COAL EXPORT PROSPECTS

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The rising demand for transportation of coal has produced a number of problems. The most pressing of these problems is that the demand for export coal has exceeded the capacity of the U.S. transportation system to move coal onto ocean-going ships. In an effort to better understand all aspects of this problem and identify needed research, the Transportation Research Board's Task Force on Transportation and Logistics of Energy Materials held a meeting in Norfolk, Virginia, April 20-22, 1981. In addition to committee members, attendees included shipper, broker, carrier, port authority, and federal agency representatives. The agenda included presentations and discussions on the following items:

1. Review of the Interagency Coal Export Task Force Draft Report,
2. The coal export market,
3. Problems of inland transportation of export coal, and
4. Problems of coal export ports and maritime transportation.

The meeting was held in Norfolk because of the opportunity to tour the Norfolk and Western and Chessie System coal transloading facilities.

The Interagency Coal Export (ICE) Task Force appointed by the Carter Administration to report on possible courses of action to increase U.S. coal exports completed its report in January 1981 (see Interim Report of the Interagency Coal Export Task Force, DOE/FF-0012, January 1981). The participants in the meeting agreed that the volumes of coal exports forecast in the ICE report are optimistic. The inherently higher production and transportation costs of U.S. coal may limit the growth of exports well below the forecast. Because of the uncertainty of the future volume of coal exports, the requirements for transportation and port investment are also in doubt. However, improvements to the U.S. transportation system are needed if this nation is to have any real chance to compete in the world market for coal.

It was generally agreed that the major bottleneck to increased coal export is, as the ICE report states, at the ports. There is sufficient inland transport capacity to support near and midterm demand for not only coal, but other export commodities, such as grain, as well. Additional equipment—rail cars, locomotives, and barges—can be acquired in less time than new port facilities can be constructed or old facilities modernized. The railroads that handle the bulk of the inland coal movements have been increasing their capacity through shifts to larger hopper cars and unit trains. New hopper cars handle 100 tons, compared with an average of 67 tons for those being retired. Unit trains now haul more than 50 percent of all coal moved by rail, compared with 29 percent 10 years ago. As a result, the railroads transported coal in late 1980 at an annual rate of more than 560 million tons without fully using existing capacity. Increased barge traffic will be a problem as some locks and dams are capacity constraints, but the amount of coal moved on inland waterways is relatively small.

While the total system capacity is not a problem in moving coal to ports, there are environmental issues to consider. Increased numbers of trucks hauling coal from mines to rail-heads will accelerate deterioration of local roads, particularly in Appalachia. Along with that will come negative impacts on highway safety and additional pollution from coal dust flying off trucks.

Concern has been expressed about potential community disruptions that might occur with the introduction of large numbers of new coal trains. Vehicle delay, additional safety hazards, and inhibition of community development have all been cited as consequences of numerous, long coal trains passing through a community.

A joint study conducted for the states of North Dakota and Minnesota and the U.S. Departments of Energy and Transportation has developed prototype measures for

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Chessie System Railroad's coal-loading facility at Newport News, Virginia. Pier on the left has a channel depth of 45 ft and a maximum loading capacity of 9000 tons/h. Pier on the right has a channel depth of 38 ft and a maximum loading capacity of 550 tons/h.

mitigating the community disruption and safety impacts of Western railroad unit trains (Alternative Solutions to Railroad Impacts on Communities—Phase I Problem Definition, October 1979, and Phase II Case Studies, May 1980—prepared for the Minnesota Department of Transportation and the North Dakota Highway Department). The applicability of these or similar measures to eastern rail systems warrants investigation. It may be possible to develop similar low-cost, environmental mitigation efforts for Appalachian coal trucks and coal haul roads. In addition, the National Waterways Study has identified several ways of minimizing negative impacts from dredging and waterway construction projects. Whether these measures are adequate to resolve environmental problems is not clear.

While the efficiency of transportation of coal to the ports by rail has been improved, a bottleneck remains in the facilities to transload coal from rail cars to ocean-going ships. Traditionally, coal exported by the United States has been metallurgical coal. The present growth in demand is for steam coal. The three largest coal ports in the United States—Newport News, Norfolk, and Baltimore—were designed for metallurgical coal, which involves the blending of hundreds of separate types of coal. This requires storage in hopper cars and single-car damping. Steam coal can be handled by using ground storage with dumping equipment to handle unit trains. Investment is needed for such facilities in these and other locations where new coal ports are planned.

