

~~Secret~~

The lag in the domestic nuclear power program, combined with slowdowns, cancellations, and political problems associated with the export of nuclear technology, has adversely affected the West German nuclear industry. The industry was developed with government support, and from its inception it has depended on export business to justify the capital expenditures involved, even when the domestic program is moving as planned. The worst blow so far was the collapse of the Shah's government in Iran and the resulting loss of orders for at least four pressurized-water reactors and the halt to construction and possible abandonment of the two under construction at Bushehr on the Persian Gulf. Recent reporting indicates the Iranians are uncertain but may want to complete these because of the large investment already committed. [13, 14, 15]

[REDACTED]

Problems have also clouded the nuclear accord with Brazil, whereby the Germans agreed to supply eight nuclear power reactors and the technology and training necessary for the Brazilians to control and operate the entire nuclear fuel cycle on their own soil. The agreement included sensitive uranium enrichment and spent fuel reprocessing technology. The Germans, in return, would gain a source of natural uranium. The entire program is behind schedule and under attack by some Brazilian leaders on economic and technologic grounds. It probably will be slowed down and may be reduced in scope. [16]

[REDACTED]

The first German-supplied power reactor (Angra-2) near Angra dos Reis, being built by Kraftwerk Union (KWU), has been delayed because of site problems. Nevertheless the West German-Brazil nuclear accord does not appear in danger of collapse. [17]

[REDACTED]

~~Secret~~

~~Secret~~

The West German Nuclear Energy Program: A Balanced Foreign and Domestic Effort

Restrictions imposed after World War II delayed the start of a nuclear energy program in the Federal Republic of Germany until 1955. After this late start, progress was rapid as a result of Federal and State (Land) government support to nuclear research and development, and the promotion of a large, export-oriented nuclear industry. The fourth German nuclear program, covering 1972 to 1976, envisioned nuclear power expansion to 100,000 megawatts electric (MWe) by 1990, and the atmosphere was one of decided optimism. As a result of events and changing conditions at home and abroad, however, the outlook for the West German nuclear power program and its associated industry has changed markedly in the past few years.

Overoptimism, energy conservation, and an economic slowdown resulted in an excess of generating capacity beyond normal reserve margins by 1978 that may last until 1980-81. Even though nuclear power is in temporary surplus, the Germans still may not meet their revised goal of 24,000 MWe of installed nuclear power by 1985. Licensing problems and legal actions by antinuclear groups have brought the construction program to a halt. These problems must be resolved soon and construction resumed if the planned capacity is to be available on schedule. Nevertheless, the government is deeply committed to nuclear power, and there is little doubt that the program will advance, although schedule slippage is likely. In addition to the 15 power reactors now installed, the West Germans have 13 more in some stage of construction or construction licensing (tables 1 and 2). [References 3, 6]

The West Germans expect to use nuclear power as a supplement to indigenous coal to reduce their dependence on oil from more than 50 percent of their current energy requirements to 27 percent by the end of the century. Nuclear power in 1978 provided about 10 percent of the country's electricity output. The West German nuclear power program ranks third in the world, having more than 8,800 MWe of installed nuclear generating capacity. [1-5, 8]

Table 1

Nuclear Power Plants Installed

Station	Power (MWe/net)	Type	Start of Operation
Kahl VAK	15	BWR	1960
Karlsruhe MZFR	51	PHWR	1966
Gundremmingen ¹	237	BWR	1967
Lingen ²	0	BWR	1968
Julich AVR	13	HTR	1968
Obrigheim	328	PWR	1969
Stade	630	PWR	1972
Wurgassen	640	BWR	1972
Karlsruhe KNK-II	18	FBR	1978
Biblis-A	1,150	PWR	1975
Neckarwestheim	805	PWR	1976
Biblis-B	1,240	PWR	1977
Brunsbüttel	770	BWR	1976
Isar-1	870	BWR	1979
Phillipsburg-1	864	BWR	(1977) ³
Unterweser	1,230	PWR	(1977) ³
Total	8,861		

¹ Currently shut down for extensive repair and modification.

² The Lingen reactor has been permanently removed from service.

³ Reactor is critical but not yet in commercial service.

A key to getting the nuclear power program moving again is the requirement that spent fuel be dealt with in a safe, secure manner with no harm to the environment. As a means of meeting this requirement, the German courts have ruled that reprocessing, along with a satisfactory radioactive waste management program, will be acceptable. Therefore, several German electric utility companies have set up an organization to construct a major national fuel cycle center at Gorleben in Lower Saxony. In addition to a reprocessing plant, the center will include spent fuel storage, fuel fabrication, and waste disposal in a salt

~~Secret~~

~~Secret~~

**The West German Nuclear
Energy Program: A Balanced
Foreign and Domestic Effort**

Key Judgments

Because of its need to become more energy independent in the next few years, West Germany probably will resume the expansion of domestic nuclear power and the development of associated nuclear fuel cycle technology, both now virtually halted by political problems. Also, the nuclear industry will continue its aggressive promotion of nuclear technology sales to foreign countries.

The West German nuclear power generating capacity reached a plateau in 1978. The current goal of 24,000 megawatts electric of installed nuclear power by 1985 is not likely to be met unless construction now halted by legal actions is resumed soon.

The West German nuclear industry will suffer for two or three years because of the slowdown of the domestic nuclear power program and because of economic, political, and technological problems being encountered with foreign customers.

As suppliers of across-the-board nuclear technology including uranium enrichment, the West Germans will continue to have an impact on problems of nuclear proliferation.

Work on spent fuel reprocessing and the recovery of plutonium for use in thermal and eventually in fast breeder reactors probably will not be deferred, because West German nuclear experts are convinced that plutonium will allow West Germany to become less dependent on foreign sources of nuclear fuel.

A 10-year program to build a national fuel cycle center at Gorleben in Lower Saxony has met and will meet opposition from antinuclear elements within major political parties and, if implemented, its completion probably will extend beyond 1990.

~~Secret~~



National
Foreign
Assessment
Center

~~Secret~~



National
Foreign
Assessment
Center

~~Secret~~

The West German Nuclear Energy Program: A Balanced Foreign and Domestic Effort

An Intelligence Assessment

*Information available as of 1 June 1979
has been used in the preparation of this report.*

The author of this paper is [redacted] Nuclear Energy Division, Office of Scientific Intelligence. Comments and queries are welcome and should be directed to [redacted]. A detailed backup paper is available upon request from OSI/IPS [redacted].

This report has been coordinated with the Offices of Economic Research and Political Analysis, the Directorate of Operations, and the National Intelligence Officers for Western Europe and Nuclear Proliferation. [redacted]

The source references supporting this paper are identified in a list published separately. Copies of the list are available to authorized persons and may be obtained from the originating office through regular channels [redacted]. Requests for the list of references should include the publication number and date of this report. [redacted]

~~Secret~~

SI 79-10065
August 1979