Congressional Record

NUCLEAR AND MISSILE PROLIFERATION (Senate - May 16, 1989)

German Firms Exported Tritium Purification Plant to Pakistan

[Page S5443]

Germany May Have Approved Exports by Prosecutor To Be Illegal
From Hamburg DPA, Jan. 30, 1989
Firm Said To Export Missile Components to Libya
From Hambury Der Spiegel, Jan. 30, 1989
Companies Exported Beryllium to India

[Page S5444]

From the New York Times, May 7, 1989
Norway Details How Heavy Water Went to India
From Jane's Defence Weekly, Apr. 22, 1989
Controlling the Spread of Ballistic Missiles

[Page S5445]

From International Defense Review, 1989
Indian IRBM Details Revealed
From Hamburg Der Spiegel, Mar. 27, 1989
Firms Involved in Iraq Missile Production

[Page S5446]

From the Washington Post, May 3, 1989
U.S. Firms Helped Iraq Gain Ability to Make Missiles, Officials Say

[Page S5447]

From the London Financial Times, 12 Apr. 1989
Prosecutor Launches Inquiry into MBB's Condor Missile Links
From Mid East Markets (MEM), Apr. 17, 1989
Condor II: An Issue to Test US-Egypt Ties
CONSEN
Substance to Nuclear Allegations Against Iraq

[Page S5448]

Saudi Concern Over Chemical Claim
UNDERSTANDING WITH ISRAEL
ADMINISTRATION'S VIEW
From the New York Times, Feb. 23, 1989
Those Chinese Missiles

[Page S5449]

U.S. Prods IAEA About Safeguards for North Korean Nuclear Plants

[Page: S5437]

- [Begin insert]

Mr. GLENN. Mr. President, I have spoken many times about the global spread of nuclear weapons and missiles, and about the measures that are needed to halt this proliferation before it sends the world into turmoil. If anyone here seriously thinks that these problems are now under effective control--or that the threats from the proliferation of these weapons are remote from the daily lives of average Americans--then I have a few comments that may change your mind.

A VOICE OF REASON

Let us start with some common sense--you do not need a top secret intelligence clearance to understand how the proliferation of these deadly weapons threatens us all. As much as I have read and spoken about this problem, I have not seen a more straightforward statement of the risks and responsibilities that we face as a nation in this area than a brief opinion piece by A.M. Rosenthal that appeared in last Friday's New York Times.

Mr. President, I ask to submit at this point in the **Record** an op-ed by A.M. Rosenthal, from the New York Times of May 12, 1989.

The article follows:

The Weapons of Hell

At least we will know where to put the blame. If the day comes when the terrorist nations use the weapons of hell against us or other enemies, at least we will know that.

At first, we will try to evade the truth. We will say it is the fault of our friends and allies who sold those mad-men the material for the chemical weapons, the missiles and the nuclear technology.

But eventually we will have to face reality: the blame belongs to us, the Government and people of the United States. We knew, and could have stopped it, but did not.

About 40 West German companies are suspected by Washington of shipping chemicals and technology for chemical warfare to a Libyan plant and other Middle Eastern countries. German companies helped Libya, Syria, Iraq and possibly Iran build missile capability.

China is sending missiles to Libya. A Swiss company negotiated with Iran to build a poison gas plant.

We know Pakistan, and probably India too, has received clandestine help from abroad in preparing its nuclear weapons capability. Pakiston is an American ally and India a democracy important to us.

But perhaps someday far less friendly regimes will rule in Islamabad or New Delhi. Then we would live in fear that nuclear weapons capability could be transferred to bitterly hostile nations.

The principal target for the chemical weapons--the Libyan plant alone will produce 40 tons a day for warfare--of course would be Israel.

But the terrorist nations showed, during the Iran-Iraq war, that they will use chemical weapons against each other and their own people.

So it is easily conceivable that countries that deliberately blow up civilian airliners might one day raise the terror level by planting and exploding a chemical weapon somewhere in the West. The Ayatollah would regard it an act of special piety.

Americans look on drowsily. Is the danger on another planet? American specialists on terrorism and weaponry are astonished at the public passivity.

American Governments have not provided leadership. The Reagan Administration sent more than 250 polite complaints to the West Germans about nuclear aid to Pakistan and chemicals to Middle Eastern countries.

But the protests were usually secret. Our German allies either buried or routinely denied them.

Now, that Swiss company finally agrees that helping Iran build a poison gas plant would not be a delicate thing to do.

The West Germans got around to arresting the former director of the company that built the Libyan plant--the same company that, in January, Bonn indignantly denied was doing anything of the sort.

Well, that's nice. But all those other complaints Washington made to Germany, what happened to them and how were investigations carried out?

But it is not useful to blame the Germans or Swiss or Chinese. Obviously they do not consider selling chemical weapons or missiles to terrorist nations that bad; matter of values.

It is this country's job and moral obligation to stop friends and allies from sending terror weapons to terrorists.

First, the Government must stop wrapping the record in secrecy, stop putting `classified' stamps on our protests, stop covering evasions and denials. The `secrets' are kept not from suppliers or receivers--just the American public. President Bush can end that with a telephone call to the State Department.

Then we should cut off from the U.S. market every foreign company we believe is sending materials or technology for these weapons to terrorists; cut them off very fast, for very long.

Legislation to do this is before the Senate and the House, introduced by members of both parties. The Administration wants the decisions to cut off trade left to the President. No; they should be automatic by law.

We must tell the Chinese Government that we happen to have our own little cultural sensitivities and that they must choose between missiles to Libya and business with us.

Then we must say much the same thing to our allies. Most of them are as worried as we--and as clean. As for Germany, perhaps we may find that more Germans will agree with us than with the grossly, unforgivably insensitive German companies on the list of traders in hell.

Of course, we have to make absolutely sure we are not in that trade in any way ourselves--as we and Israel were so shamefully when the missiles were sent to Iran. It is part of waking up and looking in the mirror--better now than waiting until just one day too late.

Mr. Rosenthal makes three key points:

First, since today's foreign friends may easily become tomorrow's foes--a lesson we learned the hard way in the cases of Libya and Iran--we should not directly or indirectly condone the proliferation of nuclear weapons or nuclear-capable missiles anywhere, even by our friends. It is our duty to encourage our friends to see the folly in possessing such weapons and to communicate our firm determination to stop this mad pursuit of what Mr. Rosenthal calls, the weapons of hell. We must have a global policy.

Second, the United States cannot shirk its responsibilities by covering up proliferation with the veil of secrecy based on political concerns--secrecy based on legitimate concern about intelligence sources and methods is one thing, but secrecy based on political convenience is quite another. When we send hundreds of diplomatic protests and messages to other nations that are chronic suppliers of matierals for these `weapons of hell,' our responsibility does not--and cannot--stop with the delivery of these so-called demarches.

Why should the Congress and the American people not be informed if our doplomacy is ineffective in stopping this deadly commerce? Why should the citizens in the offending country never be provided an opportunity to learn of the concerns that we are expressing to their leaders? Are we using secrecy to protect the guilty, or to mask a failed policy? If so, maybe an appropriate subject for Mr. Rosenthal's next op-ed might be, the `policies of hell.'

His third point is that our policies must have some teeth--when we detect illicit trafficking in commodities associated with nuclear weapons, missiles, chemical or biological weapons, we must have something more in our grab-bag of diplomatic responses than what Richard Perle has recently called, demarche-mallows. I believe Mr. Rosenthal is right: The time has come for the United States to impose stiff economic penalties on companies that chronically traffic in goods related to all of these types of weapons. We need to penalize not just the use of these weapons in war. We need to go after the `kingpins' of the illicit nuclear and missile marketplace. The world must know where we stand.

[Page: S5438]

THE VOICE OF THE AMERICAN PEOPLE

Although the previous administration did very little to educate the American people about the threats we all face from the proliferation of nuclear weapons and their various delivery systems, I am convinced that the public understands that nuclear terrorism or regional wars involving these `weapons of hell' are threats that deserve a high priority in any administration.

In the early days of the last Presidential campaign, the polling firm, Marttila & Kiley, Inc., released a survey of randomly selected American voters which shows that the public at large is definitely concerned about the problem of nuclear proliferation. Here a few quotes from the findings of that survey:

Several findings point to a growing public concern that nuclear proliferation and Third World instability, perhaps even more than a continued arms race between the superpowers, represent the gravest threats to our national security.

Other than `tensions in the Persian Gulf' * * * Americans are more likely to view `the spread of nuclear weapons to the Third World' as a serious threat to our country's security than any other item we tested.

Fully 76 percent regard nuclear proliferation as an `extremely' or `very' serious threat to national security * * * this ranks higher than either the `nuclear weapons buildup by the U.S. and Soviet Union' (64 percent), or `Soviet aggression around the world' (56 percent).

More recently, the Roper Center for Public Opinion Research has reported a Yankelovich survey in which 1,000 randomly selected registered voters from across the Nation were asked to assess the extent to which `the spread of nuclear weapons to Third World countries' threatened our national security interests.

Here are the results of that October 1988 poll: An astounding 87 percent of the respondents ranked nuclear proliferation as either an `extremely serious' or a `very serious' threat. It is interesting that this figure is over 10 percent higher than the result obtained in October 1987 to the same question. Only 2 percent of the voters in the 1988 poll called the proliferation

threat, `not very serious.'

This, Mr. President, is the voice of the American people--this is where we stand.

THE VOICE OF THE MEDIA

In recent months, the international and domestic news media has been issuing one horror story after another about the worsening global spread of nuclear weapons, missiles, and chemical and biological weapons. I ask to submit into the **Record** at the end of my remarks the full texts of several of these reports. Here is what the media is reporting:

Pakistan continues its march toward the bomb: The European press is having a field day with reports that Pakistan has acquired from West Germany United States-origin tritium--an H-bomb material--tritium recovery equipment, lithium--used in producing tritium--and a United States-origin laser, the latter as part of a package of equipment for making nuclear fuel. Meanwhile, the Pakistani army chief has boasted that his recently tested surface-to-surface missiles `are extremely accurate systems and can carry a payload of over 500 kg (1,100 pounds).' All of these developments are occurring in a country that receives hundreds of millions of dollars in United States economic and military aid--aid that President Reagan recently certified `will reduce significantly the risk' of Pakistan acquiring the bomb.

India's nuclear and missile programs are rolling like the ancient juggernaut: India is now reported to be ready to test fire a 1,500 mile intermediate-range ballistic missile. It is ironic that India, after having condemned the United States and the Soviet Union for many years for failing to make progress in nuclear disarmament, is now developing a nuclear-capable missile that is within the class of delivery systems that the United States and Soviets have just agreed to eliminate. India has also reportedly acquired United States-origin beryllium--a material used in components of United States nuclear weapons--for its nuclear program and has been openly accused by the Government of Norway as the illicit destination of over 20 tons of Norwegian heavy water, a material used in producing plutonium.

Nuclear and missile developments are of growing concern in East Asia: China persists in its stubborn refusal to join international treaties against the proliferation of nuclear weapons, while aggressively promoting sales of ballistic missiles and missile technology to unstable regions. Admiral Thomas Brooks, the Director of U.S. Naval Intelligence, recently testified before the House Committee on Armed Services that in 1988, `the PRC began marketing its `M' series of short range tactical missiles * * * the M-9 SRBM (325 nm range) is certain to find clients in a number of Middle Eastern / South Asian states.' The Chinese are also marketing dual-use equipment and materials associated with the development of nuclear weapons. Meanwhile, I have learned that our Government is considering selling to China valuable nonnuclear parts for nuclear powerplants, worth hundreds of millions of dollars, even though United States law bars the provision of United States nuclear technology to China until certain nonproliferation conditions are met. And thanks to a recent 30-year United States / Japan nuclear agreement, Japan no longer needs United States case-by-case approvals to make use of or ship, by air or sea, ton quantities of weapon-usable plutonium

produced from United States-supplied nuclear fuel or reactors. Press reports are also circulating that North Korean may be building an unsafeguarded nuclear reprocessing plant for plutonium production, and that South Korea is working on a ballistic missile that meets the standard international criteria of being `nuclear-capable.' If the Korean peninsula goes nuclear, how long could Japan afford not to follow suit?

