

ENERGY TRANSPORTATION

Yesterday, Today and Tomorrow
 Mario Cardullo, Acting Director, Office of Energy
 Transportation Policy, U.S. Department of Energy

Mr. Chairman, honored guests and fellow participants I appreciate this opportunity to appear before you today to present the Energy View of Energy Transportation. I have chosen for my theme Energy Transportation Yesterday, Today and Tomorrow. I believe in this manner we can focus in on the task that we face by viewing this important field in the perspective of time.

Yesterday

Under any free rational system, energy materials should follow a very simple rule and that is: move from their source to the nearest market maximizing their utilization before moving and being utilized in any other market. I believe this a simple consequence of the laws of thermodynamics--however--economists among you may feel otherwise. In any matter, the real economic, regulatory, environmental, technological world poses a series of constraints to this simple law.

Prior to DOE and the multiplicity of governmental and semi-governmental bodies, energy resources did indeed move in the most economic manner consistent with the technology available. The first movement of American petroleum took place in bottles. "American Rock Oil", as it was called, was skimmed from Appalachian pools and streams and sold as a remedy for all sorts of ailments - listening to the President July 15 it looks like the remedy has become the cause of the national ailment.

However, the movement of petroleum from the first producing wells near Titusville, Pa., was in barrels on horse-drawn wagons and in flat boats in the local creek. The railroad became the principal mode in 1862 when the first line was completed from the original oil fields. By 1875, however, pipeline technology had been developed which started to effectively compete with railroads -- it seems history does indeed repeat -- I only wish we wouldn't take so long to learn its lessons. The movement of petroleum by water in barrels on flatboats had also played a significant role in the early transportation scheme, but pipeline traffic eventually eclipsed that of river barges for the movement of crude.

However, all this took place in the much simpler national climate - one of national growth and expansion of unlimited social values.

The various components of the transportation system of the United States have played a vital role in the development and expansion of our energy industries.

Today

Where do we find ourselves today! As we all so painfully know - it is a changed world - one in which things are not as our forebearers knew them. Today we have many more technological tools available but also our social concerns have been raised. Today we face a world where it is not solely a question of how to move energy resources - but what energy resources to move. The Presidential policy we all heard July 15 I believe will help to focus our task - the task of the energy transportation planner to meet the goals that have now been set. I believe our goals today are:

1. Reducing the regulatory impediments for the movement of energy materials while minimizing the environmental risks.
2. Developing economical and energy efficient transportation systems for the increased movement of

coal, synthetic fuels, domestic petroleum and natural gas which minimize environmental risks and damage.

To achieve these broad and general goals we should have as clear a policy framework as possible.

Coal

This country's future energy security depends in large part on its ability to rapidly expand the use of coal. This also implies the need for a well balanced transportation system to distribute this coal. Let me reflect briefly on the importance of coal to our national energy strategy. A key element of that strategy is to rely heavily on coal in the future. Recent DOE forecasts indicate that by 1990 this country will be using between 1.3 and 1.6 billion tons of coal per year for industrial and utility purposes. This alone is at least twice the coal production of 1977. To this now must be added the coal necessary for the critical synthetic fuels program the President has outlined. Expansion of our country's capacity to transport this increased amount of coal is essential. However, in developing the necessary transportation capacity, let us not erode coal's competitive advantages. It is therefore important that:

1. Coal users do not bear a disproportionate share of the cost of upgrading and maintaining railroads.
2. That any proposals for railroad deregulation emphasize protection for captive shippers such as utilities.
3. Passage of legislation to grant the right of eminent domain to coal slurry pipelines so that a framework is established within which the economic and public merits of any particular project can be debated and determined and ground rules for that determination provided. The feasibility and viability of many synthetic fuel plants will depend on the ability to provide large volume transportation of coal over long distances. Such conditions particularly favor coal slurry pipelines.

Petroleum

The goals set by the President will not only limit the amount of foreign imports but form the basis for requirements of the transportation systems. These goals also raise a number of yet unresolved questions.

In 1978, the United States was a net importer of 8,514,000 barrels (1,354,000 cubic meters) a day of petroleum consisting of 2,000,000 barrels (317,000 cubic meters) a day of refined petroleum products and 6,514,000 (1,037,000 cubic meters) barrels per day of crude oil. These imports are now planned to be substantially reduced by 1990. In light of these reductions it is important to review our existing petroleum transportation forecasts and plans.

The changes envisioned by the President's plan focus on the increased reliance on domestic production. This implies development of Alaskan frontier resources, such as the Beaufort Sea and increased North Slope production, increased California heavy oil production, and synthetic fuel based on coal and shale plus substantially reduced foreign imports. Thus we must assess the needs for expanded crude oil pipeline systems.

The existing domestic system of over 70,000 (112,630 km) miles of trunk pipelines and an equal number of gathering and product pipelines is now based upon a system which was configured to have access from the existing domestic fields and ports (for imported petroleum.) If the Presidential objectives are achieved then the system could literally take a different direction. That direction is a greater reliance on additional Alaskan energy resources

and also from the now declining Rocky Mountain region. The President's oil curb could also seriously impact the need and plans for superport developments on the Gulf and West Coasts.

