into a more varied electric system. They also have the benefit of permitting the gradual shifting into diverse fuels for individual systems rather than requiring a major and possibly traumatic conversion, like building a nuclear plant to replace current oil facilities, for a single system. Since a transmission system is not reliant on a single fuel source, it has the quality of providing national fuel diversity and fuel accessibility to individual systems. In this way, the electric consumers will benefit from the lower bulk power costs while hopefully retaining the benefits of the high quality of service attributed to more locally-operated utility systems. I do not intend to suggest that the alternative presented in this discussion will solve the nation's energy problems, but I think it is too important to be overlooked as part of the solution.