But there are other regions that are receiving their fair share of press reports in recent months:

The Middle East is on the verge of an arms race involving all of the `weapons of hell.'--While Israel's nuclear weapons and long-range missile programs remain unfettered and a subject that is taboo for discussion even among Israel's own citizens, Iraq appears determined to develop its own heavy missiles, chemical and biological weapons and, according to some recent reports, nuclear arms to meet its own regional ambitions. Egypt appears determined to acquire its own IRBM with the assistance of Argentina, Iraq, and unscrupulous European arms dealers. Saudi Arabia, meanwhile, is sitting comfortably with its new Chinese nuclear-capable CSS-2 IRBM's. According to Admiral Brooks--the United States naval intelligence chief--Libya, Iraq and Iran are all, in his words, `actively pursuing' a nuclear weapons capability. Who knows who will be the next to toss a match into the Middle East tinderbox?

Projects are underway in Latin America to develop nuclear submarines and nuclear-capable missiles: Along with continuing concerns about the refusal of both Argentina and Brazil to join international treaties banning the acquisition or proliferation of nuclear arms, a concern heightened by the dangers of political instability in each country, both nations appear determined to acquire long-range ballistic missiles and nuclear submarines. And both Argentina and Brazil appear intent to export their nuclear-capable missiles to customers in the Middle East.

[Page: S5439]

THE VOICE OF THE NEW ADMINISTRATION

President Bush has stated both in the campaign and after coming to office, that he regards nuclear and missile proliferation to be among the foremost threats facing the Nation and our allies. I hope that he is able to translate his concern into tangible policies designed to halt the spread of these dangerous weapons. He will certainly have my support in pursuing this objective.

Soon the new administration will have a major choice to make. Will we continue the policies of the past, with all of their trappings--such as the demarche-mallows, the refusal to report bad news to Congress and the American people, the blindness to proliferation activities in friendly countries, and the myth that being a reliable supplier of nuclear goods and military aid will purchase responsible nonproliferation policies among recipients of those supplies? Or will we reinvigorate our policies with new ideas, fresh approaches, and a heightened sense of national commitment? I hope we are prepared to show the world that we not

content with trying to manage proliferation, and that we are willing to work creatively with other nations to stop it outright.

Mr. President, as chairman of the Committee on Governmental Affairs, I would like to announce that the committee will hold a hearing on Thursday, May 18 to hear the views of the new administration on these issues. We will hear the testimony of CIA Director William Webster, Mr. Reginald Bartholomew, who has been called the `nonproliferation czar' at the State Department, and Ambassador Ronald Lehman, the new Director of the Arms Control and Disarmament Agency, to assess the threat and our national responses to these awesome challenges facing the Nation.

I hope that this hearing marks the start of a new era of cooperation and consultation between the Executive and Congress in the nonproliferation area. We are going to need this cooperation at home if we are to expect any cooperation or respect from our friends and foes abroad.

The material to be printed in the **Record** follows:

From Nuclear Fuel, Mar. 6, 1989

[FROM NUCLEAR FUEL, MAR. 6, 1989]

U.S. Repeatedly Warned Germany on Nuclear Exports to Pakistan

(BY MARK HIBBS)

The U.S. government has issued about 100 specific communiques to the West German government related to planned exports to the Pakistan Atomic Energy Commission (PAEC) and its affiliated organizations, according to information obtained by NuclearFuel. Documents reveal that since the early 1970s planned exports--some of which were carried out--included a range of items--from computer technology to uranium.

Beginning in 1982, U.S. nonproliferation officials began warning Bonn that PAEC attempted to acquire technology for capture of pure tritium. In March, and again in May, 1986, the U.S. told German officials that the firm Linde AG was planning to export a tritium extraction facility to PAEC.

In responding to U.S. requests, German officials contacted Linde, which said it `had no plans' to export such a facility.

The U.S. sent a third warning in December 1986. `Notwithstanding Linde's assertions, we continue to believe that the information we provided you previously is correct, and that Linde submitted a proposal to PAEC for installation of a tritium recovery facility.'

While on two previous occasions German export officials asserted that technology from Linde `could not result in a form of pure tritium,' the U.S. government replied that `our technical information indicates that such a facility could result in a pure form of tritium.'

Western tritium experts queried by NuclearFuel said that the U.S. position was correct. Linde AG, one of a handful of firms in the world with expertise in the field of cryogenic distillation of hydrogen isotopes, could have supplied a heavy water detritiator with capability to purify the tritium gas product.

In 1985, Germany licensed for export to Pakistan a tritium plant by the firm NTG Nukleartechnik GmbH (NTG), preferring to call it a `heavy water purifier' instead of--as the U.S. preferred--a `tritium recovery facility' in the interests of complying with German regulations on sensitive nuclear exports. While heavy water purification technology is not subject to export controls in Germany, technology for the recovery of tritium is controlled.

The U.S. believed that Germany would control export of tritium capture technology to Pakistan according to a pledge made by German officials at a spring 1986 meeting of the Coordinating Committee on Export Controls (COCOM). While German officials previously told the U.S. they `had no authority' to control tritium technology exports, the U.S. government told Bonn that Germany `should now have the legal authority to control the export of a tritium recovery facility.' Equipment especially designed for tritium production or recovery appears on Germany's Nuclear Energy List of March 25, 1988. That list of items needing an export license is an annex to Germany's Foreign Trade Ordinance.

The U.S. also discussed with Bonn reports that nuclear trader Alfred Hempel may have been working to assist PAEC is acquiring material for an unsafeguarded reactor.

According to a German government report, citing `friendly intelligence,' Hempel, in late 1986, made an offer to PAEC through the firm Ventron GmbH for supplying boron carbide, an absorber material used in reactor construction. U.S. officials told Bonn that `it is well known that Pakistan is developing an indigenous, unsafeguarded reactor' and advised export officials to intervene. In November 1987, German officials advised the U.S. embassy in Bonn that boron exports to Pakistan would require an export license and that none would be given.

Based on other intelligence information, the U.S. Arms Control and Disamament Agency (ACDA) had requested in 1980 that the West German government investtigate several dealings of Nuken GmbH with PAEC.

According to a German government report prepared at ACDA's request, Nukem officials, in 1973, were negotiating the sale of 8 metric tons (MT) of heavy water to the Pakland Corporation, which, according to intelligence sources, was a purchasing arm of PAEC. In the same year, Nukem discussed selling PAEC an undisclosed amount of uranium metal. German officials said that in 1977 the U.S. Energy Research & Development Administration, DOE's predecessor agency, approved the export by Nukem of materials testing reactor (MTR) `reprocessing and transport' technology to the unsafeguarded Pinstech reprocessing

facility in Rawalpindi.

The report also says that Nukem sent 30 kilograms of UF6 of unspecified enrichment to PAEC via the Pakistan embassy in Paris in 1978. In the same year, Nukem officials negotiated delivery of `waste liquid vaporizing technology' to PAEC for New Labs, another unsafeguarded reprocessing facility, as well as melting crucibles and 145 kg of depleted uranium.

Nukem officials, according to the report, said only the UF6 was sent to Pakistan. Three additional exports planned for 1979--MTR reflector material to Pakistan, tritium targets to PAEC, plus beryllium metal and beryllium oxide to the Pakistan Directorate of Industrial Liaison--were `held up' by U.S. reexport requirements, Nukem officials were quoted as saying in the report.

The U.S. will not pay more attention to proliferation concerns in Germany, Western diplomatic sources in Bonn said. However, the sphere of influence of U.S. proliferation officials in Germany will be limited because other foreign policy issues--primarily modernization of Lance missiles stationed in Germany--will take precedence.

U.S. officials are also said to be taking a wait-and-see attitude regarding German pledges to tighten nuclear export controls (Nucleonics Week, 5 Jan., 3).

While proposed export restrictions might `put smaller fry like NTG out of business,' one source said, non-proliferation officials are skeptical that larger nuclear establishment firms--such as Leybold Heraeus GmbH--will be penalized. The future prosecution of Leybold Hereaus management for its role in exporting sensitive high-enriched uranium centrifuge equipment to Pakistan in 1987 is viewed by U.S. officials as a litmus test of German will to punish nuclear proliferators, sources said. The U.S. `will keep bringing up this case,' one source said. German justice officials said the case is presently mired by problems of international law surrounding the alleged theft of Urenco enrichment know-how.

Diplomatic sources also said that the U.S. is looking for an avenue to exert `more direct influence' on officials in the Economics Ministry responsible for export control. One 1986 interoffice memo penned by an Economics Ministry official said that U.S. communiques warning of planned nuclear exports to South Asia `usually land in my wastepaper basket.'

--

--

[Page: S5440]

German Firm's Exports Raise Concern About Pakistan's Nuclear Capabilities

(BY MARK HIBBS)

Information obtained by Nuclear Fuel about West German nuclear exports to Pakistan provides indirect evidence of intensified nuclear weapons research by the Pakistan Atomic Energy Commission (PAEC), Western experts said.

Because Pakistan does not appear to possess technology to detritlate heavy water, German criminal justice officials are puzzled about the purpose of a tritium gas storage and purification plant provided in 1987 by the German firm NTG Nukleartechnik GmbH (NTG), now called NTG Neuetechnik, (NF, 6 Feb., 7). `It is a subject we have been thinking about every day,' said Hanau prosecuting attorney Reinhard Huebner.

According to western experts, however, Pakistan may want to irradiate lithium-6 targets--perhaps in an unsafeguarded research reactor--to obtain weapons-significant amounts of tritium gas. The plant provided by NTG, they said, would be capable of purifying this tritium gas to 98% as alleged by suspects' confessions in the case.

In amounts of about 4 to 5 grams, tritium, the heaviest hydrogen isotope, is used as a booster in a fission nuclear weapon.

Information obtained by Nuclear Fuel about the plant design indicates that the tritium facility erected and tested in Pakistan would not be capable of separating hydrogen isotopes present in impure tritium gas extracted from heavy water. This `effectively eliminates' the possibility that the plant is used to purify gas obtained by detritlating heavy water from the Kanupp reactor, one expert said.

In addition to the tritium isotope of hydrogen, `dirty' tritium gas obtained by detritiating heavy water contains large amounts of deuterium, as well as normal hydrogen. The three hydrogen isotopes must be separated in order to extract pure tritium.

Although U.S. proliferation officials repeatedly warned Germany about Pakistani intentions to acquire heavy water detritiation technology and although German export control officials indeed approved an application by NTG to export a heavy water detritiating plant to Pakistan (NF, 26 Dec. '88, 1), justice officials have no evidence that such a plant was exported to Pakistan.

The plant confirmed to be in Pakistan could, however, purify the gas product obtained from irradiated lithium-6 targets, since separation of hydrogen isotopes would not be required. Bombarding lithium-6 with neutrons produces an end product of tritium, large amounts of helium-3 and helium-4. `Pakistan is irradiating lithium targets,' one U.S. expert said, `the German plant could give them a basically pure tritium product.'

Western experts said that U.S. proliferation officials have been concerned for several years about the possibility that Pakistan was interested in procuring targets or lithium-tritium technology. A U.S. note to the German Foreign Office from March 13, 1986 expressed the concern that Pakistani agents in Germany were operating on the `international market' to be

able to procure `tritiated targets' which could be used `at the Pinstech plant in Rawalpindi' to extract pure tritium.

Export documents indicate that prior to this date German officials approved exports of sub-kilogram amounts of lithium metal and lithium aluminum hydride to Pakistan and India. But according to officials from the Federal Ministry of Research & Technology (BMFT), which evaluated the export applications, the quantities exported were too small to have nuclear application.

Production of tritium via lithium requires bombarding the lithium-6 isotope with neutrons in a reactor. Western experts said, however, that it was not likely that PAEC would use the Kanupp heavy water reactor, which is under IAEA safeguards, for this purpose.

An official at the IAEA said that while heavy water at Kanupp is safeguarded along with reactor fuel, the control rods are not explicitly checked. `From a safeguards point of view irradiation of lithium at Kanupp would be a theroretical possibility,' a U.S. safeguards official said.

