

ing consortium headed by Deutsche Bank for most of the loan, but this was wrecked by rising interest rates and by the Germans getting cold feet over the size of the loan.

A more modest scheme was then devised whereby a loan of 8 billion DM would be made to cover the cost of imported equipment for a much simpler pipeline running



**The unbroken line marks the new route of the Yamal pipeline. The broken line is the original route and if the Yamal line had followed this, its construction cost would have been lower. The new route has been chosen, however, because it runs through some of the most heavily populated industrial regions of the USSR, whereas more than half of the old route runs through practically uninhabited regions, and if the Western European countries succumb to American pressure and cancel the deal, then the Russians are in a much better position to use the pipeline for their own purposes.**

## YAMAL GAS PIPELINE

The construction is about to begin in the USSR of a natural gas pipeline stretching from the desolate wastes of Western Siberia to Western Europe. Called the Yamal pipeline, after the Yamal-Nenetskii region where the USSR's (and the world's) largest gasfields are located, it will carry 40 billion cubic metres a year of gas from the giant Urengoi field to West Germany, France, Italy and a number of other countries. It will be over 5,000 kilometres long, 1.42 metres in diameter, and will cost up to \$ 15 billion to build.

When the idea was first mooted, the Russians hoped that Western banks would cough up a loan of 20 billion deutschmarks for the project. The pipeline would run from the Yamburg field, 200 kilometres to the north of Urengoi, which lies wholly in a continuous permafrost zone requiring radically different engineering for its development. A preliminary agreement was signed by the Russians and a German bank-

from Urengoi. So far, 4.4bn DM has been lent by the Deutsche Bank consortium, and it is likely that Italian banks will lend most of the rest. This money is to be spent mainly on the import of pipe from the Mannesmann and Thyssen Stahlunion steel plants of Germany (an initial contract for 1.2 million tons has just been signed) and 41 compressor stations with 125 heavy duty turbines for pumping the gas along the pipeline. Contracts have been awarded by the Soviet organisation Machinoimport to a German/French consortium of Mannesmann and Creusot Loire for 22 stations and 68 turbines for the eastern half of the line, and to the Italian ENI subsidiary of Nuovo Pignone

for 19 stations (57 turbines) for the western half. Nuovo Pignone make their own turbines, but Mannesmann and Creusot Loire have to buy them in, and the Russians nominated AEG-Kanis of Germany to make 47 turbines and John Brown Engineering of Glasgow to make 21. In fact, considering that Britain will neither lend any money nor buy any gas, British firms have done surprisingly well. The John Brown order is worth £104 million, plus a further £43 million for spares, and will keep 1,650 workers occupied for 2 years. Ruston Gas Turbines and Plenty of Newbury have won orders worth £29.7 million and £20 million for compressor station equipment and Rediffusion Computers will supply a computer system for £7.8 million.

But who needs Yamal gas? So far, orders for 27.2 billion cubic metres a year have been wrapped up, with the West Germans taking 10.5, West Berlin 0.7, France 8 and Italy 8.5 billion cubic metres a year, although the Italians have still to confirm their contract. The Netherlands, Belgium, Spain, Switzerland and Austria are all negotiating for various amounts, and the Russians only need to sell 33 BCM/yr for the pipeline to be viable. This is the normal throughput of a 1,420 mm diameter pipeline but the Yamal line expects to squeeze through another 7 BCM/yr by cooling the gas, thereby reducing its volume, and keeping it cool by means of German-supplied refrigeration plants located at intervals along the pipeline.

The Europeans need Yamal gas because of the coming oil squeeze which many people expect before the end of the century. Europe's indigenous gasfields at Groningen (Holland) and the North Sea are subject to conservation policies, coal and nuclear power are environmentally unpopular, and imports of gas from elsewhere would have to be liquified, making them very expensive. A liquefaction plan for Nigerian gas has recently collapsed for this reason.

The USSR needs to sell gas to the West. The Comecon countries have notched up a debt to the West of over 80 billion dollars which is accruing interest all the time, and which looks increasingly impossible to pay off. The countries with the most unmanageable debts, like Poland, are facing acute difficulties in merely paying the interest. The Soviet Union, helped by its large oil sales to the West, has succeeded in keeping its debt down to 15-17 billion dollars, but with its oil exports falling and oil prices tumbling, it needs to sell gas to get into the black.

The Russians hope to get an average price (in 1981 terms) of 0.187 dollars per cubic

metre for the 1,000 BCM they will sell the West over 25 years. This will bring them 187 billion dollars of hard currency which should enable them to increase their imports of Western goods, pay off their debts, and guarantee the debts of Eastern European countries.

The Reagan administration has been trying hard to get the deal stopped, ostensibly on the grounds that Western Europe will become over-dependent on Soviet fuel by the late 1980s. The turbines for the compressor stations are patented by General Electric, who supply certain parts for them from their Schenectady factory, and as long ago as last November, the Americans informed the Russians that they would not allow these parts to be used for the Yamal pipeline. This affects John Brown and AEG Kanis in particular, and they are unlikely to offend their American supplier by trying to circumvent the new sanctions. The Russians have foreseen this eventuality, and are busy tooling up their Venskii Zavod factory in Leningrad to produce similar turbines, which they originally planned to use on another important pipeline from Urengoi to Novopskov in the eastern Ukraine. They are now likely to use the Leningrad turbines for the Yamal line, and take delivery of the Western machines for the domestic pipeline

as and when John Brown and AEG Kanis are able to supply them.

The Yamal pipeline is due for completion by mid-1984, but Soviet planners have predicted that the gas will start flowing by the end of 1983. The project is likely to be of immense benefit to both the USSR and Western Europe, while the Americans will merely succeed in shooting themselves in the foot.

Henry Taylor

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