Another type of port improvement that will significantly increase throughput is dredging channels to a depth of 55 ft. Present channels on the east coast are a maximum of 45 ft that limit bulk carriers to 80 000 deadweight tons (dwt). The only port in the United States with a deeper channel is Long Beach, California, which only handles a small amount of coal. Deepening channels to 55 ft will accommodate the newest design vessels that are as large as 170 000 dwt. Ships more than 80 000 dwt now leave U.S. ports partially loaded.

Dredging of the channel at Baltimore to 50 ft may proceed after a number of years of dispute over location of dredged material disposal sites largely because of concern for marine life in the Chesapeake Bay. The U.S. Army Corps of Engineers is also studying Hampton Roads and the Port of Mobile for deepening to 55 ft. Dredging to that depth in Philadelphia and New Orleans may not be possible because of the dangers of intercepting aquifers just beneath the bottoms of the present channels.

Hydraulic loading via coal slurry pipeline is a possible alternative to construction of on-shore loading facilities and deepening channels. Iron ore is now loaded in open waters off New Zealand. A single point mooring buoy 9800 ft off shore permits loading of 100 000-ton vessels. Although this technique has not been applied to loading coal into ships, coal slurry is being used for storage and handling of coal in a generating station, the Mohave Station. Scaling up of the ore handling system, which is only 1000 tons/h and adapting the coal slurry handling to ship loading application will be necessary.

Port capacity expansion—loading facilities, dredging, etc.—cannot be viewed from the perspective of coal alone but may also accrue benefits to other export commodity movements. Benefits that have been attributed to increasing the export of all commodities through port facilities are improved balance of payments, creation of jobs and income at the ports and in the exporting industries, and the indirect economic effects accruing to support industries.

Given the present administration's pay-as-you-go philosphy, user fees may be the most probable source of funds for dredging channels. It appears that the only source of funds for transloading facilities will be private

Norfolk and Western Railroad's piers at Norfolk, Virginia, have capacity to load 40 million tons of coal annually. In October 1981, a record 3.7 million tons of coal were ship loaded. Newest of the two piers was completed in 1964 and is the fastest-loading facility in the world. New pier can handle ships with up to 46.5-ft drafts, while older pier takes ship drafts up to 36 ft.

investment. However, reliance on user fees generally requires a firm demand projection. Despite the ICE report projections of large increases in demand for coal export, the Norfolk meeting participants were not sure of the true extent of those increases. In addition, the plans of several importing countries to significantly increase their nuclear power-generating capacity makes long-term coal contracts less likely. Without such long-term contracts, private investment will be difficult. At the same time it was agreed that lack of improvements could send foreign buyers elsewhere.

Two additional major issues were presented but left unresolved during the Task Force meeting. First is whether existing institutions can effectively pursue the development of the coal export market. The institutional setting currently is characterized by myriad public and private and other competing interests. This has resulted in a lack of coordinated response among complementary interests, counterproductive actions taken by competing interests, and the lack of an initiative sufficiently strong to fully develop the coal export market. New, improved institutional arrangements may have to be established if export market issues are to be properly and efficiently addressed.

The second issue is whether efforts to improve the efficiency and capacity of the U.S. coal export transportation system will result in increasing the level of U.S. coal exports. Based on information presented during the meeting, the relative delivered cost for U.S., South African, and Australian export steam coal is such that there is some doubt that improvements in the U.S. export coal distribution system will greatly enhance the U.S. market share versus its significantly lower-cost competition. Even if this is true, improving the U.S. system and reducing its costs may well compel competitors to do the same in order to maintain their market shares. The improved efficiencies will reduce the cost of all export coal relative to oil and help to achieve the quintupling of world steam exports by the year 2000, which is projected in the U.S. Interagency Coal Export Study. Increasing this total market for export coal through improved efficiencies, regardless of the U.S. market share, will help to minimize the price of U.S. oil imports by reducing world demand for oil. Expansion of the use of alternative fuels has been cited by several leaders of the Organization of Petroleum Exporting Countries (OPEC) as one reason for the recent moderation in oil prices.

In summary, at the Task Force meeting some questions associated with the transport of export coal were resolved and other issues raised that could not be answered. Some of the same issues will be explored further at the 1982 TRB Annual Meeting in January in a symposium on "Transportation Issues in International Trade." The symposium will consist of a morning session on an overview of markets and problems, which will include speakers on coal and grain exports markets, transportation bottlenecks in international trade, and state concerns in transportation for foreign trade. The session will be followed with a panel discussion by representatives of carriers, shippers, port authorities, and buyers. That evening there will be a caucus to discuss research needs and possible roles for the Transportation Research Board. (See the preliminary program of the 1982 TRB Annual Meeting in this issue.)