But experts queried said circumstantial evidence points instead to the possibility that Pakistan may want to irradiate lithium-6 at an unsafeguarded, unknown research reactor. Because of the low melting point of the aluminum used in target cladding, irradiation in a Candu reactor core--where temperatures above 500 degrees F obtain--would also be undesirable, experts said.

One expert recently at PAEC said that Pakistan might be building a 50-MWt research reactor which could produce plutonium with a few high-enriched uranium `driver' rods in the core, but which could also be used to irradiate lithium targets. PAEC is `very proud' of its present capabilities in enrichment, reactor technology, and fuel fabrication, the source said. `I have no doubt PAEC has the means' to build the plant, he said.

Indirect evidence for the plant is provided by testimony in the NTG affair obtained by NuclearFuel.

Confessions of key suspects and documentary evidence indicates that NTG supplied `know-how for design and constuction' of a `small, pool-type' research reactor which prosecutors said might not yet have been completed or erected. In 1987, NTG also supplied aluminum rods and tubes for this reactor.

According to information from Bonn export officials, during 1987, Inam Ul-Haq, identified by intelligence sources as a buyer for PAEC, attempted to buy 30 metric tons of aluminum tubing for the firm Multinational Incorporation in Lahore, Pakistan. A German firm unsuccessfully attempted to export the tubing to Pakistan via Italy, sources said.

Western experts said that the aluminum obtained by PAEC would be useful as cladding material for lithium-6 targets. Aluminum tubes are used for cladding because lithium-aluminum bondings are more chemically stable than lithium-zircaloy bondings.

Western experts believe that it would not be difficult for Pakistan to acquire the technologies to enrich the lithium-6 isotope in lithium metal (over 90% of which naturally occurs as lithium-7) and then bond the cladding to the lithium. The process technology for the final step prior to purification--extraction of tritium gas from irradiated targets--calls for melting the targets in a high-temperature vacuum oven. Details are considered classified information in established weapons states, but engineers in Pakistan `could figure it out without too much difficulty,' one weapons expert said.

According to documents, NTG exported to PAEC a high-temperature vacuum oven in 1987.

Beyond expertise for an unsafeguarded reactor, documents also reveal that PAEC also illegally obtained from NTG about 7,000 kilograms of fuel cladding material for Kanupp, the document indicate. This was procured in India and then shipped via Germany to Pakistan, falsely declared as stainless steel tubing and not reported to German export control officials. Because of the word `nuclear' in the full name NTG, Pakistani agents `expressly requested' that the tube transfers be handled by Physikallsch-Technische Bundesanstalt (PTB), a consulting firm under contract to NTG, according to the West German documents.

--

--

[Page: S5441]

From Der Spiegel, Feb. 20, 1989

[FROM DER SPIEGEL, FEB. 20, 1989]

Nuclear Exports to Pakistan Reported

Pakistan has the ability to build the atom bomb. West German firms supplied parts and know-how.

The laboratory is hidden in a desert at the foot of the Kashmir mountains. Anti-aircraft artillery protects the area, soldiers guard the doorways into and out of the laboratories, storehouses, and underground vaults.

In the laboratory, generators whir, selected scientists operate highly sensitive aggregates; measuring instruments, vacuum pumps, and automated precision tools work around the clock.

In the nuclear plant, which forms part of the nuclear center of Pinstech near Rawalpindi, elements for the Islamic bomb are produced in strict secrecy--with machinery made in Germany.

The German equipment--for the time being the last delivery--was tested on site by Peter Finke, 45, on behalf of the Gelnhausen-based firm New Technologies (NTG). In July last year, the physicist showed his Pakistani colleagues for 2 weeks how to operate the complicated glove-compartment plant for the recovery of tritium.

Since then the scientist (`I am a pacifist') has had pangs of consicence; possibly the equipment could be `converted,' he says. He stresses that anyway, a `pure training plant' was supplied--allegedly, in order to clean the tritium-contaminated Pakistani nuclear reactor in Karachi, which is, however, 1,100 km away.

Radioactive tritium is sold on the international black market of weapons-grade nuclear products at even higher prices than plutonium. A few grams of this gas are sufficient to increase the power of an explosive `substantially,' says nuclear weapons scientist Gerhard Locke, 56, of the Euskirchen Fraunhofer Institute. Therefore, `the second bomb generation of the lighter type' cannot do `without tritium,' he says.

However, the artificially produced superheavy hydrogen decomposes quickly into helium. Therefore, it must be constantly renewed.

That is precisely what the NTG plant can do: Every day, five grams of tritium can be recovered--a quantity which according to Locke is `incredibly large.' That is why Albert Farwick, chief of the Nanau public prosecution which is investigating NTG, considers `some civil use practically inconceivable.'

There is no doubt that Munir Ahmed Khan, chief of the Pakistan Nuclear Authority, with whom Finke already had a cup of tea, has secretly developed his country into a nuclear power; the bomb puzzle is complete. He had many individual parts--ranging from transformer sheets to uranium conversion--supplied by small West German firms, using a network of agents to this end.

The special pipes and supersolid steel from Singen and Saarbruecken, the mass spectrometers and magnets from Bremen and Bonn were made-to-measure for Khan's program which is carried out in a number of nuclear centers:

In Rawalpindi, where in addition to the bomb plant, a 24-year-old U.S. research reactor is in operation and a reprocessing plant produces about 20 kg of plutonium every year;

In Kahuta, Abdil-Kadir Khan, who is admired as `the new Einstein,' meanwhile has produced more than 100 kg highly enriched weapons-grade uranium, using ultra-highspeed centrifuges;

At the Dera-Ghazi-Khan center, natural uranium is pulverized and converted into uranium hexafluoride, the initial product for further processing, in three conversion plants supplied by the Freiburg businessman Albrecht Migule for DM15 million.

The Pakistani `atom shopping' has often had Bonn's official approval. The Federal Economics Office (BAW) in Eschborn approved the export of an electronically controlled miling machine of the Munich-based Friedrich Deckel AG, which a secret U.S. study assesses as `extremely useful' for the `production of elements of a nuclear explosive system;' the Economics Ministry rejected as `unacceptable and irrelevant' the U.S. demand to guarantee that the machine not be used in the nuclear industry.

The export of a special press to compact hard-metal powder, which was supplied by Dieffenbacher GmbH & Co in the Swabian town of Eppingen in 1985, was also approved, even though the purpose of the machine (price DM1.3 million) was not kept secret. The responsible officials knew that the isostatic hot press was intended `for use in an ammunition factory for the manufacture of heavy-metal cores for projectiles.'

What types of cores could be meant was discovered post facto by experts of the Federal Research Ministry: `A highly efficient nuclear explosive' must be compressed to the largest possible extent, and `the easiest way' to achieve this is by using a press that is hardly different from the Dieffenbacher model.

The press and the milling machine, made in Germany, were so-called dual-use goods that can also be used for peaceful purposes and are therefore not contained in the embargo lists. However, the U.S. Administration had warned Bonn in time about such deals. U.S. intelligence services reported in 1979 that with the blueprints that he stole in Almelo, in the Netherlands, Abdil Khan was now in a position to build a uranium enrichment plant. To this end, he would buy `equipment on the European market,' they said.

U.S. President Jimmy Carter wrote to Chancellor Helmut Schmidt at the time that `we must be careful and prevent this program from beng completed.' U.S. experts specifically went to Bonn to instruct the responsible officials. They told them that two firms, the Hanau-based Leybold-Heraeus and the Renningen-based Team Industries, were already `doing business.'

Several weeks later, two managers of the enterprises mentioned informed the Economics Ministry that the deals had been carried out. Team Industries had just shipped 31 frequency converters to Pakistan, highly sensitive instruments that are used for the power supply of uranium centrifuges. Leydold-Heraeus manager Gotthard Lerch reported that his firm had supplied valves, vacuum pumps, brazing furnaces, measuring instruments, and a gas purifying plant `in the past 3 years'--together `worth DM1.3 million.'

Lerch also said that of course, `it cannot be totally ruled out' that such instruments are useful in a uranium enrichment plant. He said that in the future he will `keep an eye on the aspect of possible use.'

He did so. Meanwhile, the Cologne public prosecution is investigating Lerch, because he allegedly smuggled cases of blueprints for the building of a uranium centrifuge out of the Federal Republic. At the same time, he had a number of special instruments copied in Switzerland, the investigators say. The individual parts, which were declared `cooper pipes, boilers, and crane girders,' were transported across the French border by truck and were

shipped in Air France planes from Lyon via Dubai to Pakistan.

The deal attracted attention after Swiss customs officers seized three specially large vacuum containers, so-called autoclaves.

The proceedings against Lerch have been dragging on for 2 years now. Only one West German exporter has been punished because of illegal nuclear exports to Pakistan: Albrecht Migule.

Quoting the Nuclear Nonproliferation Treaty, the judges said at the time that `owing to a law enforcement deficit, the FRG must accept being accused of having failed to meet its contractual obligations.' They added that `the goals' of the nuclear nonproliferation treaty have been `attacked,' because the authorities made it so easy for Migule that he did not have to proceed `particularly cleverly.'

SPD Bundestag Deputy Hermann Bachmaier says that `the motto by which people in the Federal Economics Ministry work appears like a red thread in the files: You never hear anything, you never see anything--and in particular, you never block anything.' Bachmaier, who heads the Bonn Nuclear Investigation Commission, says: `Our doors are just open.'

The Karlsruhe Nuclear Research Center (KFK), which is 90 percent government-owned, also was involved in unrestrained exports. The KFK scientists supplied to their colleagues in Rawalpindi parts of a mass spectrometer, without which it is impossible to determine the degree of uranium enrichment. They trained Pakistani scientists, and even allowed one of them to visit their sanctary--the `hot cells' where plutonium is separated, and they passed on valuable know-how.

Even the Economics Ministry found the close contacts between Karlsruhe and the Pinstech laboratories `astounding.' The ministry said that whereas `constant efforts are being made to inhibit the Pakistani nuclear program,' the KFK `maintains very close contacts with relevant Pakistani authorities to convey know-how for just this nuclear program.' No conclusions were drawn.

The same thing happened when roughly 100 kg of specially hardened steel was shipped from Bremerhaven to Karachi on 9 August 1985. The hot goods on board the `Nedloyd Everest' were just being shipped across the Red Sea, when it dawned on the German authorities that it might perhaps be the so-called maraging steel of Arbed Saarstahl, which is subject to approval and is indispensable for the inside casing of uranium centrifuges, the rotors. The investigators later wondered why `so much fuss' was made about the shipment which involves a number of minor order addresses; however, the proceedings were discontinued.

No matter whether computer systems where involved that can be used for the `control of weapons systems,' highly sensitive electronic hardware or ring magnets which according to reports of the Federal Intelligence Service just corresponded to the dimensions of the Pakistani high-speed gas centrifuge of the second type (German version). A coincidence? The officials in the Bonn Economics Ministry always felt pestered, instead of feeling challenged

to intensify their checks, when the Foreign Ministry passed on secret documents of U.S. intelligence services warning about planned deliveries.

Such `anonymous papers usually end up in my wastebasket,' Buenter Welzien of the Federal Economics Institute furiously wrote to the Economics Ministry, wondering whether Bonn had `ever bombarded the Department of Commerce in a similar way?' Even when the Americans asked Bonn to find out about negotiations conducted by German firms on the possible sale of so-called cryotons--tiny electronic elements with which the time a bomb detonates can be determined with an accuracy of one-millionth of a second--the Federal Economics Ministry's reaction was particularly rough. A responsible official called Spies scribbled on a piece of paper: `I reject such employment measures on principle.'

However, the request had not been that absurd, after all. Rudolf Maximilian Ortmayer, at the time NTG manager, reportedly also negotiated in Pakistan with a man called Sulfikar Ahmed Butt--the very Pakistani who had attracted attention in the United States when he was trying, via agents, to purchase 50 cryotrons from EG & G Inc. Wellesley, Massachusetts, the only producer in the world. Butt, who is considered to be the chief buyer for the Pakistani bomb builders, reportedly presented to Ortmayer a comprehensive wish-list.