It must be added that due to the reduced availability of foreign imports, the domestic supplies such as the Alaskan North Slope crude could achieve with refinery conversions a maximization of use on the U.S. West Coast. Many of the new domestic supplies such as the increased California and Alaskan production will be the heavier sour crudes, which will require refinery conversion. Refinery configurations coupled with transportation options will determine where these specialized crude oils will be processed.

It is therefore important that the proper planning have factored into it these changes in sources of supply. Similarly, it is important that the proper regulatory climate exist for these newer developments.

It is unacceptable that many important developments of the pipeline system have been delayed by the regulatory structure. It is hoped that the proposed Energy Mobilization Board can achieve a balance in reducing the permitting regulatory maze while maintaining the proper environmental balance. Further, the resolution of current Federal Energy Regulatory Commission dockets on pipeline rate making will also reduce the level of uncertainties.

Natural Gas

The new directions set by the President July 15 also place a larger reliance on the increased use of natural gas. This area of energy transportation requires an expeditious solution to the financing problems facing the Alaskan gas line. The President has made it an important point that this line be built as soon as possible. The availability of this line will not only provide an additional reduction of imports but will assist Alaskan crude oil production. The associated Alaskan North Slope Gas cannot be continued indefinitely to be re-injected; it must eventually be shipped. The existing developments in the Overthrust Belt in the Rocky Mountain area while not as costly as the Alaskan gas line are equally important. Here again the Energy Mobilization Board and its expected procedures could be of assistance coupled with an expeditious conclusion of the FERC rate process.

Nuclear and Electrical

Even though the area of nuclear material transportation and electrical transmission are not within my area of responsibility, I would like to briefly touch upon these important issues. In the area of nuclear waste transportation, I would like to say that DOE seeks to assure the continued development of environmentally secure systems. The DOE is working to develop its systems and regulations to this end.

The Department of Energy is engaged in a number of research and development programs seeking more efficient methods for its own marketing systems such as Bonneville and the other Power Administrations, and will continue to work to provide effective systems.

Tomorrow

I would like to relate some of the things the DOE, and in particular my office, are doing and will continue to do in the area of energy transportation:

1. National Energy Transportation Study - DOE and the DOT are conducting a joint study of the ability of the nation's transportation system to move the projected mix of energy supplies to their markets out to 1990. A report will be completed and hopefully re-

leased before the end of the calendar year.

2. Northern Tier Study - The office is in the final phases of completing and issuing the final version of draft report, Petroleum Supply Alternatives for the Northern Tier and Inland States Through the Year 2000.

3. Energy impacts of the Milwaukee Railroad Abandonment - The office has begun a preliminary study to determine the impacts on energy production, movement, and use in areas currently being served by the Chicago Milwaukee Railroad that we expected to be abandoned.

4. In the forthcoming FY we are planning to develop the framework for a National Energy Transportation Plan which will be tied to the National Energy Plan. This document will be a planning document with goals, forecasts, programs and plans. This project is in the early stages of development.

I would like now to relate to you, what I believe is one of our more exciting projects. It appeared to us that crude oil pipelines exist in several places in proximity to coal deposits. For example, crude oil flows through 3 lines, the Plateau, Amoco and Arapahoe pipelines from Wyoming to the mid-continent refineries. The total crude oil flow out of Wyoming at present is about 200,000 barrels per day. It occurred to us that if ever a small amount of coal could be carried along with crude oil in these pipelines and successfully employed to enhance the net hydrocarbon output from the same amount of crude oil, the benefits could be significant. Some very preliminary studies that we have had undertaken on our behalf have indicated that a program to enhance the hydrocarbon supply of the Nation by the transportation of coal/crude oil slurries in existing pipelines and the integration of such a slurry system into modifications of existing refineries or into new conversion facilities could potentially be easier and more economical than coal liquification alone. Our very preliminary studies indicate it may be possible to incorporate up to 5% coal by weight using existing lines and pumps and modifying trays in distillation units. With pipeline modifications, and hydrotreated and other heavy oil facilities it may be possible to incorporate as much as 30% by weight coal, this translates to 20% more barrels per day of production. Hence, from technical, economical, and public policy viewpoints, such methods may offer better potential to enhance the supply of liquid hydrocarbon production than liquification. We are in the process of exploring this concept in deeper detail.

In closing, I would like to tell you a story: It seems that mankind likes to repeat its mistakes. In the early days of the Roman Empire, western society started to become highly dependent upon an eastern product - spices. These rare and wonderful substances made it possible for western society to tolerate and eat food that in many instances had started to spoil due to the lack of refrigeration. This dependence of spices and other rare substances grew even with the decline and fall of the Western Roman Empire. But then we had the rise of Mohammed.

With the spread of Mohammedism the vital caravan trade routes came under the control of the eastern powers -- this in turn led to increased cost and finally with the collapse of the Byzantine Empire a total monopoly was achieved which was assisted with the multinationals of the time -- the sea powers of Genoa and Venice. Only through searching for new routes did western society stumble upon new land -- the moral of this is that by seeking a better or new energy transportation system to reduce our dependence on foreign resources we may hopefully find a new energy future.