However, the negotiations were only more specific regarding tritium: Butt ordered 10 grams.

The nuclear buyer soon was not interested any more in the heavy water clearing plant that the Pakistanis initially planned to buy, although Ortmayer had engineered everything so nicely to legalize the deal. He invited the responsible official of the Federal Economics Institute, Manfred Ruck, and the Bonn expert spies to see him in Gelnhausen. Having a glass of sherry, the gentlemen discussed the export wishes.

Ruck wrote to his colleague Spies that the plant is absolutely harmless, comparable, `in a figurative sense, to a drinking water treatment plant.'

The application was approved.

--

--

[Page: S5442]

From Defense & Foreign Affairs Weekly, May 15-21, 1989

[FROM DEFENSE & FOREIGN AFFAIRS WEEKLY, MAY 15-21, 1989]

Pakistan Perfects N-Detonator, China Helps

Sources close to the Pakistani nuclear program have revealed that Pakistani scientists have now perfected detonation mechanisms for a nuclear device. Islamabad has successfully produced bomb casings which can withstand the buffetting of high speed flights. Such as device, it is learned, can be delivered by Pakistan's F-16s. It has been further learned that China is making arrangements for a Pakistan nuclear test, most likely at its Lop Nur testing ground. Over the past two years Pakistani scientists have been producing enriched uranium at the Kahuta plant. Pakistan's success has been made possible to a large degree by China. Informed sources have told the *Weekly* that China continues to help Islamabad in its nuclear ambitions. Chinese scientists have been visiting Kahuta and Pakistani scientists have been reciprocating the visits.

U.S. CANNOT HALT INDIAN, ISRAELI MISSILE PROGRAMS

US Assistant Secretary of State Allen Holmes has told the Senate subcommittee on defense industry and technology that Washington can do little to rein in the Indian and Israeli missile programs. Holmes is reported to have said that both New Delhi and Tel Aviv had developed indigeneous missile programs, with marginal external support and Washington would have little or no leverage over the two respective programs. Meanwhile Senator Jeff Bingaman has been pressing US Commerce Secretary Robert A. Mosbacher to bar the sale to India of US ballistic missile testing equipment that he fears will directly aid that country in the development of its *Angi* ballistic missile, which has a range of 1,500 miles. The *Weekly* has learned that missile proliferation will be a major issue to be discussed between Secretary of State James Baker in his meetings with Soviet Foreign Minister Eduard Shevardnadze in Moscow later this week. Washington is expected to press the USSR to reconsider joining a seven nation Western undertaking to end the sale of ballistic missile technology to developing nations. The Bush administration is taking the missile proliferation issue very seriously and Washington is expected to remind Moscow that the Soviet Union has been `primarily responsible' for the delivery of thousands of Soviet-made *Scud* missiles over the past decade ot Iran, Egypt, Libya and Syria. US officials are hopeful that Moscow will agree to impose unilateral restraints because of growing Soviet concern about the proliferation of missiles capable of reaching Soviet territory in a number of countries including Israel, Saudi Arabia, Iraq and Iran.

--

From Nuclear Fuels Magazine, Feb. 6, 1989

[FROM NUCLEAR FUELS MAGAZINE, FEB. 6, 1989]

German Firms Exported Tritium Purification Plant to Pakistan

(BY MARK HIBBS)

Two West German firms exported to Pakistan between 1985 and 1987 a plant for storage and

purification of large amounts of tritium gas, according to German federal prosecuting attorneys. The firms, Ncue Technologien GmbH (NTG) and Physikalisch Technische Beratung (PTB), have been under investigation since late last year on suspicions they violated German law (NF, 26 Dec.'88, 1).

Tritium gas can be used in nuclear fission weapons as an igniter or as a booster--the latter typically using about four grams of tritium gas. In microgram amounts, tritium also has civilian uses, such as in the watch industry and in medical research.

Industry experts queried by NuclearFuel, concurring with German prosecutors, said a civilian use for such a plant in Pakistan is difficult to imagine.

Moreover, 0.8 gram of tritium was exported illegally from Germany to Pakistan via Hong Kong to be used to leak-test the tritium plant. Part of that tritium was of Soviet origin, while the rest was produced from U.S.-origin heavy water in a German reactor.

Reliable sources said that prior to startup of the purification plant, Pakistani agents had tried unsuccessfully to import from a German firm at least 300 liters of tritium gas corresponding to about 65 grams of pure tritium at standard temperature and pressure.

Alfred Farwick, senior federal prosecuting attorney in Hanau, revealed details of the plant export January 26 in a closed session of the Bundestag (parliamentary) committee investigating the activities of German nuclear firms.

Hanau prosecutors have been investigating nuclear exports since they received information last fall that top officials from at least two companies, NTG and PTB, were believed to have violated the German Foreign Trade Act by exporting sensitive nuclear equipment and nuclear-related material to several non-NPT countries.

The plant installed in Pakistan can purify tritium gas contaminated with helium-3, oxygen, and deuterium, sources said. Experts explained that `dirty' tritium gas, stored on large absorber beds, is heated and passed through a uranium filter that captures the impurities by forming metal hydrides, yielding 98% pure tritium on the other side of the filter.

According to information obtained by German prosecutors, the total holdup capacity of the purification plant sent to Pakistan is 100,000-240,000 curies of tritium gas. Industry sources suggested that the daily throughput of the plant would be approximately 5,000-10,000 curies, the equivalent to production of 0.5-1.0 gram / day of pure tritium gas. One source said this would be an `enormous amount for a country like Paskistan.'

The plant would be able easily to purify all the tritium gas--estimated to range anywhere from 200,000 to 2-million curies--present in the heavy water moderator system of the 137-MW Kanupp reactor--Pakistan's sole official potential source of tritium.

The large size of the plant is fanning speculation that Pakistan may have sources of unsafeguarded heavy water, since purification of tritium gas distilled from all Kanupp's

heavy water would take only 200 days at the plant's nominal throughput of 10,000 curies / day. Experts said it would be extremely unusual to detritiate an entire heavy water inventory in a single step. The plant, one industry official alleged, would be `big enough to accommodate' the western world's total annual civilian requirement for pure tritium gas. `I can't believe that a plant that size can have a peaceful use in Pakistan,' he said.

Western experts are puzzled, however, about the absence of direct evidence that Pakistan has acquired the technology necessary for detriatiating heavy water--a key link in the process chain which starts with tritium-contaminated heavy water and ends with `clean' heavy water and purified tritium gas as a byproduct.

When heavy water is used as a moderator for natural uranium reactors, it becomes contaminated with tritium over time and must be decontaminated using cryogenic distillation technology--a `sophisticated affair,' one western engineer said. `Pakistan would have little use for a tritium gas purification plant if it didn't have the upstream technology to detritiate heavy water,' he said.

So far there is only indirect documentary evidence that Pakistan has acquired heavy water detritiating technology. In 1984, NTG informed the Bonn government it planned to export a `heavy water purificiation plant' to Pakistan (Nucleonics Week, 5 Jan., 3). Sources said the matter led to a dispute between the Economics Ministry, which controls nuclear exports, and Foreign Office officials who had been asked by the U.S. government to intercede, after U.S. intelligence got wind of the planned export. Washington believed two firms--Linde AG and Sulzer--may have been involved in the planned export to Pakistan.

Despite the U.S. appeal, in September 1985, the Federal Economics Office (BAW) ruled officially that a license was not required for export of a `heavy water purification plant' to Pakistan.

While prosecutors said the tritium plant in Pakistan cost about DM 2.5-billion ($1.4-million), a Bonn legislator said the total value of the planned tritium technology export was about DM 13-million ($7.2-million). The difference might be accounted for by the more expensive upstream detritiating equipment, an industry source said.

According to prosecutors, although PTB director Peter Finke went to Pakistan to test-operate the completed facility, Finke said he was never told, and could not ascertain, the facility's precise location. Finke said he concluded, however, that it was not in the vicinity of the Kanupp reactor.

Prosecutors are now investigating the German source of Pakistan's tritium technology. The staff of one German nuclear research center may have been involved, as well as a former employee of Nukem GmbH who had access to tritium process technology because of a previous tritium joint venture. A scientist at the Maz Planck Institute for Plasma Physics in Garching is also said to have contributed to Pakistan's tritium expertise.

The 8,000 curies of pure tritium gas used to test-operate the plant in Pakistan were obtained

for PTB from a German heavy water reactor and from the USSR by two other firms: Gutekunst, a manufacturer of liminous paints in Schwennigen, Germany, and chemical isotopes company Radium-Chemie AG of Teufen, Switzerland.

Sources said it is unclear where Pakistan might obtain impure tritium gas to feed into the purification plant. Large amounts of deuterium in the `dirty' gas would point to an unsafeguarded heavy water supply in Pakistan, one expert said. Large amounts of oxygen in the feed gas, however, would indicate that Pakistan is producing tritium gas by bombarding lithium-6 targets in a reactor with alpha particles--a technology used by nuclear weapons states. This could mean, according to one source, that Pakistan has constructed a secret unsafeguarded reactor.

--

[Page: S5443]

Germany May Have Approved Exports by Prosecutor To Be Illegal

(BY MARK HIBBS)

Some nuclear-related exports from West Germany to non-signatories of the Nuclear Non-Proliferation Treaty (NPT) apparently were offically sanctioned by the German bureaucracy amd supported by legislators in the Bundestag. At least two of the items originally alleged to have been exported illegally--a tritium extraction plant sent to Pakistan and an ultrasound fuel testing device sent to South Africa--may have left Germany quite legally, the latest information indicates.

On December 21, the senior federal prosecuting attorney in Hanau, Alfred Farwick, announced that suspects from the firm NTG-Neue Technologien GmbH (NTG) and the nuclear consulting firm Physikalisch-Technische Beratung (PTB), `illegally exported nuclear technology to Pakistan without the required permits' from the Federal Economics Office (BAW), an arm of the Federal Ministry of Economics in Bonn (NF, 26 Dec. `88, 1; Nucleonics Week, 5 Jan., 3). NTG was known until 1986 as NTG-Nukleartechnik GmbH. The firms were said also to have exported various nuclear equipment and technology to India and South Africa.

Since the, more suspects have signed confessions and the official investigation has widened to other parties, reliable German sources said.

Last week, Federal Minister of Environment and Nuclear Safety (BMU) Klaus Toepfer suspended the nuclear licenses of a third firm, Gutekunst, after Hanau prosecutors said it may have been involved in procuring tritium gas and nuclear technology for PTB and NTG, possibly in another country.

According to confessions leaked to the conservative daily Die Welt last week, another small trading company called Rieckermann in Hamburg served as an NTG broker with Pakistan. In addition, former directors of NTG and PTB were said to have been in Pakistan about 20 times until agreement was reached on terms for the export of tritium extraction equipment and 300 liters of tritium gas. According to officials from BMU, much less tritium--about 8,000 curies, or just under one gram--was actually delivered from Germany.

U.S. officials knowledgeable about nuclear weapons technology said that one gram of tritium would be far more than Pakistan would require for commercial purposes, but just under the quantity needed for use in a nuclear weapons.

Officials in Bonn called on the Pakistan embassy last week, after suspects alleged that the former Pakistan ambassador to Germany acted as a courier between the exporting firms and agents in Pakistan. A spokesman for Chancellor Helmut Kohl said that as the present Pakistan ambassador claimed he knew nothing of the matter, Bonn would not take further diplomatic action for the time being.

The ultrasound device for fuel fabrication exported to South Africa--termed `measuring technology' in the prosecutors' original report on December 21--appears to be a fuel clad quality control device manufactured and supplied by Nukem GmbH.

The so-called ROTA-25 ultrasound testing device, used to check the neutron porosity of zircaloy fuel cladding, was supplied by Nukem to yet another small German firm, GASA, which did a large volume of business with South Africa before filing for bankruptcy last fall. According to company officials, Nukem Knew the equipment was destined for South Africa and assisted in making the device operable after it was delivered. Nukem cleared the sale with federal export control officials at BAW, who ruled on March 8, 1985 that no export permit was necessary.

Nukem officials said direct military use of the Nukem technology by South Africa is `out of the question.'

The export of a tritium extraction plant to Pakistan may also have been legal. According to information obtained by Nuclear Fuel, NTG informed Bonn in 1984 of its plans to export heavy water purification technology to Pakistan. The planned sale led to a dispute between the export-promoting Economics Ministry and the Foreign Office, responsible for ensuring Gemany's commitment to nonproliferation.

A senior U.S. State Department official told Nuclear-Fuel last month that Germany `has always shared our concern about the potential for illegal exports to unsafeguarded programs and has been fully cooperative.' However, documents in the case show that Washington's plea to block the export of tritium technology was rejected by the German bureaucracy.

In a message dated March 13, 1986, the State Department said an export of such technology to Pakistan from a U.S. firm `would not have been approved' and urged Bonn to block the

sale. The German Foreign Office, fearing the export would damaged Germany's nonproliferation credentials, encouraged the Economics Ministry to block the export.

An Economics Ministry note dated April 25, 1986, said that NTG management had requested the firm not be named in discussions of the delicate export license matter. They said NTG management feared terrorist reprisal if it became known the firm was negotiating to export nuclear technology to Pakistan.

Nonetheless, NTG's planned export of tritium technology to Pakistan appears to have been no secret to federal legislators. On May 7, 1985, a Christian Democratic (CDU) Bundestag MP from the state of Hesse (where the firm is located), wrote to Rudolf Sprung, parliamentary state secretary in the Economics Ministry, urging support of the NTG export to Pakistan in the interest of local jobs.

--

From Hamburg DPA, Jan. 30, 1989

[FROM HAMBURG DPA, JAN. 30, 1989]

Firm Said To Export Missile Components to Libya

Karlsruhe (DPA)--Highly valuable missile components have been transported to Libya according to a report in the `BADISCHE NEUESTE NACHRICHTEN' (BNN) via a firm in northern Baden. As the newspaper, which is published in Karlsruhe (Tuesday edition) [31 January] reports, quoting Gustav Eduard Michaelis the president of the Karlsruhe Finance Office, this illegal export was discovered last year by customs investigators. As investigation was started on the possible violation of the law on the control of weapons of war.

Out of concern for the enquiries which were still in progress, the Karlsruhe Higher Financial Directorate refused to give further details on the extent of the arms dealing. The name of the firm was also not given. This is not the only occurrence of transportation of weapons to Libya through northern Baden, the paper quotes Michaelis as saying.

--

From Hambury Der Spiegel, Jan. 30, 1989

[FROM HAMBURY DER SPIEGEL, JAN. 30, 1989]

Companies Exported Beryllium to India

[Excerpts] Bonn authorities permitted the export of beryllium to nuclear-weapons-possessing India in 1984. Beryllium is used for constructing bombs.

[passage omitted]

According to sub-paragraph 0112 of Bonn's `export list B,' which is intended to prevent exports of nuclear goods that can be used for the production of weapons to problematic countries, the export of beryllium is classified as strictly requiring an export license. However, as is coming to the surface now, in the spring of 1984, the Hanau-based Degussa company is suspected of having exported 95 kg to India, of all countries, a country that has nuclear weapons-and Bonn had `non objections.'

The deal which was authorized by the authorities of the then Economic Minister Otto Graf Lambsdorff (FDP), and Foreign Minister Hans-Dietrich Genscher, might become the cause of new irritations in FRG-U.S. relations. As can be learned from the application papers, which Der Spiegel has, the bulk of the material came from the United States; as middleman, Degussa passed the hot goods on to India.

The transaction took place at a time when, internationally, the rumor was growing stronger that, after its atomic bomb, India was about to develop its own hydrogen bomb. The delivery was forwarded to an address, which, according to FRG nuclear researcher Gerhard Locke, is `most suspicious': The Bhabha Atomic Research Centre (BARC) in Trombay, north of Bombay.

This center likes to boast its nuclear developments in the fields of medicine and agriculture. However, the Indians are less ready to supply information concerning the military part of their research.

International safeguard controls have no access to information regarding the amount of plutonium--the stuff of which the bomb is made of--the nuclear reactors in Trombay breeds. What is certain is that the material for India's first nuclear explosion in 1974 was provided by Trombay. U.S. experts estimate its present plutonium production at some 25 kg per year.

What is strange is that by consenting to the Degussa deal on 15 May 1984 with a specific form, the ministries in Bonn discarded any `suspicion of abuse of beryllium for nuclear purposes.' Last week, Degussa itself, parts of the shares of which are held by a subsidiary of the Henkel Washing Powder Company and Dresdner bank, did not find anything objectionable to the deal with India. According to company spokesman Joachim Nimtz, the delivery `was carried out with the permission of the authorities.'

On 21 October 1983 the Federal Economic Office (BAW) accepted the first of two applications for exports by the Hanau enterprise. Only 4 months previously, in June 1983, the Reagan Administration had stopped all U.S. deliveries of this kind to India--at that time secret intelligence services noticed intensive efforts by India to start a second nuclear test, possibly with a hydrogen bomb.

Similar reports were spread by the Federal Intelligence Service (BND) almost 2 years later. The `BARC Nuclear Research Center In Trombay,' the BND warned in a classified report of May 1985, has been ordered by the Indian Defense Ministry to `continue work on developing

a nuclear fusion weapon (hydrogen bomb).'

In its application for exports, Degussa put under the heading `use' `research and development work' in smelting, compressing, and casting of beryllium, which is often used for alloys. Material of `high purity'--at least 98 percent--had been ordered. Degussa added a telex of the Indian Nuclear Ministry [title as published] to the documents for the application. In this telex a government representative claimed that India does `not have any program for the production of nuclear weapons.'

According to experts, the amount of beryllium ordered at that time makes sense: 95 kg--this is `a manageable amount for about 20 bombs,' arms researcher Locke says.

In building a hydrogen bomb, the metal can be put around the radioactive core as a sheath. The desired effect: According to Locke, the neutron-multiplying properties of the relatively cheap beryllium reduce the demand for valuable plutonium `by a factor of about two.'

The Bonn experts cannot have ignored this possibility of use: experts of the FRG Research Ministry expressly warned against the fact that the metal can `be used as a neutron reflector for the construction of nuclear weapons,' when they had to deal with an application for the export of 60 kg of beryllium nitrate to India in February 1980.

Only because--as the BAW calculated--`at the most 2.637kg' of pure beryllium can be produced from the nitrate was the permit issued at that time.

The Research Ministry experts noted that for the building of bombs India needs `amounts ranging in kilograms'. These were delivered 4 years later--almost 100kg.

--

--

[Page: S5444]

From the New York Times, May 7, 1989

[FROM THE NEW YORK TIMES, MAY 7, 1989]

Norway Details How Heavy Water Went to India

(BY SANJOY HAZARIKA)

New Delhi, May 6: Norwegian investigators say they have evidence that material that could be used in the manufacture of atomic weapons was illegally shipped to a Bombay company in 1983. The company is listed in the Bombay telephone directory as an affiliate of the Indian Government's Department of Atomic Energy.

The Norwegian investigators say their evidence of the shipment, involving 21 tons of deuterium oxide, or heavy water, is a document and a statement from a witness. But the chairman of India's Atomic Energy Commission, M. R. Srinivasan, denied that such a transaction had taken place.

`At no stage have we bought heavy water from Norway,' Dr. Srinivasan said in an interview. `We do not know the veracity of these documents; we have not had anything to do with Norway. We are one of the most important producers of heavy water in the world and we do not have any imports except from the Soviet Union.'

It has been previously reported that India obtained heavy water from Norway and the Soviet Union, but this is the first time that Norway has given details of the company that they said received the shipment at Bombay.

Norwegian officials say they have the original flight document that traces the shipment from Oslo to Basel in Switzerland and then to Dubai in the United Arab Emirates and finally to Bombay. They are also relying on testimony by a man hired by a West German company to accompany the cargo.

Under the Nuclear Nonproliferation Treaty, shipments of more than one ton must be reported to the International Atomic Energy Agency and put under safeguards if shipped to countries like India, which has not signed the treaty. That was not done in the case of the 1983 shipment.

Heavy water is used in reactors to slow the neutrons emitted in nuclear fission to a speed at which they cause additional fissions. Ordinary water can also be used, but it absorbs neutrons and therefore requires use of enriched uranium, which is expensive and difficult to make. With heavy water, reactors can run on natural uranium. Reactors using uranium produce plutonium, a bomb fuel, as a byproduct.

Plutonium is also used to start new atomic reactors, and Dr. Srinivasan, the nuclear official, has said that critics who say that India is diverting the material to a nuclear arms program overlook this point. In an interview last year, he said that 50 kilograms of plutonium were used in 1985 to start up a new `fast breeder' test reactor that uses raw material available in India.

Although most of India's nuclear plants are not open to international inspection, New Delhi has denied having a secret weapons program. Its capability of building a nuclear weapons system was shown, however, when it exploded what it called a peaceful nuclear device in 1974.

Norway said a West German company, Rohstoff Einfuhr, bought 15.18 tons of heavy water from Norway in 1983, flew it to Basel in Switzerland by West African airlines. Then, with the addition of six tons of Soviet heavy water, it was flown to Dubai and India. The consignment landed in Bombay, the Norwegians said, about Dec. 7, 1983.

The Chief Public Prosecutor for Oslo, Anstein Gjengedal, who is leading the investigation of the shipment, said in a telephone interview that he did not know whether the destination was an Indian Government department.

`All I have is an address in Bombay, not a name, and we have found this address on a freight document written in West Germany and we still do not know if this is the end user,' he said.

Mr. Gjengedal said the address on the freight consignment document listed the Directorate of Purchase and Stores at Palton Road in Bombay as the consignee. He quoted a West German national who reportedly accompanied the flight to India as saying that the consignment was `handed over to this address.'

A visit to the address given by the Norwegians showed that the department had moved. A security official at the Directorate's office said the office was move `three or four years ago.' The Bombay telephone directory lists the Directorate under a listing for Central Government offices of the Atomic Energy Dpartment.

--

--

From Jane's Defence Weekly, Apr. 22, 1989

[FROM JANE'S DEFENCE WEEKLY, APR. 22, 1989]

Controlling the Spread of Ballistic Missiles

(BY BARBARA STARR)

CIA Director William Webster predicts that by the year 2000, at least 15 nations will be producing their own ballistic missiles.

`Although missiles being developed by these countries are somewhat crude and inaccurate, many of them have capabilities well beyond battlefield range and can strike in a matter of minutes,' Webster said.

He did not identify the 15 countries, in a speech following Congressional testimony in which he warned of the proliferation of nuclear, chemical, and biological weapons, especially in the Middle East.

Webster says as many as 20 nations are developing chemical weapons and 10 countries are working to produce biological weapons.

As missile attacks on cities in the Gulf War accelerated in the 1980s, seven industrial nations

announced a new effort in April 1987 to curb the transfer of technology that could enable other nations to develop ballistic missile systems.

Yet since the formation of that Missile Technology Control Regime (MTCR), a seemingly unstoppable number of nations have continued to proceed with development of long-range missiles capable of derlivering nuclear warheads, as well as chemical or biological weapons.

The MTCR attempts to control missile technology exports through the co-ordination of the seven member nations: the United States, Canada, France, the UK, Italy, Japan and West Germany. The Soviet Union, China and Israel are not signatories.

Non-proliferation advocates say Third World nations have to go to these 10 suppliers for reliable and usable technology.

The MTCR has had only moderate success as a limiting force. Yet, as Webster said, it does not include `key players in today's missile and advanced technology market.

`The agreement also does not reduce the incentive or ability of Third World nations to develop ballistic missile technology on their own.'

Moreover, critics say the MTCR does not take a strong enough stand against export of so-called dual use items, such as components which could easily be transferred from a space programme to a missile programme.

For example, US officials are keeping a close eye on whether India is using technology gained in its space programme for its ballistic missile test programme. India is reportedly planning the first test launch of its Agni medium-range ICBM, said to have a 2000 km range, next month.

The MTCR is not an official treaty, and there is no ruling body to administer sanctions or controls. Each member nation must develop its own laws to control exports restricted under the MTCR.

`The only enforcement mechanism is if the CIA finds out a nation is doing something it shouldn't,' says Gary Milhollin, a former nonproliferation consultant to the Pentagon. `The MTCR is not going to stop the spread of ballistic missiles to the Middle East. It is too little, too late.'

The regime does provide for a detailed system of regulating the export of certain materials and components that could be used in ballistic, as well as cruise missiles.

Under the terms of the agreement, an envelope is established whereby there is a strong `presumption of denial' to export items capable of delivering at least a 500 kg payload to a range of at least 300 km.

According to the official text of the regime, this means member nations will generally agree

not to export `complete rocket systems (including ballistic missile system, space launch vehicles and sounding rockets) and unmanned air vehicle systems (including cruise missile systems, target drones, and reconnaissance drones)' that fall within those capability parameters.

Also not to be exported are individual rocket stages, re-entry vehicles designed for non-weapons payloads, some solid or liquid fuel rocket engines, some types of guidance sets, and arming, fuzing and firing mechanisms.

Another category of items is established where exports are more readily permitted if it is determined on a case-by-case basis that the components will not be used for ballistic or cruise missiles.

These include lightweight turbojet and turbofan engines, ramjet and scramjet engines, some liquid fuel control systems and propellants.

This complex regime has yet to stop some key nations, however. For example, recent reports indicate that Egypt is co-operating with Argentina and Iraq on the development of the SS-1C Condor II with a range of up to 1000 km.

The Condor programme has experts around the world worried. It is a potential threat to Israel--but the UK is also worried that Argentina could use it against the Falklands (Malvinas).

A report in the Argentinas newspaper suggests however that Israel is pressing Argentina to end the relationship with Cairo, in return for which Israel will deliver 12 promised A-4Q aircraft.

In response to international pressure, the West German Government has been taking a closer look at missile technology exports. But many in the US Congress are critical.

Rep. Howard Berman alleged recently that West Germany's largest aerospace firm Messerschmitt-BoÿAE4lkow-Blohm (MBB) has played a key role in Condor II and that Fiat's SNIA-BPD is also contributing components. `There is also reliable evidence that MBB is participating in a separate Iraqi missile project in the northern city of Mosul, the suspected site of Iraqi chemical weapons development,' he said.

Berman, and a bipartisan coalition of four other Congressman, have introduced legislation to strengthen the MTCR.

The legislation would require the President to impose at least one of the following sanctions on any company he finds in violation of the MTCR: denial of US export licenses; denial of US Government contracts; and / or a ban on imports into the USA.

`Perhaps our allies have done as much as they politically can. But by enacting this legislation, the United States can do more. Companies engaged in these projects will be forced to forego

their business with us if they continue to pursue the profit gained by this extremely risky and ill-advised business,' says Berman.

--

--

[Page: S5445]

From International Defense Review, 1989

[FROM INTERNATIONAL DEFENSE REVIEW, 1989]

Indian IRBM Details Revealed

For the first time, India has officially admitted the existence of the Agni surface-to-surface IRBM. IDR understands that its first firing will take place shortly from the Interim Test Range at Baliapal in Onssa State. Agni (Fire) is the biggest and longest-range missile being developed by the Defense Research & Development Laboratory (DRDL) at Hyderabad under the Integrated Guided Missile Program launched in 1983. Its design team was headed by Dr. A.P.J. Abdul Kalam, Director of DRDL, who had also been in charge of the earlier Prithvi program (see IDR 5/1988 p. 478).

Significantly, the first stage of Agni is the solid-propellant first stage of the SLV-3 satellite launch vehicle. The four-stage SLV-3 was also designed by Dr. Abdul Kalam, while at the Indian Space Research Organisation (ISRO). It has a three-segment polybutadene acrylic acid acrylonitrile (PBAN) solid-propellant charge. The 10m-long. 1m-diameter stage weighs 10,000 kg. While its thrust and burning time are not given, the thrust should be over 20t, since the complete SLV-3 weighed 17t at lift-off.

For the first time, India has thus used a component of its purely civilian space research program for a military application. (Under former Chairman Dr. Satish Dhawan, ISRO had consistently opposed any military application for its SLV-3 or any other product).

The Second of Agni's two stages has a storable liquid propulsion system. While the 250km-range Prithvi, first test-fired on 25 February 1988, has a low-energy propellant combination of RFNA and xylidene and the same could also very likely be used on the Agni upper stage. India also has the N2O4/UDMH technology in hand.

Press accounts state that the Agni will have a `twin-microprocessor-based missile-guidance computer with interrupt-driven real-time software'. Design work on the control and guidance system was also undertaken at DRDL, with collaboration from researchers at the Indian Institute of Science, Bangalore, under the Joint Advanced Technology Program. The earlier Prithvi has an advanced inertial navigation and guidance system, as well as an onboard mission controller.

The Agni, with a range probably exceeding 2,000 km. is expected to have a conventional warhead. While no details have been released, the warhead is likely to be extremely heavy, and there may be various types for deep strikes against high-value targets.

--

--

From Hamburg Der Spiegel, Mar. 27, 1989

[FROM HAMBURG DER SPIEGEL, MAR. 27, 1989]

Firms Involved in Iraq Missile Production

Iraq is building its own missile production. Technology and know-how for the research center were delivered by German companies.

On 5 August 1987 at 1602 telex machine `298078 Con MIK' starts to rattle. Telex number 3368 goes `to Gipro site office' and starts with a call for help:

`Since at the moment it is hardly possible to reach a competent person at project Saad 16,' the `very esteemed gentleman' Nitsche and Isele are asked to convey the `list of training companies with the appertaining dates of the courses.'

The telex line belongs to the Vienna Consultco Limited. In Al Thakafiya Street [spelling as published] in the north of the Iraqi university town of Mosul this Austrian construction company has a joint office with the Bielefelder Gildemeister Projecta Limited (Gipro).

Gipro is the general contractor for Saad 16--a project for which `laboratories and workshops comparable with facilities for technical colleges and test institutes' are being built, according to the Gipro management.

The comparison is misleading; In reality Saad 16 is the currently largest and most secret armament project in Iraq. Documents and eyewitness reports available to DER SPIEGEL are substantiating the suspicion: The facilities being constructed on the northern rim of the town on the Tigris River are certainly not the harmless institute that `is to be operated in cooperation with Mosul University,' as the Gipro management claims.

Telex number 3368 proves: German companies are involved much more in the project than has been assumed to date.

Dozens of FRG companies have delivered technology and know-how for the `Technology Center,' in which--according to intelligence information--missiles and chemical weapons are to be developed. The Iraqis are basing their work on preliminary work done by Egypt and

Argentina--the Condor 2 missile project. Its goal is the development of a precise intermediate-range missile whose range could cover the entire Middle East.

The beneficiary of FRG business efficiency is a dictatorship, which is striving for regional supremacy after 8 years of war in the Gulf, which tried to break the resistance of its own Kurdish minority in the north of the country with cowardly poison gas attacks in violation to international law, and which has recently been accused by the human rights organization Amnesty International of systematically torturing even children.

A structural diagram from the documents of a company involved in Saad 16, which was published in the previous edition of the Austrain magazine PROFIL, proves FRG influence on the DMI.5-billion project: According to this, 5 years ago the state-owned Iraqi company Saad General Establishment contracted Gildemeister Projecta in contract number 16/1/84 as the general contractor for `technology' and Consultco as subcontractor for the `civilian parts' of the project--overground workings and foundation work as well as transportation and insurance.

The most important deliverer of technology of the planning company Gipro became Messerschmidt-Boelkow-Blohm (MBB), a Munich aircraft company, which has been developing various kinds of flying armament for decades--from the Tornado fighter bomber to the Fighter 90, from antitank missiles to large-scale missiles. MBB is participating in the Mosul deal with DM77 million. The people from Munich and Bielefeld hired several other subcontractors. `As a German company,' the Gipro management assured DER SPIEGEL, `we tried to contract German producers for the delivery of equipment if it was possible in any way.' Obviously with success.

From the German BP to Carl Zeiss, from Degussa to Tesa--renowned companies are working for the Saad 16 project: 38 FRG companies are dealing with a comprehensive training program for Iraqi experts, which are to be trained in operating chemical laboratories and electronics workshops, wind tunnels, and physical test facilities.

The list of contractors in a monthly Gipro report also contains companies which have repeatedly been suspected of dubious arms deals.

Fritz Werner Industrial Equipment Limited provided a universal drilling machine. The company from Geisenheim, which is 10-percent state owned has been conducting profitable arms deals for years, also with Iran, Iraq's enemy in the Gulf war.

By far, the most comprehensive monthly delivery in July 1987 was ordered at Karl Kolb Company. The public prosecutor is currently investigating this laboratory equipment company because of the suspicion that the Hesse firm delivered poison gas facilities to Iraq.

The Rheinmetall cannon production company is involved via its subsidiary Aviatest, providing two wind tunnels; and with the Mauser gun manufacturer another FRG arms producer is listed in Gipro's order books.

There is even a direct missile trace from MBB to Iraq, which has now been retraced by PROFIL journalists Herbert Langsner and Alan George. The Munich company has been involved in the Argentine Condor I Project since 1979, which first was allegedly destined to build a weather research rocket. Soon it turned into a `multipurpose' missile.

Not quite 2 years ago, when it had long become clear that the Argentines were working on a military missile program, MBB had to cease cooperation upon pressure by Bonn. MBB engineers, which were hired by partners of the Munich company in the Condor project, remained in business--and with them the technical know-how of the Bavarians.

Insiders believe that the old Condor crew are now providing their technical knowledge to Iraq for serial production of those weapons that are developed near Mosul. Europeans report from Baghdad that a top secret production facility is currently being established somewhere in northern Iraq.

Gildemeister is able to present a clearance certificate for the dubious deals--clearance number 48422 of the Federal Economic Office.

`For presentation to the customs authorities' the Federal Economic Office attests to Gildemeister Projecta Limited that `according to current rules, machinery, electrical equipment, regulation, measuring, and testing instruments for a research, development, and training institute with eight main sections, name: Project Saad 16, do not need an export permission.'

The subcontractors also stress that their deliveries were legal. Peter Resz Czynski of the Hamburg Koerber AG assures that Blohm company, a member of the concern, has in no way delivered computer-controlled grinding facilities, which are subject to export permission, to Iraq. In 1985 and 1986 three standard grinding machines, type HFF 512 and Hanseat 11, `older model' (Resz czynsik) were ordered. Operators were trained for these machines in Germany and Iraq. `Everything completely harmless,' Resz Czynski says.

MBB spokesman Udo Philipp also wants to give this impression. Testing centers `for surface analysis' and calibration labs were sent to Iraq. However, Philipp admits, `something like this' can `also be used for military purposes.'

Gipro, too, does not want to absolutely exclude the possibility that the technology center, all of which will be handed over to Iraq `by mid-1989,' could be used militarily: `In general, all universal products and facilities can often be used for several purposes.'

However, what eyewitnesses have seen on site and what is proved by construction plans, goes far beyond the mere possibility of military utilization. Saad 16, located in a valley 1 km off the transit road to Sachu [spelling as published], is strictly guarded with electronics and video cameras by the military.

The more than 3.3-km-long fence is equipped with watchtowers, the main entrance is equipped with quick-action barriers. Mercedes Unimog vehicles, which are equipped with

radar antennas, are patrolling between the buildings. Bungalows for managers, a first-aid station, a fire brigade, and an independent energy supply stress the isolation from outside.

Camouflage and bunkers emphasize the military character of the facility, whose center is a more than 100-meter-long hall for the construction of prototypes. In the northern part of the area a 120-meter-long subterranean shooting gallery--4 meters wide and 4 meters high--was tunneled into the mountain. The walls, insulated with noise-proof naps, look as if a chicken farm had donated its annual stock of egg cartons to this.

In a side valley to the west, there are 28 so-called resistance buildings, which have particularly stable roofs that are slanting down on one side and three stable walls, the fourth wall, on the other hand, is made only of wood. Thus, in case of laboratory accidents, the pressure of an explosion is purposefully directed into a harmless direction. Most of the 58 chemical laboratories are located there.

Adjacent, protected by walls on all sides, there is a missile test stand with control rooms and climate chambers. The buildings with measuring laboratories (from MBB), which are close by, are also protected by a 150-meter-long wall against the chemical laboratories.

Several times the speed of sound can be stimulated in the 12-meter-long wind tunnels, and the 27 electronics laboratories have a nonechoing room built by Siemens.

`Only if one is inside this room,' an insider says ironically, `can one overlook that this is a military project.'

--

--

[Page: S5446]

From the Washington Post, May 3, 1989

[FROM THE WASHINGTON POST, MAY 3, 1989]

U.S. Firms Helped Iraq Gain Ability to Make Missiles, Officials Say

(BY DAVID B. OTTAY)

Before U.S. export restrictions in 1987, some American companies sold equipment that helped Iraq build a military-industrial complex capable of developing missiles, U.S. officials disclosed yesterday.

`We're aware of the fact that American technology was sold to the Saad 16 complex,' said a

U.S. official, who described the facility near Mosul in northern Iraq as `a defense-industrial establishment' involved in engineering and manufacturing missiles, planes and other military items.

The disclosure came amid a U.S. diplomatic drive to get West European nations to crack down on companies selling technology and expertise to Third World nations seeking to build missiles or chemical and biological warfare plants.

The United States imposed a ban in 1980 on the sale by U.S. companies of all military equipment and so-called `dual-use' items--those with civilian or military application--to Iraq and Iran during their 1980-88 Persian Gulf war.

Whether the American equipment at the Saad 16 complex were `dual-use' items was not immediately clear. But U.S. officials insisted no U.S. export laws were violated by the American firms.

The officials refused to disclose the firms' names, but said the equipment provided to the Iraqis was `relevant to missile production' and sold `directly or indirectly' to the Saad 16 complex.

A spokesman for Hewlett-Packard Co., the California computer firm, said in a telephone conversation last night in 1985-86, the company had delivered `electronic equipment of various types' to the German company, Messerschmitt-Boelkow-Blohm (MBB), under a license authorized by the German government and the U.S. Department of Commerce.

`The end-user on the license was shown as the State Organization for Technical Industries-Saad General Establishment,' Hewlett-Packard spokesman Richard Harmon said. He added that the Iraqi organization was described as `an institute for higher learning.'

He added, `In summary, anything delivered to Saad was done through MBB and subject to a specific authorization.'

A spokesman for another U.S. firm, Wiltron Co., in Morgan Hill, Calif., which makes electronic test and measuring instruments, confirmed that in early 1987 Wiltron had sold a $50,000 `'scalar analyzer system' to its subsidiary in Germany, which in turn provided it to MBB for the Saad complex. Peter Chalfont said the firm had obtained a Commerce Department license indicating that the Saad site was the end user.

In testimony yesterday before a Senate Armed Services subcommittee, W. Seth Carus, an expert on missile proliferation at the Washington Institute for Near East Policy, referred to recent reports in West German and Austrian media that U.S. companies `may have supplied 40 percent' of the equipment for the Saad 16 complex.

State Department officials confirmed U.S. involvement in building the complex but said `it was not clear' on what the 40 percent estimate was based.

They said it was legal for U.S.
companies to obtain export licenses to sell certain high-tech items abroad until restrictions were imposed by the Missile Technology Control Regime (MTCR) signed by the United States, Canada, France, West Germany, Italy, Japan, and Britain in April 1987.

The regime bans export of missiles or their components and any technology or equipment related to the production of ballistic and cruise missiles capable of delivering a payload of at least 500 kilograms to a distance of 300 kilometers or more.

`They [U.S. firms] obtained export licenses and nothing illegal was done,' one U.S. official said.

However, congressional sources said that in 1985, two years before it formally committed the U.S. to the MTCR, the Reagan administration had begun adhering informally to the regime. They questioned whether licenses should have been issued in the 1985-87 period.

U.S. officials said while the United States had sought to adhere to the MTCR terms since March 1985, the Commerce Department had no legal basis for halting such sales as those involved in the Saad 16 complex until the regime went into effect in 1987.

The officials said they were unaware of any U.S. sales to the Iraqi complex since April 1987.

Carus said that in addition to MBB, West German and Austrian news reports had identified a German-Austrian company, Gildemeister, as the principal builder of the Saad 16 complex. He said the reports named two U.S. firms besides Hewlett-Packard and Wiltron which allegedly provided equipment to it.

The two others were Tektronix Inc. of Beaverton, Ore., a manufacturer of computer graphics terminals and measuring instruments, and Scientific-Atlanta Inc. of Atlanta, which makes telecommunications and satellite ground station equipment.

A spokesman for Tektronix said yesterday the firm was searching records for sales to Iraq or the Gildemeister firm. A person at Scientific-Atlanta said offices were closed for the day.

Carus testified that `a variety' of West German firms were involved in building the Saad 16 complex, in which Iraq had invested more than $200 million. He described it as a research and development facility to build `a variety of different types of missiles, including both ballistic and cruise missiles.'

But U.S. officials said they thought the complex would also be involved in the production of various weapons, including missiles.

The West German magazine Stern said Hewlett-Packard had provided computers for more than 50 laboratories in the complex.

--

--

[Page: S5447]

From the London Financial Times, 12 Apr. 1989

[FROM THE LONDON FINANCIAL TIMES, 12 APR. 1989]

Prosecutor Launches Inquiry into MBB's Condor Missile Links

(BY SIMON HENDERSON AND DAVID GOODHART IN BONN)

The Munich city prosecutor is investigating reports that a subsidiary of the West German aerospace concern Messerschmitt-BoÿAE4lkow-Blohm (MBB) broke export control laws by delivering parts for a DM70m missile system to Iraq.

MBB would make no comment on the allegations but did confirm yesterday that its subsidiary MBB-Transtechnica was being investigated.

Western officials say that a group of 16 companies in Europe, known as the Consen Group, is using West German rocket designers and other specialist to help Egypt, Argentina and Iraq develop a 1,000km-range missile capable of carrying nuclear and chemical warheads. The companies are registered in Monaco, Switzerland, Austria, West Germany, and Argentina.

MBB is one of six big European companies named in documents as being `most important in co-operation and as sub-contractors'.

Western officials expressed concern at the activities of the Consen Group, which they say is acting as a `European missile management company', buying in expertise for the missile, the Condor II, particularly on propellants and guidance systems, using predominantly West German engineers.

One Consen company, the IFAT Corporation of Zug, Switzerland, was quoted last year in US court documents as sending more than $1m to an Egyptian-born American citizen now awaiting trial in California charged with conspiring to export missile parts to Egypt without a license.

Another company in the group, Desintec, also of Zug, attempted to buy missile nozzles from the US in 1984 for the Argentine Air Force.

Western officials describe the Condor II as a two-stage, solid fuel rocket. They say that it was due to be tested in Argentina in October but was delayed by technical problems. Development is being conducted in parallel in both Egypt and Argentina, with Iraq funding part of the

Egyptian programme. Deployment is not expected until 1992.

Washington and London are leading a diplomatic effort to stop the development of the missile. In 1987 they agreed with other Western European nations and Japan on a Missile Technology Control Regime which tightened export controls on sensitive items. The UK is worried that the Condor II will have the range and accuracy to hit the airfield on the Falklands from Argentina. The main US concern is the impact in the Middle East.

Israel, which has already test-fired its own long-range missile, the Jericho II, is developing its own anti-missile missile. Western intelligence officials credit the Israeli secret service, Mossad, with causing three explosions in Europe seeking to break up the Consen operation, including one last May when the car of Consen's general manager was blown up on the French Riviera.

MBB has admitted helping Argentina develop an earlier missile, Condor I, but says it is not involved in Condor II. But its subsidiary MBB Transtechnica is a sub-contractor to another West German company, Gildemeister, on a project in Iraq known as Saad 16. Last week West German investigators seized files from Gildemeister.

--

--

From Mid East Markets (MEM), Apr. 17, 1989

[FROM MID EAST MARKETS (MEM), APR. 17, 1989]

Condor II: An Issue to Test US-Egypt Ties

A reference to a new missile in MEM on February 6 1989 set off a whole series of articles elsewhere and brought into the open a simmering diplomatic row. MEM understands that when President Mubarak was in Washington he was asked about Egypt's intentions concerning the missile which it is building with Argentina's technical help and Iraqi finance. The Israeli Prime Minister, Yitzak Shamir, also asked the US what was going on, and last week the Israeli Foreign Minister, Moshe Arens, asked the West German Defence Minister, Rupert Scholz, about the involvement of West German companies.

Although still to be flight-tested the Condor II missile is state-of-the-art. It has two solid-fuel stages and will fly a 700kg payload over 1000km. It is likely to have terminal guidance to make it accurate to within 100m. Existing missiles in Arab arsenals are antiquated by comparison and hardly accurate enough to hit even a city. The Soviet-supplied Scud is a version of the Nazi V-2 missile from World War Two. It has a single-stage liquid-fuelled motor which means that the missile must be accompanied by tankers containing highly volatile fuel to top up the missile.

The new Iraqi missiles--Al Hussein (range 650km) and Al-Abbas (range 860km)--are merely enhanced Scuds with a longer range obtained by using less warhead and more fuel. The Saudi missiles obtained from China are also liquid-fuelled and probably unserviceable most of the time: imagine storing and handling the fuming nitric acid and industrial alcohol fuels in desert temperatures of over 40«C!

CONSEN

Argentina and Egypt agreed to cooperate on Condor II in the early 1980s, with Iraq helping Egypt under a secret exchange agreement believed to be known as Badr 2000. All three countries have been helped by a mysterious collection of European companies known as the Consen Group. One Consen company, the Ifat Corporation, financed an attempt to buy missile technology last year in the US for which an Egyptian-born US citizen is awaiting trial. The man, Abdel Kader Helmy, is described by his lawyer as being a childhood friend of the Egyptian Defence Minister, Abdel Halim Abu Ghazala, who is also implicated in the attempt to break US export laws.

Another Consen company, Desintec, tried to buy rocket nozzles for the Condor II from a California company in 1984. They were to be sent to the Argentine air force. Plans for the nozzles are shown here, including a cross-section of the missile with its internal star shape to ensure best burning of the propellant. (Consen declined to comment on its involvement with Condor II.) [Graphs not reproducible.]

The Consen Group has used West German rocket engineers and other specialists to help Egypt and Argentina, and may also have helped Iraq in its Scud enhancement programme, which tilted the balance in the Gulf war when the modified missiles started to rain down on Tehran last year.

The Egyptian missile production facilities are being readied at Military Factory 90 in the Abu Zabaal area outside Cairo. This is also where reports claim that Egypt has a chemical weapons plant, and where Field Marshal Abu Ghazala wants to build a production line for the US Abrams tank.

Iraq's Scud modification plant is thought to be at the Sa'ad 16 complex near Mosul, although there is another programme, designated Project 395, which is considered more closely linked to the Condor II. There have been direct contacts between the Iraqi Technical Corps for Special Projects (Teco), the organisation responsible for Project 395, and the Argentine Institute of Aeronautical and Space Research, which co-ordinates work on the Condor. Teco, which also drafts experts into oilfield work and other non-military areas, comes under the direct authority of President Saddam Hussein, although it is run by his son-in-law, the Minister for Industry and Military Industrialisation, Brig. Hussein Kamel Majid.

During recent weeks West German officials have started investigating the activities of a subsidiary of the aerospace giant, Messerschmitt-Bolkow-Blohm (MBB) which is involved with another West German company, Gildermeister Projecta, at Sa'ad 16 in Iraq. Yet other West German companies are linked to Military Factory 90 in Egypt.

--

Substance to Nuclear Allegations Against Iraq

Although the US Government was annoyed when Israeli officials leaked reports that Iraq was trying to develop a nuclear weapon, the denials of the more knowledgeable officials were more qualified than much of the press noticed.

The assertion of the Washington Post was that Israeli officials thought that Iraq was between two and five years from making an atomic bomb. The newspaper also claimed that the device was intended to put on the Condor II missile being developed in conjunction with Egypt and Argentina (see separate story).

The more conventional estimate for Iraq achieving membership of the nuclear club is 10 years. Nuclear status might have been reached
eight years ago, but the destruction caused by an Israeli bombing raid on the Tuwaitha nuclear centre in 1981 was so total that the possibility of using a research reactor to produce plutonium had to be abandoned.

Present concern about Iraq is based on increasing efforts that the country is trying to build a uranium enrichment plant using the centrifuge principle. Highly enriched uranium is an alternative weapon material to plutonium, but can only be produced using an elaborate and sophisticated industrial plant. Western officials have noted over the years the number of Iraqi students being sent abroad to study the two basic principles of uranium enrichment diffusion and centrifuges. Recently, they say, it became clear that Iraq had opted for the centrifuge route in which uranium, in a gaseous form, is pumped through hundreds of linked high-speed centrifuges.

USA officials confirm that $400,000 worth of vacuum pumps destined for Iraq, and suspected to be destined for a nuclear plant, were recently stopped from being shipped. What had caught the attention of US agents was that the pumps in question were designed for use with vegetable oil but were being ordered by the State Company for Oil Projects, Iraq's main oil equipment purchase body. When asked to explain the order by the US, Iraqi officials were not able to give an adequate answer.

There are very few centrifuge plants in the world, and most produce low enriched uranium for power stations. The only one in the developing world is in Pakistan which, despite denials, has been producing enough highly enriched uranium to make between four and six bombs a year for the last two years. The Pakistan plant uses techniques similar to those developed by the Urenco consortium of the UK, the Netherlands and West Germany to produce uranium for their power stations.

Pakistan took 10 years to build and start operating its plant, overcoming foreign export controls and technical difficulties, hence the time frame for Iraq. The difference, western officials say, is that Iraq is putting considerably more money and effort into its buying

programme. Maybe the Israelis were right after all.

--

[Page: S5448]

Saudi Concern Over Chemical Claim

The Saudi Government is showing its usual sensitivity: this time on the delicate subject of chemical weapons. A fairly innocuous reference in a long series on the subject in the Chicago Tribune elicited from Saudi officials a denial that was considerably longer than the original claim.

The Chicago Tribune on April 4 listed 25 countries it said were known or suspected by US intelligence officials to possess or be developing chemical weapons. The Middle East countries included were Israel, Egypt, Libya, Syria, Iran and Iraq. The Tribune then added: `Suspected of being in the next echelon of those who have an interest in an possible access to resources needed to build chemical weapons are Saudi Arabia, Pakistan, India, Thailand, Brazil, Argentina, Chile and Peru, according to these sources.'

This was the sole reference to Saudi Arabia in a cluster of articles and background pieces on chemical warfare published by the Tribune and totalling more than 10,000 words. But it was enough to prompt a statement from the official Saudi Press Agency that the kingdom had issued a categorical denial of the report's allegation that it was a country with the potential to produce chemical weapons.

`A responsible Saudi source told the Saudi Press Agency here today that what had been published by the Chicago Tribune is merely baseless and fabricated,' the agency said in a report issued on April 6. The kingdom had declared, and again reiterated, its opposition to the production of chemical weapons. The agency's report then drew attention to the kingdom's recent ratification of the Nuclear Non-Proliferation Treaty.

This was the important point, because the denial was as much aimed at scotching reports in the US press that Riyadh had agreed to help Iraq underwrite the financial costs of refurbishing its Osirak nuclear facilities at Tuwaitha outside Baghdad--bombed by Israel in 1981--as at replying to vague assertions that the kingdom possessed some potential for chemical weapons manufacture.

The episode is also instructive because it underscores the strong sensitivity of the Saudis on the delicate issue of unorthodox weapons of any kind. Having received their medium-range East Wind missiles from China, the Saudis are taking pains to make it clear to the US that there is no question of them being equipped with anything other than conventional warheads.

UNDERSTANDING WITH ISRAEL

For more than a year the US has been engaged in discreet but parallel talks with the Saudis and the Israelis aimed at preventing either a pre-emptive strike--presumably by Israel--or any wedding of chemical weaponry to existing missiles--presumably with regard to the Saudis.
(Western intelligence officials say that the Chinese missiles delivered to the kingdom have had their range reduced to between 1200-1400 km. In Chinese service the missile carried a nuclear warhead; indeed it was the missile used to test China's fourth nuclear bomb, the design of which was subsequently passed on to the Pakistanis, the officials say.)

For the Saudis, much is at stake. The kingdom is currently seeking assurances from the Bush Administration that the US will agree to a major sale of some 315 General Dynamics Land Systems Divison M1-A1 main battle tanks, together with between 50 and 100 replacement aircraft for its aging fleet of 110 F-5 reconnaissance aircraft and interceptors. The Saudis are also seeking to secure the tracked Multiple Launch Rocket systems (MLRS) battlefield rocket and 2,000 of the Mark-84 aerial bombs. US companies concerned with the potential sales are engaged in a major campaign to inform Congress of the importance of these arms deals. They are basing their case not so much on Saudi Arabia's defence needs, but on the economic costs to the US if these deals, which are potentially worth several billion dollars, fail to go through.

ADMINISTRATION'S VIEW

The Bush Administration--and in particular the new Director of Policy Planning at the State Department, Dennis Ross--remains particularly concerned about the growing political acceptability of chemical weapons in the Middle East following Iraq's successful use of chemical weapons in both its campaigns against Iran and in its represson of Iraqi Kurds. The Saudis therefore need to counter this impression if they are to secure the weapons systems they favour.

US defence industry officials have told MEM that the Saudis are again looking to the US for military aircraft, because it is complicated enough having to introduce one totally unfamiliar aircraft into their inventory--the British Aerospace Tornado--and they would feel comfortable if the replacement for their F-5s were to come from the US.

Ideally, they would like a further 50 McDonnell Douglas F-15 interceptors, which could then be incorporated into the Saudi arsenal with relative ease as the Royal Saudi Air Force already possesses 60 F-15s. Failing that, they would choose to replace their 110 F-5s on a one-for-one basis with General Dynamics F-16s or McDonnell Douglas F / A-18s.

--

--

From the New York Times, Feb. 23, 1989

[FROM THE NEW YORK TIMES, FEB. 23, 1989]

Those Chinese Missiles

(BY WILLIAM SAFIRE)

Washington.--If you keep tugging on a loose thread, the Hong Kong tailors warn, your whole suit could fall apart.

Here's a loose thread: In Chicago, consular representatives of the People's Republic of China are now forbidden to travel in their consular cars outside the environs of Cool County. Public transportation, yes; private cars, no.

Tug gently on that stray fact. Why can't these Chinese diplomats travel in their own vehicles to catch whatever is playing in Peoria? What are we afraid they may see?

Nothing. It' part of a proper tit-for-tat policy, begun last Oct. 24, reciprocating for a seemingly weird policy of the Chinese Government. For some reason, American diplomats in Shenyang, a large city between Beijing and the border of North Korea, are forbidden to drive unaccompanied to see what's happening along the border.

Tug again. What might our officials in China want to eyeball, and perhaps photograph or ask questions about, along that road that has the Chinese so sensitive? We know from our statellites that no top-secret military or research installaiton is hidden there.

The road we cannot travel unaccompanied runs from Beijing alongside the railroad line to Dandong, on the Yalu River. That is where the train crosses into North Korea, delivering missile-length boxes first fo Sinuiju and later to the port of Nampo.

Keep tugging. These are the ports from which North Korea exports missiles and missile-support electronics to Iran, Libya and Syria. Some American officials, whose suspicions are pooh-poohed in our State Department, believe that these IRBM's are built in China, sent by rail to North Korea and transshipped to the Middle East terrorist nations.

A company of great interest to international missile-watchers is Poly-technology, which is affiliated with Citic, the Chinese trading-banking-industrial development combine. Polytech is said to be staffed by the sons and daughters of China's leading political families, whose prestigious rice bowls will be hard to break.

The P.R.C. officially denies selling
Silkworm missiles to Iran, or any missiles to Libya, Iraq or Syria that might be used to deliver locally produced poison-gas warheads. The Chinese do not deny--indeed, proudly assert--a deal made last year to supply Saudi Arabia with its CSS-2 East Wind missiles, with a range up to 2,000 miles.

That Chinese-Saudi missile deal stunned Washington, which mistakenly thought that neither Beijing nor Riyadh would alter the balance of power in the Middle East without at least

checking with the U.S.

Frank Carlucci, then Secretary of Defense, was dispatched to the Chinese capital last September to seek assurances that no missilery would be sold to the Terrorist Club.

Now here is where at least some of the suit falls apart, Secretary Carlucci, operating without Presidential supervision or senatorial oversight, may have thought he had assurances from the Chinese to stop the dangerous spread of missiles, in return for secret promises to more U.S. technical aid. He passed the word around pre-election Washington: Not to worry.

But the Chinese are proud to compete with superpowers on rocketry, and are the subtlest negotiators. They may be keeping their word, if such was given, not to export missiles to the Middle East--but that would not include weaponry to North Korea, which may be falsely promising not to transship from Nampo. Equally important, the Chinese leadership may believe it is free to sell the equipment and knowhow to any nation seeking to make missle systems on its own soil.

The embarrasing question President Bush will hate to ask, when he visits China this weekend, is this: Is a Chinese company on the verge of a deal to supply Colonel Qadhafi, or anyone, with the technical package needed not only to produce but to launch and guide missiles?

Mr. Bush should not put his personal inclination to be a polite visitor above America's national interest. He can hope, with delicacy but with firmness, that Chinese missile support systems--using such hot stuff as cable digital communications, pulse width modulation or microcomputer technology--are not for sale to dictators endangering world peace.

Deng Xiaoping will catch his drift: without a credible and reportable agreement to restrict missile delivery systems, China can expect no further U.S. technological cooperation.

With that understood, the two leaders can clink glasses, reminisce, pose in front of the Great Wall and otherwise pre-empt the visit of Mr. Gorbachev.

--

--

[Page: S5449]

U.S. Prods IAEA About Safeguards for North Korean Nuclear Plants

(BY ANN MACLACHLAN)

The U.S. complained to the February meeting of the IAEA Board of Governors about North Korea's delay in submitting its nuclear facilities to agency safeguards. The Peoples Democratic Republic of Korea (PDRK) signed and ratified the Nuclear Nonproliferation Treaty (NPT) several years ago in anticipation of a nuclear plant deal with the USSR (Nucleonics Week, 2 Jan. '86, 7) However since that action, the Asian nation has neither consummated the purchase of Soviet PWRs nor concluded the required safeguards agreements with the IAEA.

The U.S. and even more so the Republic of Korea which is still technically at war with the PDRK, are doubly concerned because satellite photographs have shown that North Korea is operating a magnox reactor. North Korea, which does not maintain diplomatic relations with the U.S., is also believed to be building a reprocessing plant near the magnox reactor.

A senior IAEA official said that following the U.S. complaint, the North Koreans were `reminded' of their obligation under the NPT to conclude a general safeguards agreement and facility attachments covering any nuclear installations containing material that comes under * * * safeguards. The U.S., said a well-informed source, has said it will take its real complaint about the two clandestine facilities formally to the IAEA board, satellite photos included, if the North Koreans continue to foot-drag in concluding the safeguard agreement.

The satellite photos show, the source said, that Pyongyang has set up a virtual replica of the 60-MW Calder Hall magnox reactor, Britain's first, which started up in 1956. The North Koreans, he said, appear to have built a reactor themselves based on the declassified design of Calder Hall. They also may have purified indigenously the graphite used as moderator block, but the uranium is assumed to be imported, the source said. The reactor started operating a year and a half ago, he said.

The reprocessing plant is observed to be under construction across a river in central North Korea.

Not surprisingly, the facilities have caused consternation across the border in South Korea, which tried to buy a reprocessing plant 10 years ago from France but was stymied by stiffening of French nonproliferation policy.

The Calder Hall reactor is still operating at British Nuclear Fuel's Windscale works, producing electricity and materials for the U.K. nuclear defense program.

- [End insert]

END